TECHNICAL REPORT

NORTH CAROLINA AIRPORT SYSTEM PLAN UPDATE

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TABLE OF CONTENTS

Chapter 1 – System Goals and Performance Measures

1.0 Introduction 1-1

1.1 System Plan Overview 1-1

1.1.1 System Plan Approach and Process 1-3

1.1.2 Project Steering Committee 1-4

1.2 System Vision, Goals, & Performance Measures 1-5

1.2.1 State Plan Vision 1-5

1.2.2 System Plan Goals & Goal Categories 1-5

1.2.3 System Plan Performance Measures 1-6

Chapter 2 – Inventory of Existing Facilities

2.0 Introduction 2-1

2.1 Inventory Process 2-1

2.2 Existing Airport System 2-2

2.2.1 National Plan of Integrated Airport System (NPIAS) 2-2

2.2.2 FAA ASSET 2-4

2.2.3 Non-NPIAS Airports 2-6

2.3 Airside Facility Inventory 2-9

2.3.1 Runways 2-9

2.3.2 Taxiways 2-10

2.3.3 Navigational Aids and Instrument Approach Capabilities 2-10

2.4 Landside Facilities and Aviation Services 2-12

2.4.1 Accessibility 2-12

2.4.2 Fuel Services 2-13

2.4.3 GA Terminal Facilities 2-13

2.4.4 Aircraft Hangars 2-13

2.5 Air Navigation 2-13

2.5.1 Airspace 2-13

2.5.2 Air Traffic Management 2-15

2.5.3 FAR Part 77 2-15

2.6 Historic Aviation Activity 2-17

2.6.1 Based Aircraft 2-17

2.6.2 Aircraft Operations 2-17

2.7 Pilot Survey....2-17
2.8 State, Local and Regional Issues....2-18
2.8.1 Land use Compatibility....2-18
2.8.2 Land Availability....2-20
2.8.3 Funding Availability....2-20
2.9 Summary....2-20

Chapter 3 – Forecasts of Aviation Demand
3.0 Introduction....3-1
3.1 National Trends....3-2
3.1.1 Commercial Service Trends....3-2
3.1.2 General Aviation Trends....3-11
3.1.3 Air Cargo Trends....3-18
3.2 North Carolina Trends....3-21
3.2.1 Commercial Aviation in North Carolina....3-21
3.2.2 General Aviation in North Carolina....3-28
3.3 North Carolina Commercial Service Airports Forecast....3-33
3.4 North Carolina General Aviation Airports Forecast....3-37
3.4.1 Based Aircraft Projections....3-38
3.4.2 Selection of Preferred Based Aircraft Projection....3-39
3.4.3 General Aviation Airport Operations Projections....3-42
3.5 Summary....3-48

Chapter 4 – Airport Groupings Update and Airport Development Planning
4.0 Background....4-1
4.1 Airport Groupings Model Update....4-2
4.2 Airport Facilities Development....4-15
4.3 Interrelationship of Several ADP Categories and Performance Measures....4-19
4.4 Summary....4-22

Chapter 5 – Current System Performance
5.0 Introduction....5-1
5.1 Goal Category: Safety....5-2

5.1.1 Percent of airports with controlling interest over the FAA design standard Runway Protection Zones (RPZs) for each runway end 5-3
5.1.2 Percent of system airports addressing wildlife issues 5-5
5.1.3 Percent of system airports with an Airport Emergency Plan 5-5
5.1.4 Percent of system airports with a General Aviation Security Plan 5-7
5.1.5 Percent of system airports that support search and rescue operations 5-8
5.1.6 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 5-9
5.1.7 Percent of system airports meeting 2013 FAA taxiway geometry standards 5-12
5.1.8 Percent of system airports meeting FAA threshold siting surface requirements 5-13
5.2 Infrastructure Health 5-17
5.2.1 Percent of system airports that meet applicable FAA runway/taxiway separation design criteria on their runways for their current ARC 5-18
5.2.2 Percent of airports meeting all mandatory items in ADP 5-19
5.2.3 Percent of Airports Meeting System Objectives in the ADP 5-23
100: Airport Approach 5-25
200: Runway Safety Area (RSA) 5-25
300: Runway Protection Zones (RPZ) 5-26
400: Pavement Condition 5-28
500: Runway Length and Width 5-31
600: Pavement Strength 5-33
700: Visual Navigational Aids (NAVAIDs) 5-35
800: Runway Edge Lighting 5-36
900: Weather Reporting Capability 5-37
1000: Standard Instrument Approach Procedures (SIAP) 5-38
1100: Taxiway 5-40
1200: Aircraft Apron 5-41
1300: General Aviation Terminal Building 5-43
1400: Taxiway and Apron Edge Lighting 5-45
1500: Airfield Signage 5-46
1600: Ground Communication 5-48
1700: Approach Lighting 5-49
1800: Aircraft Rescue & Fire Fighting (ARFF) Equipment 5-50

1900: Hangars 5-52
2000: Airfield Maintenance Equipment & Storage Building 5-54
2100: Perimeter Fencing 5-57
2200: Fuel Facilities 5-58
5.2.4 Percent of system airports that are adequately accessible in terms of signage and wayfinding 5-59
5.3 Mobility 5-60
5.3.1 Percent of population within 30 minutes of a system airport by role grouping 5-61
5.3.2 Percent of total employment/businesses within 30 minutes of a system airport 5-67
5.3.3 Percent of system airports with a published instrument approach procedure 5-69
5.3.4 Percent of population within 30 minutes of a system airport meeting business user needs (5,000' runway, jet fuel, approach (250' & 3/4m minimums), and ground transportation) 5-70
5.3.5 Percent of population within 60 minutes of a system airport with commercial airline service by at least one airline 5-70
5.3.6 Percent of system airports that provide intermodal options for their community, including public transportation interfaces at the airports 5-73
5.3.7 Percent of system airports with 24/7 fueling 5-74
5.3.8 Percent of system airports with jet fuel 5-75
5.3.9 Percent of system airports operating below 60% operational capacity 5-76
5.3.10 Percent of system airports meeting service objectives (FBO, pilot training, maintenance, charter, terminal amenities) 5-77
5.3.11 Percent of system airports that are incorporated in local comprehensive plans 5-78
5.4 Summary 5-79

Chapter 6 – Future System Performance

6.0 Introduction 6-1
6.1 Goal Category: Safety 6-2
6.1.1 Percent of airports with controlling interest over the FAA design standard Runway Protection Zones (RPZs) for each runway end 6-3
6.1.2 Percent of system airports addressing wildlife issues 6-7
6.1.3 Percent of system airports with an Airport Emergency Plan 6-7

6.1.4 Percent of system airports with a General Aviation Security Plan.....6-8
6.1.5 Percent of system airports that support search and rescue operations..... 6-9
6.1.6 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 6-10
6.1.7 Percent of system airports meeting 2013 FAA taxiway geometry standards..... 6-14
6.1.8 Percent of system airports meeting FAA threshold siting surface requirements..... 6-15
6.2 Goal Category: Infrastructure Health.....6-16
6.2.1 Percent of system airports that meet applicable FAA runway/taxiway separation design criteria on their runways for their current ARC 6-16
6.2.2 Percent of airports meeting all mandatory items in ADP..... 6-19
6.2.3 Percent of Airports Meeting System Objectives in the ADP..... 6-21
100: Airport Approach 6-26
200: Runway Safety Area (RSA) 6-26
300: Runway Protection Zones (RPZ) 6-29
400: Pavement Condition 6-30
500: Runway Length and Width 6-32
600: Pavement Strength 6-33
700: Visual Navigational Aids (NAVAIDs) 6-34
800: Runway Edge Lighting 6-35
900: Weather Reporting Capability 6-35
1000: Standard Instrument Approach Procedures (SIAP)..6-36
1100: Parallel Taxiway 6-37
1200: Aircraft Apron 6-39
1300: General Aviation Terminal Building 6-40
1400: Taxiway and Apron Edge Lighting.....6-41
1500: Airfield Signage 6-41
1600: Ground Communication 6-42
1700: Approach Lighting 6-42
1800: Aircraft Rescue & Fire Fighting (ARFF) Equipment...6-43
1900: Hangars 6-44
2000: Airfield Maintenance Equipment & Storage Building.....6-46
2100: Perimeter Fencing 6-47
2200: Fuel Facilities 6-47

6.2.4 Percent of system airports that are adequately accessible in terms of signage and wayfinding 6-48

6.3 Goal Category: Mobility 6-48

6.3.1 Percent of population within 30 minutes of a system airport by role grouping 6-49

6.3.2 Percent of total employment/businesses within 30 minutes of a system airport 6-60

6.3.3 Percent of system airports with a published instrument approach procedure 6-62

6.3.4 Percent of population within 30 minutes of a system airport meeting business user needs (5,000' runway, jet fuel, approach (250' & 3/4m minimums), and ground transportation). 6-62

6.3.5 Percent of population within 60 minutes of a system airport with commercial airline service by at least one airline. 6-65

6.3.6 Percent of system airports that provide intermodal options for their community, including public transportation interfaces at the airports 6-67

6.3.7 Percent of system airports with 24/7 fueling 6-67

6.3.8 Percent of system airports with jet fuel 6-68

6.3.9 Percent of system airports operating below 60% operational capacity 6-68

6.3.10 Percent of system airports meeting service objectives (FBO, pilot training, maintenance, charter, terminal amenities) 6-69

6.3.11 Percent of system airports that are incorporated in state and local comprehensive plans.....6-69

6.4 Summary.....6-70

Chapter 7 - Future System Recommendations and Program Implementation

7.0 Overview of Chapter 7-1

7.1 Future Airport Grouping and System Impacts..... 7-1

7.1.1 Outside Influences..... 7-2

Roadway Projects 7-2

Railway Projects 7-2

Industry Growth 7-3

State Policies and Areas of Investment 7-4

Summary of Outside Influences.....7-5

7.1.2 Airport System Accessibility and Coverage..... 7-7

Coverage of Red Counties 7-12

Relocation and Replacements 7-13

7.1.3 Consideration of Private Airports and NPIAS/ASSET Classifications 7-14
NPIAS and ASSET Eligibility Criteria 7-17
Evaluation Results 7-18
7.1.4 Future Airport Grouping Consideration 7-22
7.2 System Recommendations by Goal Category 7-23
7.3 Goal Category: Safety 7-23
7.3.1 Percent of Airports with Controlling Interest over the FAA Design Standard Runway Protection Zones (RPZs) for each runway end 7-23
7.3.2 Percent of System Airports Addressing Wildlife Issues 7-24
7.3.3 Percent of System Airports with an Airport Emergency Plan... 7-25
7.3.4 Percent of System Airports with a General Aviation Security Plan 7-26
7.3.5 Percent of System Airports that Support Search and Rescue Operations 7-26
7.3.6 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 7-27
7.3.7 Percent of System Airports Meeting 2013 FAA Taxiway Geometry Standards 7-28
7.3.8 Percent of Airports Meeting FAA Threshold Siting Surface Requirements 7-29
7.3.9 Percent of System Airports that have Adopted a FAR Part 77 Airport Height Ordinance 7-30
7.4 Infrastructure 7-31
7.4.1 Percent of System Airports that Meet Applicable FAA Runway/Taxiway Separation Design Criteria on their Runways for their Current ARC. 7-31
7.4.2 Percent of Airports that have Adopted Minimum Operating Standards and Rules and Regulations 7-32
7.4.3 Percent of Airports Meeting System Objectives in the ADP..... 7-32
100: Airport Approach 7-32
200: Runway Safety Area (RSA) 7-32
300: Runway Protection Zone (RPZ) 7-33
400: Pavement Condition 7-34
500: Runway Length and Width 7-34
600: Pavement Strength 7-35
700: Visual Navigational Aids (NAVAIDs) 7-36
800: Runway Edge Lighting 7-36
900: Weather Reporting Capability 7-37

1000: Standard Instrument Approach Procedures (SAIP) . 7-37
1100: Parallel Taxiway 7-38
1200: Aircraft Apron 7-39
1300: General Aviation Terminal Building 7-39
1400: Taxiway and Apron Edge Lighting 7-40
1500: Airfield Signage 7-40
1600: Ground Communication 7-40
1700: Approach Lighting 7-41
1800: Aircraft Rescue & Fire Fighting (ARFF) Equipment .. 7-41
1900: Hangars 7-42
2000: Airfield Maintenance Equipment & Storage Building..7-42
2100: Perimeter Fencing 7-43
2200: Fuel Facilities 7-43
New ADP: Percent of Airports with an Up-to-Date Airport Layout Plan (ALP) 7-44

7.4.4 Percent of System Airports that are Adequately Accessible in Terms of Signage and Wayfinding..... 7-44

7.5 Mobility 7-45

7.5.1 Percent of Population Within 30-Minutes of a System Airport by Role Grouping 7-45

7.5.2 Percent of Total Employment/Businesses Within 30-Minutes of a System Airport 7-45

7.5.3 Percent of System Airports with a Published Instrument Approach Procedure 7-46

7.5.4 Percent of Population Within 30-Minutes of a System Airport Meeting Business User Needs (5,000' Runway, Jet Fuel, Approach (250' & 3/4m Minimums), and Ground Transportation)..... 7-46

7.5.5 Percent of Population Within 60-Minutes of a System Airport with Commercial Airline Service by at Least One Airpline 7-47

7.5.6 Percent of System Airports that Provide Intermodal Options for their Community, Including Public Transportation Interfaces at the Airports 7-50

7.5.7 Percent of System Airports with 24/7 Fueling..... 7-50

7.5.8 Percent of System Airports with Jet Fuel 7-51

7.5.9 Percent of System General Aviation Airports Operating Below 60 Percent Operational Capacity..... 7-51

7.5.10 Percent of System Airports Meeting Service Objectives (FBO, Pilot Training, Maintenance, Charter, Terminal Amenities)..... 7-51

7.5.11 Percent of System Airports that are Incorporatied in State and Local Comprehensive Plans..... 7-52

7.6 Financial Needs 7-53

7.6.1 Methodology 7-53
7.6.2 Assumptions 7-55
Runway/Taxiway Separation Design Criteria 7-55
050: Airport Layout Plan 7-55
100: Runway Approach 7-56
200: Runway Safety Area 7-56
300: Runway Project Zone 7-56
400: Pavement Conditions 7-56
500: Runway Length/Runway Width 7-57
600: Pavement Strength 7-57
700: Visual Navigational Aids 7-57
800: Runway Edge Lighting 7-57
900: Weather Reporting Capability 7-57
1000: Standard Instrument Approach 7-57
1100: Parallel Taxiway 7-57
1200: Aircraft Apron 7-58
1300: General Aviation Terminal Building 7-58
1400: Taxiway and Apron Edge Lighting 7-58
1500: Airfield Signage 7-58
1600: Ground Communication 7-58
1700: Approach Lighting 7-58
1800: ARFF Equipment 7-59
1900: Hangars 7-59
2000: Airfield Maintenance Equipment/Storage Building 7-59
2100: Perimeter Fencing 7-59
2200: Fuel Facilities 7-59
7.6.3 System Plan Cost Summary 7-59
7.6.4 Funding Sources 7-63
Federal Funding 7-63
State Funding 7-64
Local Funding 7-65
Other Funding Sources 7-66
Federal Funding 7-63
7.6.5 Historical Funding 7-67
7.6.6 System Costs by Funding Sources 7-67
7.7 Implementation Responsibilities 7-67
7.8 Continuous Planning 7-70
7.8.1 Surveillance 7-70
7.8.2 Reappraisal 7-71
7.8.3 Service and Coordination 7-71

7.8.4 Special Studies 7-72
7.8.5 Updates 7-74

FIGURES

Chapter 1 – System Goals and Performance Measures

Figure 1.1: Planning Approach.....1-3

Chapter 2 – Inventory of Existing Facilities

Figure 2.1: North Carolina System of NPIAS Airports.....2-3

Figure 2.2: North Carolina Privately-owned Public-use Airports.....2-5

Figure 2.3: North Carolina Airport System by FAA ASSET Category.....2-8

Figure 2.4: U.S. Airspace Classifications.....2-14

Figure 2.5: FAA Part 77 Imaginary Surfaces.....2-16

Figure 2.6: Airport Influence Areas Example.....2-19

Chapter 3 – Forecasts of Aviation Demand

Figure 3.1: U.S. Commercial Air Carriers, Historical Passenger (2000-2011).....3-3

Figure 3.2: U.S. vs. NC Historical Enplanements (2005-2011).....3-4

Figure 3.3: Monthly Average US Oil and Jet A Prices.....3-5

Figure 3.4: U.S. Commercial Air Carriers – Capacity, Traffic, & Load Factors (2000-2031).....3-7

Figure 3.5: U.S. Legacy Carriers & mergers (2000-2012).....3-9

Figure 3.6: U.S. Commercial Air Carriers, Historical, and Forecast Passengers.....3-10

Figure 3.7: U.S. General Aviation Fleet Mix (2000-2031).....3-13

Figure 3.8: Active U.S. General Aviation and Air Taxi Aircraft.....3-14

Figure 3.9: U.S. General Aviation and Air Taxi Hours Flown.....3-15

Figure 3.10: U.S. Aircraft Operations at Airports with Control Towers (2000-2031).....3-17

Figure 3.11: World Air Freight Industry Distribution Channel Analysis……3-19

Figure 3.12: U.S. Historical and Forecast Air Cargo Revenue Ton Miles (RTMs) (2000-2031)……3-20

Figure 3.13: North Carolina Enplanements by Commercial Service Airport (2002-2011)……3-22

Figure 3.14: North Carolina vs. U.S. Enplanements (2005-2011)……3-23

Figure 3.15: CMSA Population Growth (2000-2031)……3-25

Figure 3.16: Historical North Carolina Population Growth by County (2000-2011)……3-26

Figure 3.17: Historical North Carolina Employment Growth by County (2000-2011)……3-27

Figure 3.18: North Carolina Based Aircraft (2002-2011)……3-29

Figure 3.19: North Carolina Based Aircraft by County……3-30

Figure 3.20: Categories of Growth in the Operations Forecast……3-46

Chapter 4 – Airport Groupings Update and Airport Development Planning

Figure 4.1: GAADP Model Results by County……4-5

Figure 4.2: GAADP Model Results by Airport……4-11

Chapter 5 – Current System Performance

Figure 5.1: Percent of Airports with Controlling Interest Over All RPZs……5-4

Figure 5.2: Percent of Airports with an Airport Emergency Plan……5-6

Figure 5.3: Percent of Airports with a General Aviation Security Plan……5-7

Figure 5.4: Percent of Airport That Support Search and Rescue Operations……5-9

Figure 5.5: Hospitals in the State within a 30-Minute Drive Time of a System Airport with Instrument Meteorological Conditions (IMC) Capability, On-Site Weather Reporting, and Jet Fuel Availability……5-11

Figure 5.6: Percent of Airports Meeting 2013 FAA Taxiway Geometry Standards……5-13

Figure 5.7: TERPS Straight-In Visual Area Surface……5-15

Figure 5.8: Percent of Airports with 18-B Surveys, Category C/S Approaches, and Night Approaches……..……5-17

Figure 5.9: Percent of Airports That Meet FAA Runway/Taxiway Separation Standards……5-19

Figure 5.10: Percent of Airports That Meet Each Mandatory Item in the ADP……..5-21

Figure 5.11: 200: Existing RSA Compliance…..……5-26

Figure 5.12: 300: Existing RPZ Compliance…..……5-27

Figure 5.13: 400: Existing Pavement Condition Compliance…..……5-29

Figure 5.14: 500: Existing Runway Length Compliance……5-31

Figure 5.15: 500: Existing Runway Width Compliance.……5-32

Figure 5.16: 600: Existing Pavement Strength Compliance…..……5-34

Figure 5.17: 700: Existing Visual NAVAIDs Compliance…..……5-35

Figure 5.18: 800: Existing Runway Edge Lighting Compliance……5-37

Figure 5.19: 900: Existing Weather Reporting Capability Compliance…..……5-38

Figure 5.20: 1000: Existing Standard Instrument Approach Procedures Compliance……5-39

Figure 5.21: 1100: Existing Taxiway Compliance……5-41

Figure 5.22: 1200: Existing Aircraft Apron Compliance……..5-42

Figure 5.23: 1300: Existing General Aviation Terminal Building Compliance……5-44

Figure 5.24: 1400: Existing Taxiway Lighting Compliance……5-46

Figure 5.25: 1500: Existing Airfield Signage Compliance…..……..5-47

Figure 5.26: 1600: Existing Ground Communication Compliance…..……..5-48

Figure 5.27: 1700: Existing Approach Lighting Compliance…..……..5-49

Figure 5.28: 1800: Number of Airports with ARFF Equipment, Infrastructure, and Support……5-51

Figure 5.29: 1800: Percent of Airports with ARFF Equipment, Infrastructure, and Support…..……..5-52

Figure 5.30: 1900: Existing Hangars……5-53

Figure 5.31: 2000: Number of Airports with Airfield Maintenance Equipment & Storage Buildings…..……5-55

Figure 5.32: 2000: Existing Maintenance Equipment & Storage (Tractor and Attachments) Compliance.....5-56

Figure 5.33: 2100: Existing Perimeter Fencing Compliance.....5-57

Figure 5.34: 2200: Number of Airports with Fuel Facilities.....5-59

Figure 5.35: Percent of Airports with Adequate Signage and Wayfinding.....5-60

Figure 5.36: 30-Minute Drive Times of Yellow Airports.....5-63

Figure 5.37: 30-Minute Drive Times of Yellow and Red Airports.....5-64

Figure 5.38: 30-Minute Drive Times of Yellow, Red, and Blue Airports.....5-65

Figure 5.39: 30-Minute Drive Times of Yellow, Red, Blue, and Green Airports.....5-66

Figure 5.40: Percent of Businesses with the Propensity to Use Aviation within a 30-Minute Drive Time of a System Airport.....5-68

Figure 5.41: Percent of Airports with a Published Instrument Approach Procedure.....5-69

Figure 5.42: Percent of Population within 30 Minutes of a System Airport Meeting Business User Needs (5,000' runway, jet fuel, approach (250' & ¾ mile minimums), and ground transportation).....5-71

Figure 5.43: Percent of Population within 60-Minute Drive Time of an Airport with Commercial Airline Service (Yellow Airport) 5-72

Figure 5.44: Airports with Access to Intermodal Options.....5-73

Figure 5.45: Percent of Airports with 24/7 Fueling.....5-74

Figure 5.46: Percent of Airports with Jet Fuel.....5-75

Figure 5.47: Percent of Airports Operating Below 60% Operational Capacity in 2011 and 2031.....5-77

Figure 5.48: Airports Meeting Service Objectives.....5-78

Figure 5.49: Percent of Airports that are Incorporated in Local Comprehensive Plans.....5-79

Chapter 6 – Future System Performance

Figure 6.1: Runway Protection Zone (RPZ).....6-4

Figure 6.2: North Carolina Hospitals within a 30-Minute Drive Time of a System or Out-of-State Airport with Instrument Meteorological Conditions (IMC) Capability, On-Site Weather Reporting, and Jet Fuel Availability…….6-13

Figure 6.3: Percent of System Airports Meeting FAA Threshold Siting Surface Requirements…….6-15

Figure 6.4: 500: Anticipated Future Runway Length Compliance……6-33

Figure 6.5: Near-Term Taxiway Compliance…….6-38

Figure 6.6: 1900: Anticipated Hangar Objective Compliance for Year 2031……..6-46

Figure 6.7: North Carolina and Out-of-State Airports Considered for 30-minute Drive Time Coverage……6-52

Figure 6.8: Percent of Population within 30-Minute Drive Times of Yellow and Red Airports including Out-of-State Airports……6-55

Figure 6.9: Percent of Population within 30-Minute Drive Times of Yellow, Red, and Blue Airports including Out-of-State Airports……6-56

Figure 6.10: Percent of Population within 30-Minute Drive Times of Yellow, Red, Blue, and Green Airports including Out-of-State Airports……6-57

Figure 6.11: State Population Density with Respect to Airport Coverage……6-58

Figure 6.12: Military Restricted Airspace as Compared to 30-Minute Drive Time Population Coverage……6-59

Figure 6.13: Percent of Businesses with the Propensity to Use Aviation within a 30-Minute Drive Time of a North Carolina or Out-of-State Airport……6-61

Figure 6.14: Percent of Population within 30 Minutes of a North Carolina or Out-of-State Airport Meeting Business User Needs……6-64

Figure 6.15: Percent of Population within a 60-Minute Drive Time of a North Carolina or Out-of-State Airport with Commercial Airline Service (Yellow Airport)……6-66

Chapter 7 – Future System Recommendations and Program Implementation

Figure 7.1: Future Non-Aviation Influences that May Affect the North Carolina Airport System ……7-6

Figure 7.2: Percent of Population within 30-Minute Drive Times of System Airports and Nearby Out-of-State Airports ……7-9

Figure 7.3: Public Use Heliports/Helipads in North Carolina with Respect to Existing 30-Minute Drive Time Coverage ……7-10

Figure 7.4: Locations Where New Public Use Heliports/Helipads may Feasibly Improve Coverage 7-11

Figure 7.5: NPIAS and Non-NPIAS Privately–Owned Public Use Airport Locations 7-16

Figure 7.6: Percent of Population within a 60-Minute Drive Time of a North Carolina or Out-of-State Airport with Commercial Airline Service (Yellow Airport).....7-48

Figure 7.7: Percent of Population within a 2-Hour Drive Time of the Major Airports (CTL and RDU) in North Carolina 7-49

Figure 7.8: System Plan Cost Summary by Airport Category (in millions) 7-62

TABLES

Chapter 1 – System Goals and Performance Measures

Table 1.1: NCASP Goal Categories and Performance Measures.....1-7

Chapter 2 – Inventory of Existing Facilities

Table 2.1: Publicly Owned Public-Use Airports in North Carolina.....2-23

Table 2.2: Privately Owned Public-Use Airports in North Carolina.....2-25

Table 2.3: North Carolina System Airports by ASSET Role Table.....2-26

Table 2.4: Summary Comparison of ASSET Roles and GAADP Groupings.....2-28

Table 2.5: Percent of NPAIS Airports by Type with One of More Runways.....2-28

Table 2.6: Summary of Primary Runways Pavement Conditions.....2-28

Table 2.7: Runway Related Data for Study Airports.....2-29

Table 2.8: Summary of Taxiway Systems on Primary Runways.....2-36

Table 2.9: On-Site Auromated Weather Capabilities.....2-36

Table 2.10: Approch Types by Airport Type.....2-38

Table 2.11: Percentage of Airports by Airport Type Having Fuel.....2-38

Table 2.12: Percent of Hangar Type by Airport Type.....2-38

Chapter 3 – Forecasts of Aviation Demand

Table 3.1: U.S. Legacy Carriers (2000-2012)……3-8

Table 3.2: Comparison of National Based Aircraft Inventory Program and NCASP Inventory……3-31

Table 3.3: Commercial Service Airport Based Aircraft Forecast……3-34

Table 3.4: Enplanement Forcast at Commercial Service Airports……3-35

Table 3.5: Total Operations Forecast at Commercial Service Airports……3-36

Table 3.6: Freight Forecast at Commercial Service Airports (all cargo in tons)……3-37

Table 3.7: Based Aircraft Methodology Comparison……3-39

Table 3.8: Preferred Based Aircraft Forcast Summary……3-40

Table 3.9: 2011 Operations by Type……3-43

Table 3.10: Aircraft Operations Forecast Methodology Comparison……3-46

Table 3.11: Aircraft OPBA Operations Forecast Summary……3-47

Table 3.12: Summary of Preferred Statewide Forecasts……3-48

Chapter 4 – Airport Groupings Update and Airport Development Planning

Table 4.1: GAADP MOdel 2010 Data Sources……4-2

Table 4.2: Updated Airport Groupings (2014)……4-7

Table 4.3: North Carolina Counties without an Airport……4-12

Table 4.4: Updated 2014 Airport Groupings By Grouping……4-13

Table 4.5: GAADP Airport Development Categories……4-16

Table 4.6: ADP System Objectives……4-17

Table 4.7: FAA Standards for Instrument Approach Procedures……4-21

Chapter 5 – Current System Performance

Table 5.1: Airport Control of Runway Protection Zones……5-81

Table 5.2: Airport Wildlife Hazard Evaluations……..5-84

Table 5.3: Airports with an Airport Emergency Plan, General Aviation Security Plan and that Support Search and Rescue……..5-87

Table 5.4: Airports Meeting 2013 FAA Taxiway Geometry Standards……5-90

Table 5.5: Airports Meeting FAA Threshold Siting Surface Requirements……5-93

Table 5.6: Airport Runway-Taxi Separation……5-96

Table 5.7: North Carolina ADP Mandatory Items……..5-20

Table 5.8: Airport Compliance with Mandatory Items……5-99

Table 5.9: ADP System Objectives……5-23

Table 5.10: 100: Runway Approach Compliance……5-102

Table 5.11: 200: Runway Safety Area (RSA) Compliance……..5-106

Table 5.12: 300: Runway Protection Zone (RPZ) Compliance……5-109

Table 5.13: 400: Pavement Condition Compliance……5-112

Table 5.14: 500: Runway Length and Width Compliance……5-115

Table 5.15: 600: Pavement Strength Compliance……5-118

Table 5.16: 700: Visual Navigational Aids Compliance……5-122

Table 5.17: 800: Runway Edge Lighting Compliance……5-125

Table 5.18: 1900: Weather Reporting Capability Compliance……5-128

Table 5.19: 1000: Standard Instrument Approach Compliance……5-131

Table 5.20: 1100: Taxiway Requirement Compliance……5-134

Table 5.21: 1200: Aircraft Apron Requirements Compliance……5-137

Table 5.22: 1300: General Aviation Terminal Building Compliance……5-140

Table 5.23: 1400: Taxiway & Apron Edge Lighting Compliance……5-145

Table 5.24: 1500: Airfield Signage Compliance……5-148

Table 5.25: 1600: Ground Communications Compliance……5-151

Table 5.26: 1700: Approach Lighting Compliance……5-154

Table 5.27: 1800: ARFF Compliance……5-157

Table 5.28: 1900: Hangars Compliance……5-160

Table 5.29: 2000: Airfield Maintenance Equipment/Storage Building Compliance……5-163

Table 5.30: 2100: Perimeter Fencing Compliance……5-166

Table 5.31: 2200: Fuel Facilities Compliance……5-169

Table 5.32: Airport Signage……5-172

Table 5.33: Percent of Statewide Population within a 30-Minute Drive Time of System Airports, by Role Grouping……5-62

Table 5.34: Percent of Statewide Employment within a 30-Minute Drive Time of System Airports, by Airport Group……5-67

Table 5.35: Airport Approaches……5-175

Table 5.36: Intermodal Access at Airports……5-178

Table 5.37: Fuel at Airports……5-181

Table 5.38: Airport Operationsal Demand/Capacity……5-184

Table 5.39: Services and Terminal Amenities……5-187

Table 5.40: Airport Inclusion in Local Comprehensive Plans……5-190

Chapter 6 – Future System Performance

Table 6.1: Performance Measures in the Safety Goal Category……6-2

Table 6.2: Performance Measures in the Infrastructure Health Category……6-16

Table 6.3: New Locations of Former GAADP Mandatory Items……6-20

Table 6.4: Compliance with ADP System Objectives……6-22

Table 6.5: Changes to Future RSAs Based on NCASP Analysis……6-27

Table 6.6: Performance Measures in the Mobility Category……6-49

Table 6.7: Out-of-State Airports Considered for Additional Coverage in North Carolina……..6-50

Table 6.8: Percent of Statewide Population within a 30-Minute Drive Time of Airports (both in and out-of-state), by Role Grouping……..6-53

Table 6.9: Summary of Current and Target Performance……6-70

Chapter 7 – Future System Recommendations and Program Implementation

Table 7.1: Percent of Statewide Population within a 30-Minute Drive Time of Aiports (both in and out-of-state), by Role Grouping ……7-7

Table 7.2: Privately-Owned Public Use Airports Meeting NPIAS Entry Criteria ……7-20

Table 7.3: Privately-Owned Public Use Airports Meeting ASSET Entry Criteria 7-21

Table 7.4: Indentification of Costs by Performance Measure …… 7-53

Table 7.5: Summary of System Plan Costs by Performance Measure ……...7-60

Table 7.6: Total Airport System Plan Costs 2015-2034 (in millions) ……7-63

Table 7.7: Total Airport System Plan Costs by Funding Source (in millions) ……..7-67

APPENDICES

Appendix A: Pilot User Survey Results

Appendix B: Aircraft Counting Programs

Appendix C: Case Studies

Chapter 1 – System Goals and Performance Measures

1.0 Introduction

This chapter represents the first in a series of technical chapters that document the North Carolina Airports System Plan (NCASP). Chapter 1 establishes the System Plan vision, goals, and performance measures.

1.1 System Plan Overview

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 a statewide airport system that encompasses 72 public use airports (10 of which are currently classified by the Federal Aviation Administration (FAA) as commercial service airports). Overall, NCDOT DOA's goal is to help facilitate the State's vision of providing a fully integrated, safe, efficient, and seamless transportation link between the people and products of North Carolina with national and international destinations through an efficient airport system that will help build upon economic development success and improve the quality of life in the State.

In addition to State and DOA goals, the NCASP is being prepared to provide information and analysis to the FAA. As defined in the FAA's Advisory Circular, 150/5070-7, *The Airport System Planning Process,* "the primary purpose of airport system planning is to study the performance and interaction of an entire aviation system to understand the interrelationship of the member airports." While not an FAA requirement, a state aviation system plan (SASP) provides information and analysis on the system of airports serving the state (North Carolina in this case) and the FAA recommends that SASPs be updated as conditions change but typically not more than 10 years.

The analysis of the airport system is even more important for North Carolina as an original participant in the FAA's State Block Grant Program. Started in 1989 the FAA's State Block Grant Program allows the 10 participating states to assume responsibility for administering the FAA's Airport Improvement Program (AIP) grants for airports that are included in the National Plan of Integrated Airport Systems (NPIAS) and classified by the FAA as general aviation and non-primary commercial service (fewer than 2,500 annual enplanements). The block grant states are allowed some flexibility in administering the grants available through the state apportionment and general aviation entitlement programs and the state must follow statutory and regulatory requirements set forth by the FAA.

State aviation system planning fits between the FAA's national planning efforts, as documented in the NPIAS and the new *General Aviation Airports: A National Asset (ASSET)*, and the more comprehensive master plans prepared for individual airports.

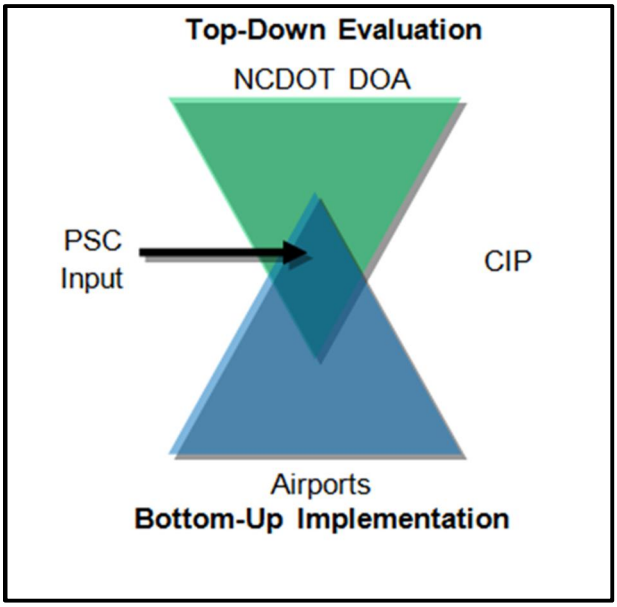
All of these documents contribute to the FAA's overall strategic goals for safety, system efficiency, and environmental compatibility. The state system plan documents the timing for and estimated costs of proposed airport development, and provides a mechanism to assist in the preparation of an airport's Capital Improvement Plan (CIP). The SASP provides information, direction, and policy guidance that can be used by airports in the master planning process by identifying the airport's role in the state system and recommending projects to ensure airports can support their role.

NCDOT DOA has long recognized the importance of planning as a proactive approach to ensuring that aviation continues its role in the statewide transportation system. As such, DOA has undertaken this NCASP in order provide analysis of the statewide airport system that will produce an extensive assessment of the condition of the current system, as well as a plan for meeting its current and future needs. Designed and conducted appropriately, the NCASP will support DOA's decision making by providing a tool that will help facilitate the continued successful development of its aviation system, with an emphasis on planning for the airport system as a whole. The emphasis of the NCASP is on the NPIAS airports, all of which are publicly owned in North Carolina. There are privately owned, public-use North Carolina airports that will be considered in terms of their contributions to the system and the need for any of these airports to be included in the NPIAS in the future.

The NCASP is also designed to provide DOA with policies and guidelines that promote the vision and mission of DOA and meet the requirements of the FAA. An effective system plan will show how investments in airports provide economic and measureable returns, will increase accountability in funding decisions, and will provide tools for decision making. This plan will help DOA determine how the North Carolina airport system should be developed to respond to future challenges and to meet changes in demand in order to promote system sustainability. The NCASP will provide the baseline for understanding the existing system and its future needs, as well as provide a foundation for future updates. This baseline will allow DOA to track changes at commercial service and general aviation (GA) airports in future years and evaluate the impact of investments in the aviation system.

It is important to note that the NCASP is not an explicit project programming document, and inclusion of any projects in this plan does not constitute a commitment of either state or federal funding. More appropriately, the NCASP is a strategic look or a "top-down" planning study whose recommendations must still be implemented from the airport project level (otherwise referred to as "bottom-up") typically through such initiatives as master planning, environmental analyses, and financial evaluations. While top-down and bottom-up planning operate as fundamentally different approaches, they can and should operate in concert with each other. The top-down planning effort provides vision, direction, and purpose, while bottom-up planning provides focus and practical implementation implications. As shown in Figure 1.1, this approach for the NCASP, when conducted with effective input from a Project Steering Committee (PSC) and appropriate capital improvement planning (CIP), will result in a cohesive and comprehensive planning model for North Carolina.

Figure 1.1: Planning Approach



Source: Landrum & Brown

Again, implementation of specific airport improvement projects identified in this plan ultimately remains the responsibility of individual airport sponsors. Some actions identified by the NCASP could require the development of additional airport-specific planning efforts prior to the actual development occurring. Information contained in this document should be used by airports in North Carolina as they evaluate and determine their individual development needs.

1.1.1 System Plan Approach and Process

The NCASP follows a strategic approach for providing a blueprint to ensure that North Carolina's future system of airports meets the State's existing and future air transportation and economic needs in a sustainable manner. The approach that will be used to conduct the NCASP will reflect the following characteristics:

- Utilize proven methods consistent with the FAA's Advisory Circular (AC 150/5070-7) on Airport System Planning
- Be visionary in establishing future goals for the system
- Leverage critical insights, experience and goals from key project stakeholders that can be effectively accessed through use of a Steering Committee
- Develop a process that is consistent with other established North Carolina statewide plans and initiatives related to other transportation modes including the *2040 North Carolina Statewide Transportation Plan*
- Establish performance measures for system evaluation
- Consider the implications of new technologies on the airport system

- Benchmark the adequacy of the current airport system
- Analyze potential changes in the FAA's National Plan of Integrated Airport Systems (NPIAS)
- Assess needs related to economic development, air service, air cargo, and multimodal accessibility
- Determine the financial requirements of the system and prioritize future system development
- Provide an implementation plan to ensure adoption and action as a result of the plan
- Create sustainability in the planning process

The first step in the NCASP is the development of a system plan vision, goals, and performance measures. This step sets the stage for the remaining elements of the NCASP, from evaluating existing conditions to developing recommendations. In order to analyze the airport system's needs, a system vision and system goals are translated into goal categories.

1.1.2 Project Steering Committee

A Project Steering Committee (PSC) was assembled by DOA to provide input and direction for the system plan. The PSC is comprised of volunteer members with a diverse base of airport/aviation and statewide knowledge and responsibilities. The PSC includes representatives from the following organizations:

- Federal Aviation Administration (FAA)
- North Carolina Department of Commerce
- North Carolina Department of Transportation
- North Carolina Airports Association (NCAA)
- North Carolina commercial service and general aviation airports

The PSC provides DOA with outside input into the system planning process and provides the Consultant Team with first-hand knowledge of the key factors impacting aviation demand and needs throughout the State. Specifically, the PSC's role within this system plan process is encompassed within the following:

- The purpose of the PSC is to appropriately represent their constituents by serving as advisors to DOA and the Consultant Team in helping to ensure that the NCASP is developed in such a way as to address key issues facing the statewide airport system
- PSC members are responsible for reviewing and commenting on system plan assumptions (such as goals, performance measures, benchmarks roles, etc.) and drafts of various system plan work products
- PSC members are expected to act as liaisons for airports, agencies, and other constituencies to the NCASP planning process with the intent that such coordination and communication will help ensure a successful project

1.2 System Vision, Goals, & Performance Measures

The NCASP is being conducted in a series of separate, but related, technical steps. The first step in the analysis of the airport system's needs is to establish a system vision and, in support of that vision, specific system goals, which are then translated into goal categories. These system goal categories are subsequently used to evaluate the adequacy of North Carolina's airport system. To facilitate the evaluation process, performance measures specific to each goal category are employed to provide the foundation for a "report card" that will ultimately be used in the NCASP to determine how well the North Carolina airport system is performing.

The remainder of this chapter is devoted to describing the system plan's vision, goal categories, and performance measures for the NCASP.

1.2.1 State Plan Vision

Through review of NCDOT documents, the following vision was established for the North Carolina Airports System Plan which mirrors that of NCDOT as a whole:

> Provide an airport system that *"Connects people and place in North Carolina – safely and efficiently, with accountability and environmental sensitivity."*[1]

This vision requires that the process used to develop the NCASP include input from a variety of sources. The process brings together representatives of airports and other public agencies to work with DOA and the Consultant Team to ensure that a comprehensive evaluation of the airport system is conducted. States, as well as individual communities within those states, continue to recognize the importance of an airport system to their statewide and local economic and transportation infrastructures, and to that end, development of a NCASP that can be supported on all levels is the primary vision.

1.2.2 System Plan Goals & Goal Categories

While the purpose of a system vision is to provide focus and direction, it does not, in and of itself, detail how to achieve that vision. In order to fulfill the overall system vision established above for the NCASP, a series of contributing airport system goals were developed that can provide the markers for tracking progress toward that vision. Through coordination efforts internal between DOA, the Consultant Team, and PSC, the following system goals were established for the North Carolina airport system:

- The State should be served by a system of airports that are safe, secure, and meet applicable FAA design standards that will satisfy the current and future needs of aviation

[1] North Carolina Department of Transportation. Retrieved from www.ncdot.gov

- The State should be served by an efficient airport system with sufficient facilities and services to maintain the airport and address the current/future needs of the aviation community
- The State should be served by a system of airports that support integration with other modes of transportation
- The State should be served by a system of airports that complies with all federal, state, and local environmental regulatory requirements
- The State should be served by a system of airports that promote and support aviation educational programs and community outreach programs

These five goals for the aviation system are tied to NCDOT's three goal categories:

- Infrastructure Health
- Mobility
- Safety

NCDOT defines these goal categories as follows in its *2040 North Carolina Statewide Transportation Plan:*

- Infrastructure Health: Projects where the primary purpose is to improve the condition of the existing infrastructure
- Mobility: Projects where the primary purpose is to improve mobility or improve access. This includes the majority of projects that add capacity or improve travel time, even if the safety or condition of the facility is also improved
- Safety: Projects where the primary purpose is to improve safety. A safety project may also improve the condition of the facility or mobility along the corridor

The five goals were categorized into these three NCDOT goal categories for ease of recognition and understanding, as well as for ease in establishing appropriate performance measures for each category.

1.2.3 System Plan Performance Measures

In developing a "report card" for airport performance, the North Carolina airport system will be evaluated or graded on the three goal categories identified above. Performance measures for each of the goal categories are the "tests" that are applied to determine how well the system is currently performing with respect to each category. Through coordination efforts between DOA, the Consultant Team, and the PSC, appropriate performance measures were established for each of the three goal categories.

Table 1.1 provides a summary of the goal categories and their associated performance measures that will be used in the NCASP. Again, most of the measures were identified by DOA and the PSC for their relevance and importance to the North Carolina airport system. It is important to note that several of the performance

measures used to evaluate the North Carolina aviation system are action-oriented, while others are more informational in nature. Many of the measures are also performance based and have the ability to be tracked in the future. The information presented in Table 1.1 is integral to the remainder of this system plan.

Table 1.1: NCASP Goal Categories and Performance Measures

Goal Category: SAFETY	
1	Percent of airports with controlling interest over the FAA design standard Runway Protection Zones (RPZs) for each runway end.
2	Percent of system airports with an Airport Emergency Plan.
3	Percent of system airports addressing wildlife issues.
4	Percent of system airports with a General Aviation Security Plan.
5	Percent of system airports that support search and rescue operations.
6	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.
7	Percent of system airports meeting 2013 FAA taxiway geometry standards.
8	Percent of system airports meeting FAA threshold siting surface requirements.
Goal Category: INFRASTRUCTURE HEALTH	
1	Percent of system airports that meet applicable FAA runway/taxiway separation design criteria on their runways for their current ARC.
2	Percent of airports meeting all mandatory items in ADP.
3	Percent of airports meeting all system objectives in ADP.
4	Percent of system airports that are adequately accessible in terms of signage and access road quality.

Goal Category: MOBILITY	
1	Percent of population within 30 minutes of a system airport by category.
2	Percent of total employment/businesses within 30 minutes of a system airport.
3	Percent of system airports with a published instrument approach procedure.
4	Percent of population within 30 min of a system airport meeting business user needs (5,000' runway, jet fuel, approach (250 feet & ¾ mile), ground transportation).
5	Percent of population within 60 minutes of a system airport with commercial airline service by at least one airline.
6	Percent of system airports that provide intermodal options for their community, including public transportation interfaces at the airports.
7	Percent of system airports with 24/7 fueling.
8	Percent of system airports with Jet Fuel.
9	Percent of system airports needing additional operational capacity.
10	Percent of system airports meeting service objectives (FBO, pilot training, maintenance, charter/aircraft rental, terminal amenities).
11	Percent of system airports that are incorporated in local comprehensive transportation plans.

Source: North Carolina Division of Aviation and NCASP Team

Chapter 2 – Inventory of Existing Facilities

2.0 Introduction

The purpose of conducting an inventory of North Carolina's system of airports is to determine the number and type of facilities that exist in North Carolina as well as their condition. The inventory process and the data collected provide a foundation for understanding the condition of the existing airport system. The data collected is used for subsequent analysis, evaluations, and recommendations throughout the study process. The data collected will also be used to populate a database for the North Carolina Department of Transportation Division of Aviation (DOA) to use to obtain updated information on airports within the study. This chapter presents an overview of the 2012 North Carolina Airport System Plan (NCASP) inventory effort.

2.1 Inventory Process

Seventy-two (72) North Carolina airports are included in the 2012 NCASP study. These airports reflect only those that are included in the Federal Aviation Administration's (FAA's) *2013-2017 National Plan of Integrated Airport Systems (NPIAS)*. The information used to develop this chapter was collected through the airport inventory and data survey process by means of on-site interviews with 69 of the 72 airports. Data for the major commercial service airports in North Carolina, including Charlotte Douglas International Airport (CLT), Raleigh-Durham International Airport (RDU) and Piedmont Triad International Airport (GSO), was collected via information provided by the DOA and/or phone interviews with airport representatives. These interviews were conducted in November and December 2012. The Airport Survey is a 13-page questionnaire with 14 specific sections detailing various airport services, facilities and activities. Airport managers, NCDOT DOA and study consultants participated in providing data for the survey. The survey was sent to each of the study airports prior to the scheduled on-site interview. Information on the survey was verified and supplemented through the, follow-up telephone calls, and secondary sources including:

- FAA Form 5010, Airport Master Record
- FAA Airport/Facilities Directory
- AirNav.com
- North Carolina Department of Transportation Division of Aviation Airport Master Plans
- Airport Layout Plans (ALP)
- 2012 Economic Impact of Airports in North Carolina Study
- Individual Airport Capital Improvement Plans (ACIP)

Data was collected for all 72 airports including the three commercial service airports (CLT, RDU, and GSO) that were not interviewed on-site. The data collected was presented in tabular form at the end of this chapter. Tables detailing existing facilities, approach and navigational aids, lighting and visual aids available, airport planning documentation, and aircraft activity and based aircraft counts are included. It is

important to note that, for this study, tables are grouped by airport type (commercial service or general aviation) and then presented in alphabetical order by associated city. Table 2.1, located at the end of this chapter, lists all study airports.

2.2 Existing Airport System

There are 338 airports in North Carolina. Of this number, 111 are listed as public-use airports while 227 are listed as private-use. Out of the 111 public-use airports in North Carolina, 72 are included in the NCASP. Study airports include ten commercial service airports and 62 general aviation airports.

i. National Plan of Integrated Airport System (NPIAS)

The NPIAS includes airports that are significant to the national air transportation system. The NPIAS is maintained by the FAA on a continual basis and is published every two years as part of a report provided to Congress. The NPIAS includes a plan for the type and cost of eligible airport development that the Secretary of Transportation, "…considers necessary to provide a safe, efficient, and integrated system of public-use airports adequate to anticipate and meet the needs of civil aeronautics, to meet the national defense requirements of the Secretary of Defense, and to meet the identified needs of the United States Postal Service." For airports to receive federal airport improvement plan (AIP) funding, they must be included in the NPIAS. All 72 airports included in the NCASP are NPIAS airports. Figure 2.1 depicts the current North Carolina system of airports.

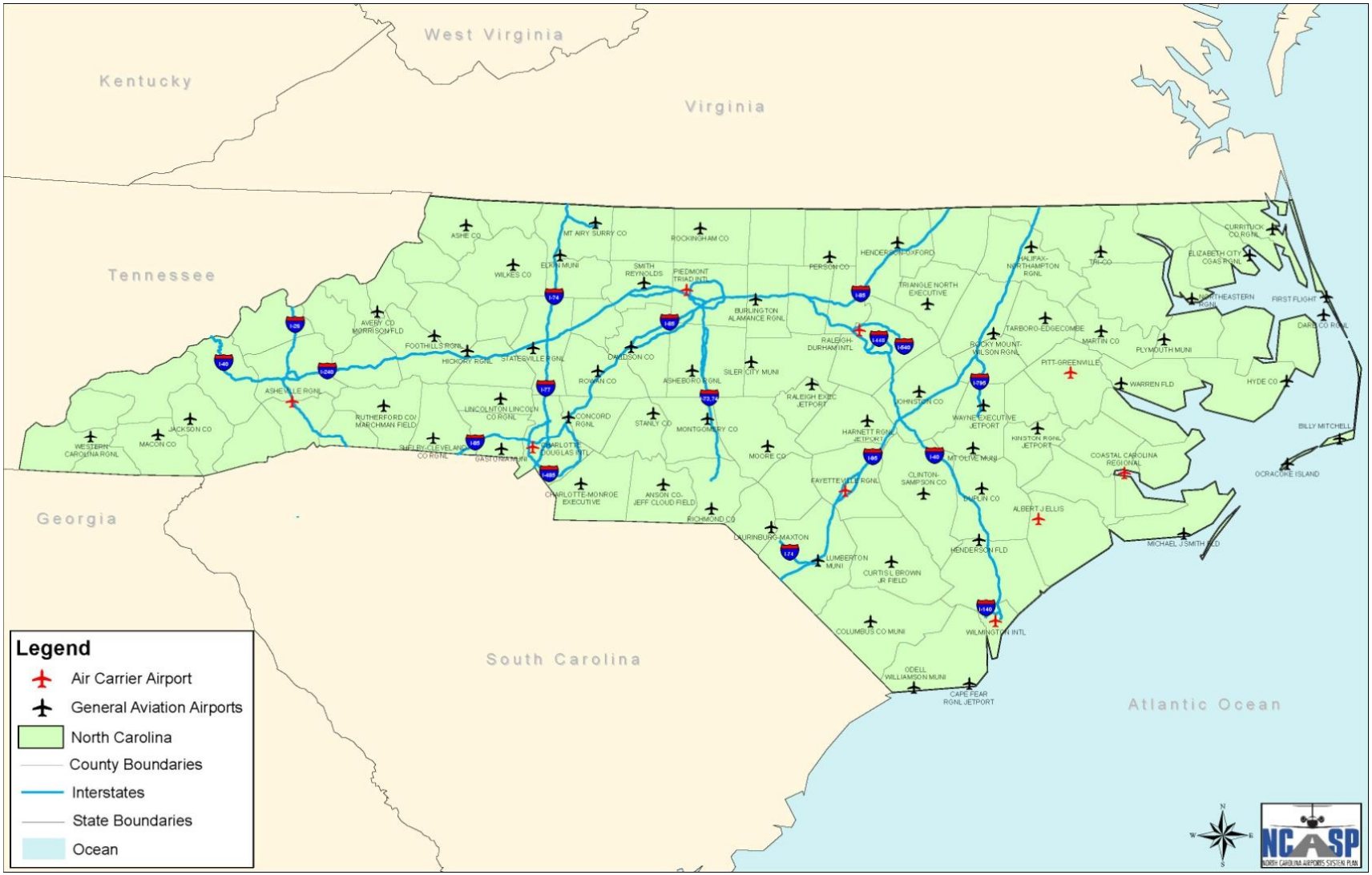
Commercial Service Airports

There are nine airports designated in the 2009-2013 NPIAS as commercial service airports in North Carolina. These nine airports are:

- Albert J Ellis
- Asheville Regional
- Charlotte-Douglas International
- Coastal Carolina Regional
- Fayetteville Regional
- Piedmont Triad International
- Pitt-Greenville
- Raleigh-Durham International
- Wilmington International

Concord regional received commercial service in 2013, bringing the total number of North Carolina commercial service airports to 10. Commercial Service Airports enplane over 2,500 passengers annually and receive scheduled passenger service. Primary commercial service airports enplane more than 10,000 passengers annually, while non-primary commercial service airports enplane between 2,500 and 10,000 passengers annually. All of North Carolina's commercial service airports are in the primary category.

Figure 2.1: North Carolina System of NPIAS Airports



Source: Parsons Brinckerhoff GIS Analysis

General Aviation Airports

The remaining 62 NPIAS airports are general aviation airports. General aviation airports include all other airports that are not commercial service airports. General aviation airports can be assigned a "reliever" status. Two airports in North Carolina are FAA-designated general aviation "reliever" airports. These include Charlotte-Monroe Executive and Raleigh Executive Jetport located in Monroe County and Sanford County, respectfully. Reliever airports are defined as those airports designated by the FAA as having the function of relieving congestion at a commercial service airport and providing more general aviation access to the overall community.

ii. FAA ASSET

Recognizing the unique roles played by general aviation airports throughout the U.S., the FAA conducted an 18-month study to further classify the general aviation airports included in the NPIAS. The results of this study were published in the report titled *General Aviation Airports: A National Asset (ASSET)* in May 2012. This report documents the importance of the general aviation airport system, the need for new general aviation categories, a description of each of the four ASSET categories, and a list of each airport in the NPIAS categorized by ASSET category.

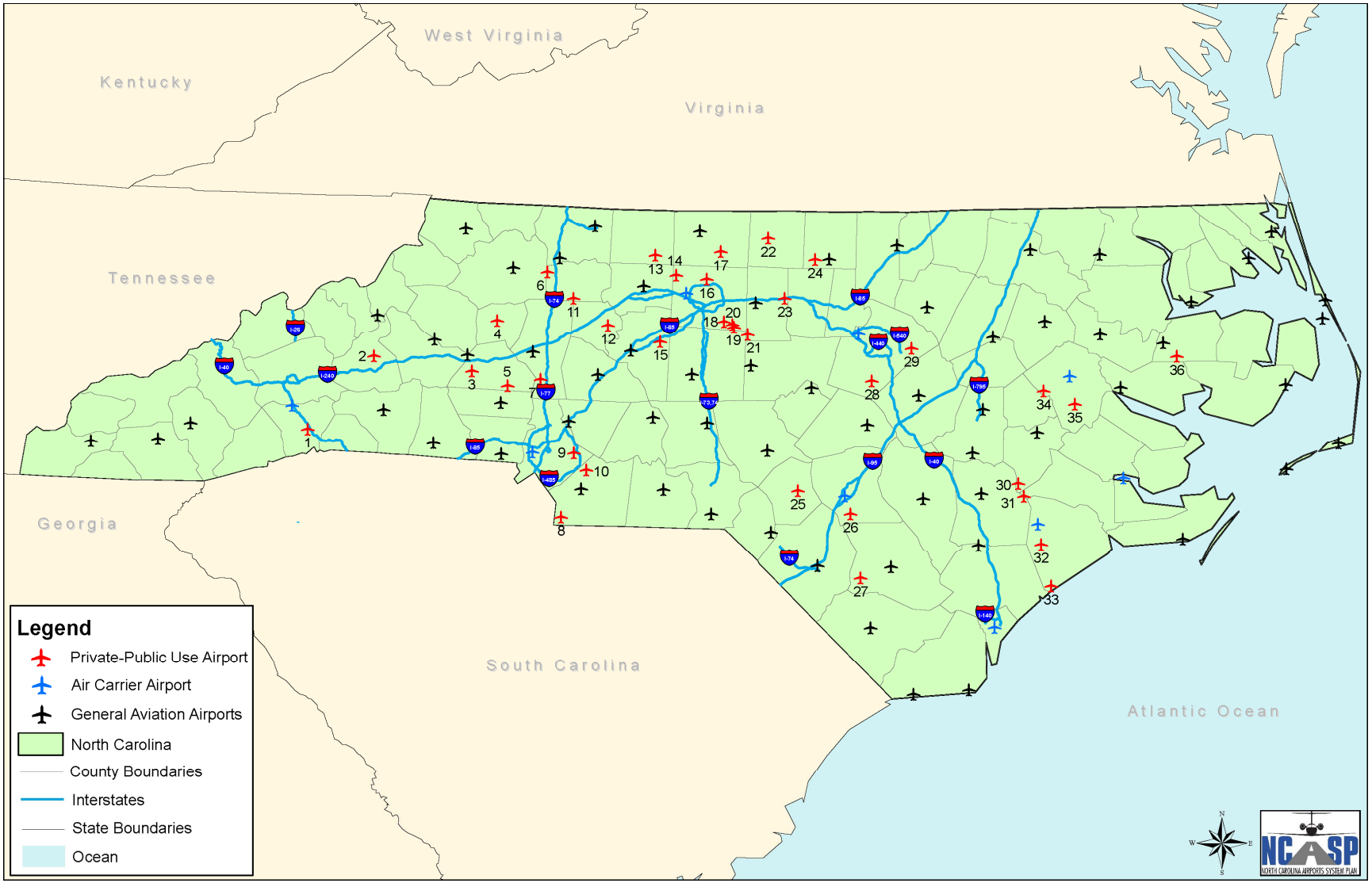
ASSET noted five key aeronautical functions provided by the general aviation airport system, including the 62 general aviation airports in North Carolina. The functions include:

- Emergency preparedness and response
- Critical community access for remote areas
- Commercial, industrial, and economic activity functions
- Access to tourism and special events and
- Other aviation specific functions including corporate flights and flight instruction

The ASSET categories were developed to provide policy makers with a better understanding of the vast and diverse general aviation system. While more detailed than the previous category designation of either general aviation-reliever or general aviation, these federal categories are still broad and will not replace existing statewide system planning or airport master planning roles or categories which utilize unique and more-detailed site-specific data to determine their role in the state or community.

The general aviation airports in the NCASP are listed by ASSET category in Table 2.2 and graphically depicted Figure 2.2. For comparison, the North Carolina groupings of Red, Blue, and Green are also depicted. Descriptions of North Carolina's airport groupings were presented in Chapter 1. Table 2.3 presents a summary of the ASSET roles compared to airport groupings for the general aviation airports. As shown, two of the NC system airports (3 percent) are classified as National Airports, 18 (29%) are classified as Regional Airports, 29 (46%) are Local Airports, and four (6%) are not classified as one of the other four ASSET roles.

Figure 2.2: North Carolina Privately-owned Public-use Airports



Source: Parsons Brinckerhoff GIS Analysis

Of the airports that were not classified, the ASSET report noted that these airports have seen a reduction in the number of based aircraft and activity due to population and economic shifts and/or the recession , and some of these airports have zero based aircraft. There is one airport in North Carolina that is currently unclassified by FAA, Tarboro-Edgecombe. This airport has less than 10 based aircraft and is within 30 miles of another NPIAS airport, which are the minimum criteria needed to be classified as a Basic Airport in ASSET. In order to become a Basic Airport, the airports would need to increase the number of based aircraft or support an FAA function such as the U.S. Forest or Postal Service.

The FAA will use the new general aviation categories to "provide a baseline from which to measure changes in operations and needs." These new categories will be incorporated into future NPIAS reports to Congress that will determine five-year development and funding needs. The airports and categories will be reevaluated biennially, in conjunction with the NPIAS Report to Congress. Within the next three years, the FAA will further evaluate airport criteria for inclusion in the NPIAS, compare historic funding levels by new general aviation funding category, and look at other funding considerations.

iii. Non-NPIAS Airports

While there are approximately 226 airports in North Carolina which are not in the NPIAS, none of these airports are included in this study. These airports are private-use airports, and typically, funding and support for these airports typically comes from non-federal sources.

In 1970, almost 44% of the publicly used airports were privately owned; however in 2007 the number had substantially decreased to nearly 19 percent on a national level.[2] There are currently 36 airports that are privately owned, public-use airports in North Carolina. These 36 privately owned, public-use airports are depicted in Figure 2.3.[3] These 36 airports serve more than 240,000 annual operations across the state according to recent data from FAA Form 5010 records. The operations at each airport vary from zero annual operations at Eagles Nest Airport in Potters Hill to 32,000 annual operations at PK Airpark in Raeford.

Each of the 36 airports provides a single runway that ranges in length from 1,400 to almost 4,200 feet. Donald's Airpark in Plymouth has the longest runway at 4,195 feet. Thirteen airports have a runway that is at least 3,000 feet long. The runways also range in width from 30 to 200 feet wide. For example, the turf runway at Swan Creek, located in Jonesville, has the widest privately owned, public-use runway at 200 feet wide; however, the runway is only 1,650 feet long making it the third shortest runway of the 36 airports. Currently 25 airports have a runway width of at least 50 feet. All of the privately owned, public-use airports' runways in the state

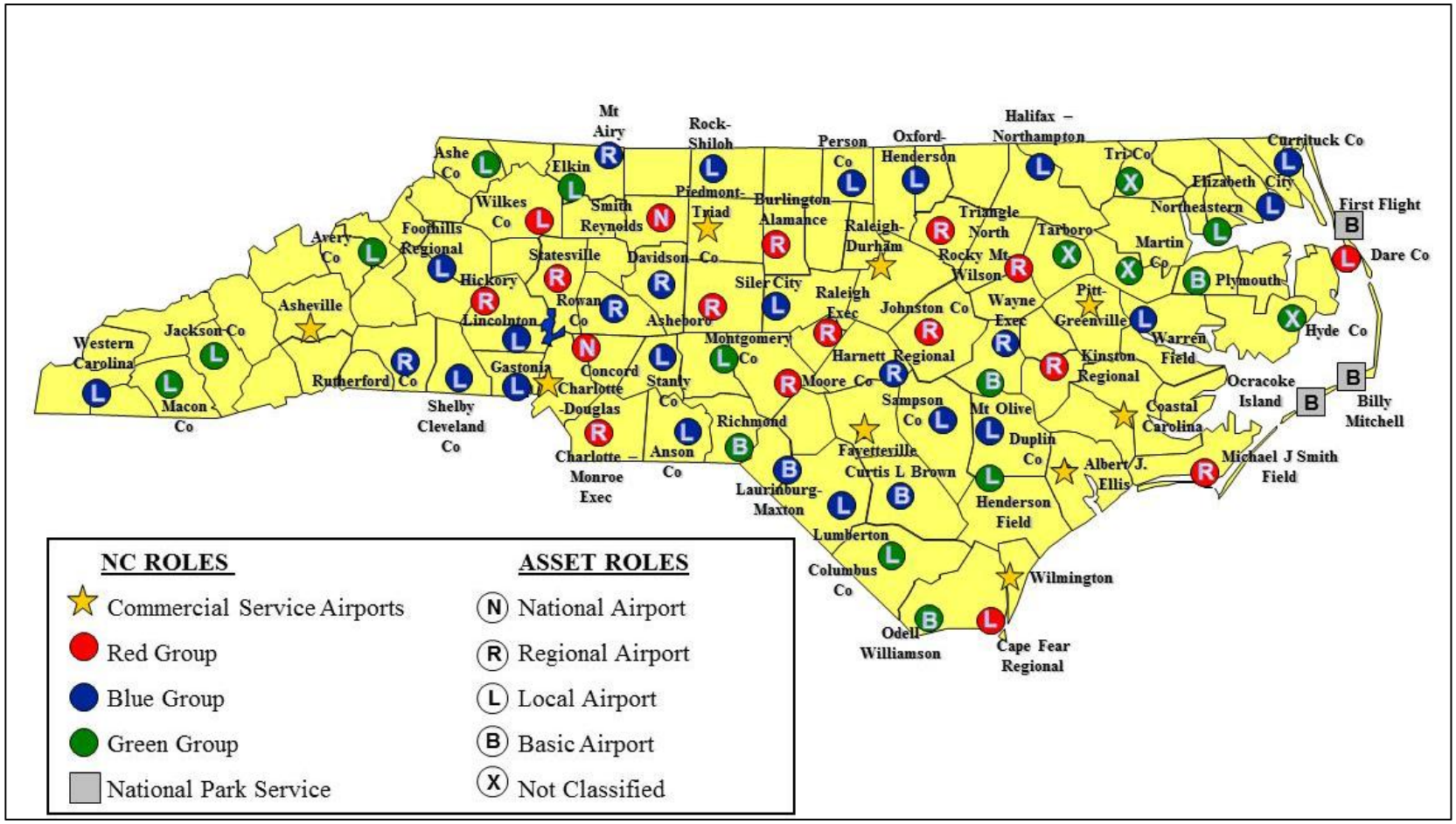
[2] ACRP Report 44: A Guidebook for the Preservation of Public-Use Airports; Transportation Research Board of the National Academies; 2011

[3] Figure 2.2 uses numbers to reflect the privately owned, public-use airports that correspond to Table 2.2.

consist of a paved concrete surface, paved asphalt surface, or unpaved turf surface and maintain an FAA-approved condition rating for the runway. These condition ratings for runways are classified by the FAA and range from poor to excellent condition. All of the privately owned, public-use airports in North Carolina maintain runways that are in fair to excellent condition, with the majority of the conditions categorized as good.

Table 2.3 summarizes data associated with each of the 36 privately owned public-use airports in the state. The airports are referenced geographically based upon their location from west to east within the state, beginning with Hendersonville as the western-most privately owned public-use airport in the state and Donald's Airpark, the eastern most privately owned public-use airport in the state. The majority of the privately owned public-use airports are concentrated around major population areas in the central portion of the state. There are very few airports located on the west side of the state, as well as the northeast corner of the state (see previous Figure 2.3).

Figure 2.3: North Carolina Airport System by FAA ASSET Category



Sources: North Carolina Division of Aviation and FAA

2.3 Airside Facility Inventory

This section includes a summary of the major airside facilities for study airports. This includes an inventory of runways, navigational aids, and instrument approach capabilities. Please note that due to the length and number of tables in this section, the tables have been placed at the end of this chapter.

iv. Runways

Of the 72 study airports, 16 have multiple runways. The number of runways at an airport ranges from only one runway at smaller airports to as many as four at Charlotte-Douglas International Airport. Eight of the ten commercial service airports have multiple runways. Table 2.4 reflects the percentages of airports that have more than one runway as classified by their NPIAS designations.

Runway Length

When discussing runway length, 5,000 feet represents a significant milestone for airport planning purposes, especially at airports with only one runway. Many insurance providers require that insured aircraft operators only operate on runways with a length of 5,000 feet; this includes many air ambulance operators as well as corporate jet operators. The impact of this runway length requirement can be felt at smaller, more rural communities where air ambulance aircraft cannot operate and/or at airports where increased corporate jet activity is taking place.

There are 88 runways at study airports in North Carolina. Runway 05/23 at Kingston Regional Jetport is the longest runway measuring 11,500 feet. Runway 15/33 at Pitt-Greenville is the shortest runway measuring 2,687 feet. Fifty-five primary runways are 5,000 feet or longer in length. Among the twenty primary and secondary runways at commercial service airports, fifteen have runways 5,000 feet or longer.

Surface Type and Condition

Approximately 96 percent of the primary runways at study airports are paved asphalt with the remaining 4 percent of primary runways being concrete. Both Charlotte-Douglas and Raleigh-Durham International Airports have concrete primary runways. Two airports have a combination of both asphalt and concrete runways; these include Currituck Regional and Elizabeth City Regional Airports. There is also one runway included in this study at Richmond County which has a turf surface. None of the airports included in this study have a gravel or dirt-gravel runway surface in the system.

The condition of the runway surface is important for every runway type, from turf to concrete. A well-maintained runway enables a pilot to perform a smooth landing and reduce the wear and tear on aircraft. The condition of the runways is portrayed in Table 2.6. It should be noted that DOA has the runways at its 62 GA airports inspected for pavement condition every two years. As shown, all of the commercial service and reliever airports have runways in good condition. Table 2.7 summarizes runway related information for the study airports.

Runway Safety Areas

A Runway Safety Area (RSA) is a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway. An assessment of RSA's was made during on-site visits at 69 airports. This assessment consisted of a visual check for compliance with FAA RSA criteria including dimensions and the location of objects within; however the visual inspection were not intended to identify minute grading issues. Based on a tally of the results, 142 of 176 total runway ends or 81 percent have RSAs that meet current FAA RSA compliance requirements. Therefore 33 runway ends do not have compliant RSAs as of 2012. The identification of compliant vs. non-compliant RSAs allows the DOA to focus on those airports needing assistance in mitigating their RSA issues so they can meet FAA Design Criteria identified in FAA Advisory Circular (AC) 150/5300-13A by the 2015 mandate deadline.

Runway Protection Zones

A Runway Protection Zone (RPZ) is an area at ground level prior to the threshold or beyond the runway end to enhance the safety and protection of people and property on the ground. Based on recent changes to the FAA Design Circular, airports are strongly encouraged to clear the entire RPZ of all above ground objects. Where this is impractical, airports, at a minimum, should maintain the RPZ clear of all facilities involving incompatible activities. Such activities include residential property, and/or place of public gathering, and fuel farms. Based on information collected during the inventory site visits, 57 percent of the airports are impacted by the new change in FAA AC 5300-13A which excludes public roadway in RPZs. The DOA will utilize the information collected during these visits to help airports achieve RPZ compliance during the project planning phase of future airport development projects.

v. Taxiways

Taxiways are a critical part of an airport's facilities and play a significant role in airfield safety. There are three common types of taxiways at North Carolina airports: full parallel, partial (less than full) parallel, and stub (turn around ends) taxiway. Full parallel taxiways allow aircraft to exit the runway so that succeeding aircraft have a clear runway on which to land. Partial parallel and stub turn-around taxiways are also important for quick turnaround and provide the ability to get to and from the apron. Each of these taxiways types creates mobility for aircraft that have just landed or those aircraft preparing to land/depart. Table 2.8 shows a summary of taxiway types for primary runways at study airports. It should be noted that in order for runways to obtain better vertically guided approaches a parallel taxiway is required.

vi. Navigational Aids and Instrument Approach Capabilities

There are a number of navigational aids (NAVAIDS) used throughout the North Carolina. NAVAIDS provide enroute and terminal information to pilots and include both lighting and navigational equipment. Data collected for NAVAIDS during the inventory process includes:

- Automated Weather
- Instrument approach capabilities
- Visual Glide Slope Indicators (VGSI) including Visual Approach Slope Indicators (VASI) and Precision Approach Path Indicators (PAPI)
- Runway End Identification Lights (REIL) Systems
- Airport Beacons
- Approach Lighting Systems (ALS)

Below is an expanded discussion of NAVAIDS data collected during the inventory relative to automated weather and instrument approach capabilities.

Automated Weather

Weather is a critical factor for pilots to consider and is one of the primary contributing factors in general aviation accidents. The availability of on-sight weather reporting at airports is extremely valuable to pilots by providing an increased level of safety. Airports with an instrument approach are required to provide on-site weather (altimeter setting) in order to provide the lowest approach minimums. The most common automated weather systems in use throughout the US are Automated Weather Observing Systems (AWOS) or Automated Surface Observation Systems (ASOS). These automated weather units typically provide basic weather data including temperature, dew point, density altitude, altimeter setting, wind speed, and direction. More advanced units also provide data such as visibility, sky conditions, precipitation types, and thunderstorm sensing. ASOS units are owned by the FAA and maintained by the National Weather Service. AWOS units are typically owned and operated locally; however, in North Carolina, NCDOT owns and maintains approximately 26 AWOS units. Both ASOS and AWOS units are certified for aviation use by the FAA and are the most common units used throughout the state. There are 12 airports in the state that have air traffic control towers (ATCT) for additional on-site weather reporting. Currently, 63 study airports have on-site automated weather including all ten commercial service airports. Table 2.9 lists the study airports that have an on-site ASOS, AWOS, AWOS-III or Super AWOS unit.

Instrument Approach Capabilities

Airport safety and capacity are greatly enhanced at airports where instrument approach procedures (IAP) are available during periods of inclement weather. As visibility around an airport decreases, specialized equipment can provide electronic guidance and allow pilots to operate and land aircraft safely. Further, the availability of instrument approach capabilities at an airport can increase capacity since aircraft can continue land at the airport at times when visual flight rules are in effect.

The instrument approach capabilities of an airport are typically broken into three categories: precision, non-precision, and visual. Precision instrument approach procedures provide highly accurate electronic lateral and vertical guidance to aircraft. Non-precision instrument approach procedures also provide electronic guidance to aircraft, but the accuracy is less refined and is mainly limited to lateral guidance only. The type and accuracy of an instrument approach is highly dependent upon airspace obstructions in the vicinity of the airport. Runways with no instrument approach

capabilities are considered visual runways. Airports with published instrument approach procedures are known as Instrument Flight Rules (IFR) airports while airports with no published instrument approach procedures are considered Visual Flight Rule (VFR) airports.

The most common type of precision approach in use today is the Instrument Landing System (ILS). Non-precision approach capabilities have been greatly enhanced by the use of satellite technologies, specifically Global Positioning System (GPS). The FAA has recently developed a new approach procedure known as a Localizer (or lateral) Performance with Vertical Guidance (LPV). This new capability utilizes the Wide Area Augmentation System (WAAS). While not considered a precision approach, LPV provides vertical guidance to aircraft to "near precision" accuracy. The FAA develops instrument approach procedures for all airports in the US. Because ground based equipment is not necessary to fly most GPS or LPV approaches, the FAA can now develop approach procedures at airports where it was previously not economical to do so. Combined with evolving technology, more and more aircraft are able to safely operate in more airport environments.

Currently, all 72 study airports have either a precision, non-precision or visual approach procedure. This includes ten commercial service airports and 62 general aviation airports. Ten commercial service airports and 22 general aviation airports have precision (ILS) approach capabilities. Non-precision instrument approach capabilities at study airports include GPS (including LPV), Very High Frequency Omni-Directional Range (VOR), Localizer, and Non-Directional Beach (NDB) approaches. Non-precision instrument approaches are also available at commercial service airports with precision instrument approaches. Six airports have only a visual approach. Table 2.10 displays the approach types available by airport type.

2.4 Landside Facilities and Aviation Services

This section highlights the landside services and general aviation services available at airports within North Carolina. These services include road accessibility, fuel, general aviation terminal facilities and general aviation hangars.

vii. Accessibility

The ability to provide sufficient access to an airport is critical to its function. Airport access roads provide connectivity between major highways and/or interstates and key facilities located at the airports throughout the state. Commercial service airports depend on accessibility to/from these roadways to provide their passengers with access to public parking, pick-up/drop-off, as well as the delivery of goods such as cargo, time-sensitive packages, and mail. Highways maintained by the NCDOT typically provide accessibility to general aviation airports. Airports throughout the state are clearly identified using airport location signs posted along key routes to the airport. Airport location signage was verified as part of the airport inventory process.

viii. Fuel Services

The availability of fuel is a basic service provided by many, but not all airports. Primary fuel for aviation activities include 100LL (AvGas) and Jet A. The majority of piston aircraft in the general aviation fleet use AvGas while the larger turbo-prop and jet powered aircraft use Jet A. Additionally, some aircraft can use automotive gas (MoGas), and its use is becoming increasingly common for light sport aircraft and older experimental aircraft. Currently, 68 study airports provide some type of fuel. Of these, 63 provide both AvGas and Jet A fuel, including all ten commercial service airports. Table 2.11 displays the percentage of airports by airport type that reported having fuel.

ix. GA Terminal Facilities

In addition to fuel, most general aviation airports provide a terminal building/facility. This building is utilized by pilots for the use of telephones, restrooms, rest/sleeping quarters, and flight planning activities. At a minimum, a terminal building should include a restroom, phone, and flight planning area. Many times a pilot lounge is sufficient to provide these basic services. Airports that have a fixed based operator (FBO) typically provide such facilities; however, access can be limited during off hours. All commercial service airports have such facilities. Of the general aviation airports in the state, 61 currently have a terminal building/facility. The NCDOT Division of Aviation recognizes the importance of having a terminal facility at its general aviation airports and has a 50/50 terminal matching grant program for airports interested in building a terminal building at their airport.

x. Aircraft Hangars

Most aircraft owners prefer to store their aircraft indoors to protect against weather. Airport sponsors, FBOs, or other private entities provide hangars for lease at many airports in North Carolina. Individual T-hangars are adequate for small aircraft, but larger box or corporate hangars are needed to accommodate larger aircraft and are also needed for maintenance businesses. During the inventory site visits, 34 airports reported having an official hangar waiting list. The data collection efforts and interviews with airports revealed that there is a demand for additional hangar space at many airports throughout the state. Table 2.12 depicts the percent of hangar types by airport type.

2.5 Air Navigation

This section describes those factors affecting aviation navigation, including the use of airspace and weather reporting systems.

xi. Airspace

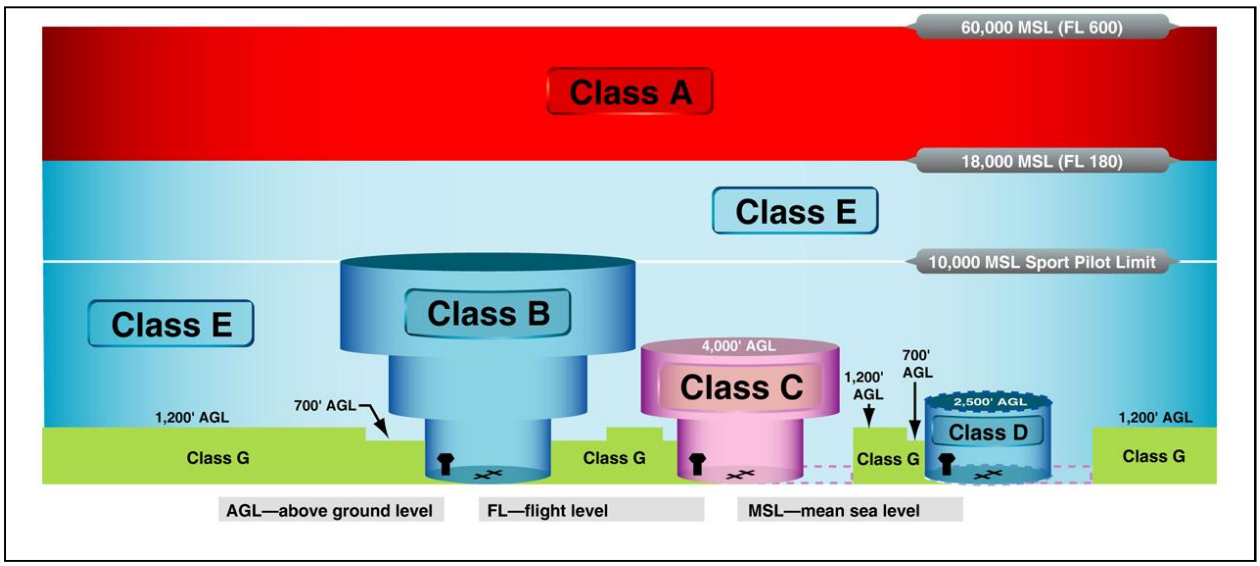
Aircraft that are approaching or departing an airport are subject to a system of controls designed to ensure that a safe separation distance is maintained between aircraft. Aircraft that fly within the US are subject to varying degrees of control depending on the specific airspace and meteorological conditions in which they

operate. The FAA is responsible for the system of air traffic control. There are two basic types of aircraft flight plans recognized by the FAA's air traffic control system: those operating under Visual Flight Rules (VFR), which depend primarily on the "seen and be seen" principle for separation, and those operating under Instrument Flight Rules (IFR), which depend on separation by air traffic controllers.

Classes of Airspace (by type)

U.S. airspace is structured into controlled and uncontrolled areas (see Figure 2.4). Controlled airspace is defined as Cass A, B, C, D and E. Class G is uncontrolled airspace. Class A airspace is 18,000 feet above Mean Sea Level (MSL) where only IFR flights are permitted along with high-altitude designated jet routes. Class, B, C, and D airspace surrounds airports with Air Traffic Control Towers (ATCTs). The airspace around Charlotte International Airport is Class B, which denotes it has approach control radar and specific levels of passengers or IFR operations. Airspace around the remaining airports with ATCTs is classified as Class D. VFR pilots must ensure that ATC clearance or radio communication requirements are met prior to entering Class B, C, or D airspace.

Figure 2.4: U.S. Airspace Classifications



Source: FAA

Class E airspace contains all instrument landing and departure procedures. Class E airspace accounts for airspace around airports that is not already classified as Class, B, C, or D. Class E airspace also includes Victor Airways, which are airspace corridors whose centerlines are defined by radio navigation aids – primarily VORTAC (Very High Frequency Omni-directional Range/Tactical Air Navigation). The purpose of Class E airspace is to provide positive control of VFR aircraft whenever weather conditions deteriorate below certain ceiling and visibility conditions.

xii. Air Traffic Management

Four Air Route Traffic Control Centers (ARTCC) provide air traffic service to aircraft operating within North Carolina on IFR flight plans within controlled airspace, primarily during the enroute phase of flight. These four ARTCCs include Cincinnati, Washington, Atlanta and Charlotte. The Atlanta and Charlotte ARTCCs encompass the majority of the state's airspace. The Cincinnati and Washington ARTCCs cover the northeastern and northwestern portions of the state's airspace, respectively.

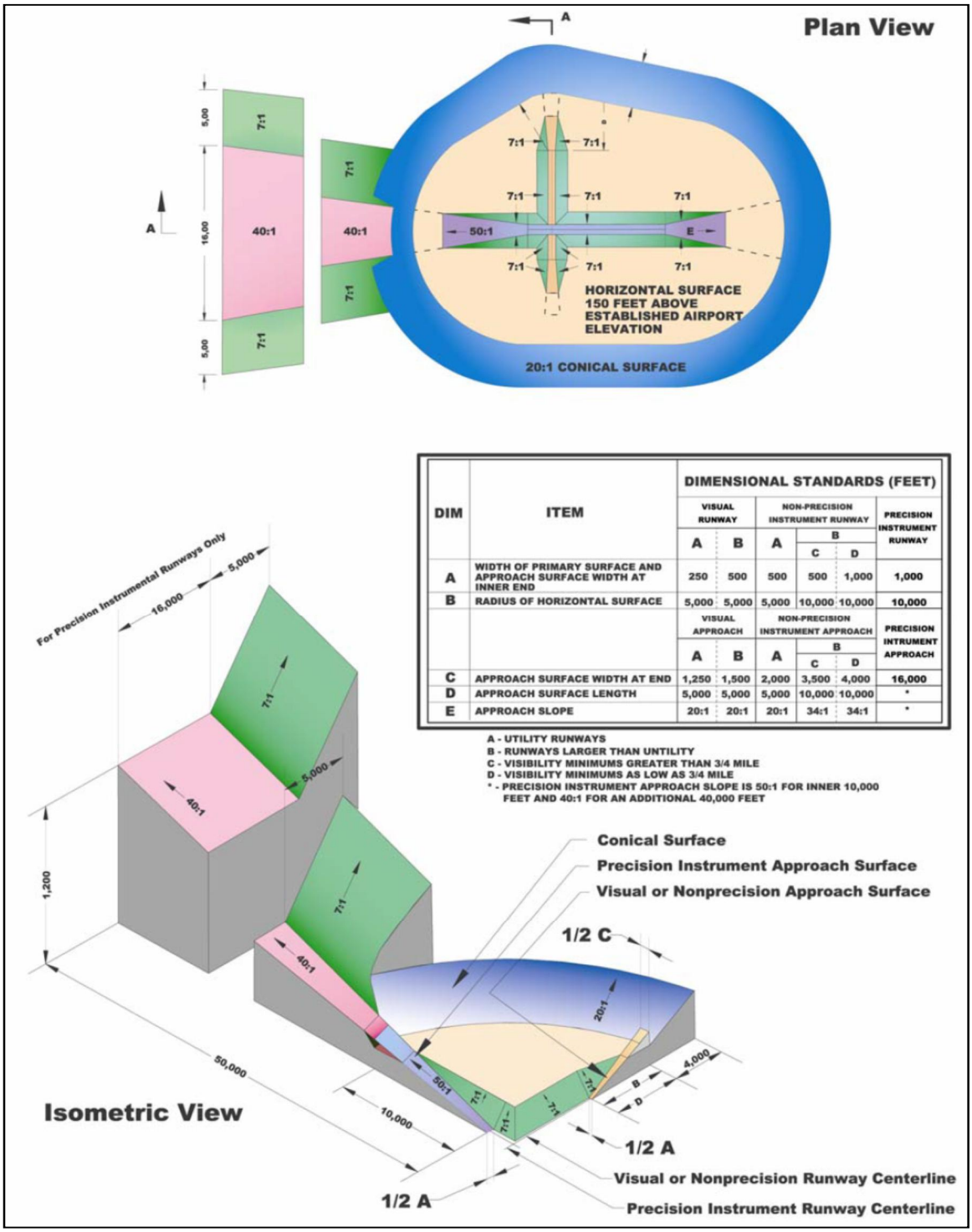
ATCTs help to ensure a safe, orderly, and expeditious flow of traffic on and near an airport. ATCTs are located at 13 airports throughout North Carolina. Of these 13, seven are located at commercial service airports and six are located at general aviation airports. Air traffic control towers rely on ground-based navigational aids and radar.

Flight Service Stations (FSS) do not control air traffic but are FAA facilities that provide pilot briefings, enroute communications, and VFR search and rescue services. In addition, FSSs relay ATCT clearances and Notices to Airmen (NOTAM), broadcast aviation weather and National Airspace System information, receive/process IFR flight plans, and monitor navigation aids. Currently there are six FSS in the US, with one being located at Raleigh-Durham International Airport.

xiii. FAR Part 77

Federal Aviation Regulation (FAR) Part 77 defines imaginary surfaces around airports that should be kept clear for flight operations. Objects that penetrate these imaginary surfaces are called obstructions. The FAA determines if an obstruction is a hazard to air navigation. As shown in Figure 2.5, the imaginary surfaces defined by Part 77 are the primary, transitional, approach, horizontal, and conical surfaces. Primary and approach surfaces for runways without instrument approaches are smaller than those for runways with instrument approaches. The largest primary and approach surfaces are those required for instrument runways that can be used when visibility is less than ¾ mile.

Figure 2.5: FAA Part 77 Imaginary Surfaces



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INTRUMENT APPROACH
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UNTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
* - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

Source: FAA

2.6 Historic Aviation Activity

The following sections provide a summary of the aviation activity for study airports. Activity data was collected from various sources including the Airport Inventory and Data Survey, FAA 5010-1 Master Record Data, and interviews with airports. The purpose of this section is to demonstrate the trends of activity and the based aircraft in the system.

xiv. Based Aircraft

As of 2011, the commercial service airports in North Carolina reported 861 based aircraft and general aviation airports reported 2,687, for a total of 3,548. The study airport with the greatest number of based aircraft is Asheville Regional Airport with 171. In contrast, there are four general aviation study airports with no reported based aircraft. Other relevant information concerning based aircraft includes:

- 9 airports (5 general aviation airports and 4 commercial service airports) reported 100 or more based aircraft
- 15 general aviation airports and 3 commercial service airports reported between 50 and 100 based aircraft
- 36 general aviation airports and 2 commercial service airports reported between 10 and 50 based aircraft
- 7 general aviation airports report less than five based aircraft

xv. Aircraft Operations

Aircraft operations are defined as the number of takeoffs and landings. When an aircraft takes off from an airport and then lands at the same airport, it is counted as two operations. Most airports in North Carolina do not have an ATC to count and/or record aircraft operations. As a result, aircraft operations at uncontrolled airports are estimates of actual activity. Additionally, it should be noted that many of North Carolina's airports accommodate a military activity, which are included in operations estimates. In 2011, commercial service airports accounted for 1,102,991 total aircraft operations. General aviation airports reported 1,449,878 aircraft operations for a grand total of 2,552,869 operations occurring in North Carolina during 2011.

2.7 Pilot Survey

A survey designed specifically for pilots was developed to help identify growing trends, existing issues, and potential improvements that are pertinent to the growth and vitality of North Carolina's system of airports. This survey took the form of an online user survey and was disseminated to solicit feedback from general aviation pilots using publicly owned and operated airports within the state. Appendix A presents the methodology and results of this survey, which obtained 266 responses during a two-month period in late 2012. Some of the key results that will be used to help guide the recommendations of the system plan are summarized below:

- Purpose to Flight: 51 percent personal (non-business); 13 percent personal (business); and 2 percent recreational

- Top Recommended Improvements: Low-price, self-service fuel; more hangars; and improved instrument approaches
- Aircraft Avionics Equipage: 93 percent GPS; 73 percent IFR capable; and 58 percent WAAS enabled
- Facilities Satisfaction: Runway length (highest), Taxiways (lowest)

2.8 State, Local and Regional Issues

During the inventory process, airports were asked to identify key issues concerning and/or affecting their airport. The following sections provide a summary of the prominent issues impacting airports in North Carolina.

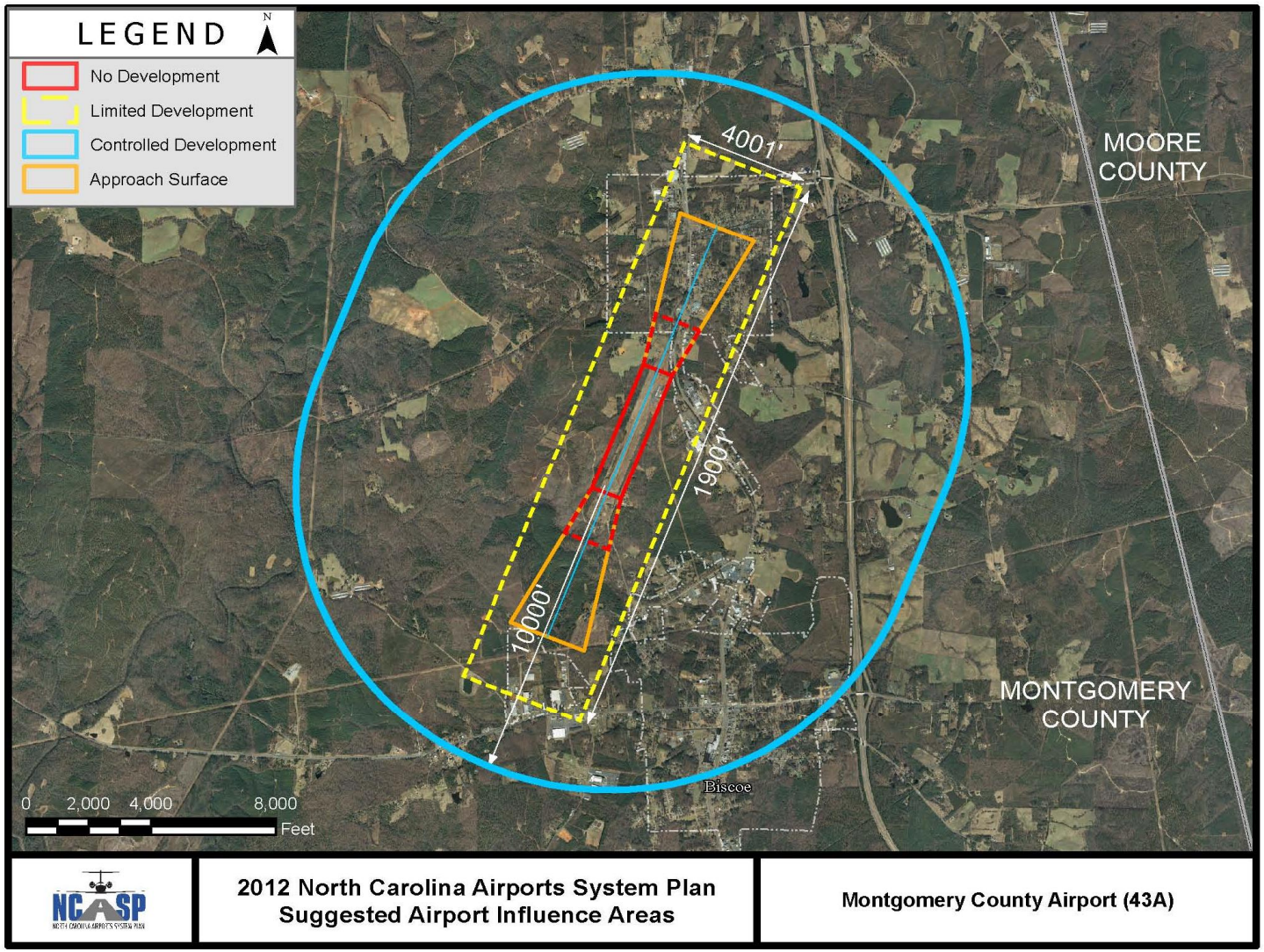
xvi. Land use Compatibility

The encroachment of incompatible land use around North Carolina airports poses a major threat to their long-term viability. Incompatible land uses near an airport can result in safety concerns for pilots as well as to the general public on the ground near the airport. Additionally, quality of life may be reduced for nearby residents. The 2012 North Carolina Statewide Logistics Plan also identified this issue in its summary of infrastructure needs and issues for airport. It recommended:

- Controlling land use in flight path areas
- Ensure adequate access between airports and the major highways
- Protect facility expansion option

The NCDOT DOA's model height zoning ordinance has enabled many North Carolina airports to protect land surrounding an airport by helping to educate airport sponsors about land use impacts, participating in local height zoning ordinance adoption, and identifying potential violations near airports throughout the state. Further, as part of the NCASP, "Areas of Influence" maps were developed for each of the 62 general aviation airports to assist them in communicating with local officials about the importance of protecting/controlling the flight paths around airports. Figure 2.6 depicts an example of one of these maps.

Figure 2.6: Airport Influence Areas Example



Source: Parsons Brinckerhoff

xvii. Land Availability

Several commercial and general aviation airports mentioned that there was a lack of available land for future airport growth. Several airports noted that the ability to expand is limited due to geography and topography, presence of major roadways, and/or presence of existing development. Runway extensions to accommodate larger aircraft were the primary reason noted for additional land needs. Land is also needed to develop aeronautical facilities such as hangars, airport support/maintenance buildings, and non-aeronautical facilities such as parking. These uses assist airports in generating revenue, which enable them to be financially self-sufficient. This is important because it is a goal of the FAA and DOA to encourage airports to be as financially self-sufficient as possible. During the interview portion of the inventory effort, airports identified areas on or adjacent to the airport premises that were available for development. This information will be shared with the North Carolina Department of Commerce and used to assist potential developers seeking land near airports.

xviii. Funding Availability

Many general aviation airports noted the general lack of funding as an issue. This includes a lack of funding for capital construction projects that would result in significant facility upgrades such as a runway extension, basic utility/infrastructure improvements, and new hangar development. Funding for system airports typically comes from three primary sources: federal (FAA), state (DOA) and local sources. As discussed previously, only those airports included in the FAA's NPIAS are eligible for federal funding through the Airport Improvement Plan (AIP). Limited funding is a result of many factors. Both FAA AIP and NCDOT DOA airport grant funding programs are funded through specific aviation related taxes including airline ticket tax and aviation fuel taxes. As such, the available funding from these sources is dependent upon the amount of activity and taxes collected. If activity decreases, less money is available for airport improvement grants. In addition, there are numerous airports that compete for this funding in a given year. At the local level, airports also frequently compete with other important services such as roads, schools, and recreation for limited amounts funding. Tight budgets and non-airport project priorities often lead to a lack of local match funding for airport needs. Thus, in general, the funding needs of the airports in the federal and state system airport system exceed the funding available.

2.9 Summary

As stated previously, the data collected in the inventory process will serve as a foundation for additional study elements including aviation forecasts, airport role analysis, facilities and service needs, and overall recommendations for North Carolina's airport system. The resulting database also provides a useful resource for the NCDOT Division of Aviation staff.

The 2012 NCASP inventory effort confirmed that the state of North Carolina boasts a diverse and active airport system. As the NCASP continues to evolve, the data collected in this study will also serve as a baseline for future airport studies. Improvements to the system can be measured by comparing current conditions and facilities to the amount of progress achieved over the next several years. As such, the results of this inventory will act as the baseline for a future "report card" for system performance. The summary below presents some of the key findings of the inventory collection process:

2.0 Runway Length:

- Of the 84 runways in the system, 55 (65 percent) of the primary runways are at least 5,000 feet in length
- Four runways (4 percent) are greater than 10,000 feet in length (CLT, RDU, GSO and Kinston Regional)

3.0 Runway Safety Areas:

- Runways that have compliant RSAs: 135 runways (80 percent)
- Airports that have all of their RSAs in compliance: 57 airports (79 percent)

4.0 Runway Protection Zones:

- Runway ends with fully controlled RPZs: 88 runway ends (52 percent)
- Airports that have full control over all of their RPZs: 29 airports (40 percent)
- Runways that do not have a public road within the associated RPZ: 78 (46 percent)
- Airports that do not have public roads within any of their RPZs: 13 (19 percent)

5.0 Airports (excluding CLT/RDU/GSO) having an official waiting list:

- 34 airports (49 percent) have an official hangar waiting list

6.0 General Aviation Airports with terminals:

- 71 airports (99 percent) have a general aviation terminal building (only Montgomery County Airport has none)

7.0 Control Towers and Airport Weather Capabilities

- 13 airports (18 percent) have an Air Traffic Control Towers, 6 of which are at general aviation airports
- 63 airports (88 percent) have on site automated weather reporting capabilities including an AWOS, ASOS, or Super AWOS system.
- 7 commercial service airports have both an ATCT and AWOS/ASOS system

Inventory Chapter Tables

Table 2.1: Publicly Owned Public-Use Airports in North Carolina

AIRPORT NAME	ID	CITY	COUNTY	AIRPORT GROUP
Albert J Ellis Airport	OAJ	Jacksonville	Onslow	Commercial Service
Charlotte Douglas Intl Airport	CLT	Charlotte	Mecklenburg County	Commercial Service
Piedmont Triad Intl Airport	GSO	Greensboro	Guilford County	Commercial Service
Concord Regional Airport	JQF	Concord	Cabarrus	Commercial Service
Raleigh Durham Intl Airport	RDU	Raleigh	Wake County	Commercial Service
Asheville Regional Airport	AVL	Asheville	Buncombe	Commercial Service
Coastal Carolina Regional Airport	EWN	New Bern	Craven	Commercial Service
Fayetteville International Airport	FAY	Fayetteville	Cumberland	Commercial Service
Pitt Greenville Airport	PGV	Greenville	Pitt	Commercial Service
Wilmington International Airport	ILM	Wilmington	New Hanover	Commercial Service
Asheboro Regional Airport	HBI	Asheboro	Randolph	Red
Burlington Alamance Reg Airport	BUY	Burlington	Alamance	Red
Cape Fear Regional Jetport	SUT	Oak Island	Brunswick	Red
Charlotte Monroe Executive	EQY	Monroe	Union	Red
Dare County Regional Airport	MQI	Manteo	Dare	Red
Hickory Regional Airport	HKY	Hickory	Catawba	Red
Johnston County Airport	JNX	Smithfield	Johnston	Red
Michael J Smith Field	MRH	Beaufort	Carteret	Red
Moore County Airport	SOP	Pinehurst/Southern Pines	Moore	Red
Raleigh Executive Jetport	TTA	Sanford	Sanford-Lee	Red
Rocky Mount Wilson Regional	RWI	Rocky Mount	Nash-Edgecombe	Red
Smith Reynolds Airport	INT	Winston-Salem	Forsyth	Red
Statesville Regional Airport	SVH	Statesville	Iredell	Red
Triangle North Exec Airport	LHZ	Louisburg	Franklin	Red
Wilkes County Airport	UKF	North Wilkesboro	Wilkes	Red
Anson County - Jeff Cloud Field	AFP	Wadesboro	Anson	Blue
Clinton-Sampson County Airport	CTZ	Clinton	Sampson	Blue
Currituck County Regional	ONX	Currituck	Currituck	Blue
Curtis L Brown Jr Field	EYF	Elizabethtown	Bladen	Blue
Davidson County Airport	EXX	Lexington	Davidson	Blue
Duplin County Airport	DPL	Kenansville	Duplin	Blue
Elizabeth City CGAS Reg Airport	ECG	Elizabeth City	Bladen	Blue
Foothills Regional Airport	MRN	Morganton	Scotland	Blue
Gastonia Municipal Airport	AKH	Gastonia	Gaston	Blue
Halifax-Northampton Co Regional	IXA	Roanoke Rapids	Northampton	Blue

AIRPORT NAME	ID	CITY	COUNTY	AIRPORT GROUP
Laurinburg Maxton Airport	MEB	Maxton	Robeson	Blue
Lincolnton Lincoln County Reg Airport	IPJ	Lincolnton	Lincoln	Blue
Lumberton Municipal Airport	LBT	Lumberton	Lee	Blue
Harnett Regional Jetport	HRJ	Erwin	Harnett	Blue
Henderson Oxford Airport	HNZ	Oxford	Granville	Blue
Kinston Regional Jetport	ISO	Kinston	Lenoir	Blue
Mount Airy Surry County Airport	MWK	Mount Airy	Surry	Blue
Person County Airport	TDF	Roxboro	Person	Blue
Rowan County Airport	RUQ	Salisbury	Rowan	Blue
Rutherford County Marchman Field	FQD	Rutherfordton	Rutherford	Blue
Shelby-Cleveland Co Regional Airport	EHO	Shelby	Cleveland	Blue
Siler City Municipal Airport	5W8	Siler City	Chatham	Blue
Stanly County Airport	VUJ	Albemarle	Stanly	Blue
Warren Field	OCW	Washington	Washington	Blue
Wayne Executive Jetport	GWW	Goldsboro	Wayne	Blue
Western Carolina Regional	RHP	Andrews	Cherokee	Blue
Ashe County Airport	GEV	Jefferson	Ashe	Green
Avery County Morrison Field	7A8	Spruce Pine	Mitchell	Green
Billy Mitchell Airstrip (NPS)	HSE	Hatteras	Dare	Green
Columbus County Airport	CPC	Whiteville	Columbus	Green
Elkin Municipal Airport	ZEF	Elkin	Surry	Green
First Flight Airport (NPS)	FFA	Kill Devil Hills	Dare	Green
Henderson Field	ACZ	Wallace	Duplin	Green
Hyde County Airport	7W6	Engelhard	Hyde	Green
Jackson County Airport	24A	Sylva	Jackson	Green
Macon County Airport	1A5	Franklin	Macon	Green
Martin County Airport	MCZ	Williamston	Martin	Green
Montgomery County Airport	43A	Star	Montgomery	Green
Mount Olive Municipal Airport	W40	Mount Olive	Wayne	Green
Northeastern Regional Airport	EDE	Edenton	Chowan	Green
Ocracoke Island Airport & Helipad (NPS)	W95	Ocracoke	Hyde	Green
Odell Williamson Municipal Airport	60J	Ocean Isle Beach	Brunswick	Green
Plymouth Municipal Airport	PMZ	Plymouth	Washington	Green
Richmond County Airport	RCZ	Rockingham	Richmond	Green
Rockingham County NC Shiloh Airport	SIF	Reidsville	Rockingham	Green
Tarboro Edgecombe Airport	ETC	Tarboro	Edgecombe	Green
Tri-County Airport	ASJ	Ahoskie	Hertford	Green

Sources: FAA and NCDOT

Table 2.2: Privately Owned Public-Use Airports in North Carolina

Ref#[1]	Airport Name	Associated City	Runway Identifier	Dimensions (ft)	Surface Type[2]-Condition[3]	Based Aircraft	Total Annual Operations
1	Hendersonville	Hendersonville	15-33	3,075 x 40	ASPH-G	47	24,550
2	Shiflet Field	Marion	10-28	3,340 x 180	TURF-G	56	8,800
3	Wilson's	Hickory	17-35	2,175 x 70	TURF-F	9	800
4	Taylorsville	Taylorsville	08-26	2,400 x 60	TURF	10	0
5	Laneys	Maiden	05-23	2,000 x 100	TURF-G	40	2,500
6	Swan Creek	Jonesville	02-20	1,650 x 200	TURF-G	2	10,500
7	Lake Norman Airpark	Mooresville	14-32	3,147 x 40	ASPH-G	70	14,000
8	Jaars-Townsend	Waxhaw	04-22	3,309 x 40	ASPH-E	11	7,135
9	Wilgrove Air Park	Charlotte	17-35	2,835 x 40	ASPH-F	42	16,000
10	Goose Creek	Indian Trail	04-22	2,350 x 35	ASPH-G	20	4,570
11	Lone Hickory	Yadkinville	16-34	2,000 x 60	TURF-G	6	550
12	Twin Lakes	Mocksville	09-27	2,943 x 50	ASPH-F	86	30,000
13	Meadow Brook Field	Walnut Cove	16-34	2,725 x 32	ASPH-G	10	12,150
14	DS ButlerFarm/Airfield	Oak Ridge	01-19	2,000 x 60	TURF-G	3	4,100
15	Hiatt	Thomasville	01-19	2,500 x 75	TURF-G	31	10,650
16	Air Harbor	Greensboro	09-27	2,460 x 65	ASPH-TURF-F	40	3,600
17	Warf	Reidsville	17-35	2,550 x 150	CONC-TURF-G	11	3,300
18	Southeast Greensboro	Greensboro	17-35	3,063 x 30	ASPH-G	40	5,500
19	Causey	Liberty	02-20	3,800 x 40	ASPH-G	25[4]	3,200
20	Kecks	Julian	05-23	1,400 x 75	TURF-G	1	325
21	Hinshaw (Greenacres)	Liberty	03-21	1,400 x 100	TURF-F	1	650
22	Caswell	Yanceyville	04-22	1,735 x 135	TURF-G	0	150
23	Hurdle Field	Mebane	03-21	2,200 x 150	TURF-G	9	3,100
24	Whitefield Farms	Hurdlemills	03-21	1,950 x 70	TURF-G	4	575
25	PK Airpark	Raeford	04-22	3,402 x 60	ASPH-F	6	32,000
26	Gray's Creek	Fayetteville	17-35	3,500 x 30	ASPH-F	25	7,100
27	Bladenboro	Bladenboro	02-20	2,850 x 135	TURF-F	5	2,300
28	Triple W	Raleigh	16-34	3,004 x 40	ASPH-F	18	15,000
29	Raleigh East	Knightdale	01-19	3,000 x 36	ASPH-F	27	7,500
30	Pink Hill	Pink Hill	01-19	2,800 x 85	TURF-G	6	450
31	Eagles Nest	Potters Hill	13-31	1,850 x 75	TURF-F	0	0
32	Sky Manor	Jacksonville	08-26	3,610 x 85	TURF-F	5	600
33	Holly Ridge-Topsail Is	Holly Ridge	14-32	3,600 x 88	TURF-G	4	4,600
34	Flanagan Field	Farmville	03-21	2,500 x 100	TURF-G	16	3,050
35	South Oaks Aerodrome	Winterville	07-25	1,850 x 50	TURF-G	22	2,500
36	Donald's Airpark	Plymouth	04-22	4,195 x 100	TURF-G	8	1,200
					Total	945	243,005

Source: FAA

Notes: [1] The reference number is provided for ease in locating the airport in Figure 2.3. The reference number only relates to this exhibit and does not convey any other meaning
[2] TURF=Unpaved Turf Runway, ASPH= Paved Asphalt Runway, CONC=Paved Concrete Runway
[3] E=Excellent Condition, G=Good Condition, F=Fair Condition
[4] This indicates there is a jet based at this airfield

Table 2.3: North Carolina System Airports by ASSET Role Table

City	Airport	Locid	NC GAADP Groupings	ASSET Category
Charlotte	Charlotte/Douglas Int'l	CLT	Com. Service	-
Raleigh	Raleigh-Durham Int'l	RDU	Com. Service	-
Greensboro	Piedmont Triad Int'l	GSO	Com. Service	-
Wilmington	Wilmington Int'l	ILM	Com. Service	-
Asheville	Asheville Regional	AVL	Com. Service	-
Fayetteville	Fayetteville Regional	FAY	Com. Service	-
Jacksonville	Albert J. Ellis	OAJ	Com. Service	-
New Bern	Coastal Carolina Regional	EWN	Com. Service	-
Greenville	Pitt-Greenville	PGV	Com. Service	-
Concord	Concord Regional	JQF	Com. Service	-
Winston	Smith Reynolds	INT	Red	National
Asheboro	Asheboro Regional	HBI	Red	Regional
Beaufort	Michael J. Smith Field	MRH	Red	Regional
Burlington	Burlington-Alamance Regional	BUY	Red	Regional
Erwin	Harnett Regional Jetport	HRJ	Blue	Regional
Goldsboro	Wayne Executive Jetport	GWW	Blue	Regional
Hickory	Hickory Regional	HKY	Red	Regional
Kinston	Kinston Regional Jetport	ISO	Red	Regional
Lexington	Davidson County	EXX	Blue	Regional
Louisburg	Triangle North Executive	LHZ	Red	Regional
Monroe	Charlotte-Monroe Executive	EQY	Red	Regional
Mount Airy	Mount Airy/Surry County	MWK	Blue	Regional
Pinehurst/	Moore County	SOP	Red	Regional
Rocky Mount	Rocky Mount-Wilson Regional	RWI	Red	Regional
Rutherfordton	Rutherford Co - Marchman	FQD	Blue	Regional
Salisbury	Rowan County	RUQ	Blue	Regional
Sanford	Raleigh Exec Jetport	TTA	Red	Regional
Smithfield	Johnston County	JNX	Red	Regional
Statesville	Statesville Regional	SVH	Red	Regional
Albemarle	Stanly County	VUJ	Blue	Local
Andrews	Western Carolina Regional	RHP	Blue	Local
Clinton	Clinton-Sampson County	CTZ	Blue	Local
Currituck	Currituck County Regional	ONX	Blue	Local
Edenton	Northeastern Regional	EDE	Green	Local
Elizabeth City	Elizabeth City Cg Air	ECG	Blue	Local
Elkin	Elkin Muni	ZEF	Green	Local
Franklin	Macon County	1A5	Green	Local
Gastonia	Gastonia Muni	AKH	Blue	Local
Jefferson	Ashe County	GEV	Green	Local
Kenansville	Duplin Co	DPL	Blue	Local

City	Airport	Locid	NC GAADP Groupings	ASSET Category
Lincolnton	Lincolnton-Lincoln County	IPJ	Blue	Local
Lumberton	Lumberton Muni	LBT	Blue	Local
Manteo	Dare County Regional	MQI	Red	Local
Morganton	Foothills Regional	MRN	Blue	Local
North	Wilkes County	UKF	Red	Local
Oak Island	Cape Fear Regional Jetport	SUT	Red	Local
Oxford	Henderson-Oxford	HNZ	Blue	Local
Reidsville	Rockingham County Shiloh	SIF	Blue	Local
Roanoke	Halifax-Northampton Regional	IXA	Blue	Local
Roxboro	Person County	TDF	Blue	Local
Shelby	Shelby-Cleveland County Rgnl	EHO	Blue	Local
Siler City	Siler City Muni	5W8	Blue	Local
Spruce Pine	Avery County/Morrison Field/	7A8	Green	Local
Star	Montgomery County	43A	Green	Local
Wadesboro	Anson County- Jeff Cloud Field	AFP	Blue	Local
Wallace	Henderson Field	ACZ	Green	Local
Washington	Warren Field	OCW	Blue	Local
Whiteville	Columbus County Muni	CPC	Green	Local
Elizabethtown	Curtis L Brown Jr Field	EYF	Blue	Basic
Hatteras	Billy Mitchell	HSE	NPS	Basic
Kill Devil Hills	First Flight	FFA	NPS	Basic
Maxton	Laurinburg-Maxton	MEB	Blue	Basic
Mount Olive	Mount Olive Muni	W40	Green	Basic
Ocean Isle	Odell Williamson Muni	60J	Green	Basic
Ocracoke	Ocracoke Island	W95	NPS	Basic
Plymouth	Plymouth Muni	PMZ	Green	Basic
Rockingham	Richmond County	RCZ	Green	Basic
Sylva	Jackson County	24A	Green	Basic
Ahoskie	Tri-County	ASJ	Green	Not
Engelhard	Hyde County	7W6	Green	Not
Tarboro	Tarboro-Edgecombe	ETC	Green	Not
Williamston	Martin County	MCZ	Green	Not

Sources: FAA and NCDOT

Table2.4: Summary Comparison of ASSET Roles and GAADP Groupings

	NC Airport Groupings				
ASSET Category	Red	Blue	Green	NPS	Total
National	1				1
Regional	12	6			18
Local	3	18	8		29
Basic		2	8	3	13
Not Classified			1		1
Total	16	26	17	3	62
% of GAADP Total					
National	6%				1.5%
Regional	75%	23%			29%
Local	19%	69%	47%		47%
Basic		8%	47%	100%	21%
Not Classified			6%		2%
Total	100%	100%	100%	100%	100%

Sources: FAA and NCDOT
Note: NPS means National Park Service airstrips

Table 2.5: Percent of NPIAS Airports by Type with One or More Runways

Airport Type	No. of Airports	Percent Single Runway Only	Percent Two or More Runways
Commercial	10	20%	80%
Reliever	2	100%	0%
General Aviation	60	86%	14%

Sources: 2012 North Carolina Inventory Data Survey and 2012 FAA 5010-1 database

Table 2.6: Summary of Primary Runways Pavement Conditions

Airport Type	Primary Runway Condition Rating			
	Poor (PCI <55)	Fair (PCI 56-70)	Good (PCI 71-85)	Excellent (PCI 86-100)
Commercial	0	0	8	1
Reliever	0	0	2	0
General Aviation	0	6	46	12
TOTAL	0	6	55	12

Sources: 2012 North Carolina Inventory Data Survey and 2012 FAA 5010-1 database

Table 2.7: Runway Related Data for Study Airports

Associated City	Airport	Elev (MSL)	No. of Run-ways	Primary Runway				
				Length	Width	Surface/Condition	Strength (000's lbs)	Parallel Taxiway
COMMERCIAL SERVICE AIRPORTS								
Asheville	Asheville Regional Airport	2164.8	1	8,001'	150'	Asphalt-F	SW-120, DW-160, DTW-260	Full
Charlotte	Charlotte-Douglas International	748	4	10,000'	150'	Concrete-G	SW-140, DW-200, DTW-350, DDTW-650	Full
Concord	Concord Regional Airport	705	1	7,400'	150'	Asphalt-G	DW-129	Full
New Bern	Coastal Carolina Regional Airport	18	2	6,153'	150'	Asphalt-G	SW-30, DW-62, DTW-140	Full
Fayetteville	Fayetteville International Airport	189	2	7,709'	150'	Asphalt-G	SW-100, DW-200, DTW-350, DDTW-750	Full
Greensboro	Piedmont Triad International Airport	926	3	10,001'	150'	Asphalt-G	SW-124, DW-170, DTW-240	Full
Wilmington	Wilmington International Airport	32	2	8,601'	150'	Asphalt-G	SW-75, DW-160, DTW-265	Full
Jacksonville	Albert J Ellis Airport	93	1	7,100'	150'	Asphalt-G	SW-75, DW-175 DTW-300	Full
Greeneville	Pitt Greenville Airport	26	3	6,505'	150'	Asphalt-G	SW-59, DW-95	Full

Associated City	Airport	Elev (MSL)	No. of Run-ways	Primary Runway				
				Length	Width	Surface/Condition	Strength (000's lbs)	Parallel Taxiway
Raleigh-Durham	Raleigh-Durham International Airport	435	3	10,000'	150'	Concrete-G	SW-75, DW-190, DTW-355, DDTW-750	Full
GENERAL AVIATION AIRPORTS								
Burlington	Burlington Alamance Regional Airport	616	1	6,405'	100'	Asphalt-G	DW-95	Full
Monroe	Charlotte Monroe Executive	682.6	1	7,000'	100'	Asphalt-G	DW-68.5	Full
Asheboro	Asheboro Regional Airport	670.7	1	5,501'	100'	Asphalt-G	SW-30, DW-60	Full
Hickory	Hickory Regional Airport	1190	2	6,400'	150'	Asphalt-G	SW-32, DW-55	Full
Winston-Salem	Smith Reynolds Airport	969.4	2	6,655'	150'	Asphalt-G	SW-110, DW-135 DTW-230	Full
Smithfield	Johnston County Airport	164	1	5,500'	100'	Asphalt-G	SW-30, DW-65	Full
Louisburg	Triangle North Exec Airport	368	1	5,498'	100'	Asphalt-G	SW-40, DW-60	Full Parallel Turn
Manteo	Dare County Regional Airport	13	2	4,305'	100'	Asphalt-G	SW-48	Full Parallel Turn
Beaufort	Michael J Smith Field	11	3	5,002'	100'	Asphalt-G	DW-60	Partial Parallel Turn
Rocky Mount	Rocky Mount Wilson Regional	157.7	1	7,099'	150'	Asphalt-F	SW-62, DW-75 DTW-140	Full Parallel Turn

Associated City	Airport	Elev (MSL)	No. of Run-ways	Primary Runway				
				Length	Width	Surface/Condition	Strength (000's lbs)	Parallel Taxiway
Pinehurst/Southern Pines	Moore County Airport	454.7	1	5,503'	150'	Asphalt-G	SW-30, DW-58	Full
Oak Island	Cape Fear Regional Jetport	26	1	5,505'	100'	Asphalt-E	SW-60, DW-80	Full
Statesville	Statesville Regional Airport	382	1	7,005'	100'	Asphalt-G	SW-30, DW-100	Full Turn
Sanford	Raleigh Executive Jetport	246	1	6,500'	100'	Asphalt-G	SW-30, DW-80	Full Parallel Turn
Wilkesboro	Wilkes County Airport	1303.1	1	6,200'	100'	Asphalt-G	SW-45, DW-60	Full Parallel Turn
Siler City	Siler City Municipal Airport	615.4	1	5,000'	75'	Asphalt-F	SW-25	Turnaround Ends
Wadesboro	Anson County	300	1	5,498'	100'	Asphalt-G	SW-12, DW-60	Full Parallel Turn
Gastonia	Gastonia Municipal Airport	798	1	3,770	100'	Asphalt-G	SW-24	Full Parallel Turn
Clinton	Clinton-Sampson County Airport	144	1	5,010'	75'	Asphalt-G	SW-26	Full Parallel Turn
Kenansville	Duplin County Airport	137	1	6,002'	75'	Asphalt-G	SW-30, DW-50	Full Parallel Turn
Elizabeth City	Elizabeth City CGAS Regional Airport	10.5	2	7,217'	150'	Asphalt Concrete-G	SW-100, DW-200 DTW-400	Turnaround End

Associated City	Airport	Elev (MSL)	No. of Run-ways	Primary Runway				
				Length	Width	Surface/Condition	Strength (000's lbs)	Parallel Taxiway
Shelby	Shelby-Cleveland Co Regional Airport	847	1	5,002'	100'	Asphalt-G	SW-21, DW-45	Full Parallel Turn
Lexington	Davidson County Airport	733	1	5,004'	100'	Asphalt-G	SW-17, DW-60	Full Parallel Turn
Elizabethtown	Curtis L Brown Jr Field	132	1	5,005'	75'	Asphalt-G	SW-30, DW-45	Full Parallel Turn
Rutherfordton	Rutherford County	1077	1	5,000'	100'	Asphalt-G	DW-66	Full Parallel Turn
Goldsboro	Wayne Executive Jetport	133	1	5,500'	100'	Asphalt-E	SW-30, DW-42	Full Parallel Turn
Oxford	Henderson Oxford Airport	526	1	5,002'	97'	Asphalt-G	SW-30	Full Parallel Turn
Erwin	Harnett Regional Jetport	202	1	5,000'	75'	Asphalt-F	SW-13	Full Parallel Turn
Lincolnton	Lincolnton Lincoln County Regional Airport	877	1	5,504'	100'	Asphalt-G	SW-30, DW-60	Full Parallel Turn
Kinston	Kinston Regional Jetport	93	1	11,500'	150'	Asphalt-G	SW-90, DW-130 DTW-260	Full Parallel Turn
Roanoke Rapids	Halifax-Northampton Co Regional	145	1	5,500'	101'	Asphalt-E	SW-45, DW-65	Full Parallel Turn
Lumberton	Lumberton Municipal Airport	125	2	5,502'	150'	Asphalt-E	SW-80	Partial Parallel Turn

Associated City	Airport	Elev (MSL)	No. of Run-ways	Primary Runway				
				Length	Width	Surface/Condition	Strength (000's lbs)	Parallel Taxiway
Maxton	Laurinburg Maxton Airport	217	2	6,503'	150'	Asphalt-E	SW-25, DW-35	Full Parallel Turn
Morganton	Foothills Regional Airport	1270	1	5,500'	75'	Asphalt-G	DW-60	Partial Parallel
Mt. Airy	Mount Airy Surry County Airport	1249	1	4,301'	75'	Asphalt-G	NA	Partial parallel
Washington	Warren Field	37	2	5,000'	100'	Asphalt-G	SW-30, DW-38	Full Parallel Turn
Currituck	Currituck County Regional	17.9	1	5,500'	150'	Asphalt Concrete-G	SW-20, DW-35	Connector
Andrews	Western Carolina Regional	1699	1	5,500'	100'	Asphalt-G	SW-25, DW-45	Partial Parallel
Roxboro	Person County Airport	609	1	6,005'	100'	Asphalt-E	SW-30, DW-67	Full Parallel Turn
Albemarle	Stanly County Airport	609	2	5,500'	100'	Asphalt-G	DW-130	Full Parallel Turn
Franklin	Macon County Airport	2020	1	5,000'	100'	Asphalt-G	DW-130	Full Parallel Turn
Sylva	Jackson County Airport	2857	1	3,200'	60'	Asphalt-G	SW-12.5	Turnaround Ends
Star	Montgomery County Airport	632.4	1	4,002'	75'	Asphalt-G	SW-20	Turnaround Ends

Associated City	Airport	Elev (MSL)	No. of Run-ways	Primary Runway				
				Length	Width	Surface/Condition	Strength (000's lbs)	Parallel Taxiway
Ocean Isle Beach	Odell Williamson Municipal Airport	32	1	4,198'	75'	Asphalt-G	SW-12	Connector
Spruce Pine	Avery County Morrison Field	2750	1	3,000'	60'	Asphalt-G	SW-12.5	Turnaround Ends
Engelhard	Hyde County Airport	8	1	4,700'	100'	Asphalt-G	SW-30, DW-43	Connector
Wallace	Henderson Field	38	1	4,153'	75'	Asphalt-E	SW-12.5	Turnaround Ends
Ahoskie	Tri-County Airport	66.6	1	4,501'	75'	Asphalt-G	SW-35, DW-45	Partial Parallel
Whiteville	Columbus County Airport	99	1	5,500'	75'	Asphalt-G	SW-24, DW-30	Turnaround End and Connector
Edenton	Northeastern Regional Airport	20	1	6,000'	100'	Asphalt-E	SW-60, DW-80	Full Parallel Turn
Tarboro	Tarboro Edgecombe Airport	52.8	1	3,999'	60'	Asphalt-G	SW-12.5	Turnaround and Connector
King Devil Hills	First Flight Airport (NPS)	13	1	3,000'	60'	Asphalt-G	SW-10	Turnaround Ends
Jefferson	Ashe County Airport	3187	1	4,296	75'	Asphalt-G	SW-12.5	Connector
Hatteras	Billy Mitchell Airstrip (NPS)	17	1	3,000'	75'	Asphalt-G	SW-30	Connector and Turnaround

Associated City	Airport	Elev (MSL)	No. of Run-ways	Primary Runway				
				Length	Width	Surface/Condition	Strength (000's lbs)	Parallel Taxiway
Williamston	Martin County Airport	74.8	1	5,000'	75'	Asphalt-G	SW-21	Turnaround and Connector
Plymouth	Plymouth Municipal Airport	36	1	5,500'	100'	Asphalt-G	SW-60	Partial Parallel
Rockingham	Richmond County Airport	358	2	5,000'	98'	Asphalt-E	SW-30	Full Parallel
Salisbury	Rowan County Airport	772	1	5,501'	100'	Asphalt-E	SW-45, DW-55	Full Parallel
Reidsville	Rockingham County NC Shiloh Airport	694	1	5,199'	100'	Asphalt-E	SW-12.5, DW-24	Full Parallel
Mount Olive	Mount Olive Municipal Airport	166	1	5,255'	75'	Asphalt-F	SW-20	Connector
Ocracoke	Ocracoke Island Airport & Helipad (NPS)	5	1	2,999'	60'	Asphalt-G	SW-30	Turnaround Ends
Elkin	Elkin Municipal Airport	1067	1	4,001'	75'	Asphalt-E	SW-25	Connector

Sources: 2012 North Carolina Data Survey and 2012 FAA 5010 Database

Table 2.8: Summary of Taxiway Systems on Primary Runways

Taxiway System for Primary Runway	No. of Airports	Percent of Airports
Full Length Parallel	47	65%
Partial Parallel	7	10%
Stub/Turn-around	13	18%
No Taxiway	5	7%

Sources: 2012 North Carolina Inventory Data Survey and 2012 FAA 5010-1 database

Table 2.9: On-Site Automated Weather Capabilities

ID	Associated City	Facility	Automated Weather Reporting Type	ATCT
AVL	Asheville	Asheville Regional Airport	ASOS	Yes
ONX	Currituck	Currituck County Regional	AWOS IIIP	No
ECG	Elizabeth City	Elizabeth City CGAS Regional	ASOS	Yes
IXA	Roanoke Rapids	Halifax-Northampton Co Regional	AWOS IIIP	No
HNZ	Oxford	Henderson Oxford Airport	AWOS IIIP	No
24A	Sylva	Jackson County Airport	SUPERAWOS	No
JNX	Smithfield	Johnston County Airport	AWOS IIIPT	No
ISO	Kinston	Kinston Regional Jetport	AWOS IIIP	Yes
1A5	Franklin	Macon County Airport	AWOS IIIPT	No
EDE	Edenton	Northeastern Regional Airport	AWOS IIIP	No
TDF	Roxboro	Person County Airport	AWOS IIIPT	No
RWI	Rocky Mount	Rocky Mount Wilson Regional	ASOS	No
ETC	Tarboro	Tarboro Edgecombe Airport	AWOS IIIP	No
ASJ	Ahoskie	Tri-County Airport	AWOS IIIP	No
OCW	Washington	Warren Field	AWOS IIIP	No
GW	Goldsboro	Wayne Executive Jetport	AWOS IIIP	No
RHP	Andrews	Western Carolina Regional	AWOS IIIP	No
OAJ	Jacksonville	Albert J Ellis Airport	AWOS III	No
7A8	Spruce Pine	Avery County Morrison Field	SUPERAWOS	No
CTZ	Clinton	Clinton-Sampson County Airport	AWOS IIIP	No
CPC	Whiteville	Columbus County Airport	AWOS IIIP	No
EYF	Elizabethtown	Curtis L Brown Jr Field	AWOS IIIP	No
MRN	Morganton	Foothills Regional Airport	AWOS IIIP	No
HKY	Hickory	Hickory Regional Airport	ASOS	Yes
MEB	Maxton	Laurinburg Maxton Airport	ASOS	No

ID	Associated City	Facility	Automated Weather Reporting Type	ATCT
IPJ	Lincolnton	Lincolnton Lincoln County	AWOS IIIP	No
LBT	Lumberton	Lumberton Municipal Airport	ASOS	No
SOP	Pinehurst/Southern	Moore County Airport	AWOS III	No
TTA	Sanford	Raleigh Executive Jetport	AWOS IIIP	No
FQD	Rutherfordton	Rutherford County Marchman	AWOS IIIPT	No
EHO	Shelby	Shelby-Cleveland Co Rgnl Airport	AWOS IIIP	No
SUT	Oak Island	Cape Fear Regional Jetport	AWOS IIIP	No
HRJ	Erwin	Harnett Regional Jetport	AWOS IIIP	No
MWK	Mount Airy	Mount Airy Surry County Airport	AWOS IIIP	No
SVH	Statesville	Statesville Regional Airport	AWOS IIIP	No
LHZ	Louisburg	Triangle North Exec Airport	AWOS IIIP	No
HSE	Hatteras	Billy Mitchell Airstrip (NPS)	ASOS	No
EWN	New Bern	Coastal Carolina Regional Airport	ASOS	Yes
MQI	Manteo	Dare County Regional Airport	AWOS IIIP	No
DPL	Kenansville	Duplin County Airport	AWOS IIIP	No
FAY	Fayetteville	Fayetteville International Airport	ASOS	Yes
FFA	Kill Devil Hills	First Flight Airport (NPS)	AWOS IIIP	No
MRH	Beaufort	Michael J Smith Field	ASOS	No
PGV	Greenville	Pitt Greenville Airport	AWOS IIIPT	No
ILM	Wilmington	Wilmington International Airport	ASOS	Yes
AFP	Wadesboro	Anson County - Jeff Cloud Field	AWOS IIIP	No
GEV	Jefferson	Ashe County Airport	AWOS IIIP	No
HBI	Asheboro	Asheboro Regional Airport	AWOS IIIP	No
BUY	Burlington	Burlington Alamance Regional	ASOS	No
EQY	Monroe	Charlotte Monroe Executive	ASOS	No
JQF	Concord	Concord Regional Airport	AWOS IIIPT	Yes
EXX	Lexington	Davidson County Airport	AWOS IIIP	No
AKH	Gastonia	Gastonia Municipal Airport	ASOS	No
RCZ	Rockingham	Richmond County Airport	AWOS IIIP	No
SIF	Reidsville	Rockingham County NC Shiloh	AWOS IIIP	No
RUQ	Salisbury	Rowan County Airport	AWOS IIIP	No
5W8	Siler City	Siler City Municipal Airport	AWOS IIIP	No
INT	Winston-Salem	Smith Reynolds Airport	ASOS	Yes
VUJ	Albemarle	Stanly County Airport	AWOS IIIPT	Yes
UKF	North Wilkesboro	Wilkes County Airport	AWOS IIIPT	No
CLT	Charlotte	Charlotte Douglas International	ASOS	Yes
GSO	Greensboro	Piedmont Triad International	ASOS	Yes
RDU	Raleigh/Durham	Raleigh Durham International	ASOS	Yes

Sources: 2012 North Carolina Inventory Data Survey and 2012 FAA 5010-1 database

Table 2.10: Approach Types by Airport Type

Airport Type	Precision	Non-Precision	Visual Only
Commercial	10	10	0
Reliever	2	2	0
General Aviation	20	60	6
Total - All Airports	32	72	6

Sources: 2012 North Carolina Inventory Data Survey and 2012 FAA 5010-1 database

Table 2.11 Percentage of Airports by Airport Type Having Fuel

Airport Type	Jet A & AvGas	AvGas Only	No Fuel
Commercial	100%	0%	0%
Reliever	100%	0%	0%
General Aviation	85%	8%	7%
Total - All Airports	87%	7%	6%

Sources: 2012 North Carolina Inventory Data Survey and 2012 FAA 5010-1 database

Table 2.12: Percent of Hangar Type by Airport Type

Airport Type	T-Hangars	Box	Corporate	Portable /Other	Transient
Commercial	4%	4%	4%	0%	4%
Reliever	13%	1%	8%	5%	6%
General Aviation	83%	95%	88%	95%	90%
Total - All Airports	100%	100%	100%	100%	100%

Sources: 2012 North Carolina Inventory Data Survey and 2012 FAA 5010-1 database

Chapter 3 – Forecasts of Aviation Demand

Introduction

Forecasts of commercial and general aviation activity have been prepared to estimate the level of activity expected at North Carolina airports. These forecasts or projections assist in verifying the roles of individual airports in the North Carolina system and help determine whether existing facilities are adequate to accommodate future demand. The forecast period for the North Carolina Airport System Plan (NCASP) is 2011 to 2031, with 2011 serving as the base year for historical activity and a 20-year forecast period.

This chapter examines and projects the following components of North Carolina airport activity:

- Annual passenger enplanements for commercial service airports
- Based general aviation aircraft
- Aircraft operations
- Air cargo or freight

It is important to note that the forecasts examine commercial service airports separately from general aviation airports. In addition to serving different segments of aviation activity, these airports also experience greater variance in growth than general aviation airports. For purposes of the NCASP, the forecasts of activity at the commercial airports primarily reflect those contained in the Federal Aviation Administration's (FAA's) Terminal Area Forecast (TAF) as available in December 2012. The TAF was also consulted for the general aviation airports, but typically the FAA does not use the same level of detailed analysis for general aviation airports and often does not actually project increases in activity at many of the general aviation airports. As noted in previous chapters, Concord Regional Airport's commercial service wasn't initiated until 2013. Therefore, in this chapter, Concord Regional is included with general aviation airports for purposes of forecasting.

To ensure reasonable results for the general aviation airports, forecasts for each component were developed using several forecasting methodologies. These include both "top down" and "bottom up" approaches, as explained below.

- Top Down Approach: Projects aviation activity for the entire North Carolina Airport system, then relates the projections back to each individual airport based upon the airport's share of statewide activity
- Bottom Up Approach: Relates local factors, including historic aviation trends and projected population and employment growth, to future activity at individual airports. It then sums each individual airport's forecasts to arrive at a system-wide total

Preferred methodologies for each aviation activity indicator were selected based upon historic and projected socio-economic factors, FAA projections, and the possible impacts of industry trends.

The chapter begins with a discussion of national and state aviation trends most often associated with changes in aviation activity.

National Trends

Nationally, demand for commercial air service and general aviation has remained strong and returned to pre-9/11 activity levels only to fall once again with the beginning of the recession in 2008. Since then, commercial air service demand has increased and is expected to return to pre-recession levels. However, the domestic commercial airline industry continues to struggle with high operational costs in an environment of intense pricing competition. In both the commercial and general aviation sectors, fuel prices have rapidly escalated the cost of flying.

The following sections review some of the most important national trends in aviation that have and will continue to impact North Carolina.

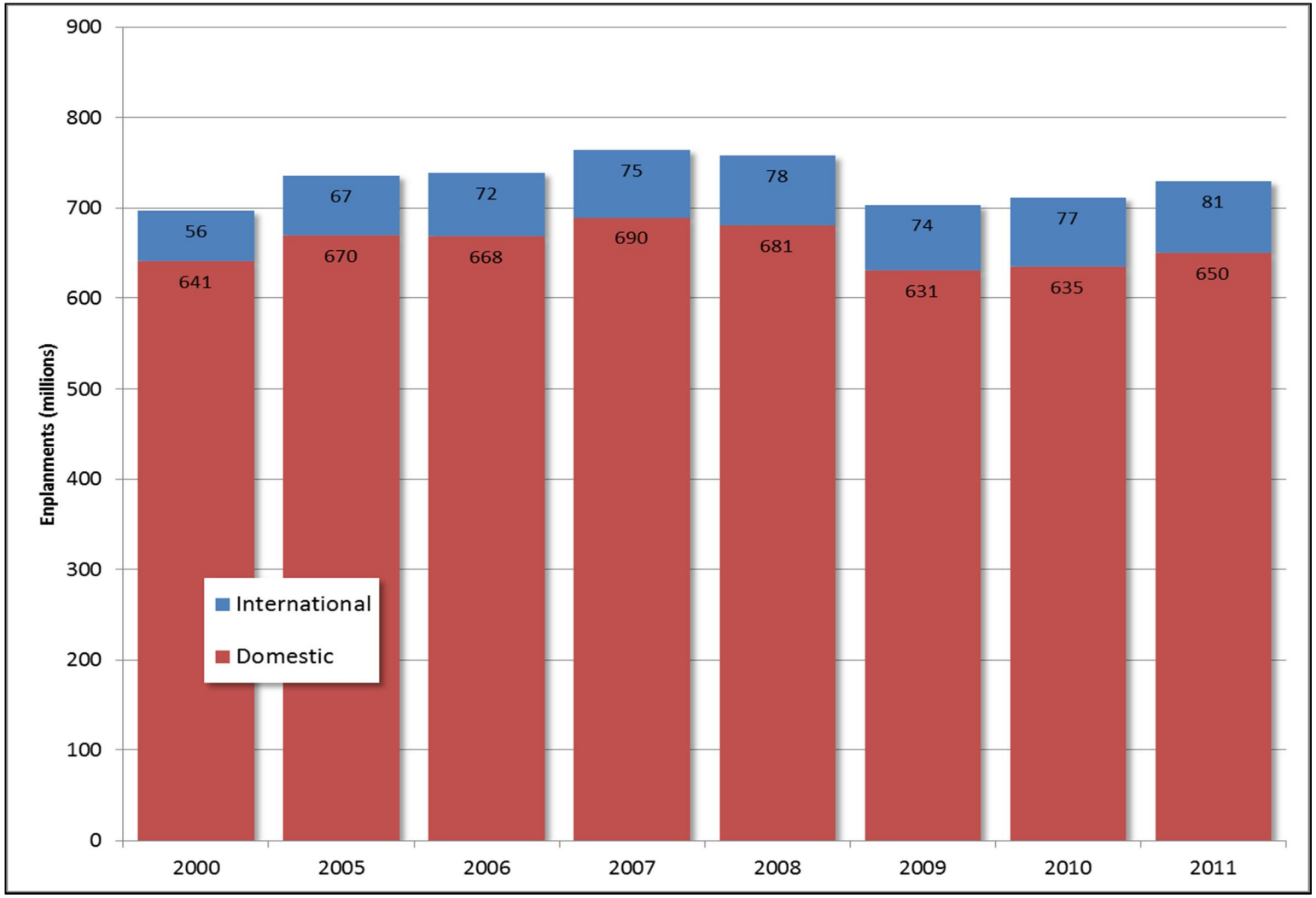
Commercial Service Trends

Commercial service includes all scheduled passenger and air cargo flights. Following September 11, 2001 (9/11), aviation forecasters anticipated that it would take some time for commercial demand to return to levels experienced in 2000. By 2005, commercial traffic levels at almost all commercial airports exceeded 2000 levels. Again after the 2008 collapse of the financial markets, commercial traffic levels dropped and were not expected to recover until the economy as a whole recovered. Figure 3.1 shows the trend in total U.S. enplanements since 2000.

Commercial Service Enplanement Trends

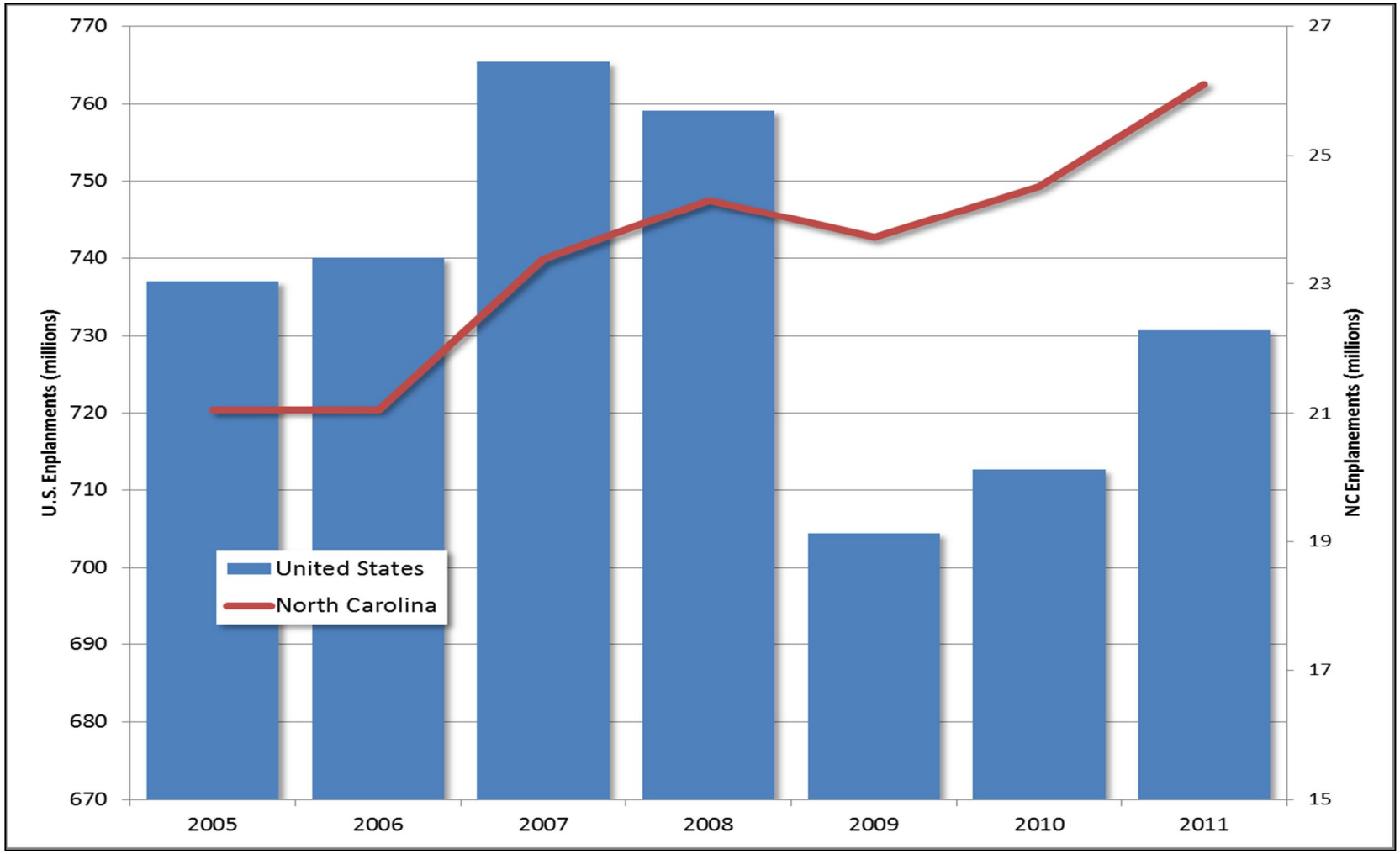
Figure 3.2 compares North Carolina's historical enplanements with U.S. enplanements for the 6-year period between 2005 and 2011. As Figure 3.2 shows, changes in North Carolina traffic have consistently tracked U.S. trends; however, North Carolina has tended to fare better than the national average in terms of passenger enplanements.

- Figure 3.1: U.S. Commercial Air Carriers, Historical Passenger (2000-2011)



Source: FAA Aerospace Forecast, Fiscal Years 2012-2032
Prepared: February 2013

- Figure 3.2: U.S. vs. NC Historical Enplanements (2005-2011)

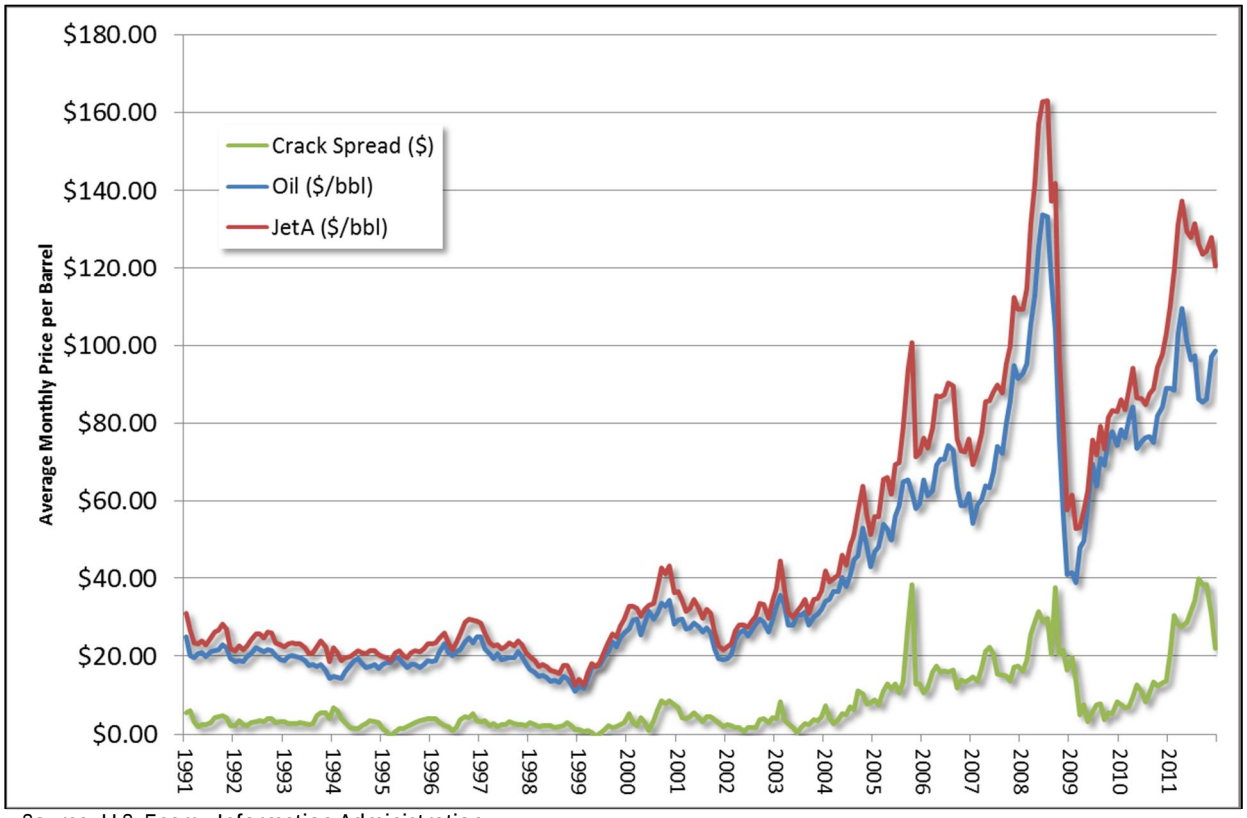


Source: FAA Aerospace Forecast, Fiscal Years 2012-2032
Prepared: February 2013

High Energy Prices

Despite a continuing increase in passenger demand, the cost of fuel continues to disrupt the financial stability of the commercial airlines and their ability to maintain profitability. Figure 3.3 shows the pricing trends of spot crude oil and jet fuel (referred to as Jet A). Since 1991, there have been three major pricing spikes in the price of oil. In the 1990s, the price fluctuated between $20 and $30 per barrel until crossing the $35 per barrel threshold briefly after September 11th, 2001. Oil then continued to steadily climb until late 2005 when Hurricane Katrina hit the U.S. Gulf Coast sending oil prices to almost $70 per barrel. Leading up to the collapse of the financial markets in the autumn of 2008, the price of oil climbed to an all-time high of around $140 per barrel. After the collapse and onset of the ensuing recession, oil prices fell to below $30 per barrel. Since that time, oil prices have made a rather steady recovery and are currently in the $90 per barrel range. In addition, the difference between crude and jet fuel cost per barrel, known as the "crack spread" has increased as well, from a historical average of $5 to just over $20 currently.

- Figure 3.3: Monthly Average US Oil & Jet A Prices



Source: U.S. Energy Information Administration
Prepared: February 2013

As a result of the surge in the price of oil, the airlines experienced significant increases in their jet fuel costs. Fuel has historically accounted for 10 to 15% of U.S. passenger

airlines' operating expenses. In 2011, operating expenses increased 12.3%, partially driven by a 24.0% rise in the price of fuel for the year.

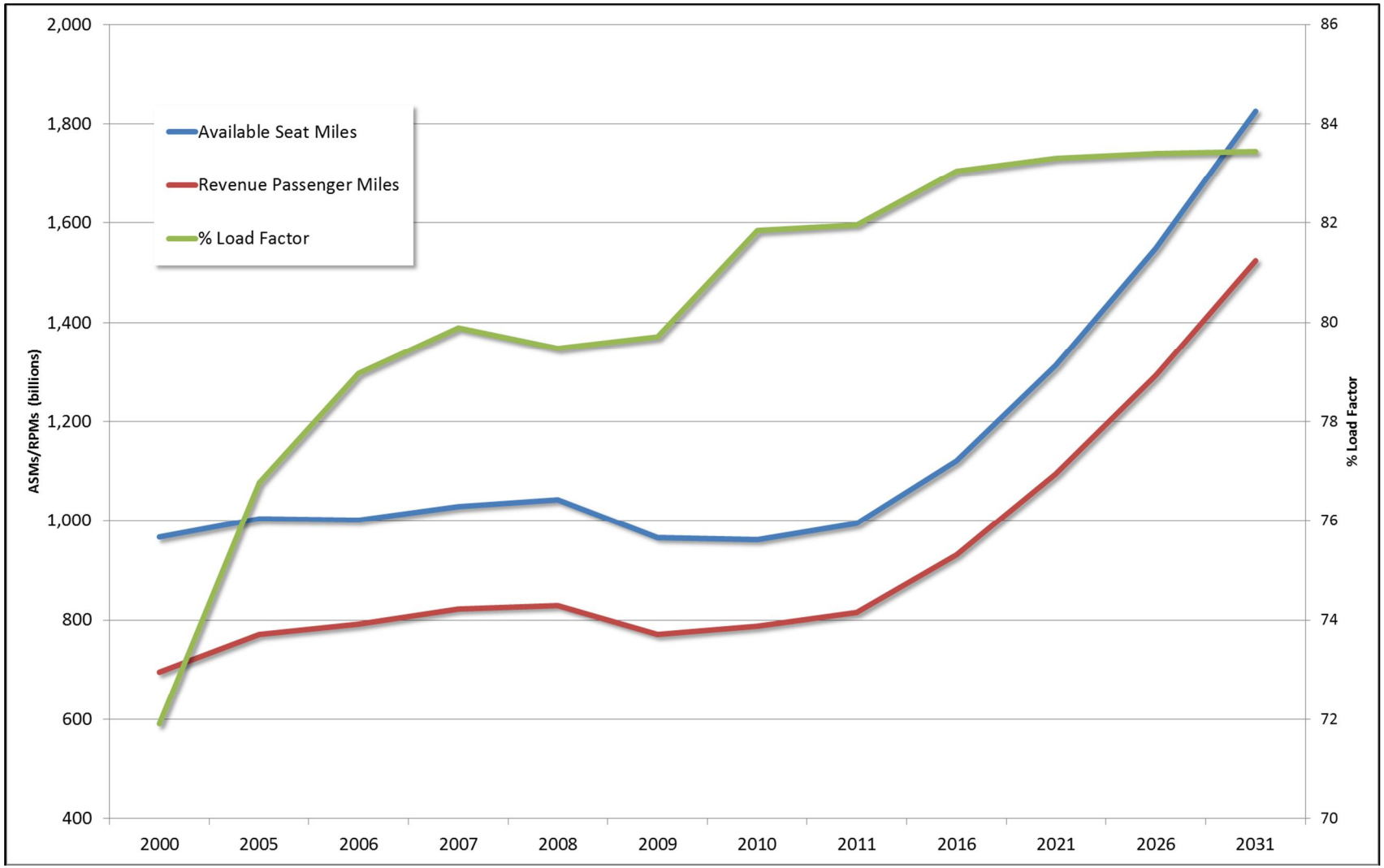
Another factor to consider with respect to the price of energy consumption is the potential for legislation to regulate greenhouse gases. Some countries have taken steps to reduce greenhouse gas emissions by enacting legislation to regulate those greenhouse gases, including those generated by aircraft. Currently, the largest program is the European Union's Emission Trading Scheme (EU ETS). This system is a "cap and trade" system where the government puts a limit on the total allowable emissions for a given time period and participants must remain within their limits or trade allowances with those who have not exceeded their limit. Aside from the EU, other countries have either adopted a similar cap and trade system or are currently in the process of creating one. Congress has tried to enact such a system in the U.S.; however, these efforts have not been successful. If a cap and trade system is enacted in the U.S. it would likely increase fuel prices, which without associated reductions in airline operating costs, could potentially increase airfares and could subsequently temper overall demand.

Capacity, Load Factors, and Airline Mergers

A way to look at the cost and revenue components of commercial air service is to compare actual passenger load factors with capacity provided by the airlines in the form of seats or seat miles. Figure 3.4 compares passenger load factors, capacity provided (Available Seat Miles), and traffic (Revenue Passenger Miles) for the major carriers. This figure clearly illustrates cuts in capacity that the airlines made after the 2008 collapse of the financial markets and how they have increased load factors in order to better cope with higher energy costs. As the number of passengers grows and the available seat miles grow at a slower rate, the result is a higher overall load factor. Higher load factors bring higher profit yields, therefore airlines are further incentivized to increase their load factors when energy costs climb.

Historically, load factors have averaged just above 70%. However, since 2000 there has been a dramatic increase in passenger load factors as airlines attempt to generate as much revenue from each flight as possible. Currently load factors are around 82% and are expected to continue to climb to just short of 84%.

- Figure 3.4: U.S. Commercial Air Carriers – Capacity, Traffic, & Load Factors (2000-2031)



Source: FAA Aerospace Forecast, Fiscal Years 2012-2032
Prepared: February 2013

This climb in load factor is primarily due to reductions in overall capacity by the airlines. Some of this capacity reduction has been natural, such as removing non-profitable routes. However, the majority of these capacity cuts have been the result of airline consolidation. In order to survive in an era of high energy costs and increased competition from Low Cost Carriers (LCCs), many airlines have had to consider mergers. In 2000 there were a total of seven "Legacy Carriers[4]" still operating in the U.S. At the time this chapter was written in January 2013, only four of these seven were still operating, with two currently seeking approval from the U.S. Department of Justice to merge, which would leave three remaining "Mega-Carriers". Table 3.1 lists the major airline mergers that have occurred since 2000. These are also depicted in Figure 3.5.

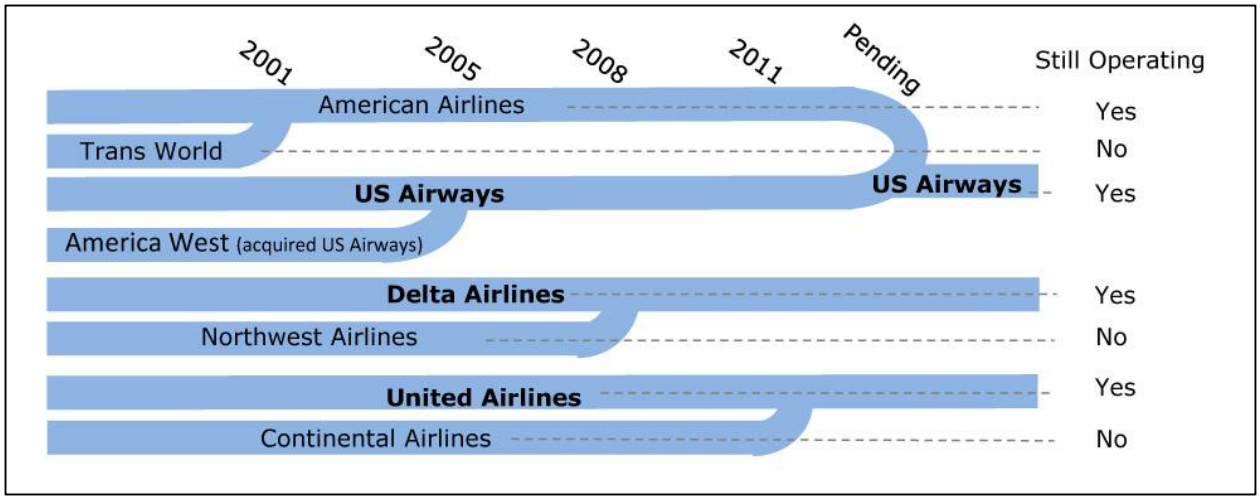
- Table 3.1: U.S. Legacy Carriers (2000-2012)

Airline	Airline Acquired:	Acquired by:	Still Operating:
American Airlines	TWA–2001	US Airways - Pending	Yes
Continental Airlines	-	United-2011	No
Delta Air Lines	Northwest-2008	-	Yes
Northwest Airlines	-	Delta - 2008	No
Trans World Airlines	-	American-2001	No
United Airlines	Continental-2011	-	Yes
US Airways	American-Pending	America West–2005	Yes

Source: Landrum and Brown
Prepared: February 2013

[4] A legacy carrier is an airline that had established interstate routes prior to the Airline Deregulation Act of 1978.

- Figure 3.5: U.S. Legacy Carriers & Mergers (2000-2012)



Source: Landrum and Brown
Prepared: May 2013

As a result of these mergers and acquisitions, the remaining airline in many cases reduced most duplicative routes, thereby reducing overall capacity without eliminating service.

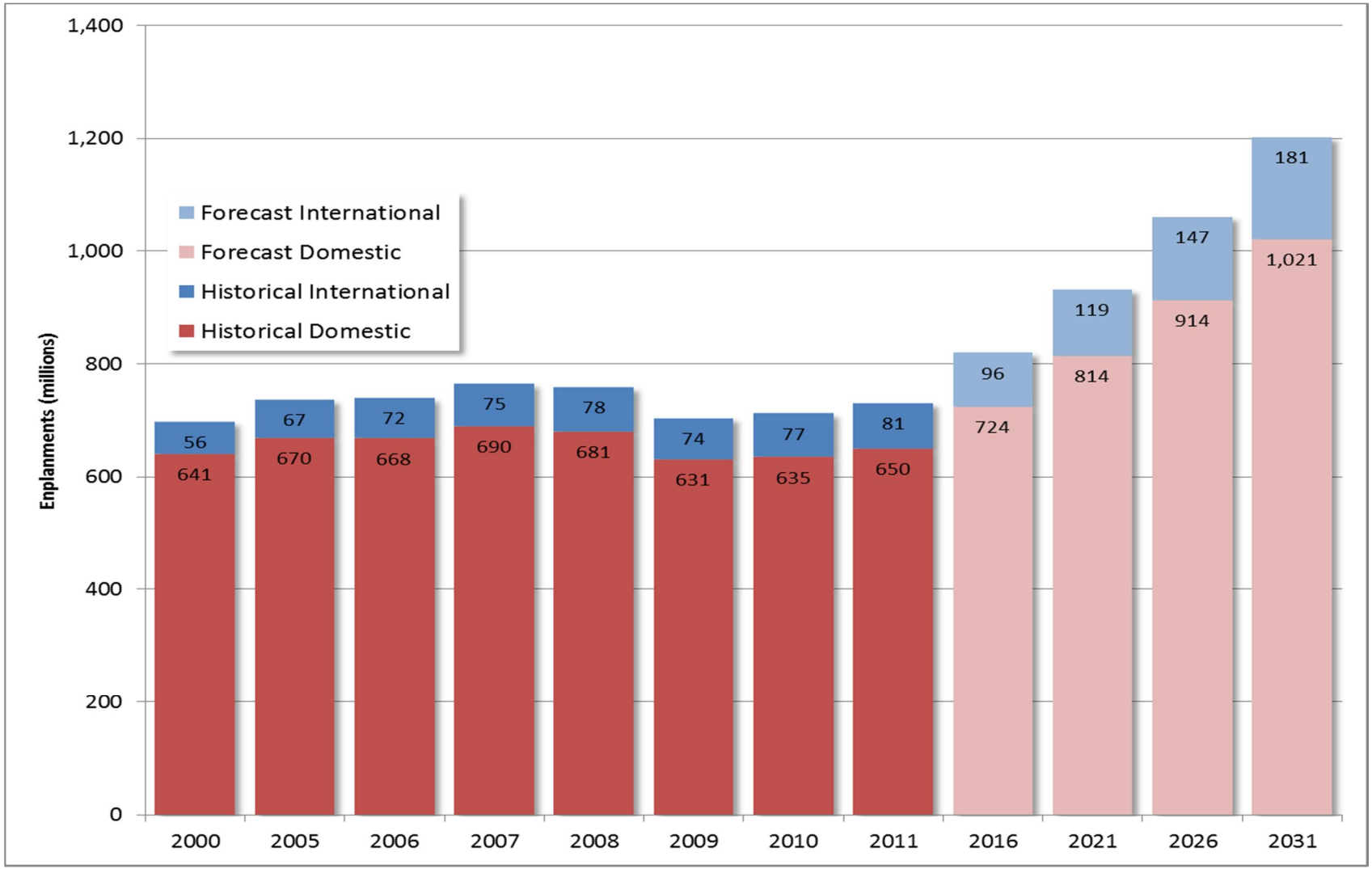
FAA Commercial Aviation Forecasts

Each year the FAA prepares a 20-year forecast for commercial aviation as part of the *FAA Aerospace Forecasts*. The forecasts are presented in March each year. The most recent commercial aviation forecasts reflect the following average annual growth rates for 2012-2032:

- Domestic enplanements – 2.29% per year
- International enplanements – 4.13% per year
- Load factors up 1.4%
- Available Seat Miles (ASMs) – 3.1% per year
- Revenue Passenger Miles (RPMs) – 3.2% per year

The FAA anticipates that international travel will be the fastest growing segment of scheduled air service. In 2011, international ASMs represented approximately 30% of the system. By 2032, international ASMs are expected to represent 37% of total ASMs. Regional carrier growth is anticipated to slow to 3.5% per year after annual increases in the 11% range between 2000 and 2011. Passenger yields are projected to improve at an average annual growth rate of 2.3%. Figure 3.6 reflects the most recent FAA forecasts for both domestic and international passengers.

- Figure 3.6: U.S. Commercial Air Carriers, Historical, and Forecast Passengers



Source: FAA Aerospace Forecast, Fiscal Years 2012-2032
Prepared: February 2013

General Aviation Trends

General aviation includes all civil aviation except scheduled passenger or air cargo operations. It includes personal transportation, business and corporate flights, air taxi defined as, "any common carrier for hire that holds an air taxi operating certificate and primarily operates small aircraft without fixed routes."[5], and helicopter operations. In North Carolina, general aviation aircraft are flown for a wide variety of reasons including business travel, agricultural spraying, flight instruction, emergency airlift, firefighting, recreation, and search and rescue. In 2011, 3,548 aircraft were registered in North Carolina with 11,836 licensed pilots[6]. These aircraft included home built/experimental, glider, agricultural, military surplus, antique and classic/warbirds, ultra-light airplanes, helicopters, single and multi-engine aircraft, and corporate and private jets.

Each year, the FAA and the General Aviation Manufacturers Association (GAMA) review the outlook for the general aviation industry. The FAA's particular areas of interest are the workload at airports with respect to FAA air traffic control towers and contract towers, airspace congestion, and changes in the U.S. fleet mix. GAMA keeps track of aircraft billings and shipments.

The following describes general aviation activity in the U.S. in order to provide a comparison for based aircraft and general aviation activity in North Carolina[7]:

- There are 222,520 general aviation aircraft registered in the U.S.; 3,548 are registered in North Carolina.
- General aviation aircraft fly over 24 million hours annually in the U.S.
- Nearly two-thirds of the hours flown on general aviation aircraft are for business purposes.
- Single-engine aircraft are the most popular and numerous aircraft in the United States. In 2011, 1,865 single-engine aircraft were shipped. However, this segment of the General aviation fleet is shrinking.
- Turboprop airplanes are a much smaller segment of the market. In 2011, 324 units were shipped.
- Business jets are the fastest growing segment of the market in terms of units shipped. In 2011, 681 units were shipped. These aircraft have the highest potential for growth.
- Domestic shipments of new aircraft reached a near term high in 2007 with a total of 4,276.

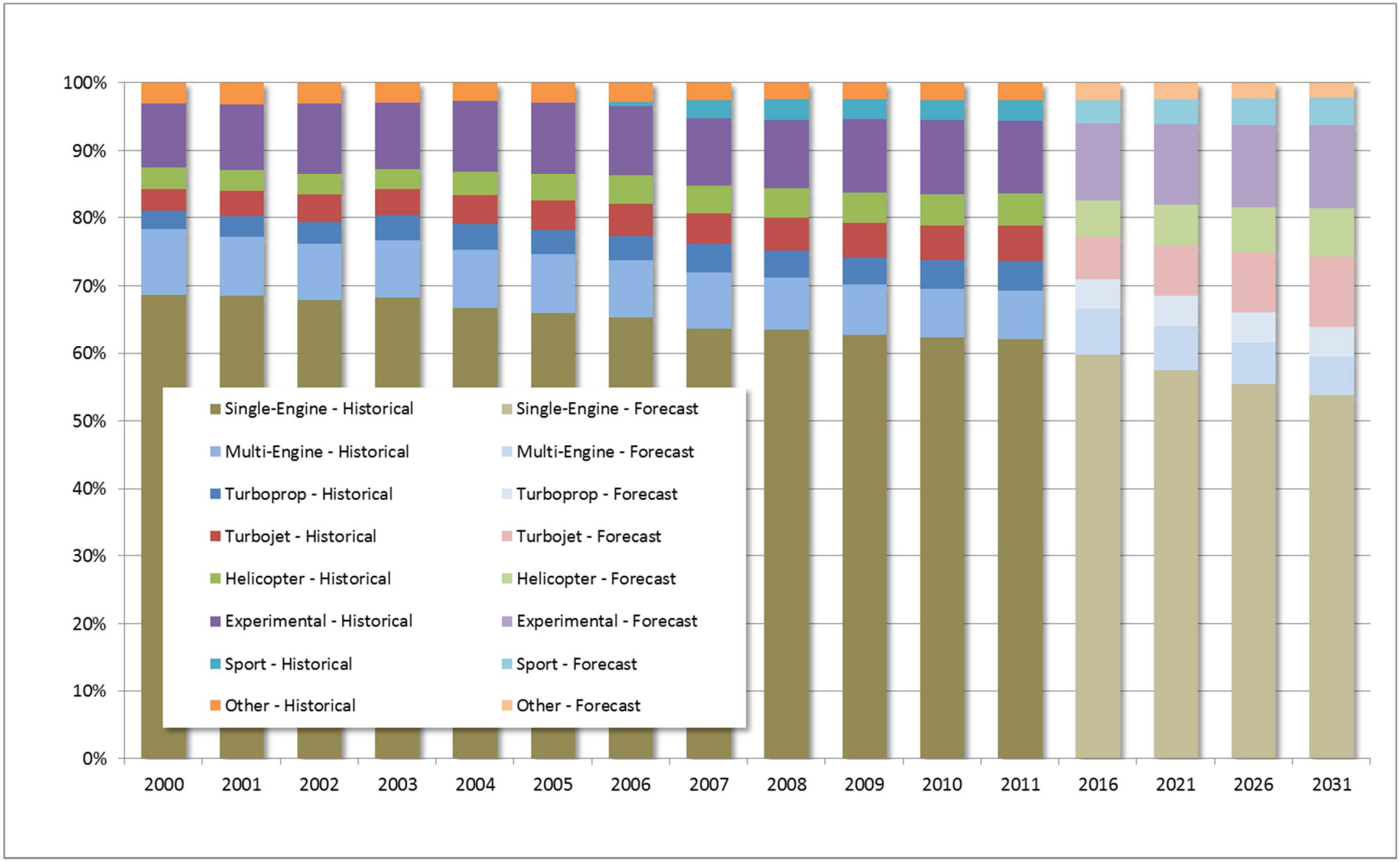
[5] Wells, Dr. Alexander T. and Dr. John G. Wensveen. *Air Transportation, A Management Perspective, Fifth Edition*. Belmont: Brooks/Cole, 2004. Print.
[6] Federal Aviation Administration, FAA Aerospace Forecast Fiscal Years 2012-2032 and 2012 NCASP On-Site Inventory Visit Data
[7] GAMA Annual Industry Review & Market Outlook Briefing

Figure 3.7 shows the historic and forecast fleet mix of general aviation aircraft in the U.S. by share of the total market. The most significant change is the shrinking share of the single-engine segment. Growth is primarily occurring in the business jet and helicopter markets.

FAA General Aviation Forecasts

As part of its forecasting effort, the FAA prepares national forecasts of active general aviation aircraft, fleet mix, and general aircraft operations. The FAA active aircraft forecast is presented in Figure 3.8. Active aircraft are defined by the FAA as any currently registered aircraft that flies at least one hour during the year, whereas a based aircraft is defined by the FAA as an aircraft that is "operational and air worthy", which is typically based at an airport for a majority of the year. In addition, the general aviation hours flown forecast is presented in Figure 3.9. The FAA conducts an annual General Aviation and Part 135 Activity survey to estimate the number of hours flown since this data is not recorded through any mechanism.

- Figure 3.7: U.S. General Aviation Fleet Mix (2000-2031)



Source: FAA Aerospace Forecast, Fiscal Years 2012-2032
Prepared: February 2013

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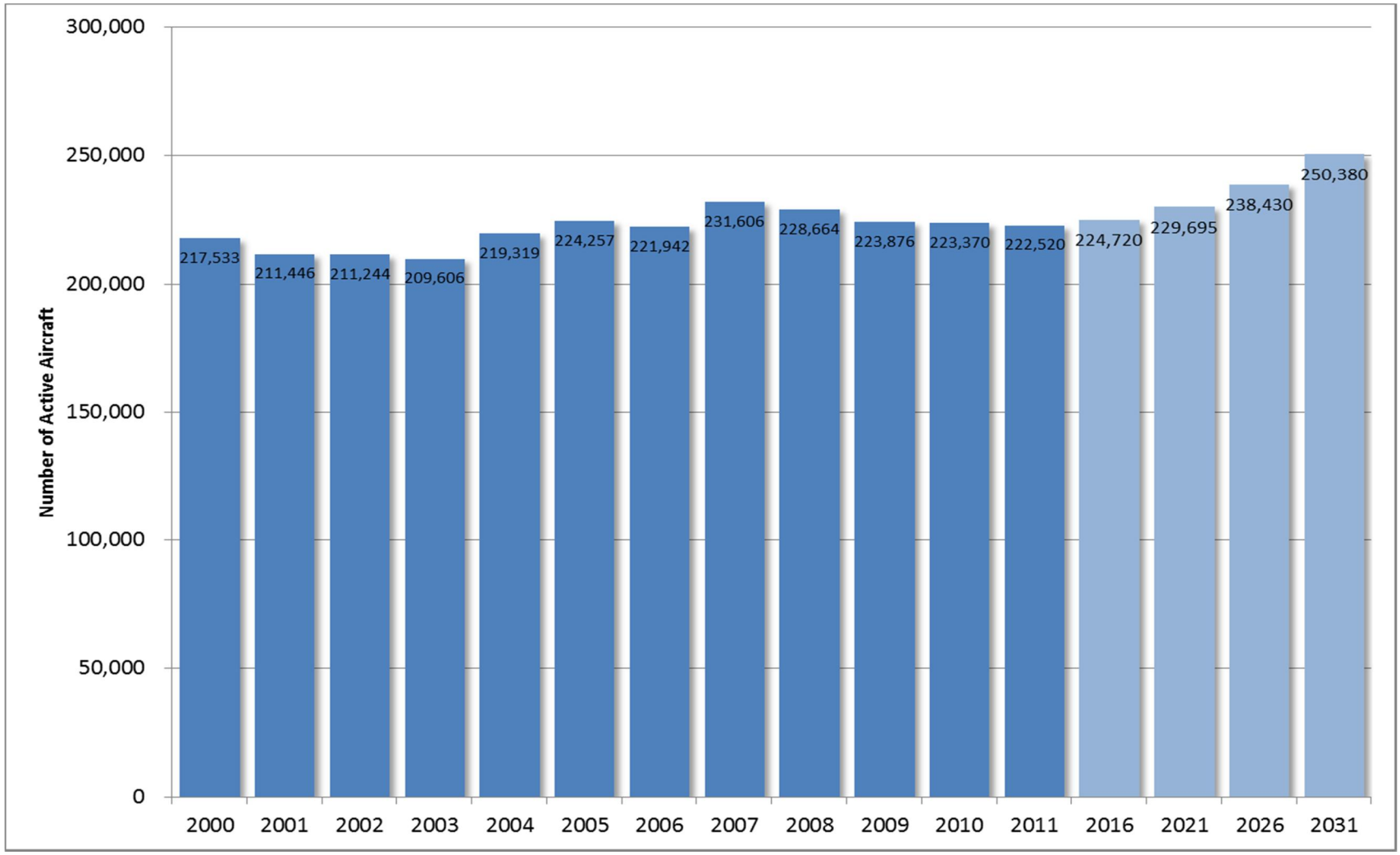
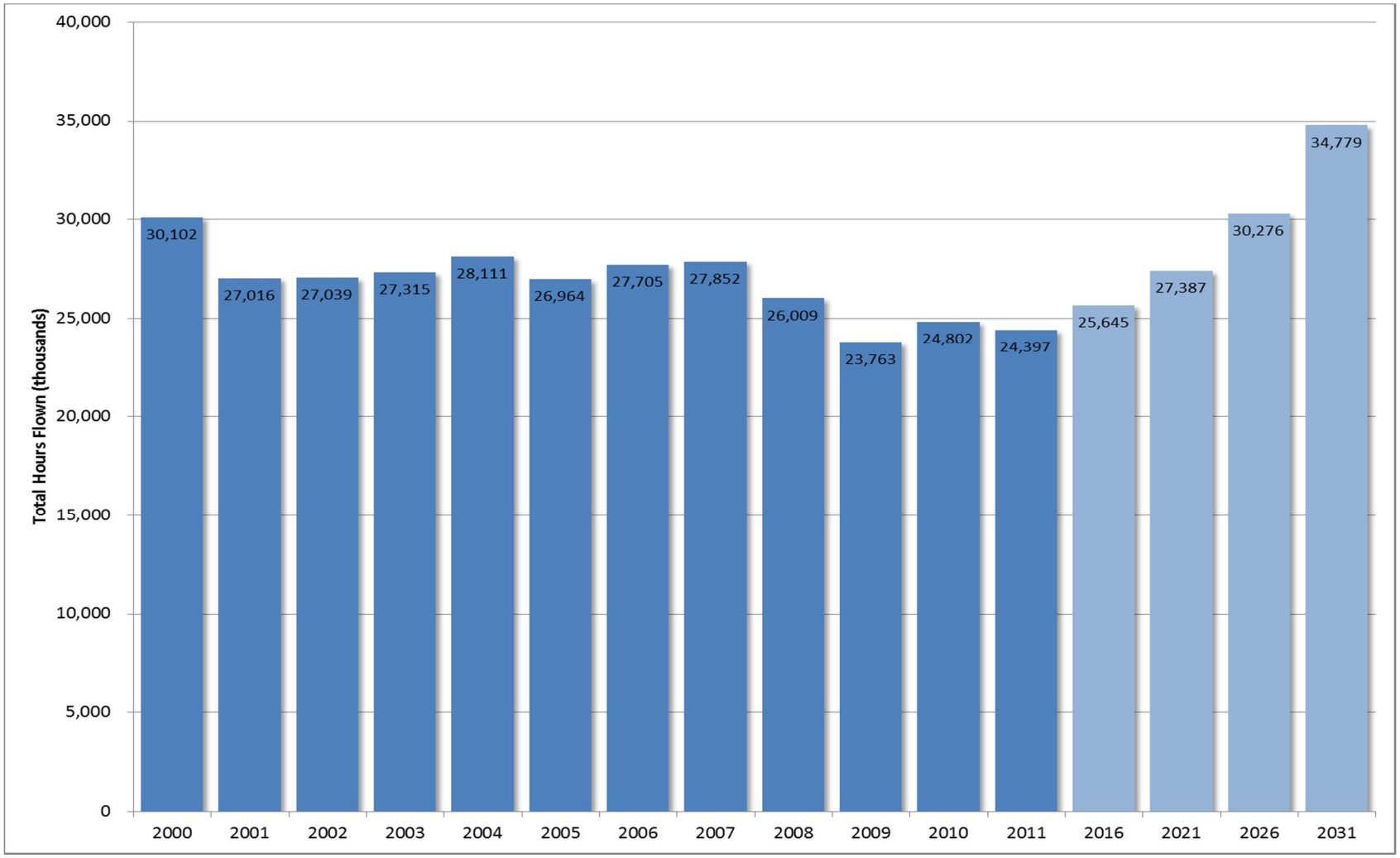
- Figure 3.8: Active U.S. General Aviation and Air Taxi Aircraft



Source: FAA Aerospace Forecast, Fiscal Years 2012-2032
Prepared: February 2013

- Figure 3.9: U.S. General Aviation and Air Taxi Hours Flown

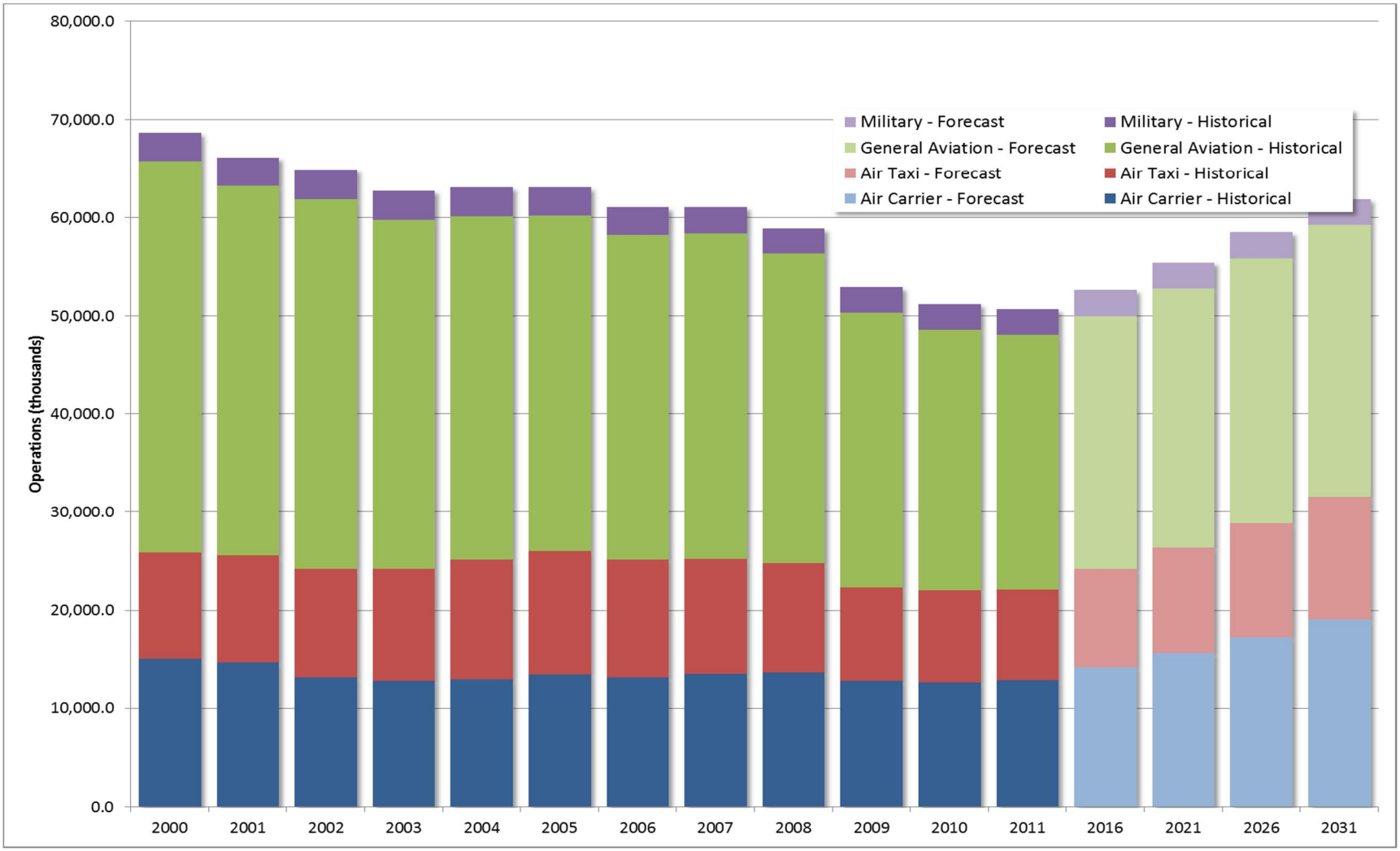


Source: FAA Aerospace Forecast, Fiscal Years 2012-2032
Prepared: February 2013

Overall, the number of active general aviation aircraft is projected to grow at an average annual rate of 0.6% for the next 20 years, according to the FAA. However, there is a significant amount of variation both with respect to the mix of aircraft and the growth rates within each category. Beginning in 2005, the FAA added “light sport” aircraft as a registration category. FAA is expecting a 2.1% average annual growth of light sport aircraft while the number of single-engine aircraft is expected to decrease. Other growth areas are the business jets and piston helicopters. Single-engine piston aircraft are expected to decline relatively slowly at average annual rates of 0.1% while twin-engine piston aircraft are expected to decline at 0.5% annually.

Figure 3.10 presents forecasted operations at airports with either an FAA or contract air traffic control tower. Commercial and air taxi/commuter operations are projected to grow 2.0 and 1.5% annually, respectively. General aviation operations are projected to grow 0.3% per year and military operations are expected to stay flat.

- Figure 3.10: U.S. Aircraft Operations at Airports with Control Towers (2000-2031)



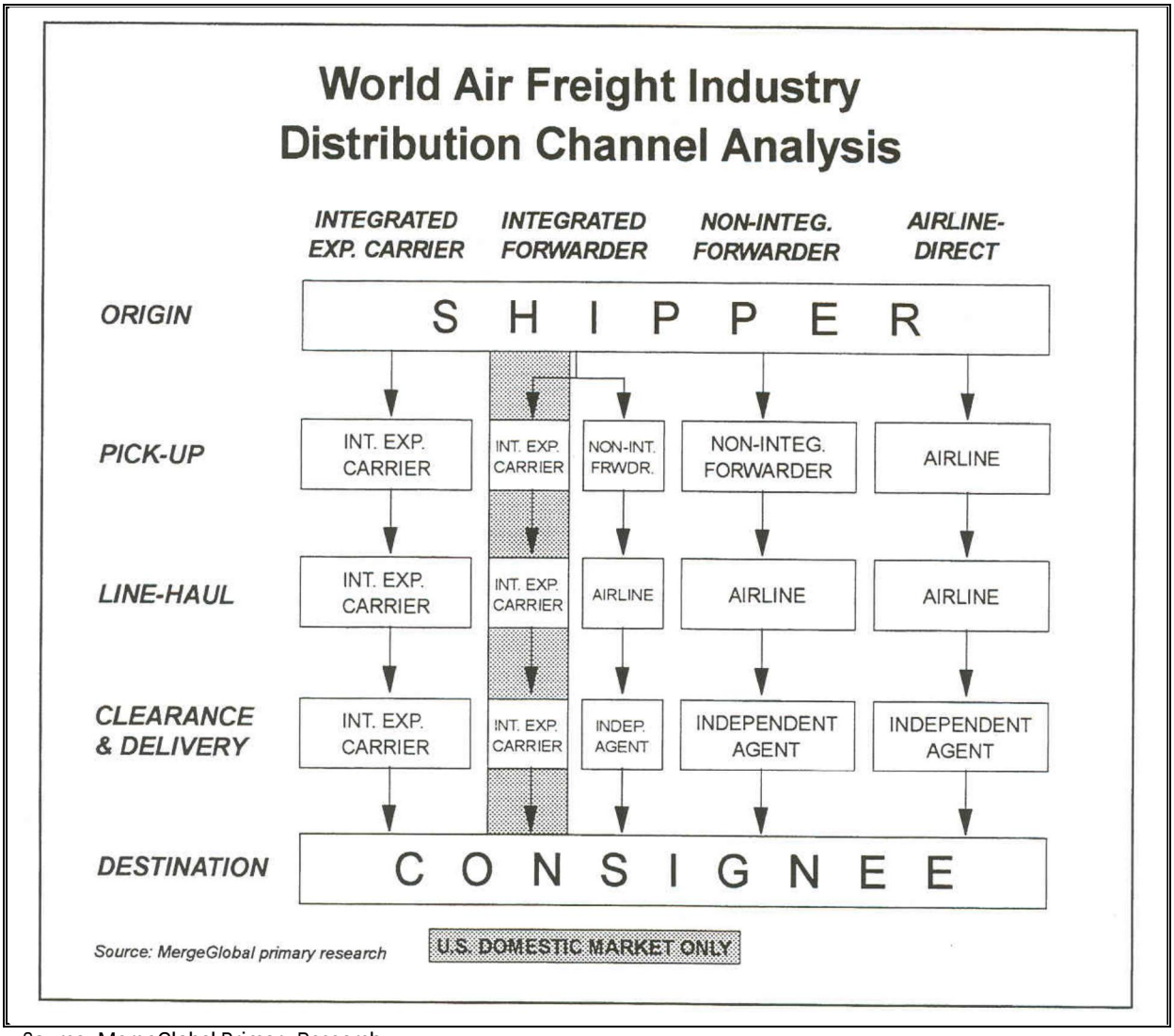
Source: FAA Aerospace Forecast, Fiscal Years 2012-2032
Prepared: February 2013

Air Cargo Trends

The FAA defines air cargo as freight and mail. FAA also typically categorizes cargo operations into one of three categories; Freighter, Integrator, and Belly Haul. Freighter cargo is cargo that is carried by an airline on an aircraft that is flying only cargo, with no passengers. Freighter cargo is handled on the ground at both ends of its trip by a third party, usually a freight forwarder. Integrator cargo is cargo that is picked up from the shipper by truck, sorted, flown on an all-cargo aircraft and then delivered by truck to the destination customer, all by the same company. The most well know examples of integrators are FedEx, UPS, and DHL. Belly Haul Cargo refers to cargo that is carried in the hold of a passenger aircraft. Many international passenger carriers also operate freighters. This creates an ideal interlining operation (sharing cargo) with the diverse domestic passenger and integrator operations at the airport. The result is typically a broad air distribution system.

Air cargo shipments begin with the shipper. This can be an individual or a major manufacturer. Figure 3.11 indicates four shipping channels: an *integrated express carrier* like FedEx, an integrated forwarder like DHL or TNT, a non-integrated forwarder like Expeditors or Panalpina, or a carrier as previously discussed in the above paragraph.

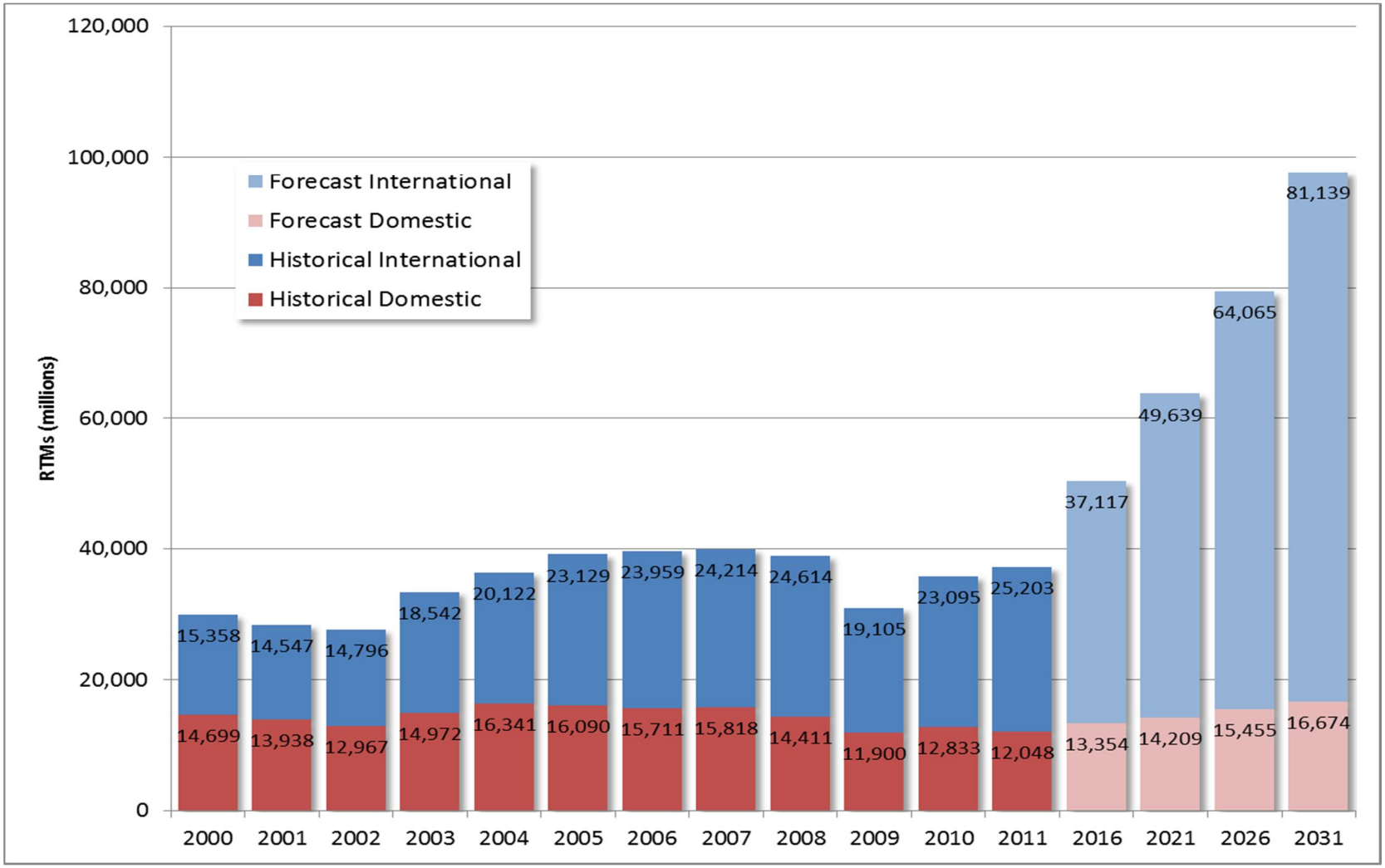
- Figure 3.11: World Air Freight Industry Distribution Channel Analysis



Source: MergeGlobal Primary Research
Prepared: February 2013

The air cargo industry has experienced many changes in the last decade. As shown in Figure 3.12, the general U.S. economic downturn adversely affected U.S. air cargo activity. Similarly, after the terrorist attacks of 9/11, cargo activity in the U.S. was immediately impacted. The cargo industry recovered by 2003 and posted strong growth for a few years. Growth in U.S. air cargo activity began to slow down in 2006 as the price of oil surged to record high levels. Fuel prices soared to $140 a barrel in 2008 causing shipping by other modes such as trucking to become more attractive. Since then, cargo has made a recovery and is nearly returned to pre-2008 levels.

- Figure 3.12: U.S. Historical and Forecast Air Cargo Revenue Ton Miles (RTMs) (2000-2031)



Source: FAA Aerospace Forecast, Fiscal Years 2012-2032
Prepared: February 2013

In 2011, U.S. air cargo airlines flew 37.3 billion revenue ton miles (RTMs), which is a 3.7 increase from the previous year. U.S. air cargo airlines made up a smaller share of the air cargo flown throughout the country making up approximately one third of the total air cargo flown in 2011. This smaller share in air cargo is partially due to the increased deployment of regional jets in passenger service, which limits the available space for air cargo in the belly of passenger aircraft, as well as increased security requirements.

All-cargo airlines carried over 75% of the total RTMs in 2011, although domestic cargo RTMs dropped 6.1% from 2010 levels. National trends in the movement of domestic cargo are partially to blame for the decrease in domestic air cargo. The shipping industry has moved away from "Next Day" to time definite second and third day delivery which has shifted a portion of air cargo to trucks. The higher price of fuel has also caused shippers to use ground shipment of cargo whenever possible.

Offsetting the decline in domestic air cargo, international RTMs increased 9.1% from 2010 to 25.2 billion in 2011 reflecting a rebound from the global financial crisis. FAA forecasts indicate an overall growth in air cargo of 5% over the next 20 years. Domestic air cargo is forecast to grow at a smaller 2% annually, while international is forecast to make up the bulk of the growth at an average annual growth rate of 6%.

North Carolina Trends

Commercial Aviation in North Carolina

North Carolina has ten commercial service airports. These airports served approximately 26.1 million enplanements in 2011. The vast majority of these enplanements occurred at Charlotte/Douglas International Airport (CLT). CLT served 74% of all North Carolina enplanements in 2011. The remaining enplanements occurred at the following airports as organized and indicated by their associated city:

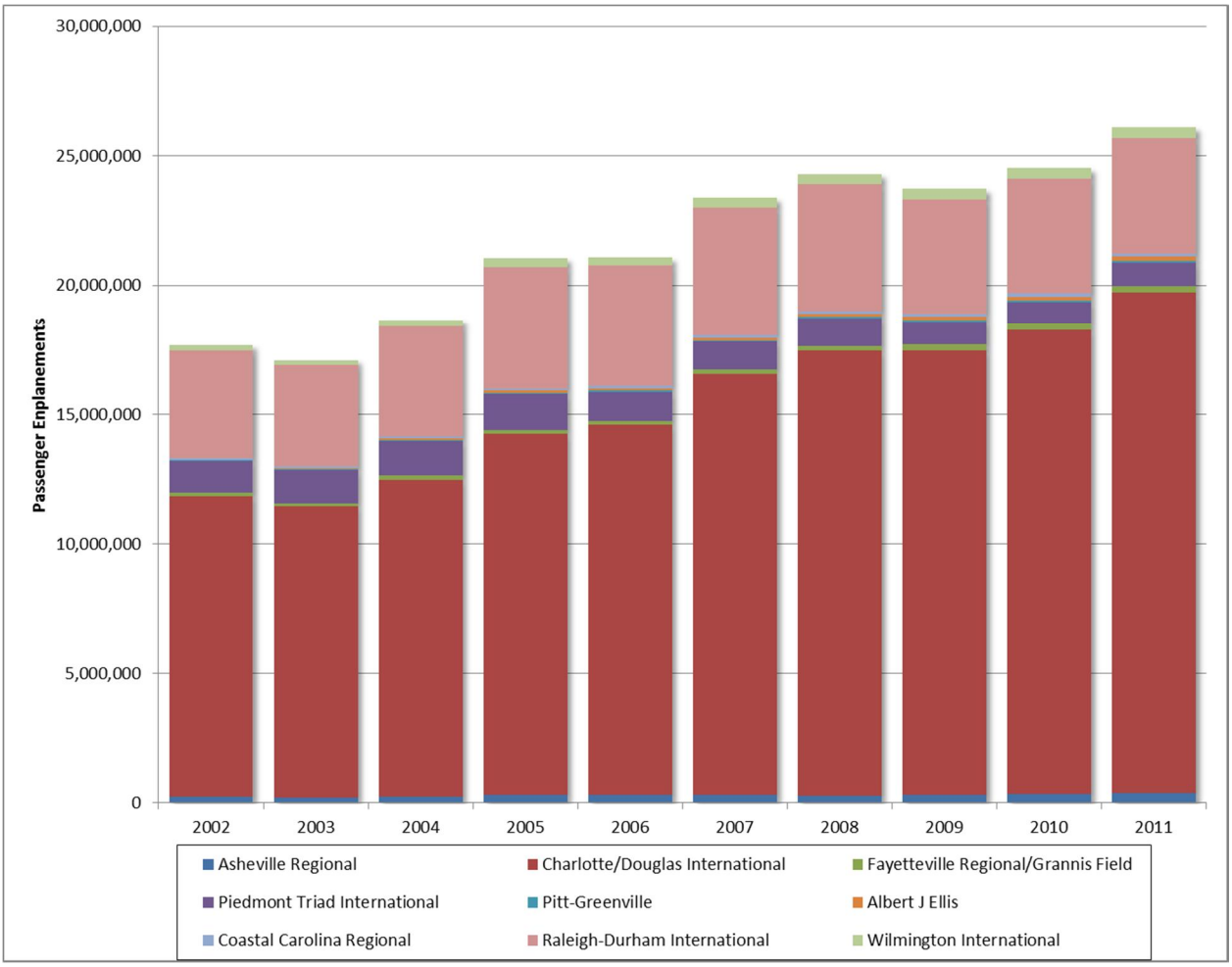
- Asheville, Asheville Regional
- Concord, Concord Regional
- Fayetteville, Fayetteville Regional/Grannis Field
- Greensboro, Piedmont Triad International
- Greenville, Pitt-Greenville
- Jacksonville, Albert J. Ellis
- New Bern, Coastal Carolina Regional
- Raleigh-Durham, Raleigh-Durham International
- Wilmington, Wilmington International

Historic data shows that enplanements at North Carolina's commercial service airports are increasing. Figure 3.13 charts North Carolina enplanement trends over the last 10 years. All commercial service airports in North Carolina gained passengers over this 10-year period with the exception of Piedmont Triad International.

It should be noted that Concord Regional Airport became a commercial service airport in 2013 and does not have enplanement data from 2011; it is thus not included in

the below graph and in the evaluation of commercial service airports in this section of the NCASP.

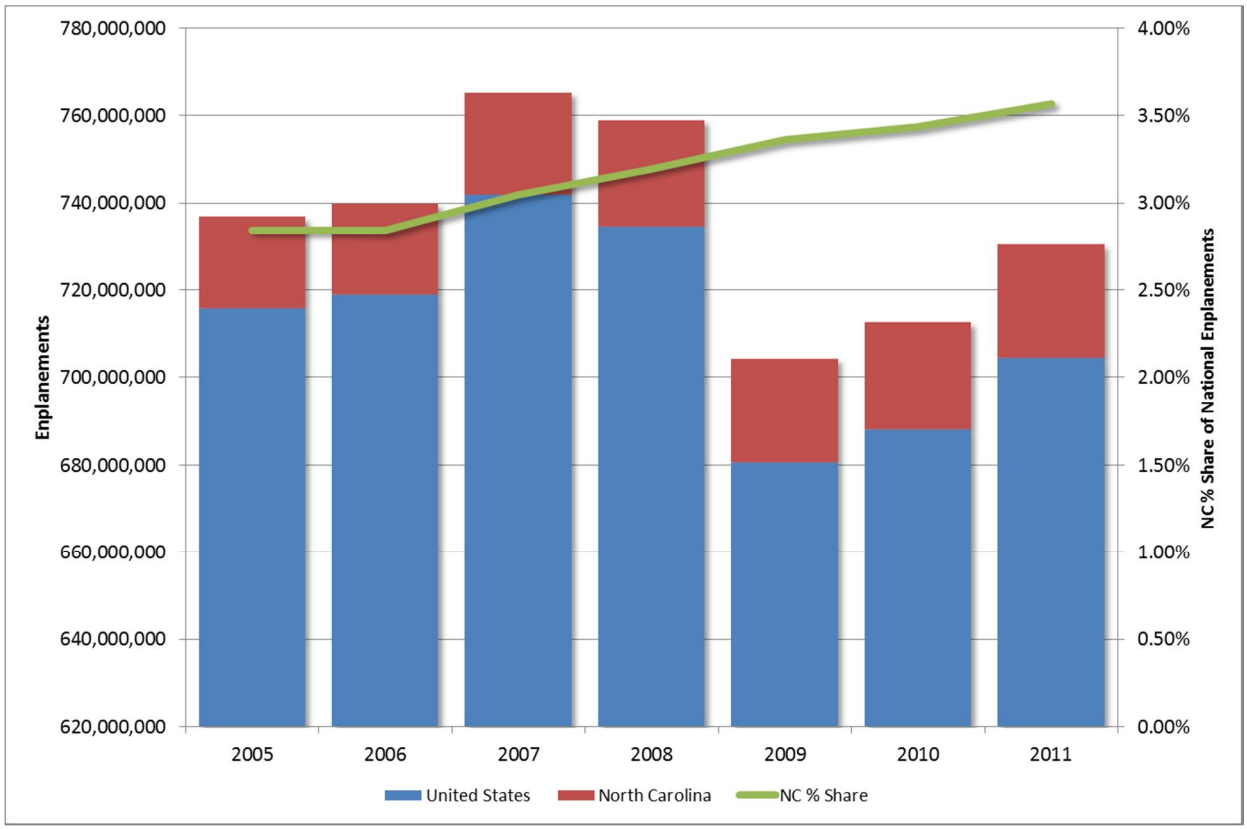
- Figure 3.13: North Carolina Enplanements by
- Commercial Service Airport (2002-2011)



Source: FAA Terminal Area Forecast, December 2012
Prepared: February 2013

Enplanements increased at the remaining eight airports, with Albert J. Ellis Airport experiencing the largest growth at 22.6% annually. Piedmont Triad International witnessed the largest decrease with average annual decline of 3.4%. In all, enplaned passengers in North Carolina grew at an average annual growth rate of 4.4% over the 10-year period. Compared to total U.S. enplanements, North Carolina's share of total enplanements in the last six years has grown steady from 2.9% to 3.6%, as illustrated in Figure 3.14. North Carolina has historically out-performed the U.S. as a whole over the past 10 years in terms of commercial passenger traffic.

- Figure 3.14: North Carolina vs. U.S. Enplanements (2005-2011)



Source: 2012 NCASP Inventory, FAA Aerospace Forecast, Fiscal Years 2012-2032
Prepared: February 2013

North Carolina Economic Trends

Aviation activity is directly related to the size and economics of an area. On a county, state, or national level, there is a positive relationship between factors such as population and employment and aviation activity.

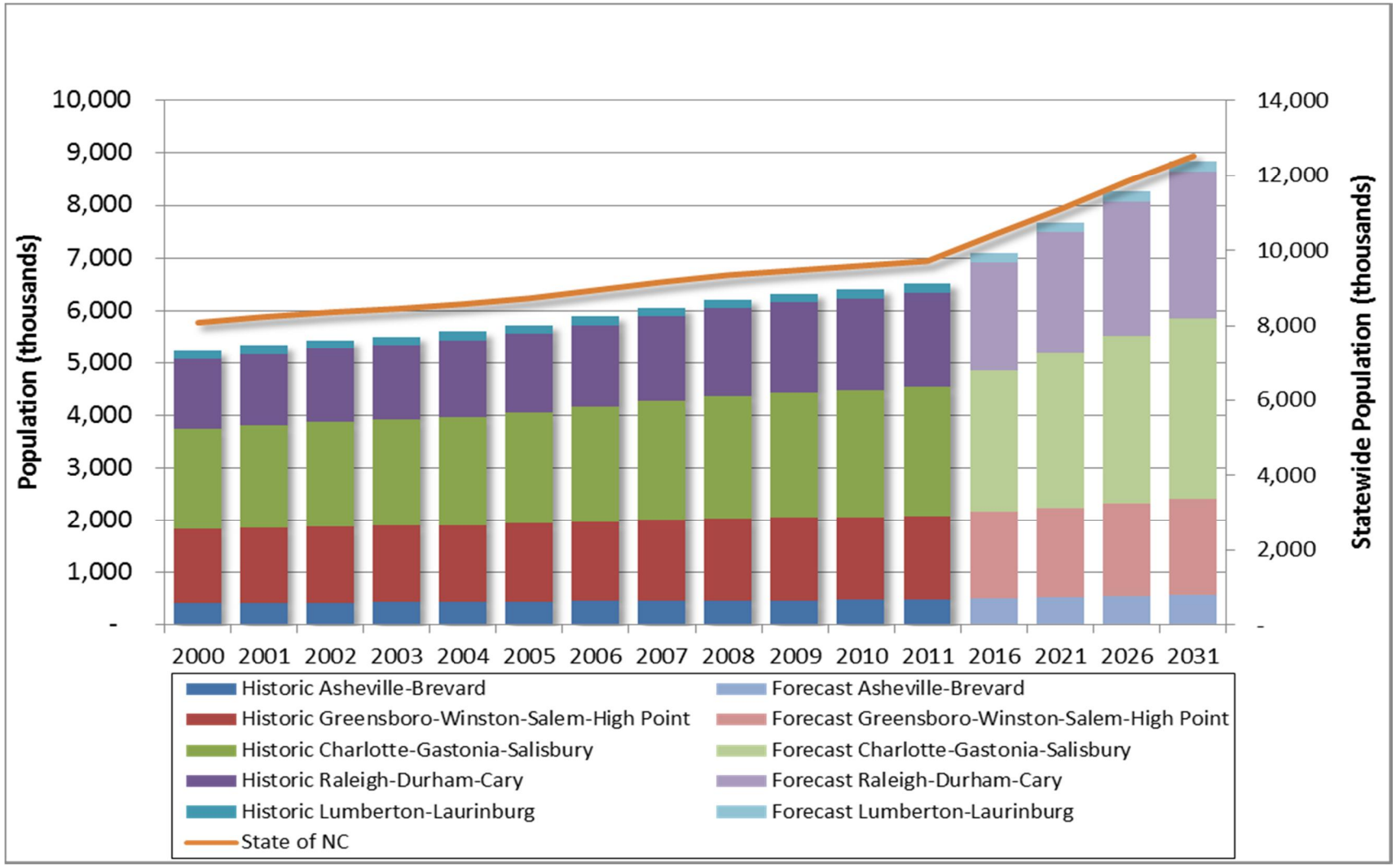
Aviation activity is not only dependent upon these economic factors; it also influences them. Making an area more accessible by air can boost tourism and promote new businesses, which can lead to increased employment and population. This section focuses on the state of North Carolina and its 100 counties and identifies existing socioeconomic conditions, along with historical trends and future projections.

As socioeconomic factors, such as population, increase, aviation activity generally increases as well. Likewise, if the same socioeconomic factors experience negative growth, it is probable that aviation activity will also decrease. Figure 3.15 shows population growth in North Carolina consolidated metropolitan statistical areas (CMSAs) since 2000 and projected through 2031. The largest CMSA is Charlotte-Gastonia-Salisbury. The smallest CMSA depicted is Lumberton-Laurinburg. Raleigh-Durham-Cary is expected to more than double its population over the next 20 years. Figure 3.16 shows the counties and their associated population growth rates from

2000 to 2011. Union County has the highest average annual growth over the last 10 years in North Carolina, at a rate of 4.7%. However, Wake and Mecklenburg counties had the highest growth in actual population over the 10-year period with population increases of over 270,000 and 220,000 people, respectively. There are seven counties that have experienced either negative growth or no growth at all in North Carolina. These counties tend to be more rural and farther from major cities. Six of the seven are located on the east side of the state. Almost half of the counties in the state have experienced less than 1% growth over the last 10 years. Halifax County had the greatest loss with over 2,000 people over the 10-year period.

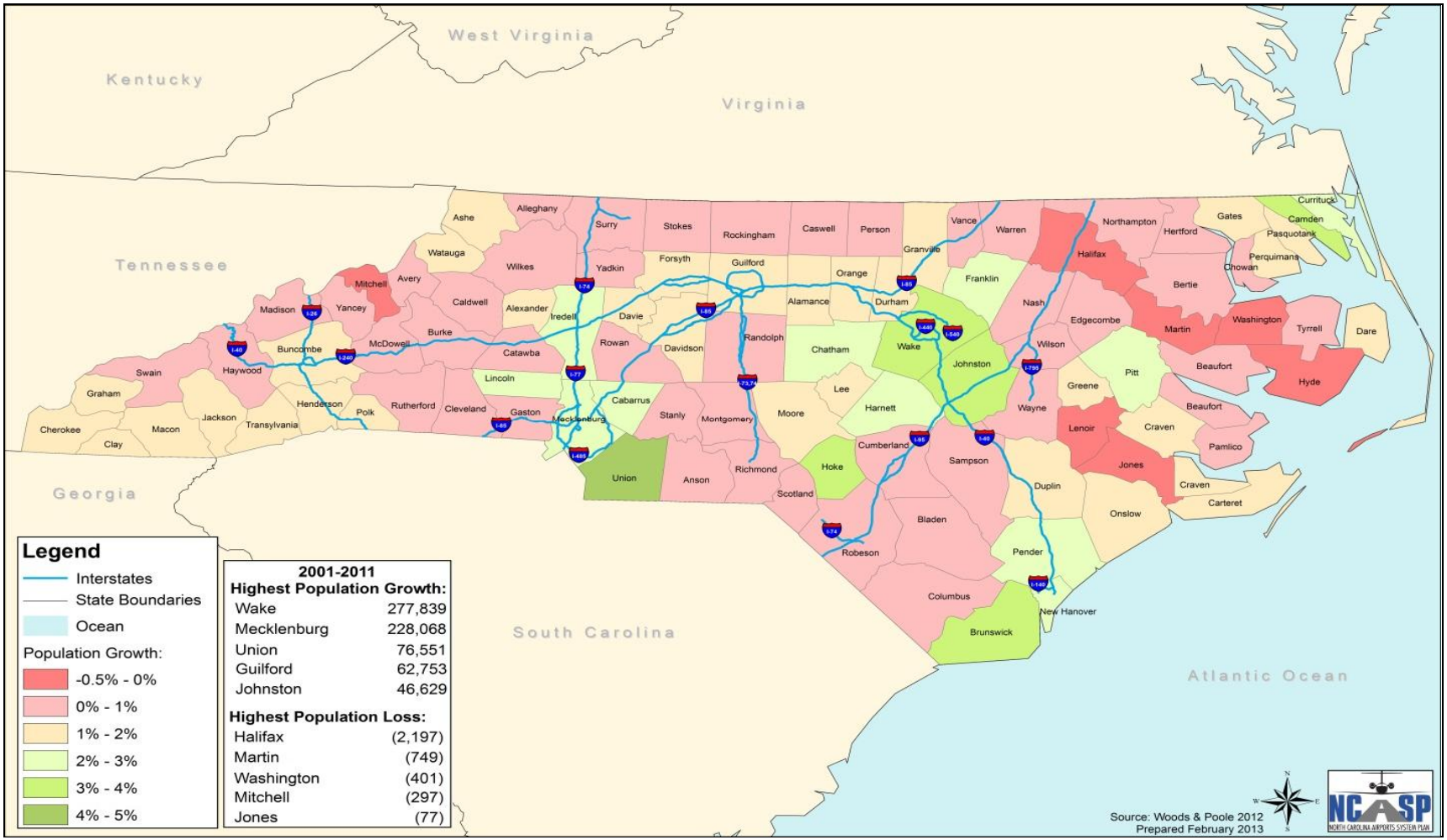
Figure 3.17 shows employment growth by county from 2000-2011. In general, employment growth tracks closely with population growth. The northeastern most counties of Currituck and Camden have experienced the highest average annual employment growth over the last 10 years. Specifically, Currituck has experienced an average annual growth rate of 3.2%, while Camden has seen an average annual growth rate of 3.9% over the last 10 years. Both counties maintained similar population growth rates over the same period. Again, Wake and Mecklenburg counties had the highest actual growth in employment over the 10-year period with employment increases of over 90,000 and 70,000 jobs, respectively. Approximately 50 counties experienced negative employment between -3% and 0% across the state. The biggest employment loss occurred in Catawba County located two counties north of the city of Gastonia. The county experienced a loss in employment of over 14,000 jobs and had an average annual decline of 1.7% over the last 10 years.

- Figure 3.15: CMSA Population Growth (2000-2031)



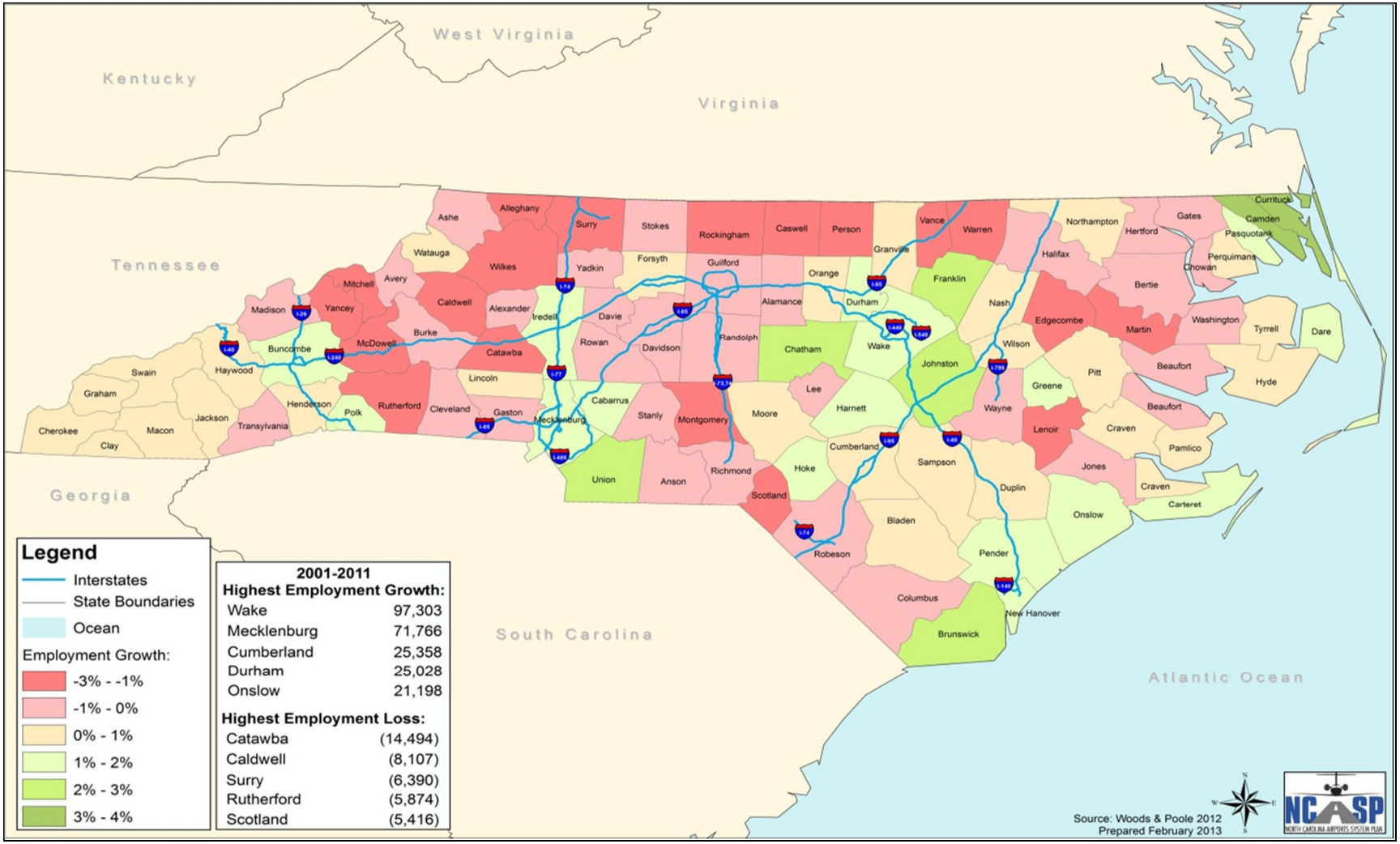
Source: Woods & Poole, 2012
Prepared: February 2013

- Figure 3.16: Historical North Carolina Population Growth by County (2000-2011)



Source: Woods & Poole, 2012
Prepared: February 2013

- Figure 3.17: Historical North Carolina Employment Growth by County (2000-2011)



Source: Woods & Poole, 2012
Prepared: February 2013

General Aviation in North Carolina

Information about current and historic general aviation aircraft in North Carolina, including based aircraft and registered aircraft, is presented in the following section. For North Carolina's system of airports, historic and current based aircraft data was obtained through the 2012 Airport Inventory and Data Survey conducted as part of this plan for the 62 NPIAS general aviation airports. Airport managers were provided with inventory surveys and were asked to complete them prior to on-site visits. More information on these surveys, including the methodology, can be found in Chapter 2.

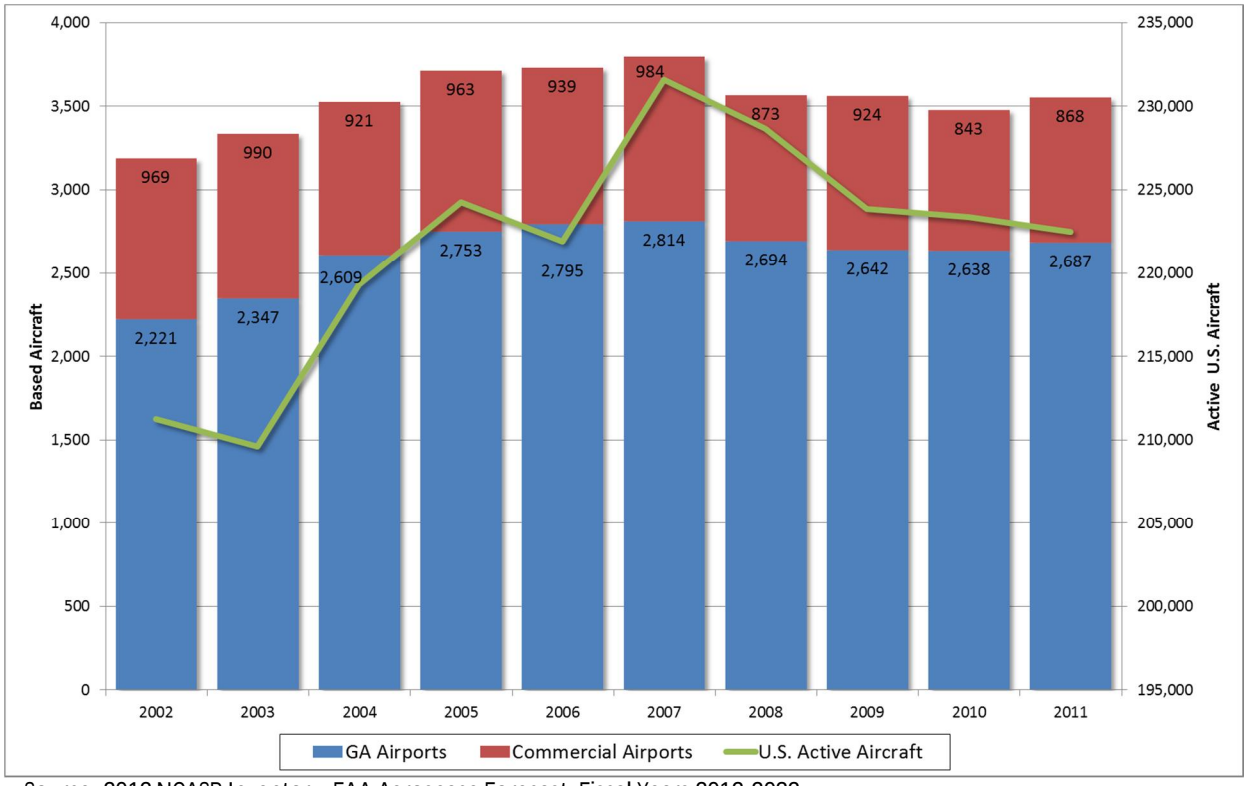
In addition to based aircraft, the FAA tracks registered aircraft, and these data were used as a resource for the analysis. A separate analysis of privately owned airports was also conducted but is presented separately.

Based Aircraft

Figure 3.18 presents historic and current based aircraft for each airport in North Carolina's system. Based aircraft are general aviation aircraft that are permanently stored at an airport either in hangars or on tie-down spaces. Based aircraft numbers frequently fluctuate based on a number of factors including seasonality, pilot preferences, on-airport aviation services, and the availability of storage units.

The number total based aircraft in North Carolina's airport system in 2011was recorded at 3,548. Interestingly, in 2007, there were 3,798 based aircraft as reported by the inventory effort of this study. This number represented a total increase of 19% since 2002. Since 2007, both at the national level and at the state level, the number of based aircraft has been declining. North Carolina has experienced a slightly larger decline than that seen at the national level, with based aircraft in North Carolina showing an average annual decline rate of -1.7%, compared to -1.0% for the U.S. as a whole.

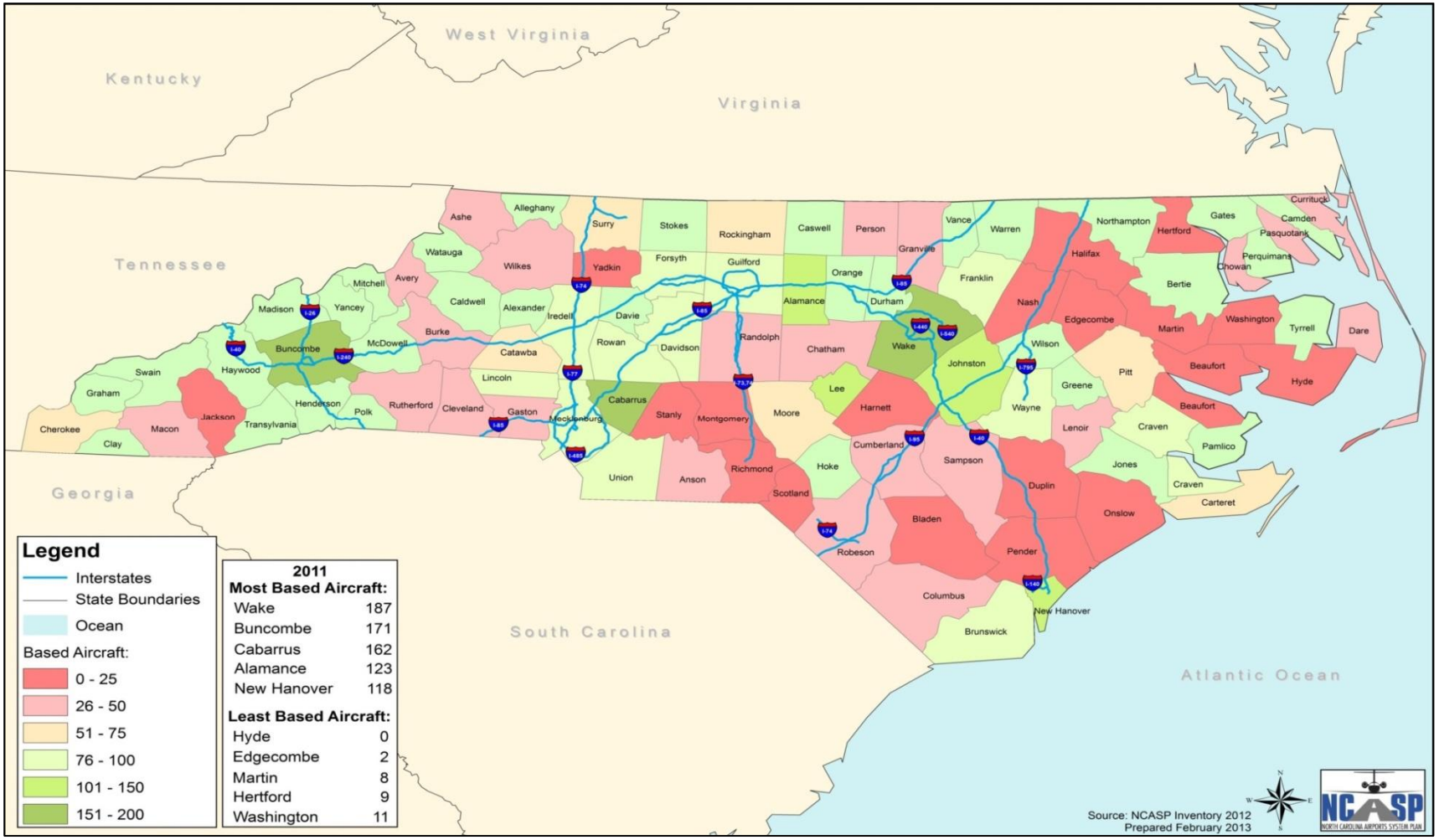
- Figure 3.18: North Carolina Based Aircraft (2002-2011)



Source: 2012 NCASP Inventory, FAA Aerospace Forecast, Fiscal Years 2012-2032
Prepared: February 2013

Figure 3.19 shows the number of based aircraft in each North Carolina County. The numbers of based aircraft tend to concentrate near the major population centers of the state: Charlotte, Raleigh-Durham, Greensboro-Winston-Salem, and Asheville. In the more rural counties, the concentrations of based aircraft are less. The top five counties with the greatest number of based aircraft in 2011 were: Wake, Buncombe, Cabarrus, Alamance, and New Hanover. The five counties with the fewest based aircraft in 2011 were: Hyde, Edgecombe, Martin, Hertford, and Washington.

- Figure 3.19: North Carolina Based Aircraft by County



Source: Woods & Poole, 2012
Prepared: February 2013

Registered Aircraft

For the NCASP, 2011 based aircraft figures were predominantly derived from the airports during the inventory data gathering effort, with the exception of a few airports where based aircraft information was not available. For these airports, the based aircraft were determined using data from FAA TAF (December 2012). The data gathered from these sources differs slightly from the active registered aircraft compiled from the FAA National Based Aircraft Inventory Program. These differences are further depicted in Table 3.2.

- Table 3.2: Comparison of National Based Aircraft Inventory
- Program and NCASP Inventory

City	Airport	National Based Aircraft Inventory Program	Inventory Based Aircraft[1]	Difference
Ahoskie	Tri-County Airport	10	9	1
Albemarle	Stanly County Airport	20	20	0
Andrews	Western Carolina Regional	59	58	1
Asheboro	Asheboro Regional Airport	34	45	-11
Beaufort	Michael J Smith Field	66	70	-4
Burlington	Burlington Alamance Regional Airport	90	*123*	-33
Clinton	Clinton-Sampson County Airport	26	26	0
Concord	Concord Regional Airport	176	*162*	14
Currituck	Currituck County Regional	43	*41*	2
Edenton	Northeastern Regional Airport	23	33	-10
Elizabeth City	Elizabeth City CGAS Regional Airport	25	30	-5
Elizabethtown	Curtis L Brown Jr Field	11	*13*	-2
Elkin	Elkin Municipal Airport	17	20	-3
Engelhard	Hyde County Airport	0	0	0
Erwin	Harnett Regional Jetport	45	17	28
Franklin	Macon County Airport	23	28	-5
Gastonia	Gastonia Municipal Airport	35	34	1
Goldsboro	Wayne Executive Jetport	59	60	-1
Hatteras	Billy Mitchell Airstrip (NPS)	0	*0*	0
Hickory	Hickory Regional Airport	73	67	6
Jefferson	Ashe County Airport	34	*32*	2
Kenansville	Duplin County Airport	23	*21*	2
Kill Devil Hills	First Flight Airport (NPS)	0	*0*	0
Kinston	Kinston Regional Jetport	37	39	-2
Lexington	Davidson County Airport	72	76	-4
Lincolnton	Lincolnton Lincoln County Regional Airport	79	89	-10

City	Airport	National Based Aircraft Inventory Program	Inventory Based Aircraft[1]	Difference
Louisburg	Triangle North Executive Airport	107	*97*	10
Lumberton	Lumberton Municipal Airport	43	*46*	-3
Manteo	Dare County Regional Airport	53	49	4
Maxton	Laurinburg Maxton Airport	14	*20*	-6
Monroe	Charlotte Monroe Executive	70	86	-16
Morganton	Foothills Regional Airport	49	50	-1
Mount Airy	Mount Airy Surry County Airport	51	53	-2
Mount Olive	Mount Olive Municipal Airport	10	17	-7
North Wilkesboro	Wilkes County Airport	31	36	-5
Oak Island	Cape Fear Regional Jetport	56	75	-19
Ocean Isle Beach	Odell Williamson Municipal Airport	13	16	-3
Ocracoke	Ocracoke Island Airport & Helipad (NPS)	0	0	0
Oxford	Henderson Oxford Airport	44	*50*	-6
Pinehurst/Southern Pines	Moore County Airport	73	67	6
Plymouth	Plymouth Municipal Airport	13	*11*	2
Reidsville	Rockingham County NC Shiloh Airport	53	51	2
Roanoke Rapids	Halifax-Northampton County Regional	23	22	1
Rockingham	Richmond County Airport	9	*14*	-5
Rocky Mount	Rocky Mount Wilson Regional	11	12	-1
Roxboro	Person County Airport	30	42	-12
Rutherfordton	Rutherford County Marchman Field	36	26	10
Salisbury	Rowan County Airport	85	*91*	-6
Sanford	Raleigh Executive Jetport	106	111	-5
Shelby	Shelby-Cleveland County Regional Airport	34	35	-1
Siler City	Siler City Municipal Airport	31	28	3
Smithfield	Johnston County Airport	101	112	-11
Spruce Pine	Avery County Morrison Field	34	32	2
Star	Montgomery County Airport	16	16	0
Statesville	Statesville Regional Airport	68	93	-25
Sylva	Jackson County Airport	15	16	-1
Tarboro	Tarboro Edgecombe Airport	5	2	3
Wadesboro	Anson County - Jeff Cloud Field	21	26	-5
Wallace	Henderson Field	23	20	3
Washington	Warren Field	22	17	5
Whiteville	Columbus County Airport	28	27	1
Williamston	Martin County Airport	5	8	-3

City	Airport	National Based Aircraft Inventory Program	Inventory Based Aircraft[1]	Difference
Winston-Salem	Smith Reynolds Airport (Winston-Salem)	91	100	-9
Statewide Totals		2,554	2,687	133

Notes:
1. Numbers shown in standard font obtained from Airport Historical Data, Parsons Brinckerhoff, while numbers shown in italicized and blue obtained from FAA TAF, 2012
2. NPS stands for National Park Service
3. CGAS stands for Coast Guard Air Station
Source: FAA Terminal Area Forecast, December 2012; Parsons Brinckerhoff, 2012; National Aircraft Registry, 2013
Prepared: February 2013

These differences in based aircraft by airport could be due to a number of factors, including the date that these based aircraft totals were reported. All airport data from the National Based Aircraft Inventory Program represent based aircraft data reported from 2009 to 2013, whereas the based aircraft inventory data collected was solely collected from the airport for 2011 during on-airport visits conducted in 2012. The data for based aircraft that was collected during the on-site airport visits is used later in the NCASP forecasting process, which is further discussed in Section 3.4. The difference between the National Based Aircraft Inventory Program data and the on-site airport collected data differs by 133 aircraft. More than 75% of the general aviation airports differ by less than 10 based aircraft between the two methods of reporting based aircraft in the state.

North Carolina Commercial Service Airports Forecast

This section projects future aviation activity for North Carolina's commercial service airports. The activity indicators evaluated for the commercial service airports include based general aviation aircraft, passenger enplanements, and total aircraft operations.

As previously noted, the forecasts examine commercial service airports separately from general aviation airports. For purposes of the NCASP, the forecasts of activity at the commercial airports primarily reflect those contained in the FAA's TAF as available in December 2012. However, the TAF did not include any growth in activity for Albert J Ellis and Coastal Carolina Regional airports. Therefore, each of these airports provided recent master plan forecast information for inclusion in this study.

Charlotte/Douglas International, Piedmont Triad International, and Raleigh-Durham International are expected to continue serving the largest numbers of passenger enplanements and be the significant providers of scheduled air service in North Carolina. The remaining six commercial service airports serve different roles but are integral to the overall commercial service aviation system in the state.

North Carolina's commercial service airports currently offer both legacy and regional air carrier service. US Airways offers flights at every commercial airport in North Carolina, while Delta offers services at all of the commercial airports except Pitt-Greenville. American Airlines and United are both present at the three largest

commercial service airports in the state. United also serves Asheville Regional. Regional/low cost carriers such as Allegiant, Frontier, and Southwest are also present at four of the commercial service airports in the state. Charlotte/Douglas International also offers service from two international carriers, Insel Air and Lufthansa.

Forecasts of general aviation based aircraft at commercial service airports are presented in Table 3.3. Overall, Piedmont Triad International is expecting the highest amount of growth, with an average annual growth rate of almost 3%, while Charlotte/Douglas is expecting a decrease in the based aircraft over the forecast period, declining at an average annual rate of less than 1%. Overall, general aviation based aircraft at North Carolina commercial service airports are expected to increase at an average annual growth rate of just over 1%.

- Table 3.3: Commercial Service Airport Based Aircraft Forecast

Associated City	Airport Name	Actual	Forecast			AAGR (2011-2031)
		2011	2016	2021	2031	
Asheville	Asheville Regional	171	139	151	181	0.28%
Charlotte	Charlotte/Douglas International	86	82	82	82	-0.24%
Fayetteville	Fayetteville Regional/Grannis Field	48	56	57	57	0.86%
Greensboro	Piedmont Triad International	100	117	135	175	2.84%
Greenville	Pitt-Greenville	51	54	57	63	1.09%
Jacksonville	Albert J Ellis	21	26	29	32	2.08%
New Bern	Coastal Carolina Regional	79	80	80	80	0.06%
Raleigh/Durham	Raleigh-Durham International	187	194	201	212	0.63%
Wilmington	Wilmington International	118	148	160	195	2.54%
	Commercial Airport Totals	861	897	952	1,077	1.13%

Notes:
1. N/A = Not Available
2. AAGR (Average Annual Growth Rate) = The average increase experienced over an identified period.
3. Pitt-Greenville forecast was determined using the Pitt-Greenville Airport Master Plan Update (Draft) from the airport since the TAF did not indicate any growth over the next 20 years
4. Jacksonville forecast was determined using the Jacksonville Master Plan Update from the airport since the TAF did not indicate any growth over the next 20 years
Source: FAA Terminal Area Forecast, December 2012
Prepared in February 2013

Table 3.4 presents the enplanement forecast for North Carolina's commercial service airports. Wilmington International is expected to see highest growth in enplanements over the forecast period for the commercial airports in North Carolina, with an average annual growth rate of approximately 3%, while Albert J Ellis is expecting only a small increase of approximately 1% over the next 20 years. The state of North Carolina is expecting an average annual growth of just over 2.5% for the forecast period, which is equivalent to the average annual growth in national enplanements

over the next 20 years. By 2031, North Carolina statewide enplanements are expected to represent just over 3.5% of the national enplanements which represents an increase of about a half of a percent since 2005.

- Table 3.4: Enplanement Forecast at Commercial Service Airports

Associated City	Airport Name	Actual	Forecast			AAGR (2011-2031)
		2011	2016	2021	2031	
Asheville	Asheville Regional	367,219	401,922	439,988	527,555	1.83%
Charlotte	Charlotte/Douglas International	19,337,381	22,513,732	25,330,608	32,139,691	2.57%
Fayetteville	Fayetteville Regional/Grannis Field	265,733	289,657	315,750	375,237	1.74%
Greensboro	Piedmont Triad International	895,169	1,131,217	1,186,050	1,306,213	1.91%
Greenville	Pitt-Greenville	63,838	68,246	77,734	100,408	2.29%
Jacksonville	Albert J Ellis	166,795	174,783	184,427	205,748	1.05%
New Bern	Coastal Carolina Regional	125,796	141,504	159,178	201,445	2.38%
Raleigh/ Durham	Raleigh-Durham International	4,469,307	4,824,778	5,569,587	7,422,705	2.57%
Wilmington	Wilmington International	404,797	469,213	544,161	732,941	3.01%
Commercial Airport Totals		26,096,035	30,015,052	33,807,483	43,011,943	2.53%

Notes:
1. N/A = Not Available
2. AAGR (Average Annual Growth Rate) = The average increase experienced over an identified period.
3. Pitt-Greenville forecast was determined using the Pitt-Greenville Airport Master Plan Update (Draft) from the airport since the TAF did not indicate any growth over the next 20 years
4. Jacksonville forecast was determined using the growth rates from the Jacksonville Master Plan Update applied to the figure provided during the inventory visit for 2011 enplanements.
Source: FAA Terminal Area Forecast, December 2012
Prepared in February 2013

Table 3.5 shows projections for total aircraft operations at the commercial service airports. It should be noted that these operations totals include all types of activity including commercial, general aviation, air taxi, and military. Piedmont Triad International will see the highest growth in total operations, with an average annual growth rate over 1.8% during the forecast period; Wilmington is expecting the lowest growth in total operations, at approximately 0.2% over the next 20 years. Total operations at the commercial service airports in the state of North Carolina are expected to grow at an average annual growth rate of approximately 1.5% over the next 20 years, which is about half a percent above the national operations growth rate.

- Table 3.5: Total Operations Forecast at Commercial Service Airports

Associated City	Airport Name	Actual	Forecast			AAGR (2011-2031)
		2011	2016	2021	2031	
Asheville	Asheville Regional	63,164	62,865	63,696	65,548	0.19%
Charlotte	Charlotte/Douglas International	544,016	607,142	659,184	777,607	1.80%
Fayetteville	Fayetteville Regional/Grannis Field	49,948	50,540	52,028	55,261	0.51%
Greensboro	Piedmont Triad International	90,441	111,936	124,362	129,889	1.83%
Greenville	Pitt-Greenville	36,219	37,773	39,971	44,846	1.07%
Jacksonville	Albert J Ellis	38,804	41,148	43,850	49,896	1.26%
New Bern	Coastal Carolina Regional	33,408	33,507	34,374	36,312	0.42%
Raleigh/Durham	Raleigh-Durham International	191,469	203,369	224,259	273,774	1.80%
Wilmington	Wilmington International	55,522	52,753	54,173	57,349	0.16%
Commercial Airport Totals		1,102,991	1,201,033	1,295,897	1,490,481	1.52%

Notes:
1. N/A = Not Available
2. AAGR (Average Annual Growth Rate) = The average increase experienced over an identified period.
3. Pitt-Greenville forecast was determined using the Pitt-Greenville Airport Master Plan Update (Draft) from the airport since the TAF did not indicate any growth over the next 20 years
4. Jacksonville forecast was determined using the growth rates from the Jacksonville Master Plan Update applied to the figure provided during the inventory visit for 2011 operations.
Source: FAA Terminal Area Forecast, December 2012
Prepared in February 2013

There are 11 airports that offer freight service. The commercial service airports accommodate freight operations along with two non-commercial airports in the state. These airports include Kinston Regional Jetport and Laurinburg-Maxton, which combined make up less than a percent of the existing statewide freight (in tons). Table 3.6*)* shows projections for freight in tons at the airports. Charlotte/Douglas International makes up approximately 42% of the freight in the state and is expected to grow at an average annual rate of about 8% over the forecast period. On the other hand, freight at Asheville Regional and Laurinburg-Maxton Airport are expected to decline at an average annual rate of just over 20%. Piedmont Triad International depicts a 16% average annual growth through 2031. This reflects the projections associated with FedEx fully developing a regional hub at the airport; however, while the trucking portion of the hub has been implemented, the air cargo portion has been delayed due to the current economic climate. Thus, the overall cargo growth at the airport may be lower than the 16% depicted in the table or the system may experience the anticipated growth in later years than forecasted. Fortunately, overall, freight in the state is expected to grow at an average annual rate of 8%.

- Table 3.6: Freight Forecast at Commercial Service Airports
- (all cargo in tons)

Associated City	Airport Name	Actual	Forecast			AAGR (2011 - 2031)
		2011	2016	2021	2031	
Asheville	Asheville Regional	137	40	12	1	-22%
Charlotte	Charlotte/Douglas International	*137,943*	203,992	301,667	659,714	8%
Fayetteville	Fayetteville Regional/Grannis Field	34	42	52	81	4%
Greensboro	Piedmont Triad International	*94,949*	198,714	415,881	1,821,580	16%
Greenville	Pitt-Greenville	37	87	203	1,112	19%
Jacksonville	Albert J Ellis	125	340	925	6,832	22%
Kinston	Kinston Regional Jetport*	82	101	125	191	4%
Maxton	Laurinburg-Maxton Airport*	500	139	39	3	-23%
New Bern	Coastal Carolina Regional	2,140	5,179	12,535	73,419	19%
Raleigh/Durham	Raleigh-Durham International	*87,820*	106,719	129,685	191,507	4%
Wilmington	Wilmington International	1,822	1,655	1,503	1,239	-2%
	Cargo Airport Totals	325,589	476,396	697,054	1,492,325	8%

Notes:
* Not analyzed as commercial airport
1. Data highlighted in blue and italicized comes from USDOT T-100
Source: Parsons Brinckerhoff, 2012; USDOT T-100 Data, 2013; Landrum & Brown Analysis, 2013
Prepared February 2013

North Carolina General Aviation Airports Forecast

General aviation activity represents all facets of civil aviation except the activity of certified route air carriers, commuters, and the military. Projections of activity at North Carolina general aviation airports are presented in the following sections. As with the commercial service airport forecasts, the time horizon is 20-years, and the base year for the forecast is 2011. Key components of the general aviation forecasts include:

- Based aircraft are the total number of active general aviation aircraft that are either in hangars or tied down at an airport.
- Operations are defined as the number of takeoffs and landings. If an aircraft takes off and lands at an airport, this is counted as two operations.

Various methodologies that can be used to project activity at North Carolina general aviation airports were evaluated and a preferred projection was selected. Preferred projections are used in various components of the system planning process to examine future needs of North Carolina's public-use airport system.

Based Aircraft Projections

Several methodologies were used to project based aircraft at North Carolina general aviation airports. To ensure a reasonable forecast, the existing characteristics of the state's based aircraft fleet were examined and used as a baseline from which future based aircraft are projected. The process used to develop projections of based aircraft is described in the following sections:

- Existing Based General Aviation Aircraft
- Based Aircraft Projection Methodologies
- Selection of Preferred Based Aircraft Projection

Existing Based General Aviation Aircraft

To establish a baseline of information for the forecasts, data on existing based aircraft was gathered from the airports' historical data. This data was verified or updated in 2012 through the Airport Inventory and Data Survey that was conducted at study airports. In addition, missing data was filled-in by using the Airports 5010 database. Data from the Airports 5010 database were compared to the FAA TAF data. There were only minor discrepancies between the two sources – approximately a 1% statewide difference. Through this process, it was determined that there were a total of 2,687 based aircraft at the general aviation airports in North Carolina in 2011.

Based Aircraft Projection Methodologies

Projections of based aircraft at the general aviation airports were developed using six methodologies. The results of these different methodologies depicted the impacts that different variables may have on the activity at study airports. From these projection scenarios, a preferred projection of based aircraft was selected. The different projection methodologies utilized in this analysis for the general aviation airports are summarized as follows:

- Bottom Up Growth Rate: Calculated growth rate from 2006-2011 for based aircraft at each airport; applied range of rates based on the FAA's active aircraft growth rates from the *FAA Aerospace Forecasts, 2012-2032* and considered the presence of jet aircraft at an airport
- TAF Growth Rate: Growth rate interpolated from statewide TAF forecast data and applied to 2011 statewide based aircraft data
- FAA Growth Rate: Compared historical national active based aircraft data and applied to 2011 statewide based aircraft
- NC State Share Growth Rate: Top-down method; Growth rate interpolated from the percent comparison of historical national aircraft growth to historical state aircraft and applied to 2011 statewide based aircraft
- Socio-Economic Growth Rate: Top-down methods
  - State Population Growth Rate: Growth rate interpolated from the statewide population growth in NC and applied to 2011 statewide based aircraft

– State Employment Growth Rate: Growth rate interpolated from the statewide employment growth in NC and applied to 2011 statewide based aircraft

Selection of Preferred Based Aircraft Projection

Table 3.7 compares the results of the statewide projection methodologies used and depicts each methodology's average annual growth rate. The preferred method selected by North Carolina was the Bottom-Up Growth Rate method which developed forecasts for each airport individually. The results of this methodology for each airport are depicted in Table 3.8. It should be noted that the three National Park Service (NPS) airports located on the Outer Banks in North Carolina are not permitted to have based aircraft, thus the forecast projects no aircraft.

- Table 3.7: Based Aircraft Methodology Comparison

Method	2011	2016	2021	2031	AAGR
Bottom-Up Growth Rate	2,687	2,877	3,083	3,547	1.40%
TAF Growth Rate	2,687	2,743	2,802	2,924	0.43%
FAA Growth Rate	2,687	2,765	2,848	3,021	0.59%
NC State Share Growth Rate	2,687	2,673	2,693	2,852	0.30%
Socio-Economic (State Population) Growth Rate	2,687	2,863	3,052	3,470	1.29%
Socio-Economic (State Employment) Growth Rate	2,687	2,896	3,123	3,632	1.52%

Notes:
1. AAGR (Average Annual Growth Rate) = The average increase experienced over an identified period.
Source: Landrum & Brown Analysis
Prepared: February 2013

- Table 3.8: Preferred Based Aircraft Forecast Summary

Associated City	Airport Name	Actual	Forecast			
		2011	2016	2021	2031	AAGR
Ahoskie	Tri-County Airport	9	9	10	10	0.6%
Albemarle	Stanly County Airport	20	21	21	23	0.6%
Andrews	Western Carolina Regional	58	64	71	86	2.0%
Asheboro	Asheboro Regional Airport	45	48	51	57	1.2%
Beaufort	Michael J Smith Field	70	74	77	85	1.0%
Burlington	Burlington Alamance Regional Airport	*123*	136	150	183	2.0%
Clinton	Clinton-Sampson County Airport	26	28	29	33	1.2%
Concord	Concord Regional Airport	*162*	170	179	198	1.0%
Currituck	Currituck County Regional	*41*	44	46	52	1.2%
Edenton	Northeastern Regional Airport	33	35	37	42	1.2%
Elizabeth City	Elizabeth City CGAS Regional Airport	30	31	32	34	0.6%
Elizabethtown	Curtis L Brown Jr Field	*13*	14	15	17	1.2%
Elkin	Elkin Municipal Airport	20	21	21	23	0.6%
Engelhard	Hyde County Airport	0	0	0	0	0.0%
Erwin	Harnett Regional Jetport	17	18	19	21	1.0%
Franklin	Macon County Airport	28	29	30	32	0.6%
Gastonia	Gastonia Municipal Airport	34	36	38	41	1.0%
Goldsboro	Wayne Executive Jetport	60	63	66	73	1.0%
Hatteras	Billy Mitchell Airstrip (NPS)	*0*	0	0	0	0.0%
Hickory	Hickory Regional Airport	67	70	74	82	1.0%
Jefferson	Ashe County Airport	*32*	34	36	41	1.2%
Kenansville	Duplin County Airport	*21*	23	26	31	2.0%
Kill Devil Hills	First Flight Airport (NPS)	*0*	0	0	0	0.0%
Kinston	Kinston Regional Jetport	39	43	48	58	2.0%
Lexington	Davidson County Airport	76	84	93	113	2.0%
Lincolnton	Lincolnton Lincoln County Regional Airport	89	94	100	113	1.2%
Louisburg	Triangle North Executive Airport	*97*	107	118	144	2.0%
Lumberton	Lumberton Municipal Airport	*46*	49	52	58	1.2%
Manteo	Dare County Regional Airport	49	51	54	60	1.0%
Maxton	Laurinburg Maxton Airport	*20*	21	21	23	0.6%
Monroe	Charlotte Monroe Executive	86	90	95	105	1.0%
Morganton	Foothills Regional Airport	50	55	61	74	2.0%
Mount Airy	Mount Airy Surry County Airport	53	59	65	79	2.0%
Mount Olive	Mount Olive Municipal Airport	17	18	18	19	0.6%
North Wilkesboro	Wilkes County Airport	36	40	44	53	2.0%
Oak Island	Cape Fear Regional Jetport	75	80	85	95	1.2%
Ocean Isle Beach	Odell Williamson Municipal Airport	16	16	17	18	0.6%

Associated City	Airport Name	Actual	Forecast			
		2011	2016	2021	2031	AAGR
Ocracoke	Ocracoke Island Airport & Helipad (NPS)	0	0	0	0	0.0%
Oxford	Henderson Oxford Airport	*50*	53	56	63	1.2%
Pinehurst/Southern Pines	Moore County Airport	67	70	74	82	1.0%
Plymouth	Plymouth Municipal Airport	*11*	12	12	14	1.2%
Reidsville	Rockingham County NC Shiloh Airport	51	54	57	65	1.2%
Roanoke Rapids	Halifax-Northampton County Regional	22	23	23	25	0.6%
Rockingham	Richmond County Airport	*14*	14	15	16	0.6%
Rocky Mount	Rocky Mount Wilson Regional	12	13	13	15	1.0%
Roxboro	Person County Airport	42	46	51	62	2.0%
Rutherfordton	Rutherford County Marchman Field	26	27	29	32	1.0%
Salisbury	Rowan County Airport	*91*	100	111	135	2.0%
Sanford	Raleigh Executive Jetport	111	123	135	165	2.0%
Shelby	Shelby-Cleveland County Regional Airport	35	36	37	39	0.6%
Siler City	Siler City Municipal Airport	28	30	32	36	1.2%
Smithfield	Johnston County Airport	112	124	137	166	2.0%
Spruce Pine	Avery County Morrison Field	32	34	36	41	1.2%
Star	Montgomery County Airport	16	16	17	18	0.6%
Statesville	Statesville Regional Airport	93	103	113	138	2.0%
Sylva	Jackson County Airport	16	16	17	18	0.6%
Tarboro	Tarboro Edgecombe Airport	2	2	2	2	0.6%
Wadesboro	Anson County - Jeff Cloud Field	26	28	29	33	1.2%
Wallace	Henderson Field	20	21	21	23	0.6%
Washington	Warren Field	17	18	18	19	0.6%
Whiteville	Columbus County Airport	27	29	30	34	1.2%
Williamston	Martin County Airport	8	8	8	9	0.6%
Winston-Salem	Smith Reynolds Airport (Winston-Salem)	100	105	110	122	1.0%
	Statewide Totals	2,687	2,877	3,083	3,547	1.40%

Notes:
1. Numbers shown in standard font obtained from Airport Historical Data, Parsons Brinckerhoff
2. Numbers shown in italicized and blue obtained from FAA TAF
3. NPS stands for National Park Service
4. CGAS stands for Coast Guard Air Station

Source: FAA Terminal Area Forecast, December 2012; Parsons Brinckerhoff, 2012; Landrum & Brown Analysis
Prepared: February 2013

General Aviation Airport Operations Projections

General aviation activity is the primary focus of a majority of general aviation airports in North Carolina. This activity consists of both local and itinerant aircraft operations, as well as commuter/air taxi. However, several of North Carolina's airports accommodate a significant amount of military activity, which is defined for purposes of this study as more than 5,000 estimate annual operations. These airports include the following:

- Currituck County Regional
- Elizabeth City CGAS Regional Airport
- Harnett Regional Jetport
- Laurinburg Maxton Airport
- Stanly County Airport
- Warren Field

When forecasting activity at general aviation airports, military activity is assumed to be constant, since changes in this type of activity are not directly related to the airports, but to other national and state issues that cannot be predicted. Therefore, the total operations were reduced to reflect civilian operations only, with military operations being removed from the total. Table 3.9 reflects the total civilian operations estimates that are used in projecting future activity at North Carolina's general aviation airports.

It is important to note that most of the annual aircraft operations estimates that are available for the general aviation airports are estimates provided by airport management; this is because there are only a limited number of airports that have an air traffic control tower or other methods for counting aircraft operations. This is typical for most general aviation airports throughout the U.S. that do not have air traffic control towers. The level of accuracy of these estimates ranges from airport-to-airport and depends on each airport's level of monitoring and knowledge of their aviation activity. As part of the forecast task, a separate analysis was conducted regarding state aviation agencies that have had or currently have aircraft counting programs for consideration by DOA. This analysis is further depicted in Appendix B.

For purposes of the forecasts analysis, data from the Airports 5010 database were compared to the FAA TAF data to establish a baseline of activity. There were only minor discrepancies between the two sources, which was estimated to be approximately 1%. The data from Airports 5010 was utilized in this analysis for the existing operations figures at general aviation airports.

- Table 3.9: 2011 Operations by Type

Associated City	Airport Name	2011				
		Commercial	Air Taxi and Commuter	General Aviation (Itinerant)	General Aviation (Local)	2011 Total Civilian Operations
Ahoskie	Tri-County Airport	0	200	6,800	6,000	13,000
Albemarle	Stanly County Airport	0	0	1,631	15,387	17,018
Andrews	Western Carolina Regional	0	1,000	5,000	14,000	20,000
Asheboro	Asheboro Regional Airport	0	0	7,000	8,000	15,000
Beaufort	Michael J Smith Field	0	3,728	3,728	33,549	41,005
Burlington	Burlington Alamance Regional Airport	0	1,000	23,000	26,000	50,000
Clinton	Clinton-Sampson County Airport	0	100	500	4,000	4,600
Concord	Concord Regional Airport	208	3,841	35,011	21,378	60,438
Currituck	Currituck County Regional	0	500	14,000	3,500	18,000
Edenton	Northeastern Regional Airport	0	500	7,000	6,000	13,500
Elizabeth City	Elizabeth City CGAS Regional Airport	0	620	9,000	6,500	16,120
Elizabethtown	Curtis L Brown Jr Field	0	0	9,000	5,000	14,000
Elkin	Elkin Municipal Airport	0	0	6,000	7,000	13,000
Engelhard	Hyde County Airport	0	50	2,500	1,000	3,550
Erwin	Harnett Regional Jetport	0	300	14,000	30,000	44,300
Franklin	Macon County Airport	0	0	4,500	4,500	9,000
Gastonia	Gastonia Municipal Airport	0	1,000	9,000	40,000	50,000
Goldsboro	Wayne Executive Jetport	0	2,000	6,700	6,500	15,200
Hatteras	Billy Mitchell Airstrip (NPS)	0	100	5,000	4,000	9,100
Hickory	Hickory Regional Airport	0	0	27,766	12,280	40,046
Jefferson	Ashe County Airport	0	0	6,000	3,900	9,900
Kenansville	Duplin County Airport	0	0	9,000	5,500	14,500
Kill Devil Hills	First Flight Airport (NPS)	0	0	14,000	23,000	37,000
Kinston	Kinston Regional Jetport	119	276	5,052	5,438	10,885
Lexington	Davidson County Airport	0	500	3,000	5,000	8,500
Lincolnton	Lincolnton Lincoln Co Regional Airport	0	0	17,900	15,300	33,200
Louisburg	Triangle North Executive Airport	0	0	18,000	42,300	60,300

Associated City	Airport Name	2011				
		Commercial	Air Taxi and Commuter	General Aviation (Itinerant)	General Aviation (Local)	2011 Total Civilian Operations
Lumberton	Lumberton Municipal Airport	0	1,000	12,000	10,000	23,000
Manteo	Dare County Regional Airport	0	10,050	4,400	2,300	16,750
Maxton	Laurinburg Maxton Airport	0	4,000	10,000	10,000	24,000
Monroe	Charlotte Monroe Executive	0	4,100	20,500	30,500	55,100
Morganton	Foothills Regional Airport	0	1,000	6,500	9,000	16,500
Mount Airy	Mount Airy Surry County Airport	0	1,000	7,000	9,000	17,000
Mount Olive	Mount Olive Municipal Airport	0	0	4,500	10,000	14,500
North Wilkesboro	Wilkes County Airport	0	1,500	1,400	2,000	4,900
Oak Island	Cape Fear Regional Jetport	0	0	44,000	30,000	74,000
Ocean Isle Beach	Odell Williamson Municipal Airport	0	0	10,000	10,000	20,000
Ocracoke	Ocracoke Island Airport (NPS)	0	100	3,000	3,000	6,100
Oxford	Henderson Oxford Airport	0	120	13,200	10,800	24,120
Pinehurst/ Southern Pines	Moore County Airport	0	875	5,600	2,400	8,875
Plymouth	Plymouth Municipal Airport	0	275	3,000	8,000	11,275
Reidsville	Rockingham County NC Shiloh Airport	0	0	9,000	15,000	24,000
Roanoke Rapids	Halifax-Northampton County Regional	0	0	1,400	1,200	2,600
Rockingham	Richmond County Airport	0	0	5,000	5,000	10,000
Rocky Mount	Rocky Mount Wilson Regional	124	1,276	19,302	8,521	29,223
Roxboro	Person County Airport	0	550	18,000	15,000	33,550
Rutherfordton	Rutherford County Marchman Field	0	0	8,000	25,000	33,000
Salisbury	Rowan County Airport	0	1,000	22,100	16,000	39,100
Sanford	Raleigh Executive Jetport	0	2,000	12,000	48,000	62,000
Shelby	Shelby-Cleveland County Regional Airport	0	0	8,000	10,000	18,000
Siler City	Siler City Municipal Airport	0	0	16,500	4,000	20,500
Smithfield	Johnston County Airport	0	0	32,000	40,350	72,350
Spruce Pine	Avery County Morrison Field	0	0	3,000	2,000	5,000
Star	Montgomery County Airport	0	0	1,500	1,300	2,800

Associated City	Airport Name	2011				
		Commercial	Air Taxi and Commuter	General Aviation (Itinerant)	General Aviation (Local)	2011 Total Civilian Operations
Statesville	Statesville Regional Airport	0	1,000	16,000	19,000	36,000
Sylva	Jackson County Airport	0	150	2,500	1,600	4,250
Tarboro	Tarboro Edgecombe Airport	0	800	2,000	2,000	4,800
Wadesboro	Anson County - Jeff Cloud Field	0	0	4,000	2,500	6,500
Wallace	Henderson Field	0	200	10,000	4,500	14,700
Washington	Warren Field	0	0	4,000	8,000	12,000
Whiteville	Columbus County Airport	0	2,100	10,000	3,600	15,700
Williamston	Martin County Airport	0	0	2,000	2,000	4,000
Winston-Salem	Smith Reynolds Airport (Winston-Salem)	94	2,617	26,780	13,032	42,523
	Statewide Operations	545	51,428	648,270	749,635	1,449,878

Notes:
1. NPS stands for National Park Service
2. CGAS stands for Coast Guard Air Station
Source: Airports 5010, December 2012; Landrum & Brown Analysis
Prepared: April 2013

Two methodologies were examined to project total civilian operations at North Carolina general aviation airports. The process used to develop projections of total aircraft operations is described in the following sections:

- Aircraft Operations Projection Methodologies
- Selection of Preferred Aircraft Operations Projection

Projection methodologies that implement "top-down" and "bottom-up" approaches were compared and a preferred aircraft operation projection was selected for general aviation airports.

General Aviation Aircraft Operations Projection Methodologies

Projections of aircraft operations at general aviation airports were developed using two separate methodologies. The results of these different methodologies depict the impacts that different variables may have on operations at the airports. The different methodologies utilized in this analysis are summarized as follows:

- Operations Per Based Aircraft (OPBA) Methodology: Assumes each airport continues to experiences the same level of OPBA, with increases tied only to based aircraft projections based upon the FAA's projections of active aircraft increases

- Socioeconomic Methodology: Uses historical 2000 to 2010 U.S. Census population growth rates by county to adjust the FAA's projected rate of growth for general aviation operations. The FAA Aerospace Forecast growth rate of 0.3 percent for general aviation operations at towered airports is adjusted based on each airport's associated county population growth from 2000 to 2010. The adjusted growth rates shown in Figure 3.20 were applied to 2011 general aviation operations at a linear rate

- Figure 3.20: Categories of Growth in the Operations Forecast

2000-2010 County Population Growth Rate	Percentage of Industry Rate	Adjusted AAGR
0% or ≤0%	50%	0.15%
>0.1% to 1.0%	100%	0.30%
>1.1% to 2.0%	150%	0.45%
>2.1% to 3%	200%	0.60%
>3%	300%	0.90%

Notes: AAGR= average annual growth rate
Source: U.S. Census Bureau, Census 2010, FAA Aerospace Forecasts, Fiscal Years 2012-2032
Prepared: April 2013

Selection of Preferred Aircraft Operations Projection

The results from the two methodologies were compared. Based on the review of the two methodologies, as shown in Table 3.10 the OPBA methodology was selected as the preferred methodology.

- Table 3.10: Aircraft Operations Forecast Methodology Comparison

Methodology	Total Aircraft Operations				AAGR
	2011	2016	2021	2031	2011-2031
OPBA	1,450,800	1,547,900	1,649,800	1,878,700	1.30%
Socioeconomic	1,450,800	1,491,200	1,530,700	1,613,800	0.53%

Notes: Operations are rounded to the nearest hundred
Source: Landrum & Brown Analysis
Prepared: April 2013

Detailed airport-specific aircraft operations forecasts using the OPBA preferred methodology are presented in Table 3.11. Four of the general aviation airports have zero based aircraft, including three NPS airports that are not permitted to have based aircraft. Therefore, these four airports do not have an OPBA, and the FAA's growth rate was applied to the 2011 operations estimate to develop a forecast.

- Table 3.11: Aircraft OPBA Operations Forecast Summary

Associated City	Airport Name	2011	2016	2021	2031	AAGR
Ahoskie	Tri-County Airport	13,000	13,400	13,900	14,700	0.60%
Albemarle	Stanly County Airport	17,100	17,600	18,100	19,200	0.60%
Andrews	Western Carolina Regional	20,000	22,100	24,400	29,800	2.00%
Asheboro	Asheboro Regional Airport	15,000	16,000	17,000	19,100	1.20%
Beaufort	Michael J Smith Field	41,100	43,100	45,300	50,100	1.00%
Burlington	Burlington Alamance Regional Airport	50,000	55,300	61,000	74,300	2.00%
Clinton	Clinton-Sampson County Airport	4,600	4,900	5,200	5,900	1.20%
Concord	Concord Regional Airport	60,500	63,600	66,800	73,800	1.00%
Currituck	Currituck County Regional	18,000	19,200	20,300	22,900	1.20%
Edenton	Northeastern Regional Airport	13,500	14,400	15,300	17,200	1.20%
Elizabeth City	Elizabeth City CGAS Regional Airport	16,200	16,700	17,200	18,200	0.60%
Elizabethtown	Curtis L Brown Jr Field	14,000	14,900	15,800	17,800	1.20%
Elkin	Elkin Municipal Airport	13,000	13,400	13,900	14,700	0.60%
Engelhard	Hyde County Airport	3,600	3,700	3,700	3,800	0.30%
Erwin	Harnett Regional Jetport	44,300	46,600	49,000	54,100	1.00%
Franklin	Macon County Airport	9,000	9,300	9,600	10,200	0.60%
Gastonia	Gastonia Municipal Airport	50,000	52,600	55,300	61,100	1.00%
Goldsboro	Wayne Executive Jetport	15,200	16,000	16,800	18,600	1.00%
Hatteras	Billy Mitchell Airstrip (NPS)	9,100	9,300	9,400	9,700	0.30%
Hickory	Hickory Regional Airport	40,100	42,100	44,300	48,900	1.00%
Jefferson	Ashe County Airport	9,900	10,600	11,200	12,600	1.20%
Kenansville	Duplin County Airport	14,500	16,100	17,700	21,600	2.00%
Kill Devil Hills	First Flight Airport (NPS)	37,000	37,600	38,200	39,300	0.30%
Kinston	Kinston Regional Jetport	10,900	12,100	13,300	16,200	2.00%
Lexington	Davidson County Airport	8,500	9,400	10,400	12,700	2.00%
Lincolnton	Lincolnton Lincoln County Regional Airport	33,200	35,300	37,500	42,200	1.20%
Louisburg	Triangle North Executive Airport	60,300	66,600	73,600	89,700	2.00%
Lumberton	Lumberton Municipal Airport	23,000	24,500	26,000	29,200	1.20%
Manteo	Dare County Regional Airport	16,800	17,700	18,600	20,500	1.00%
Maxton	Laurinburg Maxton Airport	24,000	24,800	25,500	27,100	0.60%
Monroe	Charlotte Monroe Executive	55,100	58,000	60,900	67,300	1.00%
Morganton	Foothills Regional Airport	16,500	18,300	20,200	24,600	2.00%
Mount Airy	Mount Airy Surry County Airport	17,000	18,800	20,800	25,300	2.00%
Mount Olive	Mount Olive Municipal Airport	14,500	15,000	15,400	16,400	0.60%
North Wilkesboro	Wilkes County Airport	4,900	5,500	6,000	7,300	2.00%
Oak Island	Cape Fear Regional Jetport	74,000	78,600	83,400	94,000	1.20%
Ocean Isle Beach	Odell Williamson Municipal Airport	20,000	20,700	21,300	22,600	0.60%
Ocracoke	Ocracoke Island Airport & Helipad (NPS)	6,100	6,200	6,300	6,500	0.30%
Oxford	Henderson Oxford Airport	24,200	25,700	27,200	30,700	1.20%
Pinehurst/Southern Pines	Moore County Airport	8,900	9,400	9,900	10,900	1.00%
Plymouth	Plymouth Municipal Airport	11,300	12,000	12,800	14,400	1.20%
Reidsville	Rockingham County NC Shiloh Airport	24,000	25,500	27,100	30,500	1.20%
Roanoke Rapids	Halifax-Northampton County Regional	2,600	2,700	2,800	3,000	0.60%
Rockingham	Richmond County Airport	10,000	10,400	10,700	11,300	0.60%
Rocky Mount	Rocky Mount Wilson Regional	29,300	30,800	32,300	35,700	1.00%
Roxboro	Person County Airport	33,600	37,100	40,900	49,900	2.00%
Rutherfordton	Rutherford County Marchman Field	33,000	34,700	36,500	40,300	1.00%
Salisbury	Rowan County Airport	39,100	43,200	47,700	58,200	2.00%
Sanford	Raleigh Executive Jetport	62,000	68,500	75,600	92,200	2.00%
Shelby	Shelby-Cleveland County Regional Airport	18,000	18,600	19,200	20,300	0.60%

Siler City	Siler City Municipal Airport	20,500	21,800	23,100	26,100	1.20%
Smithfield	Johnston County Airport	72,400	79,900	88,200	107,600	2.00%
Spruce Pine	Avery County Morrison Field	5,000	5,400	5,700	6,400	1.20%
Star	Montgomery County Airport	2,800	2,900	3,000	3,200	0.60%
Statesville	Statesville Regional Airport	36,000	39,800	43,900	53,500	2.00%
Sylva	Jackson County Airport	4,300	4,400	4,600	4,800	0.60%
Tarboro	Tarboro Edgecombe Airport	4,800	5,000	5,100	5,500	0.60%
Wadesboro	Anson County - Jeff Cloud Field	6,500	6,900	7,400	8,300	1.20%
Wallace	Henderson Field	14,700	15,200	15,700	16,600	0.60%
Washington	Warren Field	12,000	12,400	12,800	13,600	0.60%
Whiteville	Columbus County Airport	15,700	16,700	17,700	20,000	1.20%
Williamston	Martin County Airport	4,000	4,200	4,300	4,600	0.60%
Winston-Salem	Smith Reynolds Airport (Winston-Salem)	42,600	44,700	47,000	51,900	1.00%
Statewide Total		1,450,800	1,547,900	1,649,800	1,878,700	1.30%

Notes:
1. Forecast years are rounded to the nearest 100 operations per each airport.
2. Airports highlighted in gray are airports that experience zero growth in operations due to their lack of based aircraft.
3. NPS stands for National Park Service
4. CGAS stands for Coast Guard Air Station
Source: Airports 5010, December 2012; Landrum & Brown Analysis
Prepared: April 2013

3.5 Summary

The projections developed in this chapter are later used in the evaluation of the North Carolina airport system's ability to accommodate future demand. The projections provided in this chapter are considered planning estimates and are based on information gathered from all available sources. These projections were generated for a system planning level of detail, rather than that of a master plan. Comprehensive airport development plans will continue to provide guidance for actual airport development as individual airport plans are developed. Table 3.12 summarizes the preferred statewide forecasts for the study.

- Table 3.12: Summary of Preferred Statewide Forecasts

	2011	2016	2021	2031	AAGR (2011-2031)
Commercial Service Airports					
Based Aircraft	861	897	952	1,077	1.13%
Passenger Enplanements	26,096,035	30,015,052	33,807,483	43,011,943	2.53%
Aircraft Operations	1,101,007	1,198,341	1,293,203	1,487,779	1.52%
General Aviation Airports					
Based Aircraft	2,687	2,877	3,083	3,547	1.40%
Aircraft Operations	1,450,800	1,547,900	1,649,800	1,878,700	1.30%

Source: Landrum & Brown Analysis
Prepared: April 2013

Based Aircraft: Throughout the state, the number of based aircraft are expected to grow at an average annual growth rate of 1.4% at general aviation airports, which is slightly higher than that of commercial airports; which are expecting an average annual growth rate of 1.13%. Wilmington International, Piedmont Triad International, and Albert J Ellis are the biggest contributors to the based aircraft growth at the commercial airports, with each depicting an average annual growth of over 2% throughout the forecast period. Nationally, the number of active general aviation aircraft is projected to grow at an average annual rate of 0.6% for the next 20 years according to the FAA.

Passenger Enplanements: At the commercial service airports throughout the state, passenger enplanements are expected to grow at an average annual growth of over 2.5% (equivalent to the national average annual growth) during the forecast period; this rate is two-times the average annual growth of the aircraft operations and based aircraft at commercial service airports. By 2031, North Carolina's statewide enplanements will represent 3.5% of the national enplanements.

Aircraft Operations: Throughout the state, operations are expected to grow at an average annual rate of 1.52% at commercial service airports and 1.3% at general aviation airports over the forecast period. Major contributors to the growth at commercial service airports include Charlotte/Douglas International, Piedmont Triad International, and Raleigh-Durham International, each depicting an average annual growth rate of almost 2%. At the general aviation airports in the state, just over ten of the airports depicted a 2% growth in operations during the forecast period. Nationally, general aviation operations are projected to grow 0.3% per year.

Air Cargo: The freight forecast was made up of 11 airports, including two general aviation airports that accommodate freight operations. The overall freight in the state is expected to grow at an average annual growth rate of 8% throughout the forecast period; however this reflects the assumption that Piedmont Triad International will grow at an average annual growth rate of 16%, which is based upon the full implementation of the FedEx regional hub. Nationally, FAA forecasts indicate an overall domestic and international growth in air cargo of 5% over the next 20 years.

Chapter 4 – Airport Groupings Update and Airport Development Planning

Background

Airport roles are defined differently from a national, state, and local perspective. As discussed in Chapter 2, the Federal Aviation Administration (FAA) has established two types of airport roles, those in the National Plan of Integrated Airport Systems (NPIAS) and specific roles for general aviation airports identified in the report titled *General Aviation Airports: A National Asset (ASSET)* published in May 2012. These roles are considered in the evaluation of North Carolina's aviation system needs; however, North Carolina has historically used its own airport groupings or roles to guide the system's development, especially as it relates to state aviation funding.

In 2004, North Carolina's Division of Aviation (DOA) developed its General Aviation Airport Development Plan (GAADP) which included an airport groupings analysis, an evaluation of airport roles within the state, and facility and development standards and guidelines for general aviation airports that are eligible for federal and state programs. The DOA noted that the purpose of the GAADP is "to identify the deficiencies that our state's (North Carolina's) GA [general aviation] airports need to address and to then provide a systematic and strategic approach for DOA to address these needs." The GAADP was updated and revised in 2006 and has served as the general aviation airport development guidelines since that time.

As part of the North Carolina Airports System Plan (NCASP), the airport groupings and the airport development categories included in the GAADP are being evaluated. A primary task of the NCASP is to provide updated information to DOA in order to understand and evaluate the system's performance and its needs. Updating the Airport Groupings Model and determining the current roles that the airports play in the system is essential to providing an updated and accurate portrayal of the North Carolina aviation system.

The NCASP also provides a mechanism to evaluate potential changes as well produce guidance that can be used by DOA and the airports to address future development needs. One significant change is the inclusion of the commercial service airports in a new "Yellow" airport grouping, as discussed in a subsequent section. The inclusion of these airports changes the focus of the NCASP from just general aviation to all public use airports, hence referring to this as the Airport Development Plan (ADP) for the remainder of the NCASP.

The following sections describe the process used to update the airport groupings as well as the categories in the ADP.

Airport Groupings Model Update

DOA developed the Airport Groupings Model as part of its GAADP to help determine the role an individual airport is meant to play in the given community. The original Airport Groupings Model was based on data from 2000 and had not been updated to reflect more current socioeconomic and relevant data since that time.

The principal task involved in updating the Airport Groupings Model is to analyze more recent data or factors used in the development of the model. The factors are predominantly economic indicators that were used in the original development of the model at the county level. For purposes of the model update, all data for the factors for each county in North Carolina were gathered from state and federal resources for the year 2010. 2010 was used as the base year because data was available for all factors, including U.S. Census data, at the time of preparation. The county-specific economic indicators, or factors, included and used in the model are the following:

- Total population
- Population growth rate 2000-2010
- Annual per capita income
- Gross retail sales
- Tourism revenues

The economic information that was gathered for each county as part of this update of the GAADP model and their sources are shown in Table 4.1.

Table 4.1: GAADP Model 2010 Data Sources

Category	Source	Link
Total Population	North Carolina Department of Commerce: February 2012 Report, Demographics	http://accessnc.commerce.state.nc.us/EDIS/demographics.html
Population Growth Rate	North Carolina Department of Commerce: February 2012 Report, Demographics	http://accessnc.commerce.state.nc.us/EDIS/demographics.html
Annual Per Capita Income	U.S. Census Bureau, 2006-2010 American Community Survey 5-Year Estimates: Per Capita Income in the past 12 months	http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?fpt=table
Gross Retail Sales	North Carolina Department of Revenue, State Sales and Tax Use Statistics, September 28, 2011: Gross Collections and Taxable Sales by County Summary for Fiscal Year 2009-2010	http://www.dornc.com/publications/fy10-11salesusestats.pdf
Tourism Revenues	North Carolina Department of Tourism, Film, and Sports Development, by the U.S. Travel Association: The Economic Impact of Travel on North Carolina Counties 2010	http://www.nccommerce.com/LinkClick.aspx?fileticket=lzOnrIypkCU%3d&tabid=1586&mid=4665

Source: Landrum & Brown

The purpose of using county-level data, as opposed to data on smaller jurisdictions such as cities, was to examine the demand for aviation at a level where data was readily available. County data was assumed to be representative of the aviation demand associated with a simplified airport market area (the county), and airports were associated with the appropriate county in which they are located. There are 31 counties in North Carolina that do not have an airport within the county boundaries. There are three counties that have more than one airport. For the counties with multiple airports, each airport was first assigned the data that was associated with the county, and then a subsequent filtering process was used to evaluate each individual airport in that county to get a specific grouping. For all of the economic indicators or factors, a numerical ranking process was used wherein the data for each factor was ranked from high to low and each county was assigned a ranking based on this sorting process. The formula for the final model run determined the original airport groupings, as well as these updated groupings, and is as follows:

Total Population Rank
+
(0.5 x % Population Change (growth rate) 2001-2010 Rank)
+
Annual Per Capita Income Rank
+
(0.25 x Tourism Revenues/Gross Retail Sales Rank)

Using the final scores from this process, this formula was applied to rank the counties from 1 to 100. Based on the final county rankings, with a 1 defined as the highest need for aviation services and a 100 as the lowest need for aviation services, the counties were then assigned to one of three airport groupings as prescribed by DOA in its original Airport Groupings Model. The following airport groupings were applied based on the results of the scores by county:

- Score of 1 to 33: Red County Group
- Score of 34 to 66: Blue County Group
- Score of 67 to 100: Green County Group

In addition to the traditional three airport groupings for the general aviation airports, there was also a need to include the commercial service airports into the system planning process. Therefore, all airports with scheduled commercial airline service were assigned to a new “Yellow” grouping that was assigned solely based on service rather than the resulting score from the above model. Scores for the counties that have Yellow airports were included but were not used to identify the grouping.

Figure 4.1 shows the results of the initial update to the using the updated economic indicators and the groupings by county (not by airport). The county groupings are described as follows:

- Red: Counties with economic and population conditions sufficient enough to support a "Regional/Business" airport from a need or demand perspective.
- Blue: Counties that can support a "Community Airport with Business Aircraft Capability" (i.e. small to medium business jet aircraft).
- Green: Counties that require only a "Small Community" airport serving basic general aviation needs.

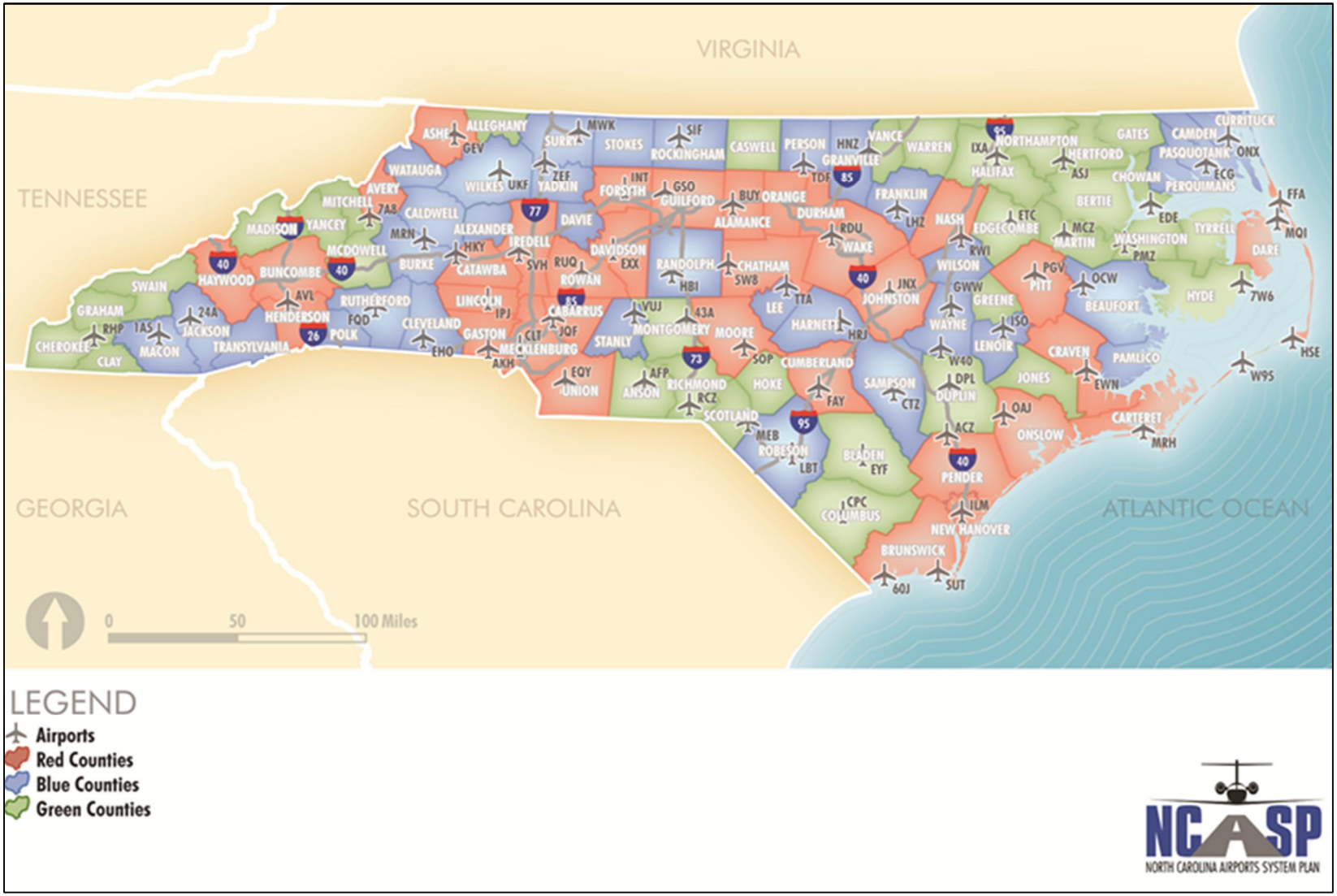
Initially, each airport was given the grouping of its respective county. After the initial ranking, a filter known as the radius rule was then applied. If there were two airports within a 20-nautical mile radius and one is a higher ranking airport of the same group (Red, Blue or Green), then the lower ranking airport was dropped to the group below. The radius rule was applied to 24 airports.

After the application of the radius rule, DOA staff filters were applied. These filters were used for evaluating an airport's ability to fulfill the goals and serve the demand associated with its assigned grouping. The staff filters were applied during a meeting in which the grouping assignment of each airport (after the radius rule was applied) was discussed in relationship to the following nine factors:

- Geography
- Cost
- Airspace Constraints
- Utilities Infrastructure
- Transportation System
- Local Support
- Regional Impacts
- Industry
- Airport Infrastructure

Based on the status of each of these factors at an airport, it was determined whether or not the model process yielded a reasonable result that matched the conditions at the airport. Through this staff filtering process, a total of 20 airports were determined to require grouping changes so that their group would more accurately reflect not only the areas demand for aviation services but also the ability of the airport to serve the demand.

Figure 4.1: GAADP Model Results by County



Sources: Landrum & Brown, Parsons Brinckerhoff GIS Analysis

Table 4.2 portrays the results of the this analysis showing the airports associated with each county as well as which airports had the radius rule and/or the staff filter applied. It also shows whether or not an airport's grouping had been a change since the 2003 airport groupings. As a result of the modeling and filter process, seven airports were moved up in their grouping and eight airports were moved down to reflect the current demand for aviation services. Additionally, two airports included in the 2003 airport groupings model were not included in this system plan; these include Horace Williams in Orange County and Wilson Industrial in Wilson County. These two airports are not included in the NPIAS and thus were not included in the NCASP analyses.

Figure 4.2 graphically depicts the 2014 airport groupings resulting from the model update after the radius rule and staff filters were applied. These groupings indicate the role that the airport is currently serving in the state aviation system. The map in Figure 4.2 identifies the location of the 72 public use airports in the state system. The number of airports by their current grouping (Yellow, Red, Blue, and Green) from the updated analysis is as follows:

- Yellow Group – Commercial Service (10)
- Red Group – Regional/Business Airport (16)
- Blue Group – Community Airport with Business Aircraft Capability (26)
- Green Group – Small Community Airport (20)

These airport groupings will be used to evaluate the current system's performance in the next chapter. Further, in the recommendations chapter later in the NCASP, these groupings will be analyzed again when considering potential need for airports to change roles in order to meet the 20 to 30-year needs that are anticipated.

A total of 32 out of the 100 counties in North Carolina do not have a system airport located within their respective borders. These 32 counties are comprised of three Red, 11 Blue, and 18 Green counties. The highest ranking county without an airport is Durham County which is served by RDU airport just over the border in Wake County. Table 4.3 presents each of these counties and their respective grouping.

Table 4.2: Updated Airport Groupings (2014)

County	Airport	ID	Radius Rule Applied	Staff Filter Applied	2014 Airport Groupings	Change from 2003 Airport Groupings
Alamance County	Burlington Alamance Regional	BUY	✗	✗	Red	⇔
Anson County	Anson County-Jeff Cloud Field	AFP	✗	✗	Green	↓
Ashe County	Ashe County	GEV	✗	✓	Blue	↑
Avery County	Avery County Morrison Field	7A8	✓	✓	Green	⇔
Beaufort County	Warren Field	OCW	✗	✗	Blue	⇔
Bladen County	Curtis L Brown Jr Field	EYF	✗	✓	Blue	⇔
Brunswick County	Cape Fear Regional Jetport	SUT	✗	✗	Red	⇔
Brunswick County	Odell Williamson Municipal	60J	✓	✓	Green	⇔
Buncombe County	Asheville Regional	AVL	✓	✗	Yellow	⇔
Burke County	Foothills Regional	MRN	✗	✗	Blue	⇔
Cabarrus County	Concord Regional	JQF	✗	✗	Yellow	↑
Carteret County	Michael J. Smith Field	MRH	✗	✗	Red	⇔
Catawba County	Hickory Regional	HKY	✓	✓	Red	↓
Chatham County	Siler City Municipal	5W8	✗	✓	Blue	⇔
Cherokee County	Western Carolina Regional	RHP	✗	✗	Blue	⇔
Chowan County	Northeastern Regional	EDE	✗	✗	Green	⇔
Cleveland County	Shelby-Cleveland County Regional	EHO	✓	✓	Blue	⇔
Columbus County	Columbus County Municipal	CPC	✗	✗	Green	⇔
Craven County	Coastal Carolina Regional	EWN	✓	✗	Yellow	⇔
Cumberland County	Fayetteville Regional Grannis Field	FAY	✓	✗	Yellow	⇔
Currituck County	Currituck County Regional	ONX	✗	✗	Red	↑
Dare County	Dare County Regional	MQI	✗	✗	Red	⇔

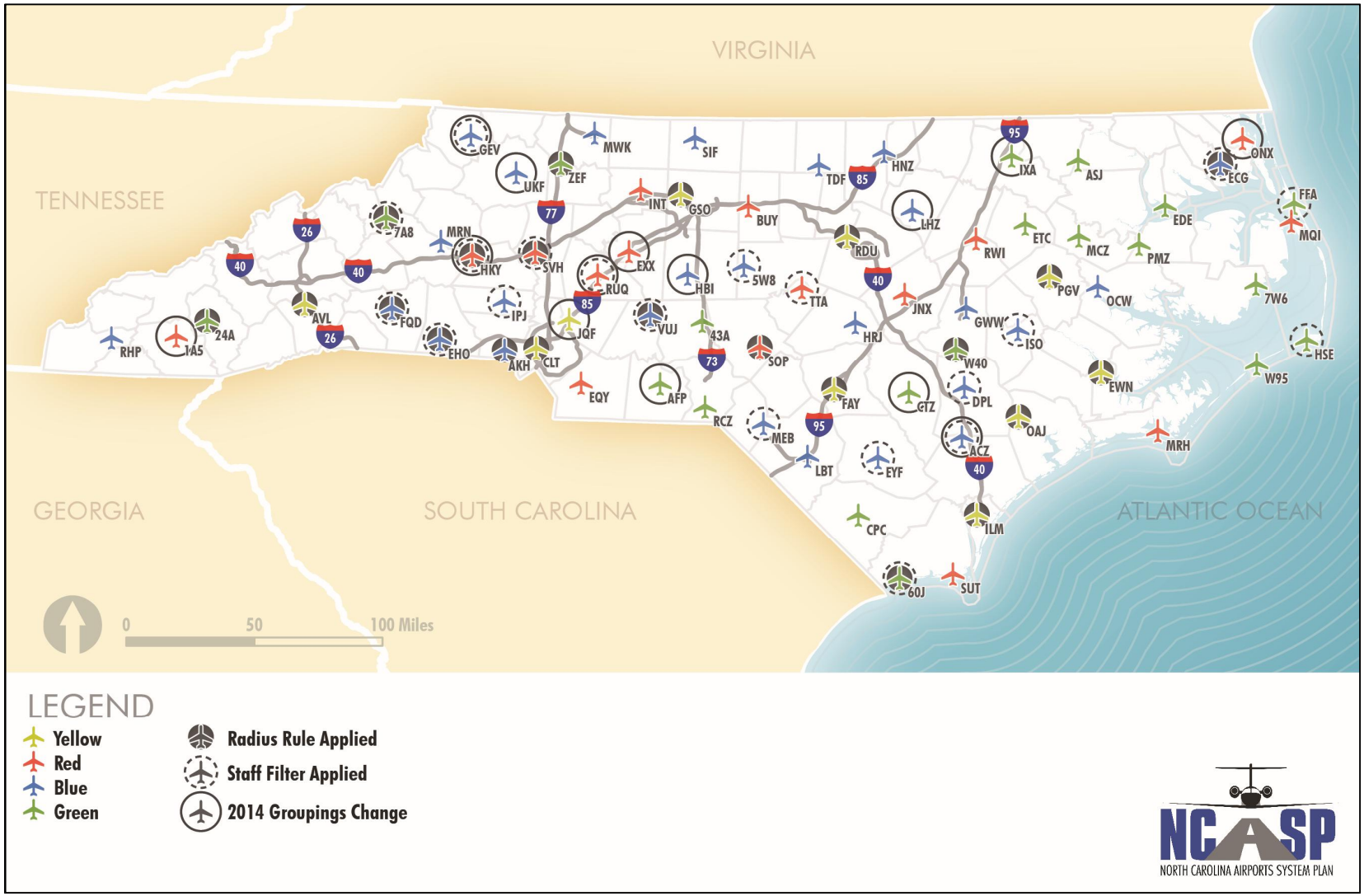
County	Airport	ID	Radius Rule Applied	Staff Filter Applied	2014 Airport Groupings	Change from 2003 Airport Groupings
Dare County	Billy Mitchell (NPS)	HSE	✗	✓	Green	⇔
Dare County	First Flight (NPS)	FFA	✗	✓	Green	⇔
Davidson County	Davidson County	EXX	✗	✗	Red	↑
Duplin County	Duplin County	DPL	✗	✓	Blue	⇔
Edgecombe County	Tarboro-Edgecombe	ETC	✗	✗	Green	⇔
Forsyth County	Smith Reynolds	INT	✗	✗	Red	⇔
Franklin County	Triangle North Executive	LHZ	✗	✗	Blue	↓
Gaston County	Gastonia Municipal	AKH	✓	✗	Blue	⇔
Granville County	Henderson-Oxford	HNZ	✗	✗	Blue	⇔
Guilford County	Piedmont Triad Int'l	GSO	✓	✗	Yellow	⇔
Halifax County	Halifax-Northampton Co Regional	IXA	✗	✗	Green	↓
Harnett County	Harnett Regional Jetport	HRJ	✗	✗	Blue	⇔
Hertford County	Tri-County	ASJ	✗	✗	Green	⇔
Hyde County	Hyde County (Engelhard)	7W6	✗	✗	Green	⇔
Hyde County	Ocracoke Island Airport & Helipad (NPS)	W95	✗	✗	Green	⇔
Iredell County	Statesville Regional	SVH	✓	✓	Red	⇔
Jackson County	Jackson County	24A	✓	✗	Green	⇔
Johnston County	Johnston County	JNX	✗	✗	Red	⇔
Lee County	Raleigh Exec Jetport at Sanford-Lee Co.	TTA	✗	✓	Red	⇔
Lenoir County	Kinston Regional Jetport at Stallings Field	ISO	✗	✓	Blue	⇔
Lincoln County	Lincolnton Lincoln County Regional	IPJ	✗	✓	Blue	⇔
Macon County	Macon County	1A5	✗	✗	Red	↑
Martin County	Martin County	MCZ	✗	✗	Green	⇔
Mecklenburg Co.	Charlotte/Douglas Int'l	CLT	✓	✗	Yellow	⇔

County	Airport	ID	Radius Rule Applied	Staff Filter Applied	2014 Airport Groupings	Change from 2003 Airport Groupings
Montgomery County	Montgomery County	43A	×	×	Green	⇔
Moore County	Moore County	SOP	✓	×	Red	↓
Nash County	Rocky Mount-Wilson Regional	RWI	×	×	Red	⇔
New Hanover Co.	Wilmington Int'l	ILM	✓	×	Yellow	⇔
Onslow County	Albert J. Ellis	OAJ	✓	×	Yellow	⇔
Orange County	Horace Williams (Chapel Hill)*	NA	✓	×	N/A	N/A
Pasquotank County	Elizabeth City CGAS Regional	ECG	✓	✓	Blue	⇔
Pender County	Henderson Field	ACZ	×	✓	Blue	↑
Person County	Person County	TDF	×	×	Blue	⇔
Pitt County	Pitt-Greenville	PGV	✓	×	Yellow	⇔
Randolph County	Asheboro Regional	HBI	×	×	Blue	↓
Richmond County	Richmond County	RCZ	×	×	Green	⇔
Robeson County	Lumberton Municipal	LBT	×	×	Blue	⇔
Rockingham County	Rockingham County NC Shiloh	SIF	×	×	Blue	⇔
Rowan County	Rowan County	RUQ	×	✓	Red	↑
Rutherford County	Rutherford County/Marchman Field	FQD	✓	✓	Blue	⇔
Sampson County	Clinton-Sampson County	CTZ	×	×	Green	↓
Scotland County	Laurinburg/Maxton	MEB	×	✓	Blue	⇔
Stanly County	Stanly County	VUJ	✓	✓	Blue	⇔
Surry County	Mount Airy/Surry County	MWK	×	×	Blue	⇔
Surry County	Elkin Municipal	ZEF	✓	×	Green	⇔
Union County	Charlotte Monroe Executive	EQY	×	×	Red	⇔
Wake County	Raleigh-Durham Int'l	RDU	✓	×	Yellow	⇔

County	Airport	ID	Radius Rule Applied	Staff Filter Applied	2014 Airport Groupings	Change from 2003 Airport Groupings
Washington County	Plymouth Municipal	PMZ	✗	✗	Green	⇔
Wayne County	Wayne Executive Jetport	GWW	✗	✗	Blue	⇔
Wayne County	Mount Olive Municipal	W40	✓	✗	Green	⇔
Wilkes County	Wilkes County	UKF	✗	✗	Blue	↓
Wilson County	Wilson Industrial*	NA	✓	✗	N/A	N/A

Source: Landrum & Brown
* Indicates that the airport is not included in the NPIAS and not part of the NCASP.

Figure 4.2: GAADP Model Results by Airport



Sources: Landrum & Brown, Parsons Brinckerhoff GIS Analysis

Table 4.3: North Carolina Counties without an Airport

County	2014 County Grouping	County	2014 County Grouping
Alexander	Blue	McDowell	Green
Alleghany	Green	Mitchell	Green
Bertie	Green	Northampton	Green
Caldwell	Blue	Orange	Red
Camden	Blue	Pamlico	Blue
Caswell	Green	Perquimans	Blue
Clay	Green	Polk	Blue
Davie	Blue	Stokes	Blue
Durham	Red	Swain	Green
Gates	Green	Transylvania	Blue
Graham	Green	Tyrell	Green
Greene	Green	Vance	Green
Haywood	Red	Warren	Green
Henderson	Red	Watauga	Blue
Hoke	Green	Wilson	Blue
Jones	Green	Yadkin	Blue
Madison	Green	Yancey	Green

Source: Landrum & Brown

The updated 2014 airport grouping results are also presented in Table 4.4 below sorted by grouping and associated city.

Table 4.4: Updated 2014 Airport Groupings By Grouping

Associated City	Airport Name	ID	2014 Airport Grouping
Asheville	Asheville Regional	AVL	Yellow
Charlotte	Charlotte/Douglas Int'l	CLT	Yellow
Concord	Concord Regional	JQF	Yellow
Fayetteville	Fayetteville Regional/Grannis Field	FAY	Yellow
Greensboro	Piedmont Triad Int'l	GSO	Yellow
Greenville	Pitt-Greenville	PGV	Yellow
Jacksonville	Albert J. Ellis	OAJ	Yellow
New Bern	Coastal Carolina Regional	EWN	Yellow
Raleigh	Raleigh-Durham Int'l	RDU	Yellow
Wilmington	Wilmington Int'l	ILM	Yellow
Beaufort	Michael J. Smith Field	MRH	Red
Burlington	Burlington-Alamance Regional	BUY	Red
Currituck	Currituck County Regional	ONX	Red
Franklin	Macon County	1A5	Red
Hickory	Hickory Regional	HKY	Red
Lexington	Davidson County	EXX	Red
Manteo	Dare County Regional	MQI	Red
Monroe	Charlotte-Monroe Executive	EQY	Red
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	Red
Pinehurst/Southern Pines	Moore County	SOP	Red
Rocky Mount	Rocky Mount-Wilson Regional	RWI	Red
Salisbury	Rowan County	RUQ	Red
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	Red
Smithfield	Johnston County	JNX	Red
Statesville	Statesville Regional	SVH	Red
Winston-Salem	Smith Reynolds	INT	Red

Associated City	Airport Name	ID	2014 Airport Grouping
Albemarle	Stanly County	VUJ	Blue
Andrews	Western Carolina Regional	RHP	Blue
Asheboro	Asheboro Regional	HBI	Blue
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	Blue
Elizabethtown	Curtis L Brown Jr Field	EYF	Blue
Erwin	Harnett Regional Jetport	HRJ	Blue
Gastonia	Gastonia Municipal	AKH	Blue
Goldsboro	Wayne Executive Jetport	GWW	Blue
Jefferson	Ashe County	GEV	Blue
Kenansville	Duplin County	DPL	Blue
Kinston	Kinston Regional Jetport at Stallings Field	ISO	Blue
Lincolnton	Lincolnton Lincoln County Regional	IPJ	Blue
Louisburg	Triangle North Executive	LHZ	Blue
Lumberton	Lumberton Regional	LBT	Blue
Maxton	Laurinburg-Maxton	MEB	Blue
Morganton	Foothills Regional	MRN	Blue
Mount Airy	Mount Airy/Surry County	MWK	Blue
North Wilkesboro	Wilkes County	UKF	Blue
Oxford	Henderson-Oxford	HNZ	Blue
Reidsville	Rockingham County NC Shiloh	SIF	Blue
Roxboro	Person County	TDF	Blue
Rutherfordton	Rutherford County-Marchman Field	FQD	Blue
Shelby	Shelby-Cleveland County Regional	EHO	Blue
Siler City	Siler City Municipal	5W8	Blue
Wallace	Henderson Field	ACZ	Blue
Washington	Warren Field	OCW	Blue

Associated City	Airport Name	ID	2014 Airport Grouping
Ahoskie	Tri-County	ASJ	Green
Clinton	Clinton-Sampson County	CTZ	Green
Edenton	Northeastern Regional	EDE	Green
Elkin	Elkin Municipal	ZEF	Green
Engelhard	Hyde County	7W6	Green
Hatteras	Billy Mitchell (NPS)	HSE	Green
Kill Devil Hills	First Flight (NPS)	FFA	Green
Mount Olive	Mount Olive Municipal	W40	Green
Ocean Isle Beach	Odell Williamson Municipal	60J	Green
Ocracoke	Ocracoke Island Airport (NPS)	W95	Green
Plymouth	Plymouth Municipal	PMZ	Green
Roanoke Rapids	Halifax-Northampton Regional	IXA	Green
Rockingham	Richmond County	RCZ	Green
Spruce Pine	Avery County/Morrison Field	7A8	Green
Star	Montgomery County	43A	Green
Sylva	Jackson County	24A	Green
Tarboro	Tarboro-Edgecombe	ETC	Green
Wadesboro	Anson County-Jeff Cloud Field	AFP	Green
Whiteville	Columbus County Municipal	CPC	Green
Williamston	Martin County	MCZ	Green

Source: DOA and NCASP Team, 2014

Airport Facilities Development

The updated airport groupings use socio-economic parameters to reflect current demand. These updated groupings are used to establish a baseline of the system's performance. An important element of analyzing the performance is how well the airport facilities meet the needs of the system users. The airport development categories included in the 2006 GAADP reflect the specifications and recommendations for various airport facilities, design standards, and protection of the airport facilities. Since the GAADP was last revised in 2006, the aviation industry has continued to evolve with changes to the aircraft fleet, changes in utilization, pilot reductions, and significant changes to the FAA's airport design standards. The state's airport system has also changed with new airports now providing commercial airline service such as Concord Regional, other airports experiencing growth or seen decline. There have been changes to the State's funding of airports. These changes warrant revisiting of the airport development, or ADP, categories, including inclusion of the Yellow airports and updating the categories to provide standards for these airports.

As part of the NCASP, each of the airport development categories from the 2006 GAADP were reviewed as were other potential categories for inclusion in an updated ADP. This updated ADP will ultimately be an outcome of the NCASP; however for purposes of this plan's analysis, the ADP's airport development categories (subsequently referred to as ADP categories) represent the performance metrics that will be analyzed to determine how the system is performing now and anticipated to perform in the future. The airport development categories included in the 2006 GAADP are depicted in Table 4.5.

Table 4.5: GAADP Airport Development Categories

100. Runway Approach	1200. Aircraft Apron Requirements
200. Runway Safety Area	1300. Terminal Building
300. Runway Protection Zones	1400. Taxiway & Apron Edge Lighting
400. Pavement Condition	1500. Airfield Signage
500. Runway Length	1600. Ground Communication
600. Pavement Strength	1700. Approach Lighting
700. Visual Navigation Aids	1800. Aircraft Rescue & Fire Fighting (ARFF) Equipment
800. Runway Edge Lighting	1900. Airfield Maintenance Equipment & Storage Building
900. Weather Reporting Capability	2000. Perimeter Fencing
1000. Standard Instrument Approach Procedures	
1100. Taxiway Requirements	

Source: North Carolina Department of Transportation - DOA

In addition to these categories, the following were discussed and determined to be important additions to the ADP categories:

- Hangars (now category 1900, with Airfield Maintenance Equipment moving from 1900 to 2000 and perimeter fencing moving from 2000 to 2100)
- Fuel facilities (now category 2200)

Other changes were also suggested relative to the GAADP's minimum and recommended goals for each of these categories with respect to each airport grouping. During the NCASP process, it was determined that "objectives" would be developed for each of the ADP categories as opposed to minimum and recommended goals. The objectives define the minimum level of development that the airport

should have in order to meet its recommended grouping or system role. It is possible that some airports may have facilities or services that are in excess of those identified for its grouping. Reduction or removal of facilities and services was not considered in this analysis. For those that do not meet the minimum, each ADP objective will be analyzed to determine if the airport can still adequately fulfill the demand for aviation activity as suggested by its role or grouping. This analysis will be evaluated as part of the future system review.

Table 4.6 summarizes the ADP system objectives used in the NCASP.

Table 4.6: ADP System Objectives

Development Category		System Objectives			
		Commercial Service	*General Aviation*	*General Aviation*	*General Aviation*
		Yellow	Red	Blue	Green
100	Runway Approach	Clear Threshold Siting Surface on all Runway Ends	Clear Threshold Siting Surface on Primary Runway	Clear Threshold Siting Surface on Primary Runway	Clear Threshold Siting Surface on Primary Runway
200	Runway Safety Area (RSA)	Meet Runway Design Code (RDC)	Meet Runway Design Code (RDC)	Meet Runway Design Code (RDC)	Meet Runway Design Code (RDC)
300	Runway Protection Zone (RPZ)	Fee Simple	Fee Simple	Fee Simple	Fee Simple
400	Pavement Condition	PCI>75	PCI>75	PCI>75	PCI>75
500	Runway Length	6500'	6000'	5000'	4200'
	Runway Width	150'	100'	100'	75'
600	Pavement Strength	Per PCN Analysis	> 60,000lbs SW or DW or Per PCN Analysis if a P139	> 30,000lbs SW or DW and < 60,000lbs SW or DW or Per PCN Analysis if a P139	< 30,000lb SW or DW and > 12,500lb SW or DW
700	Visual Navigational Aids	Rotating Beacon, Lighted Wind Sock, PAPI-4	Rotating Beacon, Lighted Wind Sock, PAPI-4	Rotating Beacon, Lighted Wind Sock, PAPI-4	Rotating Beacon, Lighted Wind Sock, PAPI-2

Development Category		System Objectives			
		Commercial Service	*General Aviation*	*General Aviation*	*General Aviation*
		Yellow	Red	Blue	Green
800	Runway Edge Lighting	HIRL	MIRL	MIRL	MIRL
900	Weather Reporting Capability	AWOS-IIIP	AWOS-III	AWOS-III	AWOS-III
1000	Standard Instrument Approach	PA <250' and < 3/4m	APV 250' - 3/4m	APV 250' - 3/4m	APV 400' - 1m
1100	Taxiway	Full Parallel	Full Parallel	Full Parallel	Full Parallel
1200	Aircraft Apron	20% Based Aircraft + 20% Busy Day Transient (GA)	25% Based Aircraft + 20% Busy Day Transient	25% Based Aircraft + 20% Busy Day Transient	50% Based Aircraft + 20% Busy Day Transient
1300	General Aviation Terminal Building	Commercial Passenger Terminal-Not Eligible. General Aviation Terminal Bldg/Parking per Master Plan	5,500 SF Terminal/Admin Bldg w/ FBO - Public Meeting Area-Restrooms and 1 auto space per based aircraft + 50% for visitors/ employees	4,500 SF Terminal/Admin Bldg w/ FBO - Public Meeting Area-Restrooms and 1 auto space per based aircraft + 50% for visitors/ employees	3,200 SF Terminal/Admin Bldg w/ FBO- Public Meeting Area-Restrooms and 1 auto space per based aircraft + 20% for visitors/ employees
1400	Taxiway & Apron Edge Lighting	MITL	MITL	MITL	Reflective Markers
1500	Airfield Signage	Runway Hold Position, Location, Guidance, and Distance Remaining	Runway Hold Position, Location, Guidance, and Distance Remaining	Runway Hold Position, Location, and Guidance	Runway Hold Position, Location, and Guidance
1600	Ground Communication	UNICOM, RCO or GCO	UNICOM, RCO or GCO	UNICOM, RCO or GCO	UNICOM, RCO or GCO
1700	Approach Lighting	ALS	ALS	ALS	ALS

Development Category		System Objectives			
		Commercial Service	*General Aviation*	*General Aviation*	*General Aviation*
		Yellow	Red	Blue	Green
1800	ARFF Equipment	As req Part 139	Case by Case	Case by Case	Case by Case
1900	Hangars	Not eligible	75% Based Aircraft	75% Based Aircraft	50% Based Aircraft
2000	Airfield Maint. Equip/Storage Bldg	Not eligible	Approved Tractor/ Building	Approved Tractor/ Building	Approved Tractor/ Building
2100	Perimeter Fencing	Not eligible	8' Perimeter	8' Perimeter	8' Perimeter
2200	Fuel Facilities	Not eligible	Based on Demand	Based on Demand	Based on Demand

Source: DOA and NCASP Team, 2014

Each of these ADP categories will be analyzed subsequently to determine performance of the system in terms of whether or not the airports meet the objectives appropriate for their grouping and whether or not they will be able to meet future needs for those facilities that are driven by demand such as apron area and hangars.

It is important to note that the ADP objectives represent a big picture, top-down analysis based on statewide goals. The projects identified as part of the NCASP to meet the ADP objectives are guaranteed future state or federal funding; all projects must still be justified from the "bottom up" during the ALP or master planning process.

Interrelationship of Several ADP Categories and Performance Measures

At the outset of the NCASP, DOA selected performance measures to evaluate the system that were reflective of the importance of certain characteristics to defining a good aviation system for North Carolina. Factors that meet FAA standards, such as clear runway approaches and RSAs, are included as performance measures, indicating their importance for measuring how the system is addressing safety needs. These performance measures are also categories within the ADP as they are items that require funding and are critical to an airport meeting standards. Similarly, the system's ability to meet the ADP objectives is also one of the many performance measures for the system. This relationship between performance measures and ADP categories is also impacted by the design standards of the airport, which are based on airport-specific criteria that must be examined individually in order to evaluate the system's performance.

It is important to recognize the specific relationships between several ADP categories in terms of airport design, both from the FAA's perspective and in the DOA's selection of the objectives for each ADP. As identified by the FAA in several tables in its AC 150/5300-13A, Change 1, *Airport Design*, there are many changes that result in increased/more demanding airport design standards when you upgrade the aircraft approach category (AAC), airplane design group (ADG), and/or visibility minimums, all of which components of an airport's reference code (ARC) and its runway design code (RDC) for the specific runway at the airport. In general terms, the size of the following airport design standards that are relevant to the ADP categories will change when you upgrade the RDC for an airport's runway:

- 100 Runway Approach
- 200 RSA
- 300 RPZ
- 500 Runway Length and Runway Width (not purely based on RDC but on specific aircraft)
- 1100 Taxiway

Changes to the runway/taxiway separation standards will also occur. While not part of the ADP, the runway/taxiway separation is a performance measure under the Infrastructure Health goal category and is being analyzed in the NCASP.

These bulleted list of ADP categories as well as the runway/taxiway separation standard performance measure will all be impacted when there are changes to the AAC, ADG and/or visibility minimum. As part of ADP category 1000: Standard Instrument Approach, different visibility minimums are recommended for the airport groupings, which affect the previously referenced ADP categories. In FAA's AC 150/5300-13A, Change 1, Table 3.4 also outlines specific "Standards for Instrument Approach Procedures" that are associated with the four categories of visibility minimums. The standards that are identified in this table that affect the ADP objectives and are interrelated are depicted in Table 4.7.

Table 4.7: FAA Standards for Instrument Approach Procedures

	Visibility Minimums			
Standards/Criteria	< 3/4 mile	3/4 to <1 mile	>= 1 mile	Circling
Height Above Touchdown (HAT)	<250 ft	>= 250 ft	>= 250 ft	>= 350 ft
Airport Layout Plan 1/	Required	Required	Required	Recommended
Minimum Runway Length	4,200	3,200	3,200	3,200
Holding Position Signs & Markings	Precision	Non-precision	Non-precision	Visual (Basic)
Runway Edge Lights 2/	HIRL/MIRL	HIRL/MIRL	MIRL/LIRL	MIRL/LIRL
Parallel Taxiway 3/	Required	Recommended	Recommended	Recommended
Approach Lights 4/	MALSR, SSALR, or ALSF	Recommended	Recommended	Not Required
Threshold Siting Criteria to be Met (width) 5/	800 ft	800 ft	120-800 ft	120-400 ft

Source: FAA AC 150/5300-13A, Change 1, *Airport Design*

Notes:
1/ An ALP is required for all NPIAS airports, even though table indicates "recommended" for circling minimums.
2/ Runway edge lighting is required for night approach minimums. HIRL are required for RVR-based minimums.

3/ A full-length parallel taxiway must lead to the threshold.

4/ ODALS, MALS, SSALS, and SALS are acceptable for 3/4 to >= 1 mile minimums. For <3/4, a full approach light system is required such as MALSR, etc.

5/ The appropriate width for threshold siting criteria is dependent upon the type of approach to the runway and the type of aircraft performing the procedure (A/B/C/D).

As shown in Table 4.7, based on the visibility minimums that are chosen for the airport and the primary runway, there are associated standards that must be achieved and others that are recommended. These interrelationships between FAA standards and the ADP are examined in subsequent analyses and referenced where appropriate in discussion of performance measures and the ability of the airports to meet the ADP objectives. For example, a Red airport's objective for ADP 1000: Standard Instrument Approach Procedure is to provide an approach procedure with vertical guidance (APV) down to 250 feet height above touchdown (HAT), with visibility minimums of less than or equal to ¾ statute mile. This ADP objective correlates to the FAA's standards from above for ¾ to less than 1 mile. For a Red airport, the ADP objectives include a 6,000-foot long primary runway and a parallel taxiway. The parallel taxiway is required to meet the FAA's standards for visibility minimums less than ¾ statute mile but the minimum runway length is only 4,200 feet. For all other visibility minimums the FAA only recommends a parallel taxiway but the ADP objective for all airports is to have a parallel taxiway. The FAA does state

in the footnotes to its table of standards that a full-length parallel taxiway "must lead to the threshold" and DOA has opted to recommend full parallel taxiways for all airports.

Summary

This chapter has set forth the initial airport groupings or roles that will be used in subsequent analyses to evaluate the adequacy of North Carolina's airport system. Updated ADP categories have also been developed to examine the facility and development needs of the airports based on current trends related to aviation activities. The performance of the ADP category objectives will be measured in the next chapter as part of the existing system performance measurement process.

2. Chapter 5 – Current System Performance

Introduction

Previous chapters of the North Carolina Airports System Plan (NCASP) have established goals and performance measures (Chapter 1); inventoried the existing facilities and activities at the system airports (Chapter 2); forecasted future aviation demand (Chapter 3); and identified updated role groupings for the airport system as well as system objectives of projects for airport development categories (Chapter 4). This chapter evaluates the current system's performance and establishes a baseline analysis of the individual system airports in North Carolina, as well as the statewide system of airports. From this baseline, the future system needs can be evaluated and recommendations for development of the system identified.

A significant portion of the system performance measurement is based on the airport groupings or classification system that was updated to reflect current socioeconomic conditions and changes to the airport system, as described in Chapter 4, *Airport Groupings and Airport Development Categories.* In addition to establishment of a new "Yellow" grouping for the commercial service airports, the airport development categories from the former General Aviation Airport Development Plan (GAADP but currently referred to as the Airport Development Plan or ADP) were revisited and system objectives were established. These updated airport development categories/system objectives were also discussed as part of Chapter 4.

This chapter provides an analysis of the airport system's adequacy[8] with respect to the five system plan goals developed at the onset of the study and described in Chapter 1, *System Goals and Performance Measures*. These five goals were translated into North Carolina Department of Transportation's (NCDOT's) three investment goal categories that were identified in the *2040 North Carolina Statewide Transportation Plan* for ease of recognition and understanding. NCDOT Division of Aviation (DOA) further defines these goal categories as follows:

- Safety: To promote a safe and efficient airport system that meets federal safety requirements and provides safety to passengers, surrounding communities, and wildlife alike. Additionally, the system should provide adequate support and accessibility to emergency health services
- Infrastructure Health: To improve the condition of the existing infrastructure and provide facility support to meet the needs of the state and its airport customers. A good airport system should be adequately developed, providing infrastructure and facilities to meet both current and future demand
- Mobility: To improve mobility or access. The connectivity or mobility that airports provide spans a spectrum of areas that add to quality of life for the citizens of North Carolina. The ability of airports to promote intermodal connectivity is vital for many users of the state transportation system and

[8] The data for this analysis was gathered in November and December of 2012.

communities. In addition, this goal category supports the economic growth and diversification of the state's economy

Within each of these goal categories, individual measures were selected to evaluate the airport system's performance toward the general goal. The remainder of this chapter discusses the analysis of each performance measure within the three goal categories. For many of the measures, the analysis is presented in tabular format, while others utilize mapping and exhibits to assess and portray the results. All tables that contain detailed analysis of each performance measure can be found at the end of the chapter. The mapping analyses are presented within the chapter.

The mapping analyses conducted in this chapter utilize NAVTEQ, a Geographic Information System (GIS), to determine drive time coverage of airports and the proximity to existing and future users. GIS uses map-based systems to develop drive times based on the types of roads and posted speed limits. Federal Aviation Administration (FAA) system planning guidelines recommend that general aviation airports be located within 30 minutes of users. Applying the 30-minute rule of thumb to North Carolina's system airports using GIS, coverage or "market" areas for each airport in the system were developed. When the drive times for each airport are calculated and applied to mapping that includes data such as population, the ability of North Carolina's airport system to serve the state and its population can be determined.

It should be noted that much of the data for the following analyses was gathered in late 2012, however, due to funding delays, the analyses were not completed until 2014. This gap has resulted in some changes to airport facilities that are not reflected in this document. These updates are being noted and will be reflected in future NCASP updates.

Goal Category: Safety

Safety is at the crux of the analysis of any transportation system and is always the DOA's highest priority when evaluating needs. This goal category evaluates the performance of the state's system of airports relative to safety, both at the airports and contributing to the safety and security of North Carolina's residents. One of the most important characteristics of a good airport system is the system's ability to meet applicable design and safety standards. Generally speaking, when airports comply with such standards this helps to promote a system of safe and efficient airports. While each airport's ability to meet standards is primarily a master planning issue, it is important for the System Plan to provide review of the system's ability to conform to appropriate standards. In addition to standards, the airport system should also support other safety necessities in terms of serving the needs of emergency medical transport and search and rescue and its ability to meet these needs should be measured.

The following safety-related performance measures are used to evaluate the system:

- Percent of airports with controlling interest over the FAA design standard Runway Protection Zones (RPZs) for each runway end
- Percent of system airports addressing wildlife issues
- Percent of system airports with an Airport Emergency Plan
- Percent of system airports with a General Aviation Security Plan
- Percent of system airports that support search and rescue operations
- 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
- Percent of system airports meeting 2013 FAA taxiway geometry standards
- Percent of system airports meeting FAA threshold siting surface requirements

The results of the system evaluation for these performance measures related to the safety goal category are discussed in the following sections. Please note that due to the length and number of tables in this section, the tables have been placed at the end of this chapter.

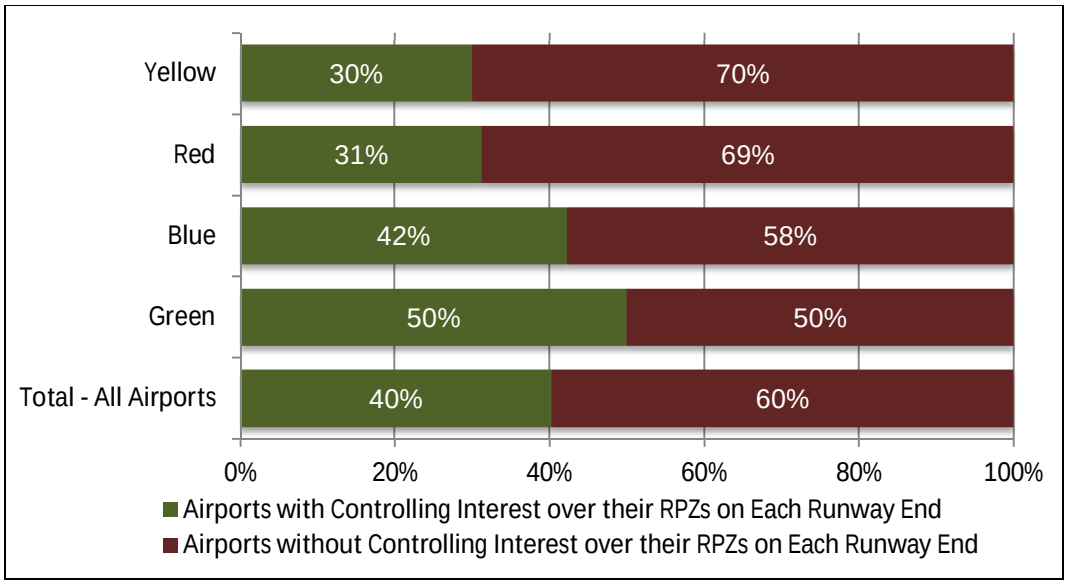
Percent of airports with controlling interest over the FAA design standard Runway Protection Zones (RPZs) for each runway end

The FAA defines the RPZ as a trapezoidal area that is centered on the extended runway centerline. The size of an RPZ will vary by airport, the type of aircraft it accommodates, and the visibility minimums of each runway. RPZs range in area from 8 acres to 79 acres of land.

The function of the RPZ is to enhance the protection of people and property on the ground. Having control of the RPZ is critical to ensuring appropriate development in the runway approaches. As part of the inventory effort, airport managers/sponsors were asked if the airport controlled the RPZs for all runway ends. Information was not gathered regarding the type of control: whether fee simple (ownership) or by means of an avigation easement. If an airport indicated it controls 100% of the RPZ on all runway ends, it is considered complete control and fulfills this performance measure regardless of the type of control. Airports were asked to indicate the level of control of the RPZs for each runway end.

Table 5.1 presents the reported control of each runway end RPZ by airport, either partial or complete control. Figure 5.1 presents airports by role grouping that have complete control of the RPZs on all runway ends as identified by the airports. Statewide, 40% of system airports completely control the RPZs at all runway ends by either fee simple or easement.

Figure 5.1: Percent of Airports with Controlling Interest Over All RPZs



Source: Airport Inventory and Data Survey 2012

The following airports noted they do not have controlling interest in their RPZs and need additional actions to gain full control of this area. It will be noted in Chapter 6, *Future System Performance* whether or not the airports are capable of fully owning their RPZs. For some airports it may not be feasible to fully own their RPZs via fee simple ownership. For example, Michael. J. Smith and Cape Fear Regional Jetport both have waterways located in their RPZs which the airport is unable to own.

YELLOW	RED	BLUE	GREEN
• Concord Regional • Fayetteville Regional/ Grannis Field • Coastal Carolina Regional • Wilmington Int'l	• Michael J. Smith • Macon County • Hickory Regional • Davidson County • Dare County Regional • Cape Fear Regional • Moore County • Rowan County • Johnston County • Statesville Regional • Smith Reynolds	• Stanly County • Western Carolina Regional • Asheboro Regional • Harnett Regional • Gastonia Municipal • Wayne Executive • Ashe County • Triangle North Executive • Lumberton Regional • Foothills Regional • Mount Airy/Surry County • Henderson-Oxford • Rutherford County-Marchman Field • Shelby-Cleveland County Regional • Henderson Field	• Billy Mitchell • First Flight • Odell Williamson Municipal • Ocracoke Island • Plymouth Municipal • Avery County/ Morrison Field • Montgomery County • Tarboro-Edgecombe • Anson County-Jeff Cloud Field • Martin County

Percent of system airports addressing wildlife issues

Various wildlife can often appear on an active airport runway, endangering aircraft, their occupants, and the animals. This is a frequent concern at many of North Carolina's airports. The FAA requires all Part 139 certificated airports[9], and recommends all other airports, to maintain a safe operating environment which includes Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans. The FAA's Office of Airports encourages general aviation airports to conduct Wildlife Hazard Site Visits or Assessments to determine what, if any, wildlife mitigation is needed. There are two draft Advisory Circulars (AC 150/5200-38, *Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plan* and AC 150/5200-33 (current), *Hazardous Wildlife Attractants On or Near Airports)* that are expected to be published in 2014 that will provide additional guidance regarding this topic for airports and DOA.

Table 5.2 shows the most recent date of the Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans that have been completed by system airports. NCDOT works closely with qualified airport wildlife biologists to conduct Wildlife Hazard Site Visits at non-Part 139 airports and Wildlife Hazard Assessments (followed up with management plans) at all Part 139 airports in order to evaluate potential wildlife hazards and provide recommendations for mitigation. Statewide, 100% of airports have had a Wildlife Hazard Site Visit, Assessment, or Management Plan since 2005. To date, DOA has not kept a record of which airports have taken steps to implement the recommendations included in the Wildlife Hazard Site Visits, Assessments, or Management Plans. These records will be developed during site visits conducted over the next several years.

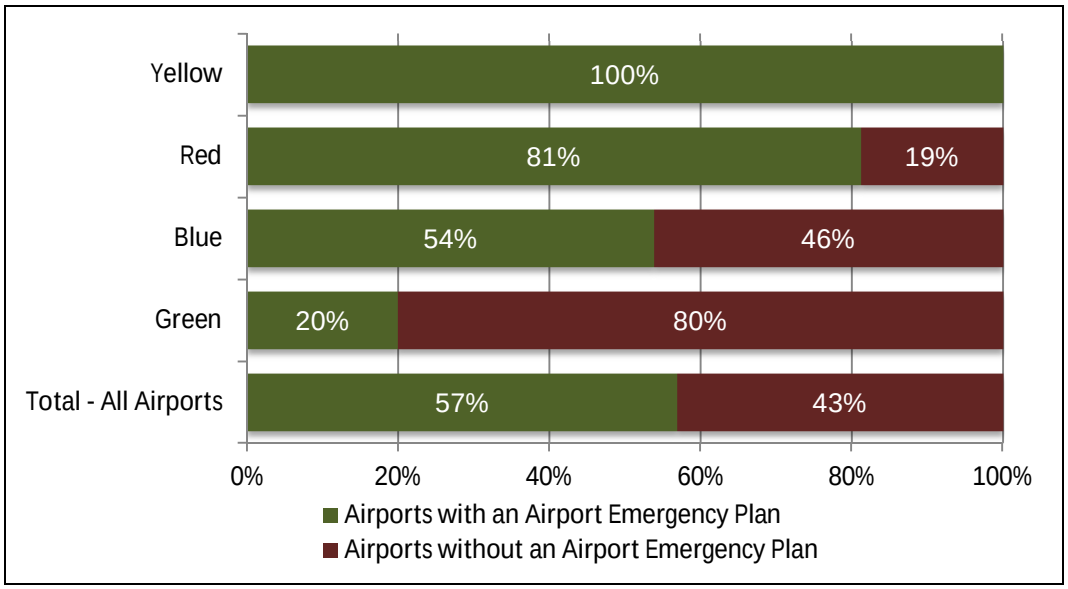
Percent of system airports with an Airport Emergency Plan

An Airport Emergency Plan at an airport is developed to facilitate the efficient and appropriate response to natural or man-made emergencies occurring on or near an airport. The FAA has published guidance for the development and implementation of an Airport Emergency Plan under AC 150/5200-31C, *Airport Emergency Plan*. Each plan lists potential emergencies at specific airports and creates response scenarios. Often, these plans are coordinated with county or municipal safety plans. Figure 5.2 shows the percentage of airports by role grouping that have adopted an Airport Emergency Plan. Statewide, 57% of NCASP airports noted that they have an Airport

[9] The FAA's 14 CFR Part 139 outlines the standards for certification of the approximately 550 U.S. airports with commercial passenger service (scheduled passenger-carrying operations using aircraft originally designed with more than nine passenger seats, or an unscheduled passenger-carrying operation using an aircraft originally designed with more than 30 passenger seats). Standards for a Part 139 airport include an FAA-approved Airport Certification Manual (ACM) and requirements for airport rescue and firefighting, emergency plans, and a snow and ice control plan, where appropriate. Also, many part 139 airports must also have a wildlife hazard management plan. The part 139 certification process ensures that the airport has standardized runway safety areas, that it conforms to stringent lighting and marking standards, and that airport personnel receive proper training in airport operations.

Emergency Plan during the inventory effort of the NCASP. All Yellow airports (100%) and 81% of Red airports reportedly have an Airport Emergency Plan in place.

Figure 5.2: Percent of Airports with an Airport Emergency Plan



Source: Airport Inventory and Data Survey 2012

As shown in Table 5.3 and presented here, the following airports reported that they do not have or are aware of an Airport Emergency Plan:

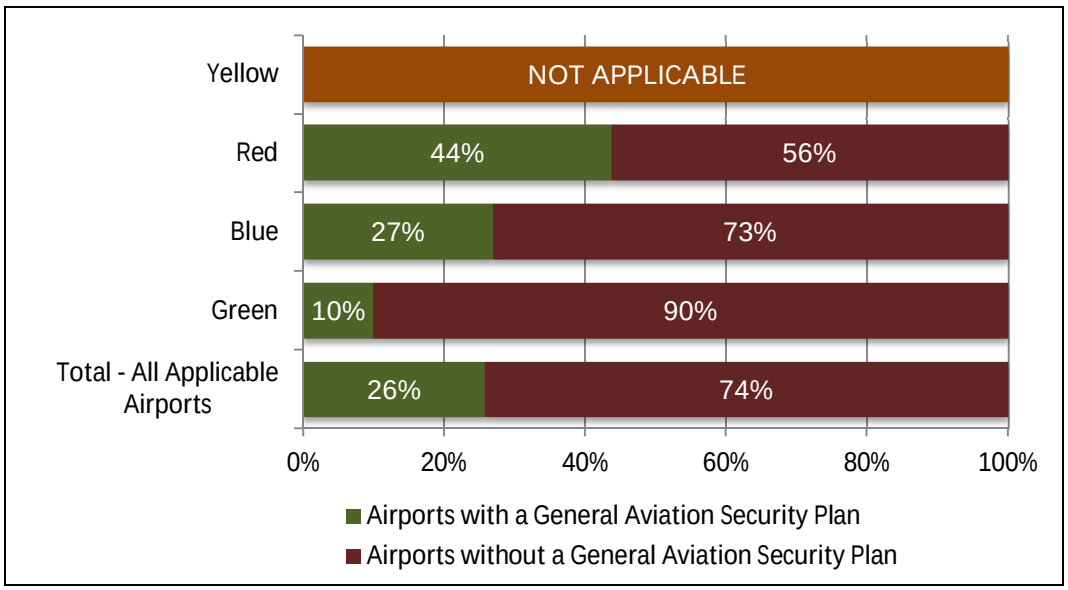
RED	BLUE	GREEN
• Burlington-Alamance • Macon County • Davidson County	• Stanly County • Western Carolina Regional • Curtis L. Brown Jr. Field • Harnett Regional • Duplin County • Triangle North Executive • Lumberton Regional • Foothills Regional • Mount Airy/Surry County • Henderson-Oxford • Rockingham County NC Shiloh • Rutherford County-Marchman Field	• Tri-County • Clinton-Sampson County • Elkin Municipal • Hyde County • Billy Mitchell • First Flight • Mount Olive Municipal • Odell Williamson Municipal • Ocracoke Island • Halifax-Northampton • Richmond County • Montgomery County • Jackson County • Tarboro-Edgecombe • Anson County-Jeff Cloud Field • Columbus County Municipal

Percent of system airports with a General Aviation Security Plan

Security plans have been a standard for commercial service airports, but until the events of 9/11, general aviation security had not received significant attention. Since that time, a General Aviation Security Plan has been identified as an important document in maintaining security for the airport, the surrounding community, as well as the region, state, and world. A security plan organizes communication between airport tenants and managers, and local law enforcement. The plan also creates a list of suspicious activities that should be reported, and increases awareness of security issues at individual airports.

This performance measure is not applicable to the Yellow (Commercial Service) airports in North Carolina since they must adhere to strict security standards outlined by the Transportation Security Administration (TSA). In North Carolina, 26% of general aviation (Red, Blue, and Green) airports have an adopted General Aviation Security Plan as shown in Figure 5.3. Table 5.3 presents which airports have a General Aviation Security Plan in place.

Figure 5.3: Percent of Airports with a General Aviation Security Plan



Source: Airport Inventory and Data Survey 2012

The following airports do not have an adopted General Aviation Security Plan:

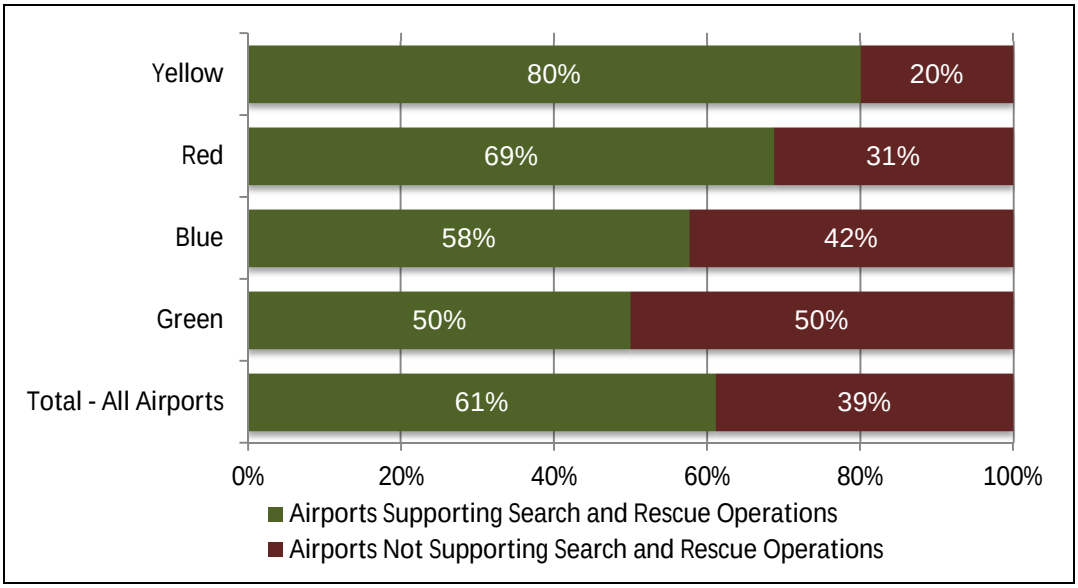
RED	BLUE	GREEN
• Michael J. Smith • Burlington-Alamance • Currituck County Regional • Macon County • Davidson County • Rocky Mount-Wilson Regional • Johnston County • Statesville Regional • Smith Reynolds	• Stanly County • Western Carolina Regional • Asheboro Regional • Curtis L. Brown Jr Field • Harnett Regional • Duplin County • Lincolnton Lincoln County Regional • Triangle North Executive • Lumberton Regional • Foothills Regional • Mount Airy/Surry County • Wilkes County • Henderson-Oxford • Person County • Rutherford County-Marchman Field • Shelby-Cleveland County Regional • Siler City Municipal • Henderson Field • Warren Field	• Tri-County • Clinton-Sampson County • Elkin Municipal • Hyde County • Billy Mitchell • First Flight • Mount Olive Municipal • Odell Williamson Municipal • Ocracoke Island • Plymouth Municipal • Halifax-Northampton • Avery County/ Morrison Field • Montgomery County • Jackson County • Tarboro-Edgecombe • Anson County-Jeff Cloud Field • Columbus County Municipal • Martin County

Percent of system airports that support search and rescue operations

Airports often play a critical role in the health and welfare of a community. For states such as North Carolina, the ways in which airports in the state system contribute to the state's quality of life can equally as important to the economic benefits that stem from the airport system. Given North Carolina's expansive geography, with areas that are relatively unpopulated, airports in the state can play important safety, emergency, and medical roles.

Due to North Carolina's coastal location and mountainous terrain in the western part of the state, aviation support of search and rescue operations is critical for locating and rescuing people in distress as well as providing disaster relief. Figure 5.4 reveals that, statewide, 61% of NCASP airports accommodate some level of search and rescue activities whether it be hosting or supporting a local Civil Air Patrol chapter, providing a refueling stop, or providing access to medical facilities. The list of airports that support search and rescue is presented in Table 5.3. This is an informational performance measure and there is no compliance associated with the results.

Figure 5.4: Percent of Airport That Support Search and Rescue Operations



Source: Airport Inventory and Data Survey 2012

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

Airports in North Carolina play a unique and important role in serving emergency medical needs and the needs of medical personnel and physicians who use aviation to reach patients in more rural areas of the state and patients who are being transported to larger hospitals. Many of the state's smaller cities and towns lack the trauma and advanced medical staff and equipment that is needed to deal with critically injured patients. In such instances, these patients are often transported to larger hospitals in North Carolina or out of state via aircraft.

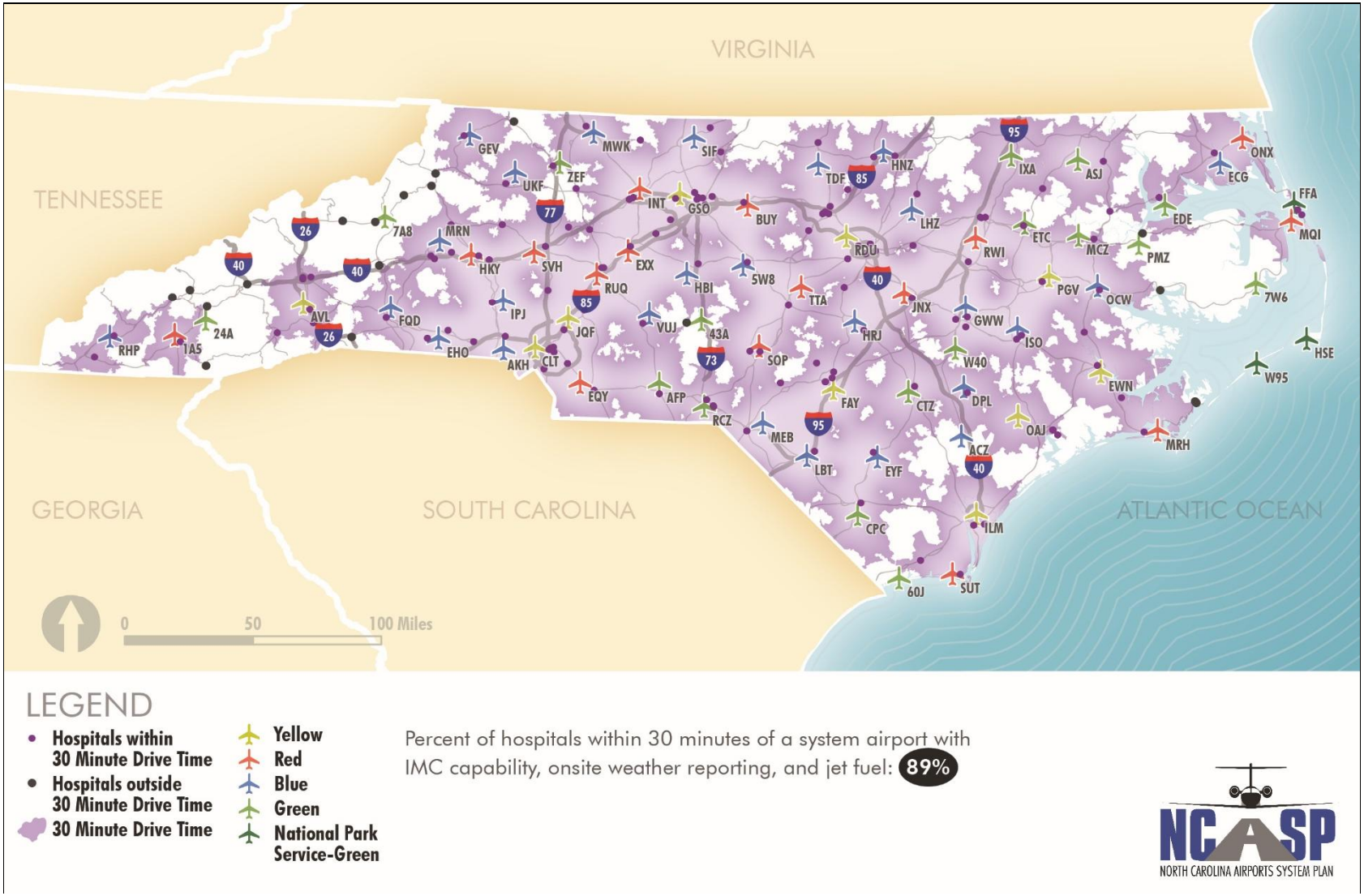
Figure 5.5 presents the location of the 160 hospitals in the state as well as the 30-minute drive times of North Carolina airports that have instrument meteorological conditions (IMC) capability, on-site weather reporting, and the availability of jet fuel, the factors considered important to medical aircraft that need to operate in all weather conditions. IMC refers to weather conditions that require pilots to fly primarily under instrument flight rules (IFR) such as bad weather or heavy cloud cover rather than under visual flight rules (VFR). Statewide, 89% of all hospitals (based on NAVTEQ GIS data) fall within a 30-minute drive time of at least one airport that meets all of these criteria.

The following hospitals fall beyond a 30-minute drive of a current system airport meeting this performance measure's criteria:

- Watauga Medical Center, Boone
- Swain County Hospital, Bryson City
- FirstHealth Montgomery Memorial Hospital, Troy
- Haywood Regional Medical Center, Clyde
- Pungo District Hospital, Belhaven
- Harris Regional Hospital, Sylva
- Highlands-Cashiers Hospital, Highlands
- Spruce Pine Community Hospital, Spruce Pine
- Cherokee Indian Hospital, Cherokee
- Charles A. Cannon Jr. Memorial Hospital, Linville
- Alleghany Memorial Hospital, Sparta
- St Luke's Hospital, Columbus
- Taylor Hospital and Extended Care Facility, Sealevel
- Eastern Carteret Medical Center
- The McDowell Hospital, Sealevel
- Washington County Hospital, Plymouth
- Yancey Community Medical Center, Burnsville
- Blowing Rock Hospital, Blowing Rock

Thirteen of the 18 hospitals are located in or near the mountains of western North Carolina. Much of this area is sparsely populated and the terrain makes it a difficult location for an airport. There are several Green airports- Jackson County and Avery County/Morrison Field- that are located in the western part of the state, but do not currently have the ability to meet the needs of emergency medical aircraft. Four of the hospitals listed above are located along North Carolina's eastern coast, just outside of the 30-minute drive times of an airport with IMC capability, weather reporting, and jet fuel. One hospital that falls outside of the coverage area, FirstHealth Montgomery Memorial Hospital in Troy, is located in central North Carolina. This hospital is near Montgomery County Airport, which currently does not meet the criteria for this performance measure.

Figure 5.5: Hospitals in the State within a 30-Minute Drive Time of a System Airport with Instrument Meteorological Conditions (IMC) Capability, On-Site Weather Reporting, and Jet Fuel Availability



Source: Parsons Brinckerhoff GIS Analysis

Percent of system airports meeting 2013 FAA taxiway geometry standards

As part of the NCASP, a high level analysis was conducted looking at the existing taxiway systems at each airport within North Carolina's airport system. Each airport's taxiway system was analyzed for compliance with the design standards set forth in the recently released FAA Advisory Circular (AC) 150/5300-13A, Change 1*, Airport Design, Chapter 4, Taxiway and Taxilane Design* using aerial photography. It is important to note that this analysis is a cursory review of where potential issues may exist with regard to the recent changes to FAA guidance. Some of the noncompliance identified is based strictly on viewing aerial photography, without specific measurements and detailed evaluation. This analysis is not meant to supersede or replace airport planning documents. Airports should work closely with the FAA during their ongoing and future planning processes to ensure that their taxiway systems meet updated and current FAA geometry standards.

Specifically, three primary concepts were analyzed for taxiway geometry: three-node, indirect access, and wide expanses of pavement. Each of these concepts are intended to aid in the safe and efficient conveyance of aircraft between the aircraft parking areas and the runways through the reduction of runway incursions by promoting "pilot awareness."

The three-node concept states that good airport design practices keep taxiway intersections simple by reducing the number of taxiways intersecting at a single location. Under the three-node concept, a pilot approaching an intersection is presented with no more than three choices, ideally, left, right, and straight ahead. This limiting of the possible choices decreases the likelihood of pilot error.

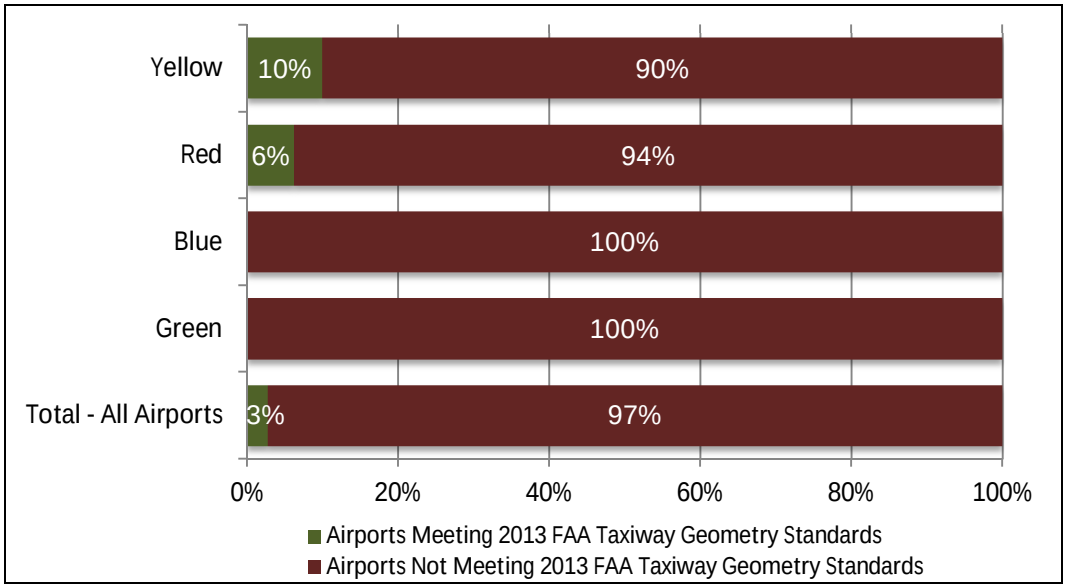
The FAA stipulates that taxiways should not be designed so that they provide direct access to a runway. That is to say, that an aircraft taxiing between the apron and a runway should be forced to make at least one turn. This turn is intended to keep a pilot from inadvertently taxiing an aircraft onto a runway when they were expecting to encounter a parallel taxiway.

The FAA states that wide expanses of pavement should be avoided. Wide pavements require the placement of taxiway signage far from a pilot's eye and reduce the conspicuity of other visual cues. Under low visibility conditions or due to a pilot's focus on the centerline, signs can be missed. This is especially critical at runway entrance points.

The findings of the taxiway geometry analysis show that the most common issue at North Carolina airports is direct access. All but two airports in the system, Asheville Regional and Michael J. Smith Field, have at least one occurrence of direct access. Most have multiple occurrences with Charlotte/Douglas International having the most with 13 instances identified through this preliminary review. Many of the smaller airfields' direct access conflicts are a result of not having a parallel taxiway onto which an aircraft must turn before entering the runway. This is especially prevalent at the

Green airports. Only three airports have an occurrence of a three-node conflict, Charlotte/Douglas International, Wilmington International, and Hickory Regional. Only two airports have occurrences of wide expanses of pavement, Charlotte/Douglas International and Raleigh-Durham International. Table 5.4 presents the number of occurrences of each taxiway geometry standards deviation at each airport in the system, as well as the type, if any, of parallel taxiway. As shown in Figure 5.6, only 3% of system airports meet all three taxiway geometry standards based on the latest FAA guidance.

Figure 5.6: Percent of Airports Meeting 2013 FAA Taxiway Geometry Standards



Sources: Airport Inventory and Data Survey 2012, Google Earth

Note: This analysis is a cursory review of where potential issues may exist with regard to the recent changes to FAA guidance. Some of the noncompliance identified is based strictly on viewing aerial photography without specific measurements and detailed evaluation.

Percent of system airports meeting FAA threshold siting surface requirements

In order to maintain a high level of safety, airports with an instrument approach are required by the FAA to keep their approaches clear. For those airports that accept federal funds, the FAA's grant assurances require "Hazard Removal and Mitigation" to protect operations at the airport.

Three of the principal sources with defined sets of criteria to determine if an object in an airport's vicinity is compatible with the facility, an obstruction to air navigation, or a hazard to air navigation are:

- FAR Part 77 – Objects Affecting Navigable Airspace
- FAA Order 8260.3B – United States Standard for Terminal Instrument Procedures (TERPS)
- FAA Advisory Circular 150/5300-13A – Airport Design

The inter-relationship between these sources and how they apply to airspace at airports is detailed in the Airport Cooperative Research Program (ACRP) Report 38: *Understanding Airspace, Objects, and Their Effects on Airports*[10]. A summary of these three documents' scope in regards to airspace protection criteria is included below:

> *"FAR Part 77 provides criteria to determine whether an object should be submitted to the FAA for evaluation; whether or not that object would be classified as an obstruction to air navigation; and, if so, whether it should be studied further in order to assess hazard status.*
>
> *TERPS and related instrument procedure design criteria provide the basis of how the aircraft relying on cockpit instrumentation take off and land at the airport in a safe and efficient manner while avoiding the existing obstacles. TERPS criteria can also be applied to evaluate whether proposed objects would conflict with existing or planned instrument procedures.*
>
> *AC 150/5300-13's Runway End Siting Requirements provide basic design standards for locating runway ends that do not conflict with existing objects and may be used to determine conflicts between existing runway ends and proposed objects. Runway end siting criteria also provide criteria for initially evaluating whether or not an object may be in conflict with all-engine instrument departure procedures and whether or not notification of a potential obstacle should be given to air carriers using the airport for evaluation of its potential effect on their OEI procedures."*

Interim policy guidance issued by the FAA in November 2013 has focused on a particular surface in TERPS known as the Visual Area Surface (VAS)[11]. The VAS is outlined in Section 3.3.2.c of the TERPS Order. The VAS is the surface that protects the final, visual portion of an instrument approach.

For straight-in approaches, the VAS is aligned with and centered on the runway centerline, has a vertical slope of 20:1 beginning from the runway's threshold elevation, begins 200 feet prior to the runway threshold, and extends until it reaches the decision altitude of the approach procedure it serves. The initial width of the VAS is either 400 feet or 800 feet wide, depending on whether the approach procedure is applicable to Approach Category A & B aircraft only (generally lower performance prop and turboprop aircraft), or also to Approach Category C & D aircraft (high performance turboprop and turbojet aircraft), respectively. According to the FAA's *Terminal Procedures Publication (d-TPP)/Airport Diagrams*, nearly all airports in North Carolina with an instrument approach have minimums published for C and D aircraft, indicating an 800 feet wide approach surface is needed.

Figure 5.7 provides a basic picture of the straight-in VAS and how its initial size varies based on the approach category. Different dimensional standards apply to VAS serving offset and circling approach procedures.

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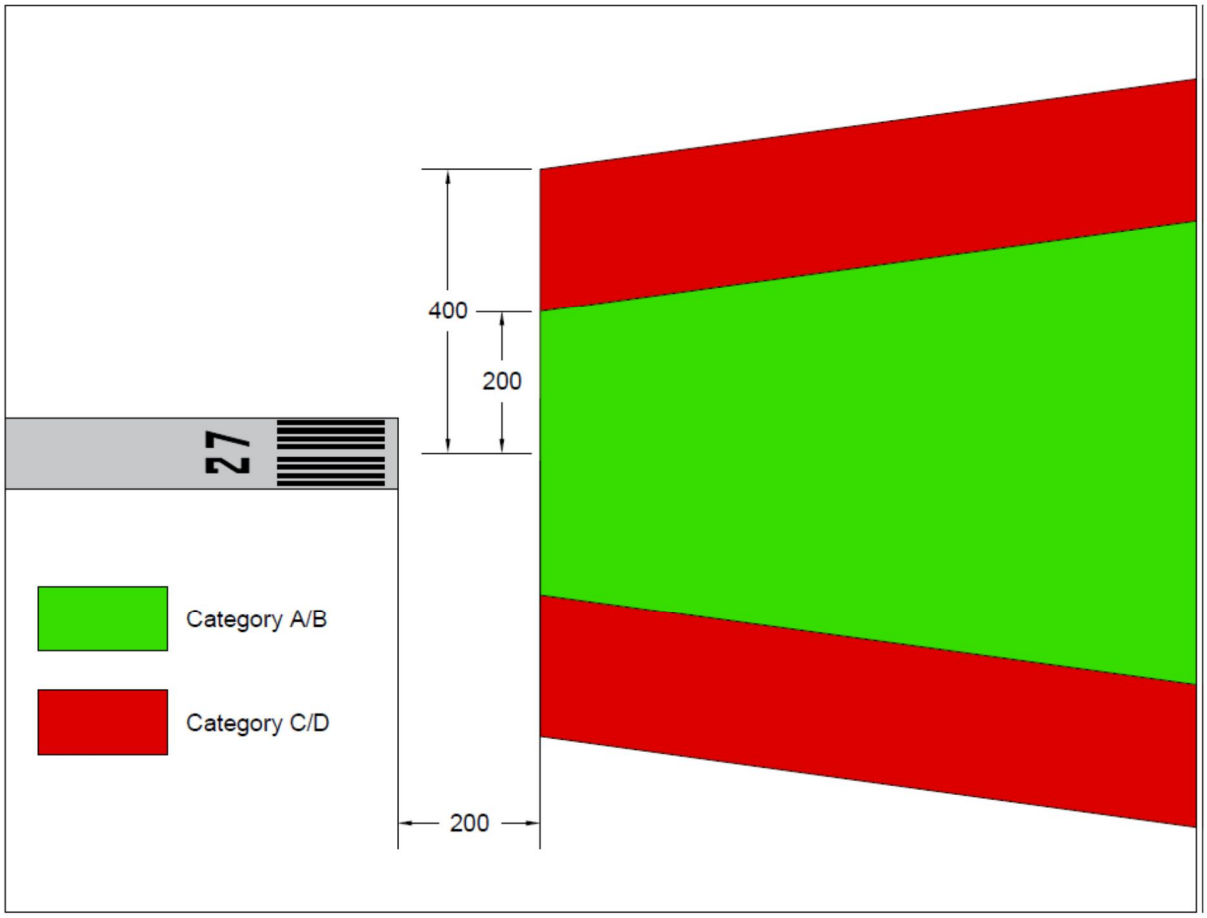
[10] ACRP Report 38: Understanding Airspace, Objects, and Their Effects on Airports; Transportation Research Board, 2010. http://www.trb.org/ACRP/Blurbs/164477.aspx

[11] FAA Memorandum, *Interim Policy Guidance for Mitigation of Penetrations to the 20:1 Visual Area Surface*, November 15, 2013.

Figure 5.7: TERPS Straight-In Visual Area Surface



Source: FAA Order 8260.3B

The FAA interim policy guidance became effective on January 6, 2014, and outlines a risk based approach to determine if obstruction penetrations are of sufficient concern to warrant immediate action. The purpose of the surface is to protect aircraft during the last stages of approach procedures when pilots transition from instruments to visual guidance. Objects penetrating the surface must be lowered or lit to ensure pilots of approaching aircraft can see them. If the objects cannot be mitigated, the visibility minimums associated with the approach may need to be increased or nighttime use of the procedure may be disallowed.

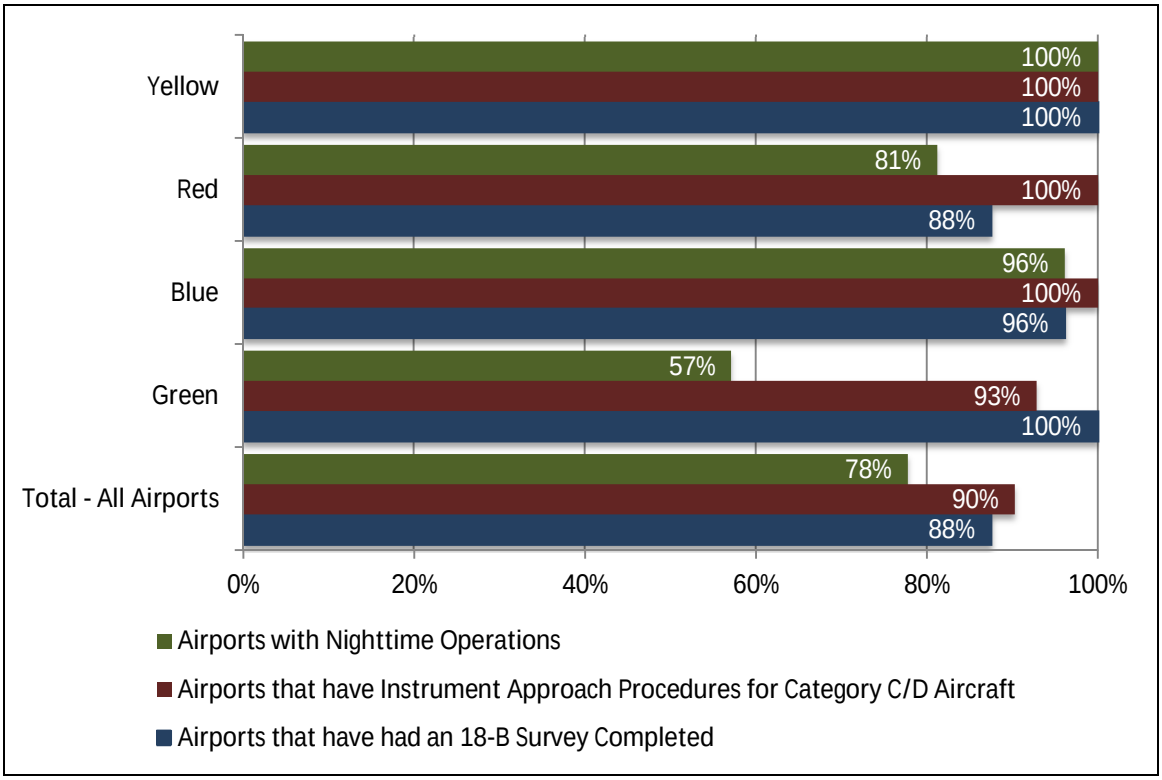
It is important to note that the VAS is not specifically defined in AC 150/5300-13A. The Airport Design AC includes a composite threshold siting surface composed of multiple TERPS surfaces, including the 20:1 surface. Although it is advisable for airport operators to review these threshold siting surfaces as well, the current FAA policy guidance only pertains to the 20:1 visual area surface.
Due to the recent changes to the FAA guidance regarding 20:1 approach penetration clearing, comprehensive data on clear threshold siting surfaces in North Carolina is not available and therefore current performance cannot be calculated for this

performance measure. Most of the system airports have received a letter from the FAA early in 2014 providing the information currently on file regarding penetrations to the 20:1 surfaces. Based on the penetrations identified, airports are currently mitigating the obstacles or providing survey data to validate the information the FAA has on file is erroneous. Nearly all North Carolina airports are required to mitigate obstacles by the end of 2014.

In order to assist airports with the identification and mitigation of obstructions, the FAA has developed the Surface Analysis and Visualization (SAV) tool to analyze, review, edit, and mitigate surface penetrations on airport surfaces. The SAV tool is a web application that evaluates airport surfaces against Geographic Information System (GIS) data to find and display object penetrations of these surfaces. Data for all airports is currently not available in the SAV tool, but it is anticipated that it will be a resource for all airports by the end of 2014.

Table 5.5 presents current data (July 2014) available at North Carolina system airports regarding the date of the most recent 18B survey, which identifies obstructions and the height of the obstructions within an airport's approach surface, whether or not the airports have approach procedures applicable to Approach Category C and D aircraft, and whether or not the airport allows night operations. This information is summarized by airport role grouping in Figure 5.8.

Figure 5.8: Percent of Airports with 18-B Surveys, Category C/D Approaches, and Night Approaches



Sources: Woolpert, FAA Digital Terminal Procedures, and FAA NOTAMS System

As shown in Figure 5.8, 78% of airports have night time approaches, 90% have an instrument approach procedures for Category C/D aircraft, and 88% have had an 18-B survey completed. These percentages will continue to change and fluctuate as obstructions develop or are mitigated. When better data is available to determine whether each airport's TSSs are clear, this ADP's compliance can be calculated.

Infrastructure Health

An airport's infrastructure includes many elements, the most important of which is the airfield. The health of the airport infrastructure is critical to maintaining a system that meets the needs of its users. In 2004 when NCDOT established the GAADP, one of the key reasons for this program was to provide standards and guidelines that would help preserve the investment in infrastructure. As previously identified in Chapter 4, the GAADP has been updated to reflect changes as a result of the 2013 Strategic Transportation Investment (STI) law and the System Plan's analysis. The new ADP includes commercial service airports as a new grouping, updated mandatory items, and new and revised airport development categories/system objectives.

Infrastructure health also relates the ability of individual airports and the system as a whole to respond to changing needs. Aircraft capabilities change and so does the technology that supports the aviation industry. Conditions within the market areas served by each airport also change. Considering this goal and its associated

performance measures helps provide DOA with the flexibility to respond to North Carolina's aviation infrastructure needs, both those that are seen and those that are unforeseen. The following performance measures were used to evaluate system's infrastructure health goal category:

- Percent of system airports that meet applicable FAA runway/taxiway separation design criteria on their runways for their current ARC
- Percent of airports meeting all mandatory items in ADP
- Percent of airports meeting all system objectives in ADP
- Percent of system airports that are adequately accessible in terms of signage and wayfinding

The results of the system evaluation for these performance measures related to the infrastructure goal category are discussed in the following sections.

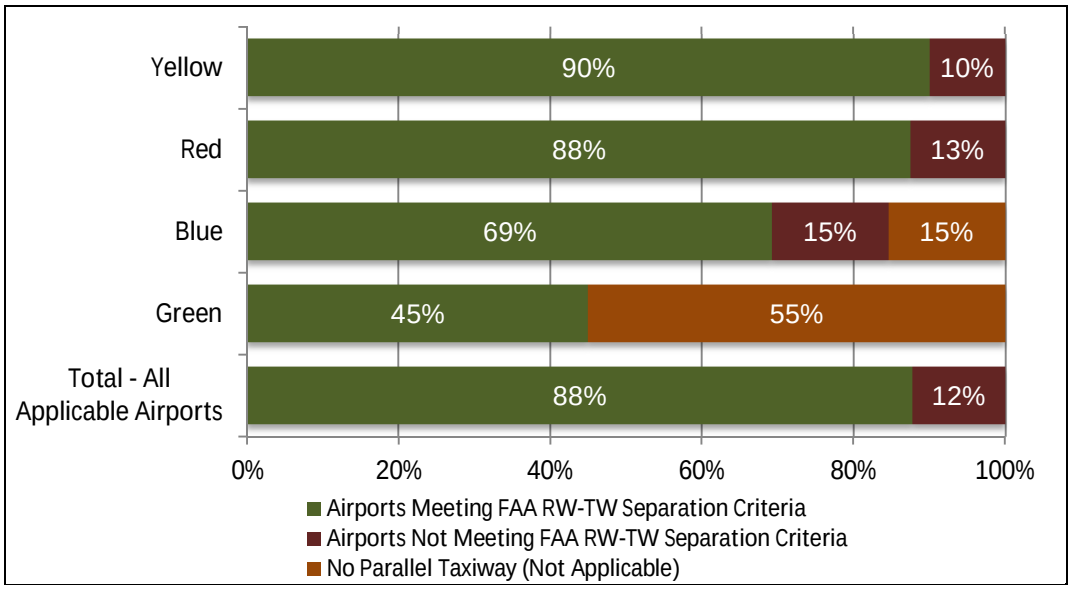
Percent of system airports that meet applicable FAA runway/taxiway separation design criteria on their runways for their current ARC

Airports included the FAA's National Plan of Integrated Airports System (NPIAS) are encouraged by the FAA to meet all applicable design and development standards. In its advisory circulars, the FAA provides specific guidance on which standards are applicable to each airport. The most demanding aircraft that operates at the airport on a regular basis (500 operations per year) determines each airport's individual design. This aircraft is known as the airport's critical aircraft.

Once an airport's critical aircraft is established during the development of an airport master plan or airport layout plan (ALP), applicable design standards are identified. Each airport's design standards are related to the approach speed (aircraft approach category or AAC), wingspan, and tail height (airplane design group or ADG) of its critical aircraft. Within FAA's planning guidelines, these parameters are used to determine each airport's reference code (ARC), which signifies the airport's highest runway design code (RDC). Table 5.6 presents the ARC for each system airport, the required runway/taxiway separation per the FAA Advisory Circular AC 150/5300-13A, Change 1, based on the ADG component, and the airport's existing runway/taxiway separation.

Figure 5.9 summarizes airports by role grouping that meet runway/taxiway separation criteria for their current ADG. These compliance percentages include only the study airports which have at least a partial parallel taxiway. Fifteen of the 72 airports do not have a parallel taxiway and therefore, the measure was not applicable. When these airports are excluded from the calculation, 88% of the system airports (50 airports) meet the standards for runway/taxiway separation and 12% do not meet their separation standards (7 airports).

Figure 5.9: Percent of Airports That Meet FAA Runway/ Taxiway Separation Standards



Sources: Airport Inventory and Data Survey 2012, FAA AC 150/5300-13A, Change 1
Note: Totals may not sum to 100% due to rounding.

The following airports currently do not meet the appropriate runway/taxiway separation standards:

YELLOW	RED	BLUE
• Asheville Regional	• Michael J. Smith Field • Smith Reynolds	• Stanly County • Gastonia Municipal • Henderson-Oxford • Rutherford County-Marchman Field

Percent of airports meeting all mandatory items in ADP

The ADP sets forth the mandatory items a publicly owned and operated airport must have in place in order to be eligible for funding. The mandatory items are outlined in Table 5.7.

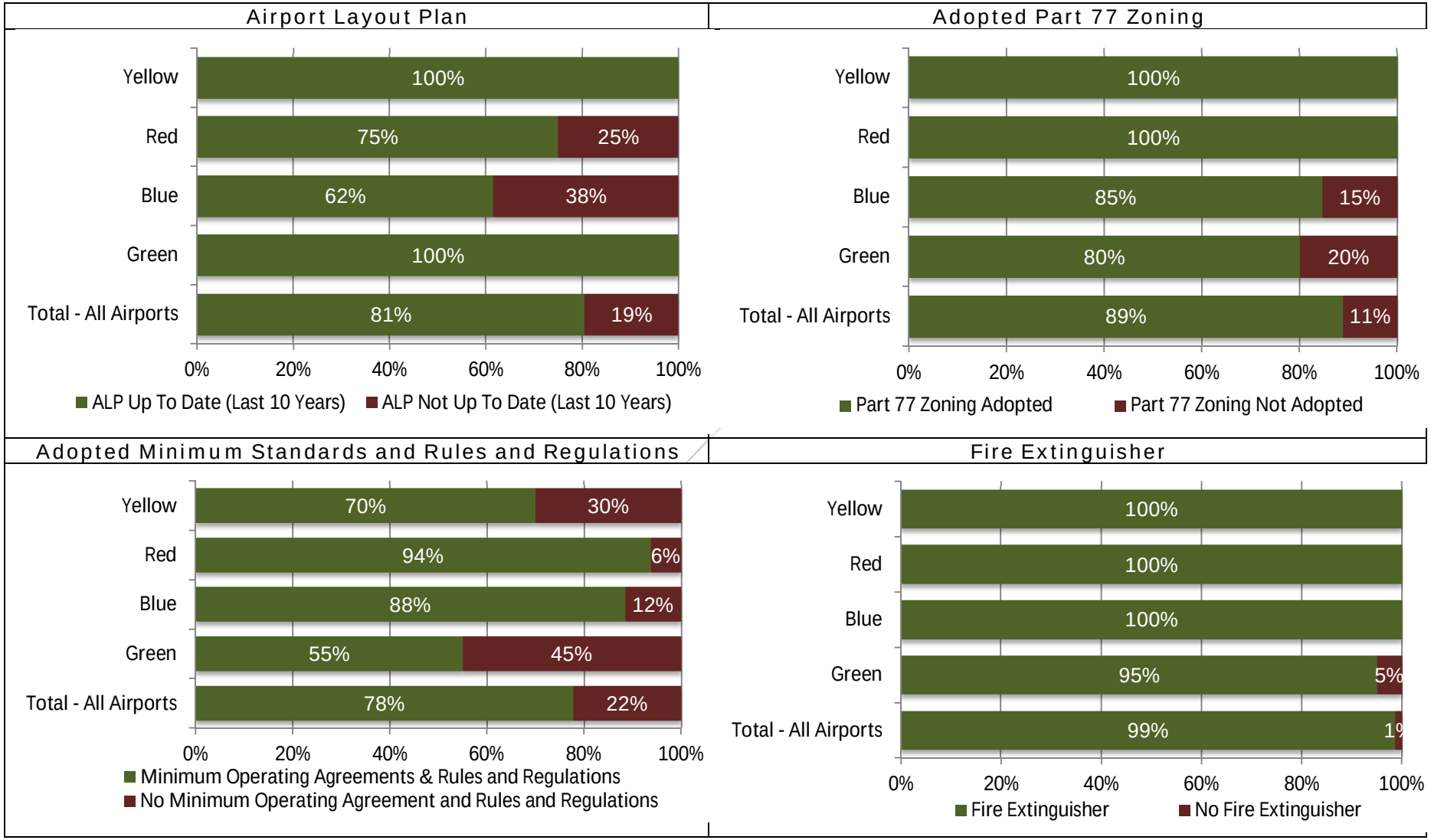
Table 5.7: North Carolina ADP Mandatory Items

1	An approved current Airport Layout Plan (ALP). For the purpose of the NCASP, "current" is considered to be completed and approved by FAA in the last 10 years (2003-2013)
2	An Airport Height Ordinance to meet Federal Aviation Regulation (FAR) Part 77, established by local ordinance. The ordinance must include the ultimate runway length as depicted on the latest Airport Layout Plan (ALP). *It is also highly recommended that each Airport Sponsor establish Land-Use Zoning for their airport.*
3	Published current Minimum Operating Standards and Rules and Regulations (accessible to the public) which have been adopted by local ordinance.
4	Runway Approach Surfaces must be clear for the primary runway. This includes Visual and the best (lowest minimums) Published Approach Surfaces as defined in FAA AC 150/5300-13A, Chapter 3, Runway Design, Section 303. Runway end siting requirement (Table 3.2). It is also recommended that any other runways have, at a minimum, a clear Visual Approach surface 20:1 as defined in FAA AC 150/5300-13A, same section as referenced above. The Division of Aviation will participate with Approach Obstruction Projects for runway approach surfaces as outlined above for the first three thousand (3,000) feet from the runway end. (See Airport Development Category Item Number 100. Runway Approach on page 6) *Note: For airports with a Standard Instrument Approach Procedure (SIAP), FAA Order 8260.3, "Terminal Instrument Procedures," (TERPS) current revision approach surfaces should be maintained clear for the lowest published minimum approach.*
5	At least one fully charged fire extinguisher available and easily accessible 24 hours a day for use around the terminal area.

Note: Secondary and tertiary runways, and related project requests will be reviewed and approved on a case-by-case basis only.
Source: NCDOT DOA, North Carolina Airport Development Plan 2013

Table 5.8 (located at the end of this chapter) summarizes each airport's compliance with each of the mandatory items noted above, excluding 4-Runway Approach Surfaces. (Approaches will be addressed under a subsequent performance measure.) Figure 5.10 graphically depicts the summary results of the analysis by airport grouping.

Figure 5.10: Percent of Airports That Meet Each Mandatory Item in the ADP



Sources: Airport Inventory and Data Survey 2012, FAA AC 150/5300-13A, Change 1, North Carolina Airport Development Plan 2013

In order to meet all mandatory items, the following airports require additional actions. Chapter 6, *Future System Performance*, will revisit the existing mandatory items to see if they are still relevant or should be updated.

Update Airport Layout Plan:

RED	BLUE
• Burlington-Alamance Regional • Currituck County • Macon County • Hickory Regional	• Stanly County • Western Carolina Regional • Gastonia Municipal • Ashe County • Kinston Regional Jetport • Lincolnton Lincoln County Regional • Henderson-Oxford • Rockingham County NC Shiloh • Siler City Municipal

Adopt Part 77 Height Zoning:

BLUE	GREEN
• Western Carolina Regional • Gastonia Municipal • Henderson-Oxford • Rockingham County NC Shiloh	• Tri-County • First Flight • Halifax- Northampton Regional

Publish and Adopt Minimum Operating Agreement and/or Airport Rules and Regulations:

YELLOW	RED	BLUE	GREEN
• Pitt-Greenville • Albert J. Ellis • Raleigh-Durham International	• Macon County	• Henderson-Oxford • Rockingham County NC Shiloh • Siler City Municipal	• Tri-County • Hyde County • Billy Mitchell • First Flight • Ocracoke Island • Halifax-Northampton Regional • Montgomery County • Jackson County • Tarboro-Edgecombe

Provide Fire Extinguisher Near Terminal Area:

GREEN
• Tarboro-Edgecombe

Percent of Airports Meeting System Objectives in the ADP

As previously stated, recent changes to the ADP included updated system objectives. Table 5.9 presents these updated ADP system objectives by development category. Using information from the NCASP's inventory effort, each airport was assessed based on its current airport grouping to determine if it presently meets the system objectives. Airport compliance for each development category is listed in individual tables. The following sections describe and summarize airport compliance by development category.

Table 5.9: ADP System Objectives

Development Category		System Objectives			
		Commercial Service	*General Aviation*	*General Aviation*	*General Aviation*
		Yellow	Red	Blue	Green
100	Runway Approach	Clear Threshold Siting Surface on all Runway Ends	Clear Threshold Siting Surface on Primary Runway	Clear Threshold Siting Surface on Primary Runway	Clear Threshold Siting Surface on Primary Runway
200	Runway Safety Area (RSA)	Meet Runway Design Code (RDC)	Meet Runway Design Code (RDC)	Meet Runway Design Code (RDC)	Meet Runway Design Code (RDC)
300	Runway Protection Zone (RPZ)	Fee Simple	Fee Simple	Fee Simple	Fee Simple
400	Pavement Condition	PCI>75	PCI>75	PCI>75	PCI>75
500	Runway Length	6500'	6000'	5000'	4200'
	Runway Width	150'	100'	100'	75'
600	Pavement Strength	Per PCN Analysis	> 60,000lbs SW or DW or Per PCN Analysis if a P139	> 30,000lbs SW or DW and < 60,000lbs SW or DW or Per PCN Analysis if a P139	< 30,000lb SW or DW and > 12,500lb SW or DW
700	Visual Navigational Aids	Rotating Beacon, Lighted Wind Sock, PAPI-4	Rotating Beacon, Lighted Wind Sock, PAPI-4	Rotating Beacon, Lighted Wind Sock, PAPI-4, REILs	Rotating Beacon, Lighted Wind Sock, PAPI-2, REILs
800	Runway Edge Lighting	HIRL	MIRL	MIRL	MIRL
900	Weather Reporting Capability	AWOS-IIIP	AWOS-III	AWOS-III	AWOS-III

Development Category		System Objectives			
		Commercial Service	*General Aviation*	*General Aviation*	*General Aviation*
		Yellow	Red	Blue	Green
1000	Standard Instrument Approach	PA <250' and < 3/4m	APV 250' - 3/4m	APV 250' - 3/4m	APV 400' - 1m
1100	Taxiway	Full Parallel	Full Parallel	Full Parallel	Full Parallel
1200	Aircraft Apron	20% Based Aircraft + 20% Busy Day Transient (GA)	25% Based Aircraft + 20% Busy Day Transient	25% Based Aircraft + 20% Busy Day Transient	50% Based Aircraft + 20% Busy Day Transient
1300	General Aviation Terminal Building	Commercial Passenger Terminal-Not Eligible. General Aviation Terminal Bldg/Parking per Master Plan	5,500 SF Terminal/Admin Bldg w/ FBO - Public Meeting Area-Restrooms and 1 auto space per based aircraft + 50% for visitors/ employees	4,500 SF Terminal/Admin Bldg w/ FBO - Public Meeting Area-Restrooms and 1 auto space per based aircraft + 50% for visitors/ employees	3,200 SF Terminal/Admin Bldg w/ FBO- Public Meeting Area-Restrooms and 1 auto space per based aircraft + 20% for visitors/ employees
1400	Taxiway & Apron Edge Lighting	MITL	MITL	MITL	Reflective Markers
1500	Airfield Signage	Runway Hold Position, Location, Guidance, and Distance Remaining	Runway Hold Position, Location, Guidance, and Distance Remaining	Runway Hold Position, Location, and Guidance	Runway Hold Position, Location, and Guidance
1600	Ground Communication	UNICOM,RCO or GCO	UNICOM, RCO or GCO	UNICOM, RCO or GCO	UNICOM, RCO or GCO
1700	Approach Lighting	ALS	ALS	ALS	ALS
1800	ARFF Equipment	As req Part 139	Case by Case	Case by Case	Case by Case
1900	Hangars	Not eligible	75% Based Aircraft	75% Based Aircraft	50% Based Aircraft
2000	Airfield Maint. Equip/Storage Bldg	Not eligible	Approved Tractor/ Building	Approved Tractor/ Building	Approved Tractor/ Building
2100	Perimeter Fencing	Not eligible	8' Perimeter	8' Perimeter	8' Perimeter
2200	Fuel Facilities	Not eligible	Based on Demand	Based on Demand	Based on Demand

100: Airport Approach

As discussed previously, in order to maintain a high level of safety, all airports are required to keep their approaches clear. For the purposes of this ADP category, each airport should meet the requirements of the Threshold Siting Surface (TSS) included in FAA's AC 150/5300-13A, *Airport Design*. Table 3.2 of the AC outlines the TSS dimensions based on runway type.

The ADP system objectives for runway approaches are for Yellow airports to have clear TSS on all runway ends and Red, Blue, and Green airports to have clear TSS on both ends of the primary runway. As noted in an earlier section, data is not currently available to calculate compliance for this category. Figure 5.8 from the previous section presents current data (July 2014) available at North Carolina system airports regarding the date of the most recent 18B survey, which identifies obstructions and the height of the obstructions within an airport's approach surface, whether or not the airports have approach procedures applicable to Approach Category C and D aircraft, and whether or not the airport allows night operations.

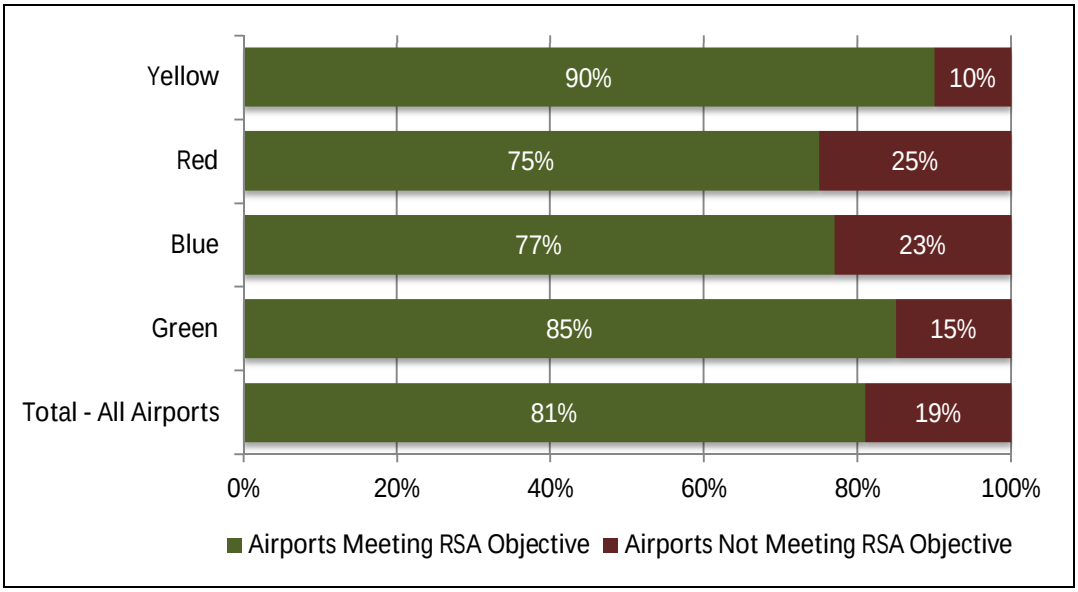
200: Runway Safety Area (RSA)

The RSA is designed to promote and increase airport safety. The dimensions for the RSA are determined by the FAA based on each airport's specific RDC. The RDC is a new term introduced by the FAA as part of the FAA's AC 150/5300-13A, Change 1, *Airport Design,* which identifies the design standards for runway design. The RSA is the area off each runway end that, in accordance with FAA standards should be free and clear of any obstructions. The RSA should also be graded. This objective for the system is two-fold. First, airports must maintain appropriate RSA dimensions. Second, system airports should also ensure that all RSAs are clear from obstructions. The FAA has indicated that RSA standards cannot be modified.

All system airports were asked during the inventory process whether or not their extended RSAs off the primary runway centerline meet current FAA design standards for their respective RDC. Table 5.11 presents the analysis associated with RSA compliance for each airport. It should be noted that while data was not collected related to the length and width portions of the RSAs, all airports should meet these FAA standards.

As shown in Figure 5.11, 81% of airports meet RSA objectives.

Figure 5.11: 200: Existing RSA Compliance



Source: Airport Inventory and Data Survey 2012

The following airports do not currently meet their RSA objectives:

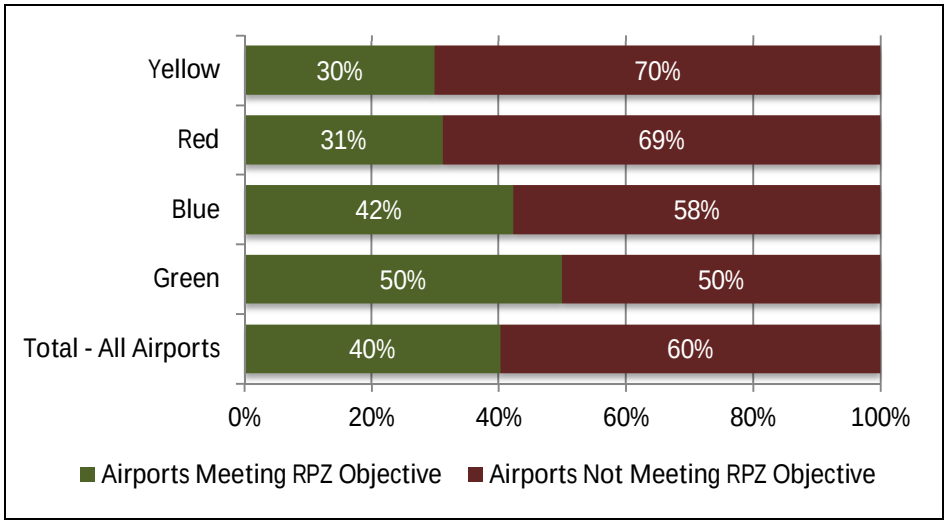
YELLOW	RED	BLUE	GREEN
• Piedmont Triad Int'l	• Burlington-Alamance Regional • Davidson County • Charlotte-Monroe Executive • Rocky Mount-Wilson Regional	• Stanly County • Elizabeth City CG Air Station/Regional • Duplin County • Triangle North Executive • Wilkes County • Person County	• Columbus County • Martin County • Richmond County

300: Runway Protection Zones (RPZ)

The FAA defines the RPZ as a trapezoidal area that is centered on the extended runway centerline. The function of the RPZ is to enhance the protection of people and property on the ground. Having control of the RPZ is critical to ensuring appropriate development in the runway approaches. During the inventory data collection, airport managers were asked if they controlled their all runway RPZs, either completely or partially. Detailed data was not collected related the control mechanisms, i.e., fee simple (ownership) or by means of an avigation easement. The ADP system objective for this category is for all airports to have complete control via fee simple (ownership) of all RPZs.

Table 5.12 presents the RPZ analysis for each airport. Figure 5.12 shows that 40% of system airports have complete control of the RPZs through either fee simple or avigation easements.

Figure 5.12: 300: Existing RPZ Compliance



Source: Airport Inventory and Data Survey 2012

The following airports do not currently have complete control of their runway RPZs:

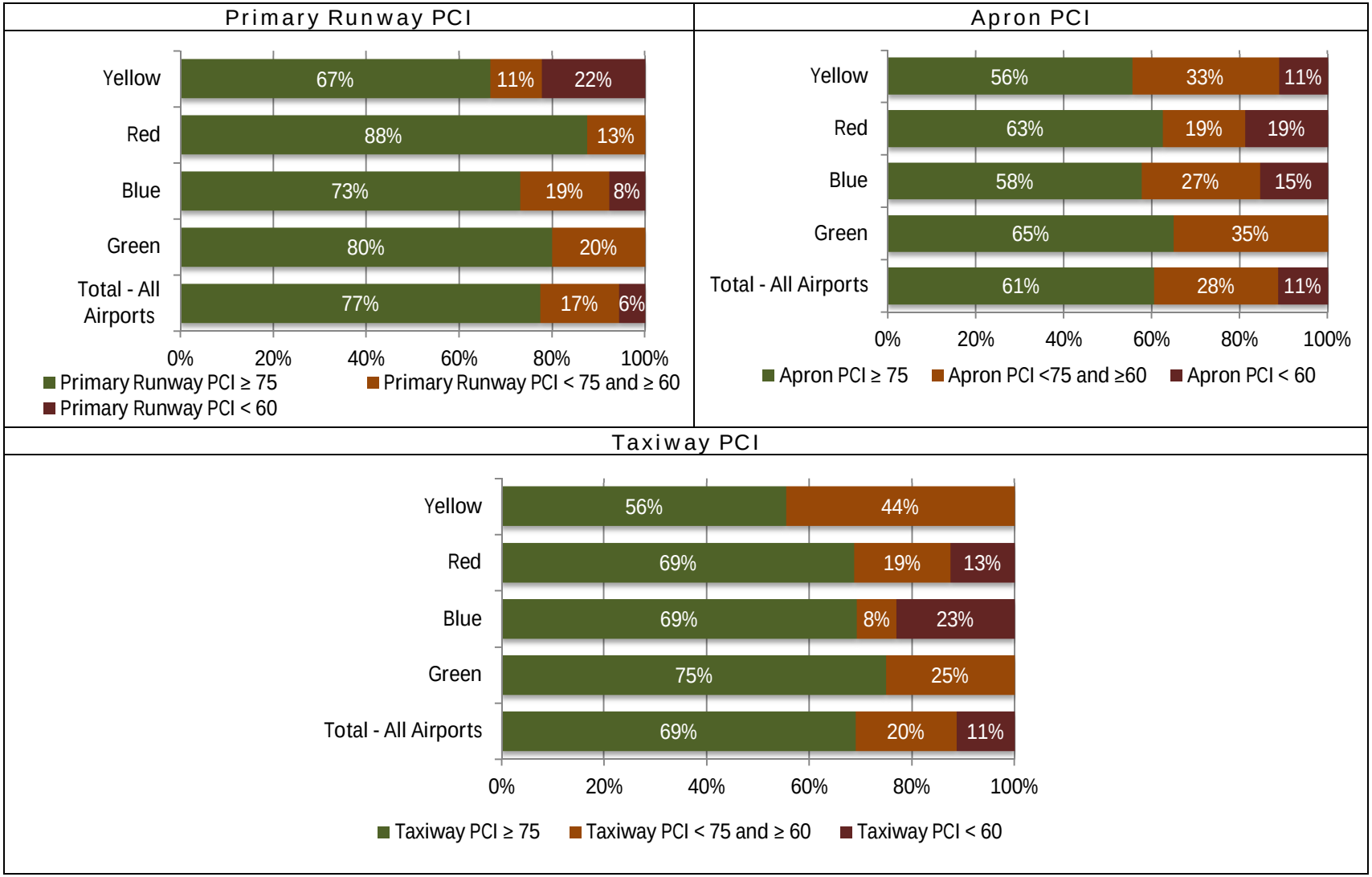
YELLOW	RED	BLUE	GREEN
• Concord Regional • Fayetteville Regional/Grannis Field • Coastal Carolina Regional • Wilmington International	• Michael J. Smith Field • Macon County • Hickory Regional • Davidson County • Dare County Regional • Cape Fear Regional Jetport • Moore County • Rowan County • Johnston County • Statesville Regional • Smith Reynolds	• Stanly County • Western Carolina Regional • Asheboro Regional • Harnett Regional Jetport • Gastonia Municipal • Wayne Executive Jetport • Ashe County • Triangle North Executive • Foothills Regional • Mount Airy/Surry County • Henderson-Oxford • Rutherford County-Marchman Field • Shelby-Cleveland County Regional • Henderson Field	• Billy Mitchell • First Flight • Odell Williamson Municipal • Ocracoke Island • Plymouth Municipal • Avery County/Morrison Field • Montgomery County • Tarboro-Edgecombe • Martin County

400: Pavement Condition

The development and maintenance of paved surfaces at all system airports requires significant and continual investment. The DOA has determined that maintaining all primary pavement sections to a certain standard helps to prevent major costly reconstruction projects. The ADP system objective for pavement condition is for all airports to maintain a pavement condition index (PCI) of 75 or greater. As part of the NCASP, a statewide Pavement Management System study was completed in 2013 for all general aviation airports and 15 Part 139 airports. This program was designed to provide DOA with an objective evaluation of each airport's airfield based on current and projection functional conditions. A 5-year Maintenance and Rehabilitation Program was developed using maintenance policies and costs that were developed for 57 general aviation airports and 15 Part 139 airports. Pavement condition data was for CLT and RDU was provided by the airports. Data for GSO was not available as an airport pavement analysis was underway as of the writing of the chapter. GSO is not included in analysis.

Table 5.13 provides the 2013 weighted average PCI for primary runways, aprons, and all taxiways for each system airport based on data from the 2013 Pavement Management System. Figure 5.13 shows that 77% of airports have a PCI of 75 or greater on their primary runway; 69% have at least a PCI of 75 on their taxiways, and 61% of airports have aprons that have a PCI of 75 or greater.

Figure 5.13: 400: Existing Pavement Condition Compliance



Source: Airport Inventory and Data Survey 2012

Note: Data for GSO was not available and therefore not included in compliance calculations.

The following airports do not meet their pavement condition objective:

Primary Runways:

YELLOW	RED	BLUE	GREEN
• Asheville Regional • Pitt-Greenville • Coastal Carolina Regional	• Rocky Mount-Wilson Regional • Raleigh Exec Jetport at Sanford-Lee County	• Elizabeth City CG Air Station/ Regional • Ashe County • Kinston Regional Jetport at Stallings Field • Wilkes County • Henderson-Oxford • Siler City Municipal • Warren Field	• Hyde County • Mount Olive Municipal • Ocracoke Island (NPS) • Columbus County Municipal

Aprons:

YELLOW	RED	BLUE	GREEN
• Asheville Regional • Pitt-Greenville • Albert J. Ellis • Coastal Carolina Regional	• Michael J. Smith Field • Currituck County Regional • Hickory Regional • Dare County Regional • Cape Fear Regional Jetport – Howie Franklin Field • Smith Reynolds	• Harnett Regional Jetport • Kinston Regional Jetport at Stallings Field • Triangle North Executive • Lumberton Regional • Laurinburg-Maxton • Mount Airy/Surry County • Wilkes County • Henderson-Oxford • Siler City Municipal • Warren Field	• Northeastern Regional • Billy Mitchell (NPS) • Mount Olive Municipal • Ocracoke Island (NPS) • Richmond County • Columbus County Municipal

Taxiways:

YELLOW	RED	BLUE	GREEN
• Charlotte Douglas International • Pitt-Greenville • Albert J. Ellis • Coastal Carolina Regional	• Michael J. Smith Field • Currituck County Regional • Dare County Regional • Raleigh Exec Jetport at Sanford-Lee County • Smith Reynolds	• Ashe County • Elizabeth City CG Air Station/ Regional • Kinston Regional Jetport at Stallings Field • Lumberton Regional • Laurinburg-Maxton • Siler City Municipal • Henderson Field • Warren Field	• Billy Mitchell (NPS) • Mount Olive Municipal • Ocracoke Island (NPS) • Avery County/Morrison Field • Columbus County Municipal

500: Runway Length and Width

Adequate runway facilities are important to aviation systems as the foundation of the airfield. System objectives for runway length and width area based on trends that are occurring within the industry which were discussed previously in *Chapter 3: Forecasts of Aviation Demand*. One growing segment of the general aviation fleet is business jet aircraft. These aircraft typically require a minimum runway length of 5,000 feet. The National Business Aviation Association (NBAA) recently released "guidelines" developed by their nationwide membership that help define the characteristics that should be present at varying types of business category airports. Their guidelines suggest a 5,500-foot long runway at a large business airport and 5,000 feet for a medium business airport.

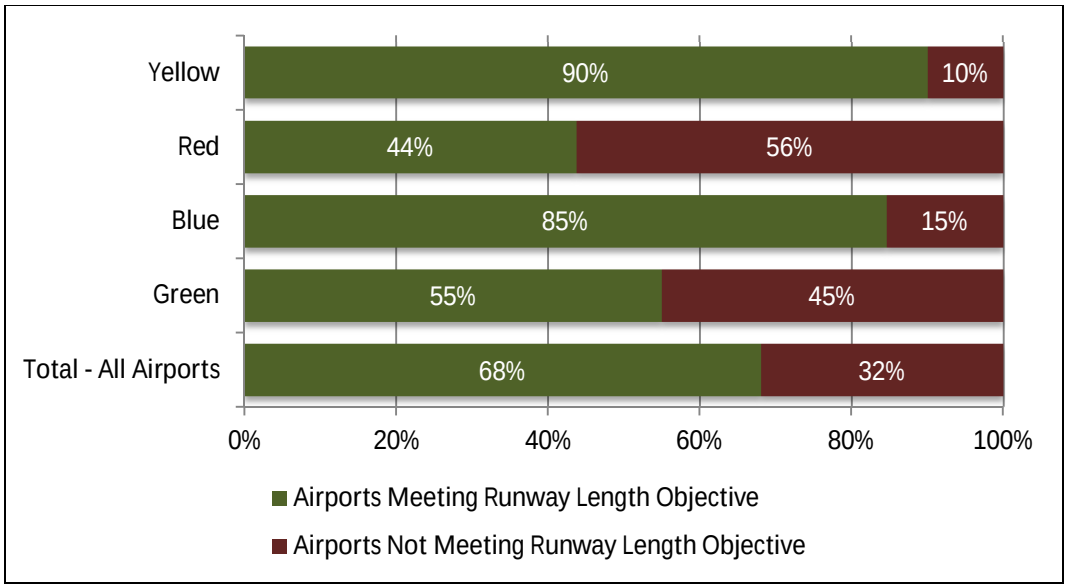
The following system objectives have been established in the ADP for primary runway length and width:

- Yellow: 6,500' x 150'
- Red: 6,000' x 100'
- Blue: 5,000' x 100'
- Green: 4,200' x 75'

An analysis of the current primary runway length and width of each airport is presented in Table 5.14. Airports that exceed the minimum primary runway length and width are recommended to maintain the existing facility infrastructure, as determined to be necessary.

As shown in Figure 5.14, 68% of the system airports meet the runway length objective for their primary runway.

Figure 5.14: 500: Existing Runway Length Compliance



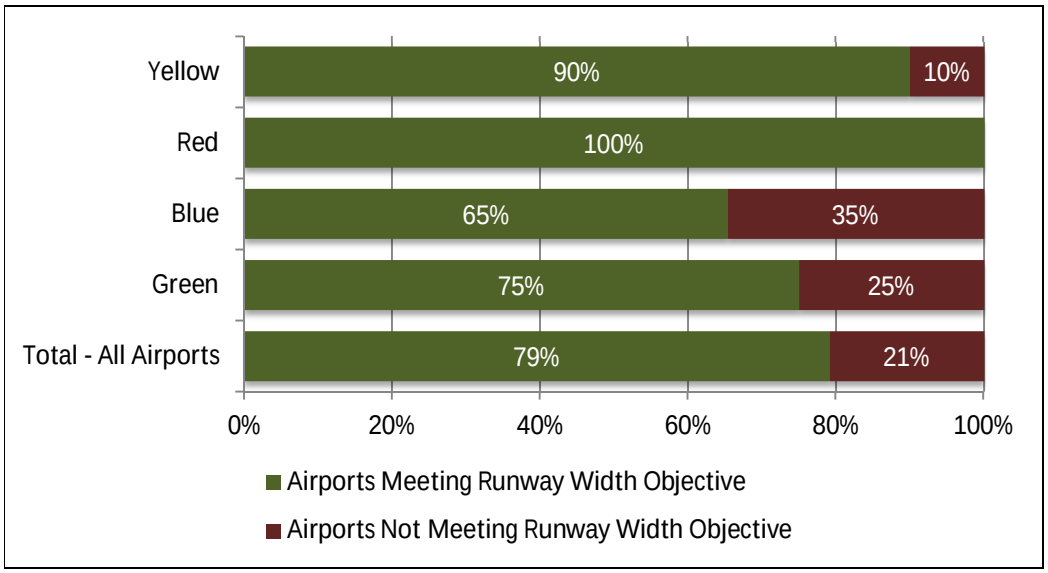
Source: Airport Inventory and Data Survey 2012, FAA 5010

The following airports do not meet their runway length objective:

YELLOW	RED	BLUE	GREEN
• Concord Regional	• Michael J. Smith Field • Currituck County Regional • Macon County • Davidson County • Dare County Regional • Cape Fear Regional Jetport • Moore County • Rowan County • Johnston County	• Gastonia Municipal • Ashe County • Mount Airy/ Surry County • Henderson Field	• Elkin Municipal • Billy Mitchell • First Flight • Ocracoke Island • Avery County/ Morrison Field • Montgomery County • Jackson County • Tarboro-Edgecombe

Figure 5.15 presents compliance with the ADP runway width system objectives. As shown, 79% of system airports meet runway width objectives.

Figure 5.15: 500: Existing Runway Width Compliance



Source: Airport Inventory and Data Survey 2012, FAA 5010

The following airports do not meet their runway width objective:

YELLOW	BLUE	GREEN
• Concord Regional	• Curtis L Brown Jr Field • Harnett Regional Jetport • Ashe County • Duplin County • Foothills Regional • Mount Airy/Surry County • Henderson-Oxford • Siler City Municipal • Henderson Field	• First Flight • Ocracoke Island • Avery County/ Morrison Field • Jackson County • Tarboro-Edgecombe

600: Pavement Strength

The strength of runway pavement determines the weight of aircraft that may operate on a regular basis on a specific runway. Runway pavement is designed to sustain continuous aircraft operations up to the published weight bearing capacity; however, runways are capable of supporting infrequent aircraft operations in excess of their published pavement strength. Runway strengthening, in most cases, depending upon the condition and structure of the existing runway, can be accomplished by a runway overlay. Runway pavement strength has typically been classified according to aircraft landing gear configuration and can be single wheel landing gear (SW), dual wheel landing gear (DW), dual tandem wheel landing gear (DTW), or double dual tandem wheel landing gear (DDTW).

In recent years, the FAA has been moving towards using Pavement Classification Numbers (PCN) in lieu of using allowable loads by gear type and in 2011, the FAA issued AC 150/5335-5B, *Standardized Method of Reporting Airport Pavement Strength – PCN.* The concept of this method of standardizing the strength of airfield pavements is grounded in every aircraft having an Aircraft Classification Number (ACN) which is a unique number to express the effect of an individual airplane on different pavements, and a PCN which is a single unique number to express the load-carrying capacity of a pavement, without specifying a particular airplane or pavement structure. Essentially a pavement with a given PCN can support, without weight restriction, an aircraft with an ACN rating equal to or less than the pavement PCN. Beginning in 2014, all primary airports serving air carrier aircraft should be assigned gross weight and PCN data and by 2016, all non-primary commercial service airports serving air carrier aircraft should be compliant with the AC.[12] It is important to note that aircraft manufacturers provide ACNs, and PCNs are now being reported on the FAA 5010 form.

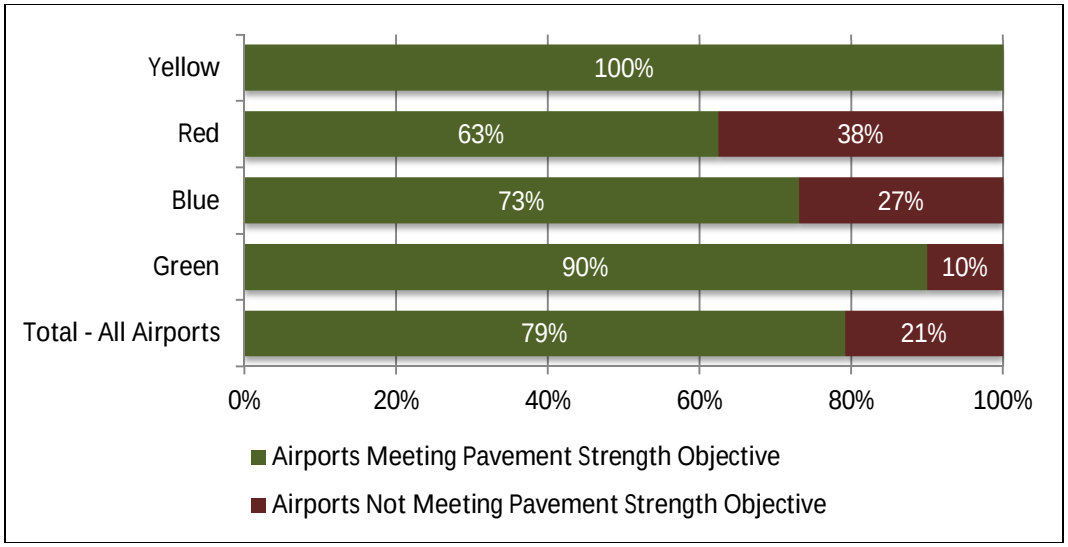
Since PCN data is not currently available for all airports, the following objectives have been established in the ADP for pavement strength by airport role grouping:

[12] A calculation of the pavement PCN ratings at each of the Part 139 airports in North Carolina will be completed as part of the NCASP in 2014. This will meet the FAA's requirements for these airports.

- Yellow: Per PCN Analysis
- Red: > 60,000lbs SW or DW or Per PCN Analysis if Part 139
- Blue: > 30,000lbs SW or DW and < 60,000lbs SW or DW or Per PCN Analysis if Part 139
- Green: < 30,000lbs SW or DW and > 12,500lbs SW or DW

An analysis of the primary runway strength for each airport is presented in Table 5.15. As of the writing of this report, only two airports (Concord Regional and Wilmington International) have reported PCNs for their primary runway. DOA is currently working towards developing PCNs for all Part 139 airports. If a Yellow airport does not currently have a PCN rating for their primary runway, it is considered to meet the system objective if they supported greater than 60,000lbs SW or DW. As shown in Figure 5.16, 79% of system airports meet the pavement strength objective for their primary runway.

Figure 5.16: 600: Existing Pavement Strength Compliance



Source: Airport Inventory and Data Survey 2012, FAA 5010

The following airports do not meet their pavement strength objective:

RED	BLUE	GREEN
• Currituck County Regional • Macon County • Hickory Regional • Dare County Regional • Moore County • Rowan County	• Harnett Regional Jetport • Gastonia Municipal • Ashe County • Mount Airy/Surry County • Rockingham County NC Shiloh • Siler City Municipal • Henderson Field	• First Flight • Odell Williamson Municipal

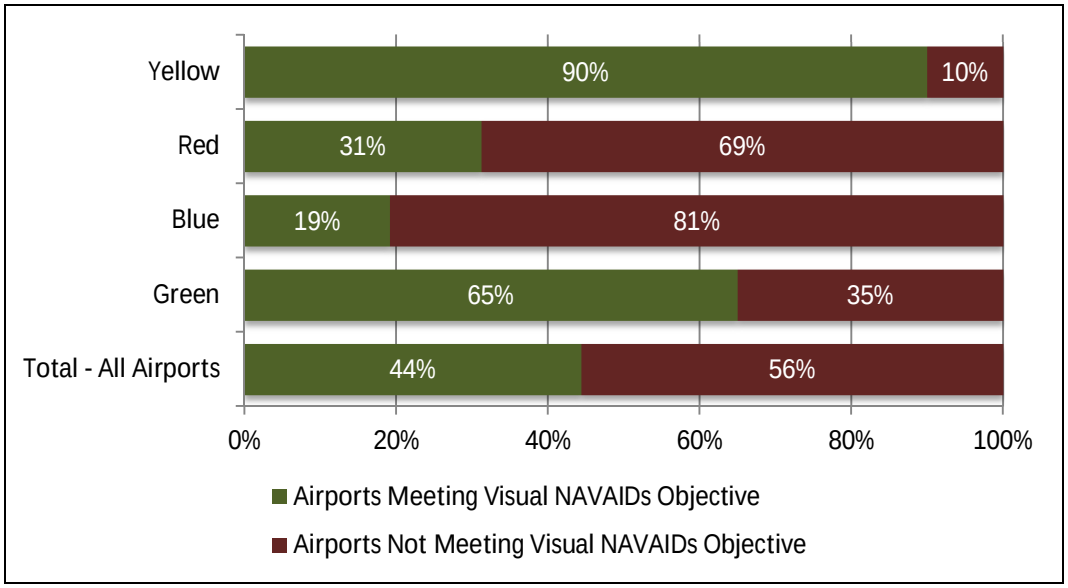
700: Visual Navigational Aids (NAVAIDs)

Various visual aids provide navigational assistance to aircraft arriving and departing North Carolina's airports. Two common visual aids include a rotating beacon which assists pilots in finding an airport during periods of darkness or low visibility, and a wind sock which is used to indicate wind direction and relative wind speed for determining the appropriate runway to use for takeoff or landing. Wind socks are often lighted for use at night. Further, visual aids provide support to instrument approaches and include Precision Approach Path Indicators (PAPIs) and Runway End Identifier Lights (REILs). PAPIs are lighting systems located adjacent to the runway to assist aircraft with visually based vertical alignment on approach to landing. REILs are installed to provide rapid and positive identification of the approach end of a runway. The following objectives have been established in the ADP for visual NAVAIDs by airport grouping:

- Yellow: Rotating beacon, lighted wind sock, PAPI-4
- Red: Rotating beacon, lighted wind sock, PAPI-4
- Blue: Rotating beacon, lighted wind sock, PAPI-4, REILs (if no ALS)
- Green: Rotating beacon, lighted wind sock, PAPI-2, REILs (if no ALS)

Table 5.16 shows which airports currently meet their system objectives for visual NAVAIDs. Notably, if an airport does not meet the three main visual NAVAIDs objectives (rotating beacon, lighting wind sock, PAPI-4 or PAPI-2) it is recognized as not meeting the system goal in totality. The installation of REILs is left up to the discretion of each airport sponsor and not included in compliance calculations. As shown in Figure 5.17, 44% of system airports currently meet their visual NAVAIDs objectives as defined by the ADP.

Figure 5.17: 700: Existing Visual NAVAIDs Compliance



Source: Airport Inventory and Data Survey 2012

The following airports do not meet their visual NAVAIDs objectives:

Rotating Beacon:

GREEN
• Billy Mitchell (NPS) • First Flight (NPS) • Odell Williamson Municipal • Avery County/ Morrison Field

PAPIs:

YELLOW	RED	BLUE	GREEN
• Asheville Regional	• Michael J. Smith Field • Currituck County Regional • Macon County • Hickory Regional • Davidson County • Dare County Regional • Charlotte-Monroe Executive • Cape Fear Regional Jetport • Moore County • Rowan County • Statesville Regional	• Stanly County • Western Carolina Regional • Asheboro Regional • Curtis L Brown Jr Field • Gastonia Municipal • Ashe County • Duplin County • Lincolnton Lincoln County Regional • Triangle North Executive • Lumberton Regional • Mount Airy/Surry County • Wilkes County • Henderson-Oxford • Rockingham County NC Shiloh • Person County • Rutherford County – Marchman Field • Shelby-Cleveland County Regional • Siler City Municipal • Henderson Field • Warren Field	• Clinton-Sampson County • Elkin Municipal • Billy Mitchell (NPS) • First Flight (NPS) • Odell Williamson Municipal • Ocracoke Island (NPS) • Avery County/ Morrison Field

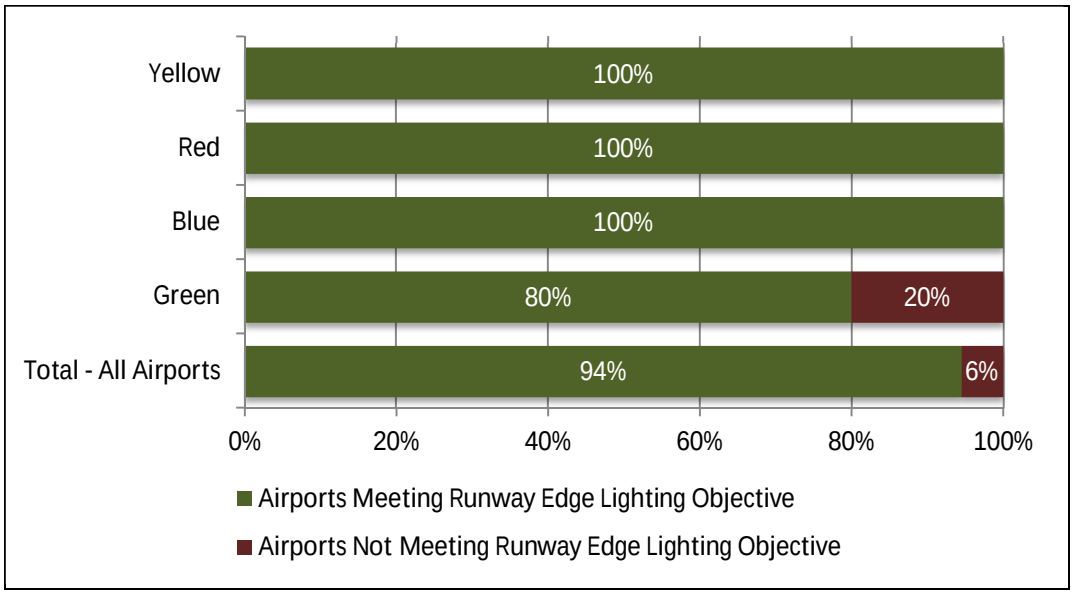
800: Runway Edge Lighting

At night and during periods of reduced visibility, airfield lighting systems provide positive identification of runway edges. These lighting systems are classified according to the degree of intensity, which refers to brightness. There are three specific classifications of runway edge lighting: High Intensity Runway Lights (HIRL), Medium Intensity Runway Lights (MIRL), or Low Intensity Runway Lights (LIRL). The ADP system objectives for runway edge lighting by grouping are as follows:

- Yellow: HIRL
- Red, Blue, Green: MIRL

Table 5.17 indicates which airports, by role grouping, are currently meeting their system objective for runway edge lighting and which airports do not. Figure 5.18 shows that 94% of all system airports currently meet their objective.

Figure 5.18: 800: Existing Runway Edge Lighting Compliance



Source: Airport Inventory and Data Survey 2012

The following airports do not meet their runway edge lighting objective:

GREEN
- Billy Mitchell
- First Flight
- Ocracoke Island
- Avery County/ Morrison Field

900: Weather Reporting Capability

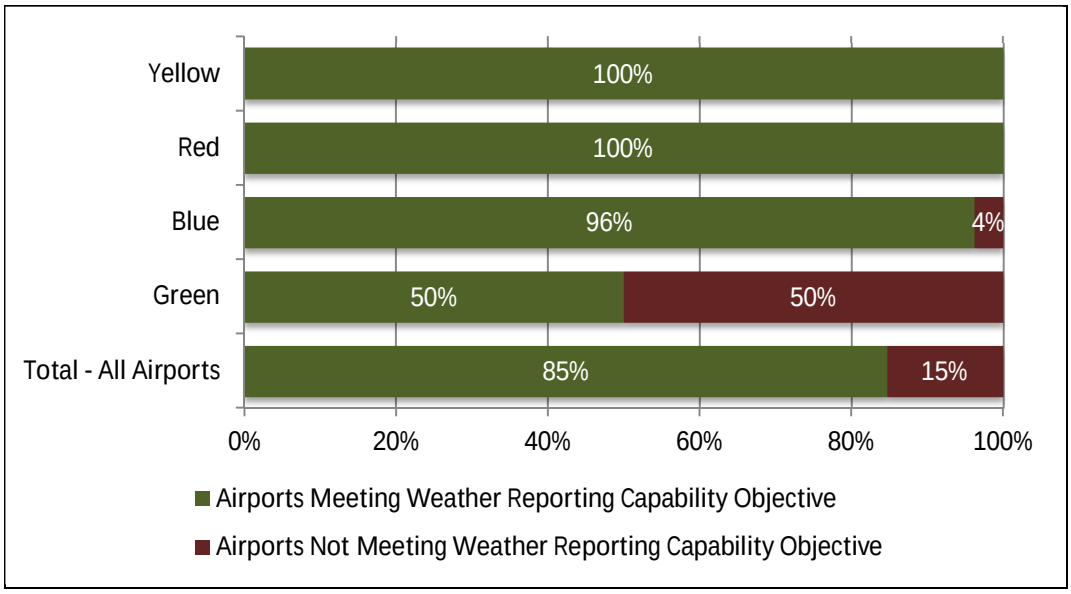
On-site weather reporting equipment at an airport compliments its approach capabilities and promotes an increased safety margin during periods of inclement or changing weather. By providing on-site weather reporting equipment, pilots are ensured sufficient information related to weather conditions at their destination airport, as well as at other potential backup airports.

The following objectives have been established in the ADP for weather reporting capability by airport grouping:

- Yellow: AWOS-IIIP
- Red, Blue, Green: AWOS-III

Table 5.18 indicates which airports, by grouping, are currently meeting their system objective and which airports are not. Figure 5.19 shows that 85% of all system airports currently have on-site weather reporting capabilities and meet their objective.

Figure 5.19: 900: Existing Weather Reporting Capability Compliance



Source: Airport Inventory and Data Survey 2012

The following airports do not meeting the on-site weather reporting objective:

BLUE	GREEN
• Henderson Field	• Mount Olive Municipal
	• Odell Williamson Municipal
	• Ocracoke Island
	• Plymouth Municipal
	• Avery County/Morrison Field
	• Montgomery County
	• Jackson County
	• Martin Count

1000: Standard Instrument Approach Procedures (SIAP)

Approach technology has significantly evolved in the last decade and continues to evolve with the development and rollout of the FAA's Next Generation Air Transportation System (NextGen). The majority of new approach procedures developed by the FAA are now satellite-based systems that rely on Global Positioning Systems (GPS), Localizer Performance with Vertical Guidance (LPV), or Lateral Navigation (LNAV); as compared to ground-based approaches such as Instrument Landing Systems (ILS), Very High Frequency Omni-Directional Range (VOR), Non-Directional Beacon (NDB) historically issued by the FAA. Recognizing the changes in

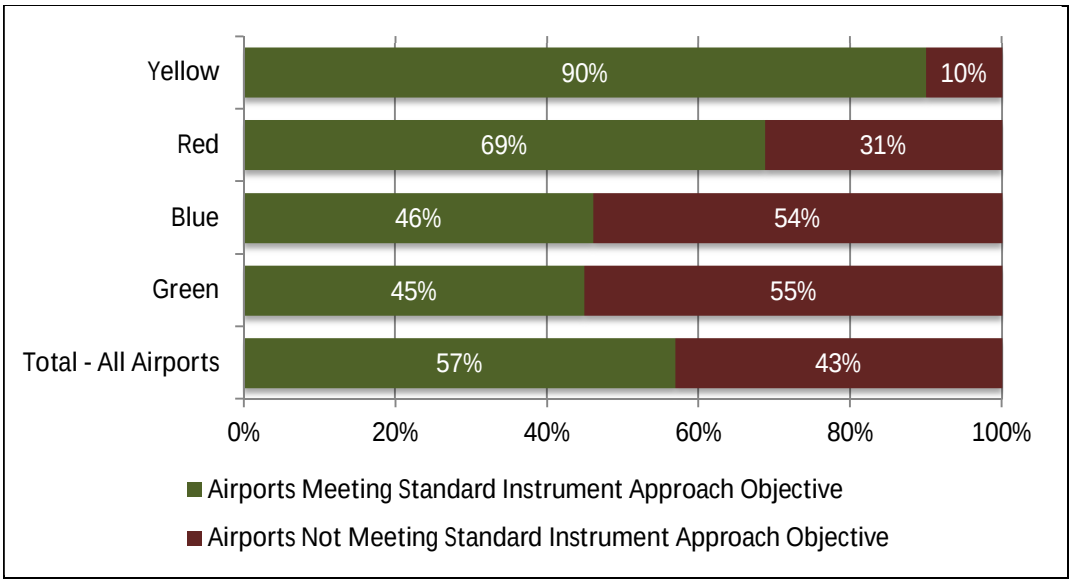
technology, the ADP was updated to reflect these changes and is consistent with FAA AC 150/5300-13A, Change 1, *Airport Design* regarding planning visibility minimums for instrument procedures.

The ADP standard instrument approach system objectives for each grouping are as follows:

- Yellow: Precision Approach (PA) <250' and <¾ mile
- Red, Blue: Instrument Approach with Vertical Guidance (AVP) 250' and ¾ mile
- Green: AVP 400' and 1 mile

Table 5.19 lists the best existing approach type and minimums at each North Carolina airport. As shown in Figure 5.20, 57% of airports currently meet their approach objective.

Figure 5.20: 1000: Existing Standard Instrument Approach Procedures Compliance



Source: FAA Digital Terminal Procedures, April 2014

It is important to note that while the listed approach objectives are desirable for these airports, they may not be feasible in all cases. Enhanced approach capabilities (typically lowered minimums) are needed to meet system objectives at the airports shown below:

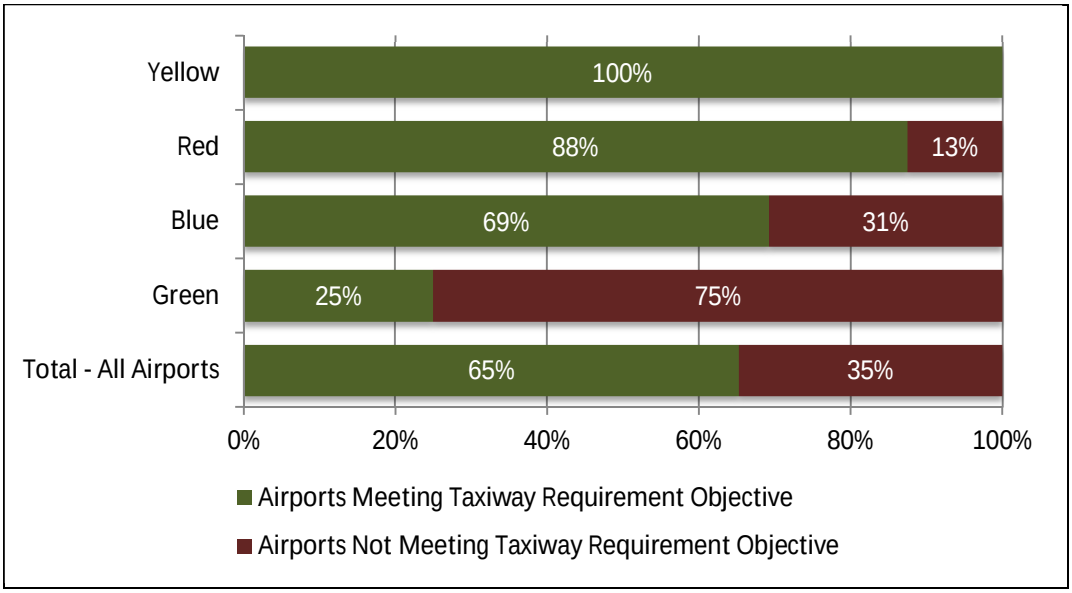
YELLOW	RED	BLUE	GREEN
• Pitt-Greenville	• Michael J. Smith Field • Currituck County Regional • Macon County • Davidson County • Cape Fear Regional Jetport	• Western Carolina Regional • Asheboro Regional • Harnett Regional Jetport • Gastonia Municipal • Ashe County • Lincolnton Lincoln County Regional • Mount Airy/Surry County • Henderson-Oxford • Rockingham County NC Shiloh • Rutherford County-Marchman Field • Shelby-Cleveland County Regional • Siler City Municipal • Henderson Field • Warren Field	• Elkin Municipal • Hyde County • Billy Mitchell • First Flight • Odell Williamson Municipal • Ocracoke Island • Plymouth Municipal • Avery County/Morrison Field • Montgomery County • Jackson County • Tarboro-Edgecombe

1100: Taxiway

Taxiways are constructed to facilitate aircraft movements to and from the runway system and to improve operating safety. Strategically placed taxiway exits permit aircraft to clear the runway after landing and significantly increase runway capacity. Some taxiways are necessary simply to provide access between the apron and runway, whereas other taxiways become needed as activity increases and more efficient use of the airfield is required. It is an ADP system objective for all airports to have a full parallel taxiway.

An analysis of each airport's ability to meet the taxiway objectives is presented in Table 5.20. Figure 5.21 shows that 65% of all airports currently have a full parallel taxiway for their primary runway.

Figure 5.21: 1100: Existing Taxiway Compliance



Source: Airport Inventory and Data Survey 2012

The following airports do not meet the taxiway objective:

RED	BLUE	GREEN
• Michael J. Smith Field • Currituck County Regional	• Western Carolina Regional • Elizabeth City CG Air Station/Regional • Ashe County • Lumberton Regional • Foothills Regional • Mount Airy/Surry County • Siler City Municipal • Henderson Field	• Tri-County • Elkin Municipal • Hyde County • Billy Mitchell • First Flight • Mount Olive Municipal • Odell Williamson Municipal • Ocracoke Island • Plymouth Municipal • Avery County/Morrison County • Montgomery County • Jackson County • Tarboro-Edgecombe • Columbus County Municipal • Martin County

1200: Aircraft Apron

Aircraft aprons or ramps are designated surfaces typically adjacent to terminal buildings, maintenance hangars, air cargo facilities, and hangars that provide areas for parking aircraft, loading and unloading, fueling, and servicing aircraft. Apron areas typically vary in size and location based on a variety of factors including: level and nature of demand, type and size of aircraft intended to use the parking surface, FAA design standards, and aircraft maneuvering needs.

System objectives for paved tie-down apron areas were developed for based aircraft and transient aircraft. The following objectives by airport grouping were established in the ADP for aircraft apron:

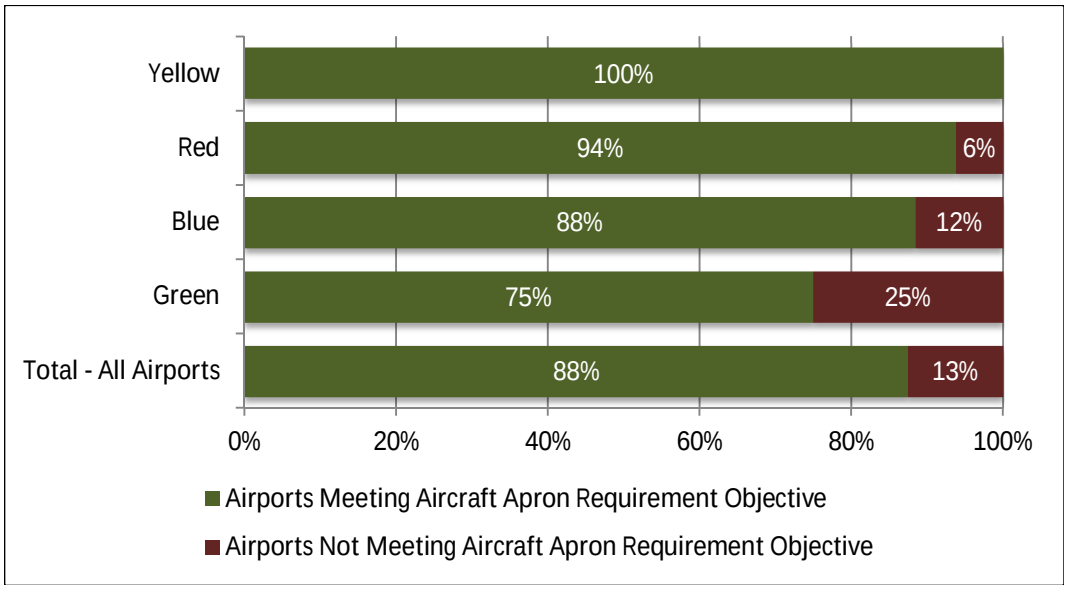
- Yellow: 20% of Based Aircraft + 20% of Busy Day Transient General Aviation Aircraft
- Red, Blue: 25% of Based Aircraft + 20% of Busy Day Transient Aircraft
- Green: 50% of Based Aircraft + 20% of Busy Day Transient Aircraft

The following assumptions were used to determine busy day transient aircraft apron space objectives for each airport:

- Transient (itinerant) operations were taken from the activity forecasts prepared as part of the NCASP (*Chapter 3: Forecasts of Aviation Demand*) and are based on the 2011 data
- Annual transient operations for each system airport were divided by 10 to derive busy month operations. Busy month operations were then divided by 30 to derive average day operations. To estimate busy day operations, it was assumed that the busy day is 15% more active than an average day

An analysis of apron area objectives for each airport is presented in Table 5.21. As shown in Figure 5.22, 88% of system airports meet their aircraft apron objectives.

Figure 5.22: 1200: Existing Aircraft Apron Compliance



Source: Airport Inventory and Data Survey 2012

The following airports do not meet their aircraft apron objective:

RED	BLUE	GREEN
• Smith Reynolds	• Foothills Regional • Henderson-Oxford • Person County	• Northeastern Regional • Elkin Municipal • Mount Olive Municipal • Avery County/Morrison Field • Columbus County Municipal

1300: General Aviation Terminal Building

General aviation terminal buildings provide essential services for passengers and pilots, as well as a facility for the transfer of passengers and flight crew to and from the aircraft. Terminal facilities can range in size based upon several factors, the most important being the type of users. Buildings can range from a small pilot room for flight planning and resting to a large multi-room building that provides services for multiple uses. A general aviation terminal building provides the first impression of a community to visitors so it is important for a terminal building to be welcoming and provide a positive experience for the visitor. Specific areas or uses in a terminal building can include: waiting areas, restrooms, pilots lounge, flight planning area, conference rooms or public meeting rooms, vending, and airport manager offices. Terminal buildings also provide office space for Fixed Based Operators (FBOs). FBOs are aviation businesses that provide aeronautical services such as fueling, hangar rental, flight instruction, aircraft maintenance, etc.

Adequate auto parking is an important component associated with the terminal building. The number of auto parking spaces at an airport varies based on the parking demand and airport services.

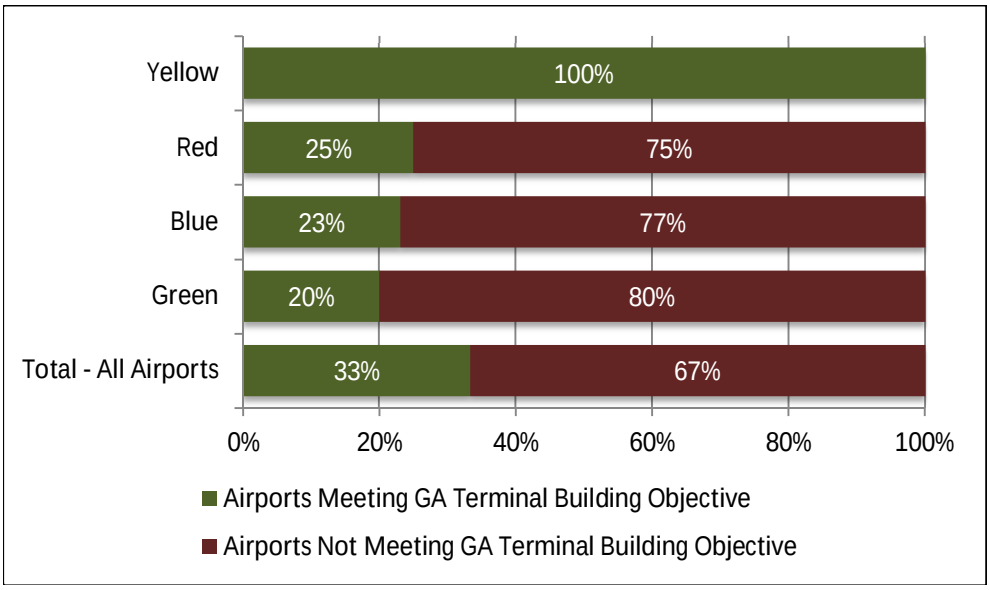
The system objectives for general aviation terminal by grouping are as follows:

- Yellow: Passenger Terminal – Not Eligible; GA Terminal Building/Parking Per Master Plan
- Red: 5,500 SF Terminal/Admin Building with FBO, Public Meeting Room, Restrooms, and 1 Auto Space Per Based Aircraft + 50% For Visitors/Employees
- Blue: 4,500 SF Terminal/Admin Building with FBO, Public Meeting Room, Restrooms, and 1 Auto Space Per Based Aircraft + 50% For Visitors/Employees
- Green: 3,200 SF Terminal/Admin Building with FBO, Public Meeting Room, Restrooms, and 1 Auto Space Per Based Aircraft + 20% For Visitors/Employees

An analysis of general aviation terminal building objectives for each airport is presented in Table 5.22 and is based on inventory data that was collected from each airport. As shown in Figure 5.23, only 33% of system airports meet their terminal

building objectives. It is important to note that the compliance with this objective was calculated based on the terminal building's square footage only.

Figure 5.23: 1300: Existing General Aviation Terminal Building Compliance



Source: Airport Inventory and Data Survey 2012
Note: For the purposed of the NCASP, it was assumed that the Yellow airports met the general aviation terminal objective, which is determined as appropriate through the individual airport master plans.

The following airports do not meet their terminal building objective (square footage only):

Terminal Building Square Footage:

RED	BLUE	GREEN
• Michael J. Smith Field • Burlington-Alamance Regional • Currituck County Regional • Macon County • Hickory Regional • Davidson County • Dare County Regional • Cape Fear Regional Jetport	• Western Carolina Regional • Asheboro Regional • Elizabeth City CG Air Station/Regional • Curtis L Brown Jr Field • Harnett Regional Jetport • Gastonia Municipal • Wayne Executive Jetport • Ashe County • Triangle North Executive	• Tri-County • Clinton-Sampson County • Elkin Municipal • Hyde County • Billy Mitchell • First Flight • Mount Olive Municipal • Plymouth Municipal • Richmond County • Avery County/ Morrison Field

RED	BLUE	GREEN
• Rowan County • Raleigh Exec Jetport at Sanford-Lee County • Johnston County • Statesville Regional	• Lumberton Regional • Laurinburg-Maxton • Foothills Regional • Mount Airy/Surry County • Wilkes County • Henderson-Oxford • Rockingham County NC Shiloh • Person County • Siler City Municipal • Henderson Field • Warren Field	• Montgomery County • Jackson County • Tarboro-Edgecombe • Anson County-Jeff Cloud Field • Columbus County Municipal • Martin County

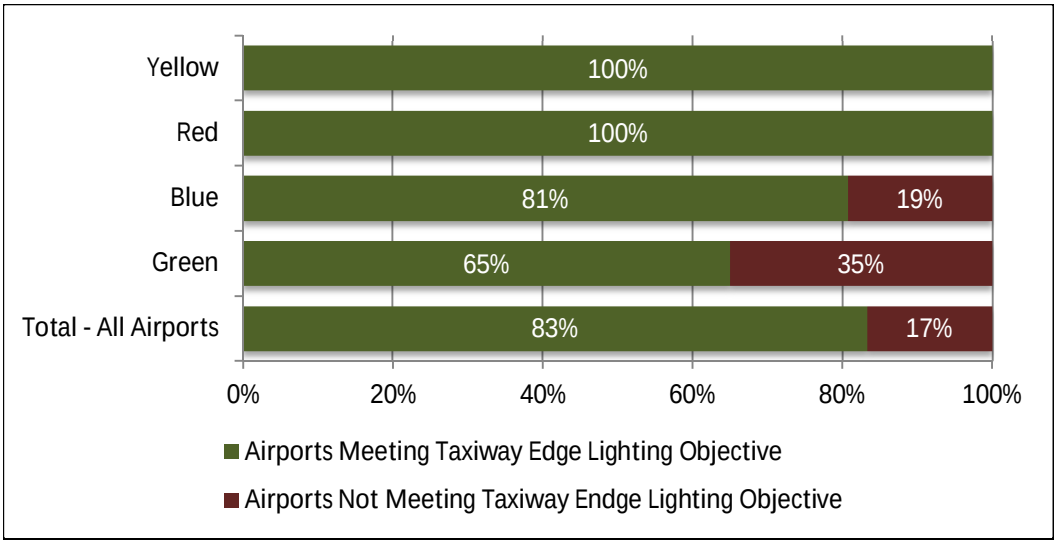
1400: Taxiway and Apron Edge Lighting

Similar to runway edge lighting, taxiway and apron edge lighting provide positive identification of these areas of the airfield at night and during periods of reduced visibility. There are three specific classifications of taxiway edge lighting: High Intensity Taxiway Lights (HITL), Medium Intensity Taxiway Lights (MITL), or Low Intensity Taxiway Lights (LITL). Reflective markers are also used to mark the edges of taxiways and aprons at airports that do not have edge lighting. These markers provide for daytime delineation of operational areas and support runway edge lighting systems. The ADP system objectives for taxiway and apron edge lighting by role grouping are as follows:

- Yellow, Red, Blue: MITL
- Green: Reflective Markers

During the inventory collection, data regarding apron edge lighting was not collected. Analysis in Table 5.23 indicates which airports, by role grouping, are currently meeting their system objective for taxiway edge lighting only. Figure 5.24 shows that 83% of all system airports currently meet their taxiway edge lighting objective. Compliance is not available for apron edge lighting at this time.

Figure 5.24: 1400: Existing Taxiway Lighting Compliance



Source: Airport Inventory and Data Survey 2012

The following airports do not meet their taxiway edge lighting objective:

BLUE	GREEN
• Western Carolina Regional	• Billy Mitchell
• Curtis L Brown Jr Field	• First Flight
• Gastonia Municipal	• Mount Olive Municipal
• Siler City Municipal	• Ocracoke Island
• Warren Field	• Avery County/Morrison Field
	• Tarboro-Edgecombe

1500: Airfield Signage

Overall safety is enhanced at an airport by the use of standardized signs. Standard airport signs provide mandatory instructions, runway and taxiway location, directional and destination information, as well as airport special information signage providing awareness for aircraft maneuvering on the ground. FAA AC 150/5340-18C, *Standards for Airport Sign Systems* and AC 150/5345-44F, *Specifications for Taxiway and Runway Signs* should be followed for proper implementation and maintenance of airport signs.

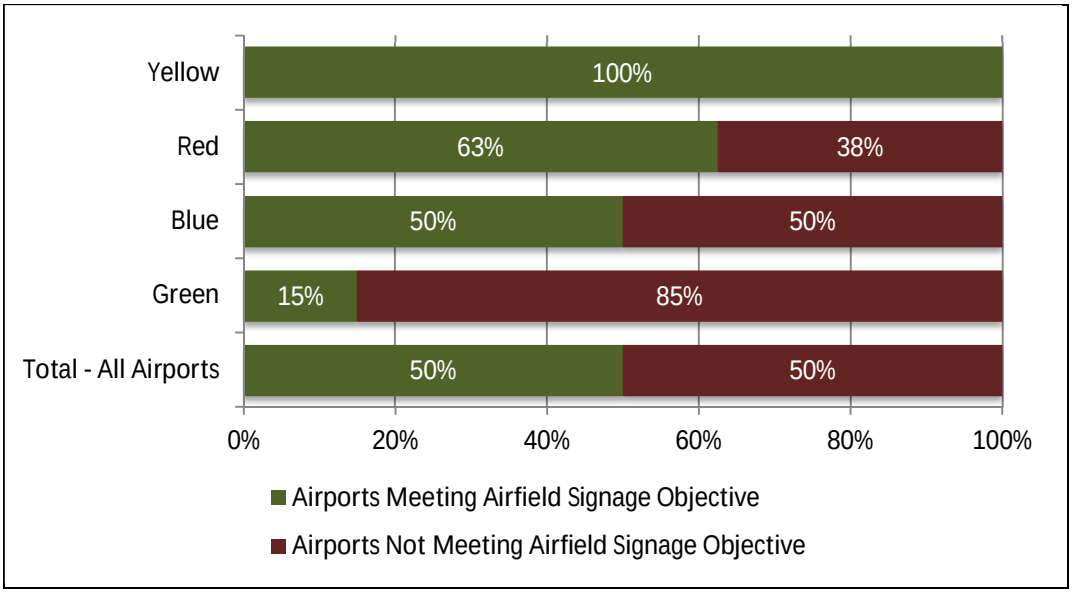
The system objectives for airfield signage by role grouping are as follows:

- Yellow, Red: Runway Hold Position, Location, Guidance, and Distance Remaining
- Blue, Green: Runway Hold Position, Location, and Guidance

An analysis of airfield signage objectives for each airport is presented in Table 5.24. During the inventory collection, data regarding distance remaining signs was not collected. Figure 5.25 shows that 50% of all system airports currently meet their

airfield signage objective. Compliance is not available for distance remaining signs at this time.

Figure 5.25: 1500: Existing Airfield Signage Compliance



Source: Airport Inventory and Data Survey 2012

The following airports do not meet all of their airfield signage objectives, not including distance remaining signage:

RED	BLUE	GREEN
• Burlington-Alamance Regional • Currituck County Regional • Cape Fear Regional Jetport • Rowan County • Raleigh Exec Jetport at Sanford-Lee County • Statesville Regional	• Stanly County • Asheboro Regional • Elizabeth City CG Air Station/Regional • Curtis L Brown Jr Field • Gastonia Municipal • Ashe County • Duplin County • Lumberton Regional • Laurinburg-Maxton • Rutherford County – Marchman Field • Shelby-Cleveland County Regional • Siler City Municipal • Henderson Field	• Tri-County • Clinton-Sampson County • Northeastern Regional • Elkin Municipal • Hyde County • Billy Mitchell • First Flight • Mount Olive Municipal • Odell Williamson Municipal • Ocracoke Island • Plymouth Municipal • Avery County • Montgomery County • Jackson County • Tarboro-Edgecombe • Anson County-Jeff Cloud Field • Columbus County Municipal • Martin County

600: Ground Communication

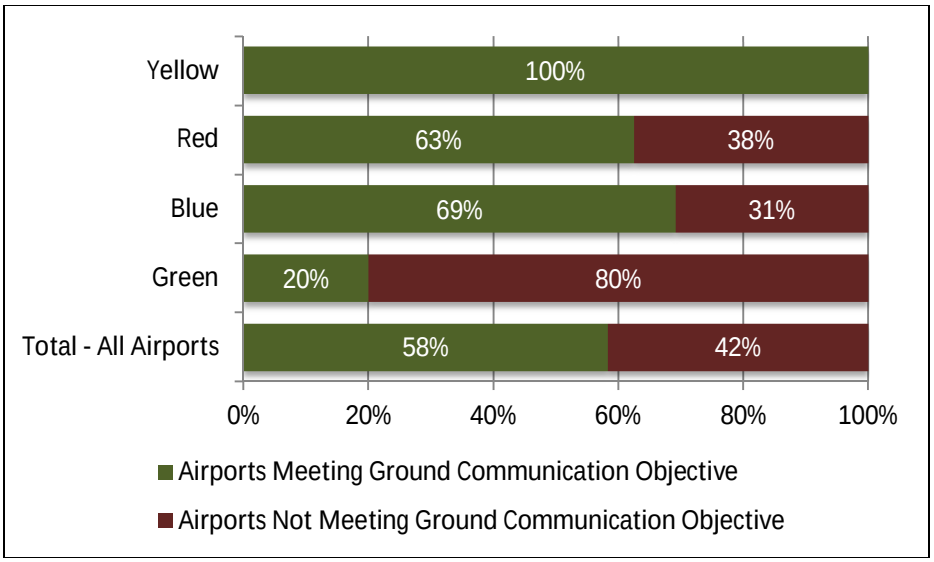
Traffic activity and availability of services at an airport usually dictates the type of communications available. A common communication service available is called the UNICOM frequency. This frequency is typically used at small, non-towered airports by pilots wishing to broadcast information pertaining to the aircraft's location to the base operator on the ground. A Remote Communications Outlet (RCO) is an unmanned communications facility remotely controlled by air traffic personnel to extend the communication range of the air traffic facility. RCOs are an important instrument for airports as they provide pilots with en route clearances, issuing departure authorizations, and acknowledgement of instrument flight rules cancellations or departure/landing times. A Ground Communications Outlet (GCO) meets the same objective by relaying such communications between pilot radios and air traffic control or flight service station personnel via a dedicated telephone connection.

The system objectives for ground communications by role grouping are as follows:

- Yellow, Red, Blue, Green: UNICOM and a RCO or GCO

An analysis of ground communication objectives for each airport is presented in Table 5.25. Several airports are noted in Table 5.25 as having a Remote Transmitter/Receiver (RTR), which is similar equipment to an RCO but they serve terminal air traffic control facilities, therefore in those instances, the airport is considered compliant. As shown in Figure 5.26, 58% of system airports meet their ground communications objective.

Figure 5.26: 1600: Existing Ground Communication Compliance



Source: Airport Inventory and Data Survey 2012

The following airports do not meet their ground communications objective:

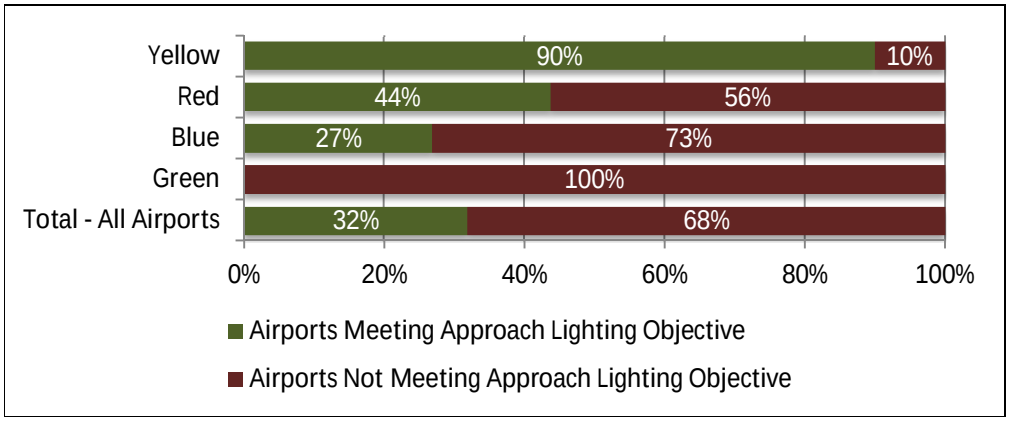
RED	BLUE	GREEN
• Currituck County Regional	• Duplin County	• Tri-County
• Macon County	• Lumberton Regional	• Clinton-Sampson County
• Dare County Regional	• Foothills Regional	• Northeastern Regional
• Moore County	• Henderson-Oxford	• Elkin Municipal
• Statesville Regional	• Person County	• Hyde County
• Smith Reynolds	• Siler City Municipal	• First Flight
	• Henderson Field	• Odell Williamson Municipal
	• Warren Field	• Ocracoke Island
		• Plymouth Municipal
		• Halifax-Northampton Regional
		• Richmond County
		• Avery County/Morrison Field
		• Jackson County
		• Tarboro-Edgecombe
		• Anson County-Jeff Cloud Field
		• Columbus County Municipal

1700: Approach Lighting

Approach lighting systems (ALS) provide a visual light path for landing aircraft at airports with an instrument approach procedure. An ALS is a configuration of signal lights beginning at the landing threshold and proceeding beyond the extended runway centerline into the approach area a distance between 1,400 feet and 3,000 feet. Some systems include sequenced flashing lights for guidance to the runway. Examples of these systems include: Medium Intensity Approach Lighting System (MALS) and Omni-Directional Approach Lighting System (ODALS). The ADP system objective is for all system airports (Yellow, Red, Blue, and Green) to have an ALS.

Table 5.26 lists those airports that have an ALS. As shown in Figure 5.27, only 32% of system airports currently have an ALS.

Figure 5.27: 1700: Existing Approach Lighting Compliance



Source: Airport Inventory and Data Survey 2012

The following airports do not meet their approach lighting objective:

YELLOW	RED	BLUE	GREEN
• Coastal Carolina Regional	• Michael J. Smith Field • Burlington-Alamance Regional • Currituck County Regional • Macon County • Davidson County • Dare County Regional • Charlotte-Monroe Executive • Cape Fear Regional Jetport • Moore County	• Stanly County • Western Carolina Regional • Asheboro Regional • Elizabeth City CG Air Station/ Regional • Curtis L Brown Jr Field • Harnett Regional Jetport • Ashe County • Duplin County • Lincolnton Lincoln County Regional • Lumberton Regional • Foothills Regional • Mount Airy/Surry County • Henderson-Oxford • Rockingham County NC Shiloh • Rutherford County-Marchman Field • Shelby-Cleveland County Regional • Siler City Municipal • Henderson Field • Warren Field	• Tri-County • Clinton-Sampson County • Northeastern Regional • Elkin Municipal • Hyde County • Billy Mitchell • First Flight • Mount Olive Municipal • Odell Williamson Municipal • Ocracoke Island • Plymouth Municipal • Halifax-Northampton Regional • Richmond County • Avery County/Morrison Field • Montgomery County • Jackson County • Tarboro-Edgecombe • Anson County-Jeff Cloud Field • Columbus County Municipal • Martin County

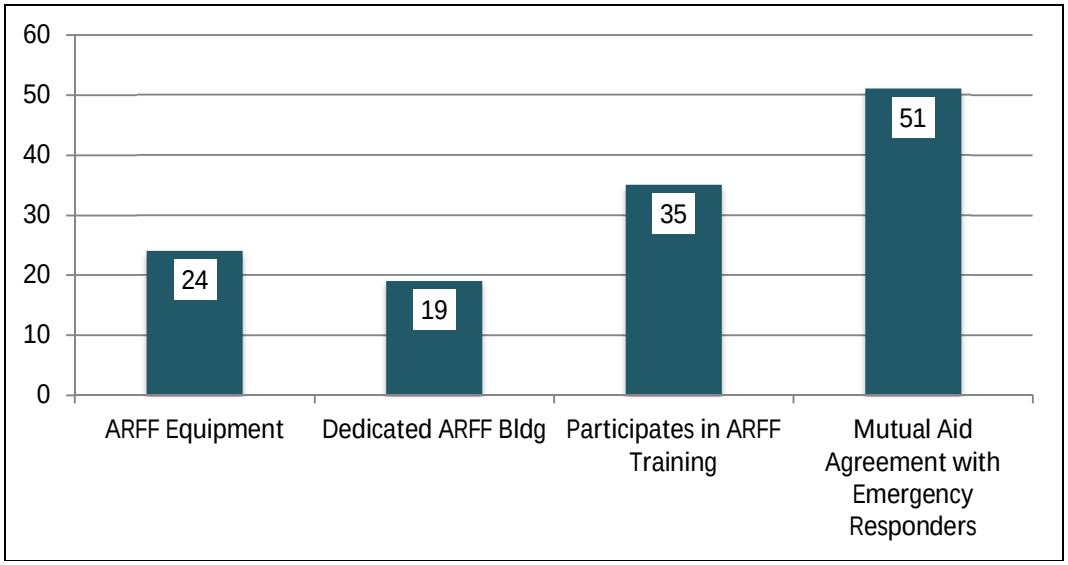
1800: Aircraft Rescue & Fire Fighting (ARFF) Equipment

The FAA has established specific requirements for Aircraft Rescue and Fire Fighting (ARFF) equipment. These requirements vary depending upon the frequency that aircraft of various sizes serve the airport. These requirements are stated in terms of "indexes" that begin with the letter "A" for airports serving small aircraft and extend to Index E for airports serving large aircraft. Each Index letter defines a range for aircraft length. The majority of North Carolina's Part 139 airports have an ARFF index of A (aircraft less than 90 feet in length) or B (aircraft at least 90 feet but less than 126 feet in length). Piedmont Triad International has an Index C that includes aircraft at least 126 feet long but less than 159 feet in length. Charlotte/Douglas International and Raleigh-Durham International are both Index D, which includes aircraft at least 159 feet in length but less than 200 feet in length. The specific ARFF requirements

can be found in National Fire Protection Association (NFPA) 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports*.

The ADP system objectives for ARFF equipment are for 15 Part 139 airports (Yellow, Red, or Blue)[13] to meet the requirements of their certification; as such, 100% of Part 139 airports meet the objective for ARFF equipment. Figure 5.28 summarizes the total number of airports that have ARFF equipment, a dedicated ARFF building, those that participate in ARFF training, and airports that currently have a formal mutual aid agreement in place with emergency responders. Figure 5.29 presents this information by the percent of airports by grouping. Table 5.27 details the ARFF equipment, infrastructure and support at each airport in North Carolina.

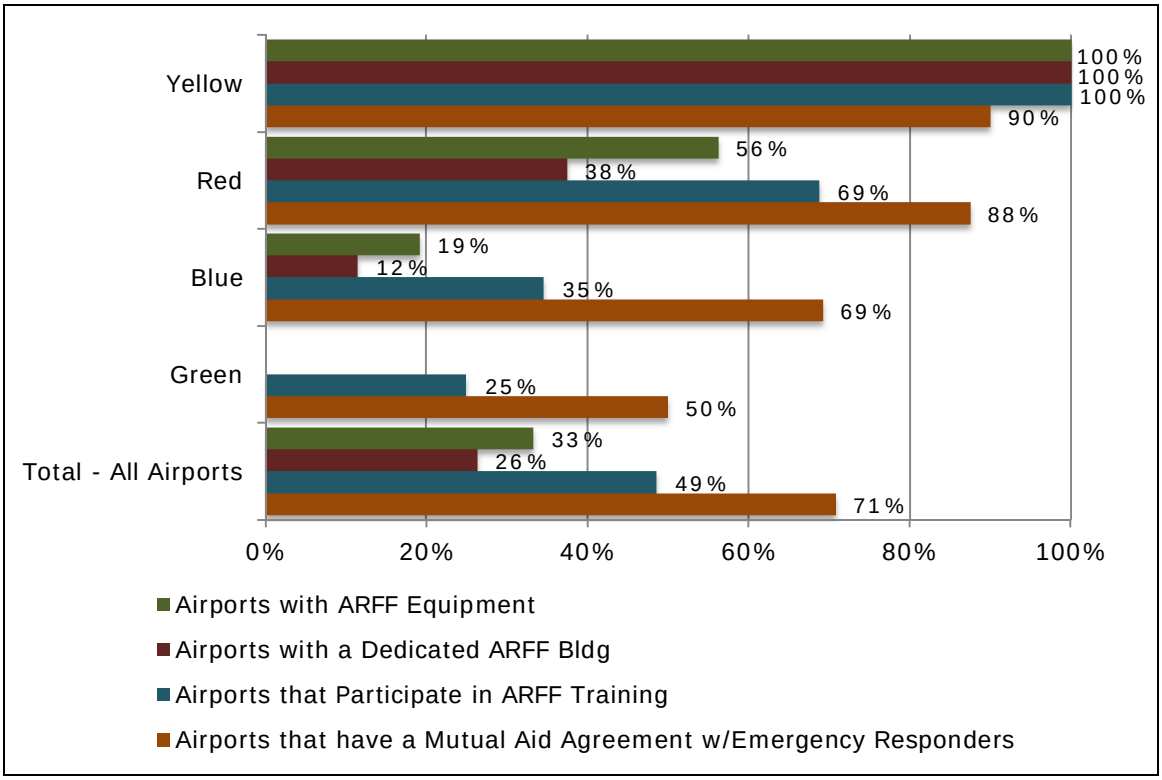
Figure 5.28: 1800: Number of Airports with ARFF Equipment, Infrastructure, and Support



Source: Airport Inventory and Data Survey 2012

[13] Part 139 airports in North Carolina include: Yellow airports- Albert J. Ellis, Asheville Regional, Charlotte/ Douglas International, Coastal Carolina Regional, Concord Regional, Fayetteville Regional/Grannis Field, Piedmont Triad International, Pitt-Greenville, Raleigh-Durham International, Wilmington International; Red airports- Hickory Regional, Moore County, Rocky Mount-Wilson Regional, Smith Reynolds; Blue airports- Kinston Regional Jetport at Stallings Field.

Figure 5.29: 1800: Percent of Airports with ARFF Equipment, Infrastructure, and Support



Source: Airport Inventory and Data Survey 2012

1900: Hangars

Demand for hangar space is directly related to the local climate and the type of based aircraft at each airport. Areas with severe weather conditions or with coastal climates may have a higher demand for hangar storage facilities. In addition, larger investments in jet and turboprop aircraft also increase the demand for hangar storage.

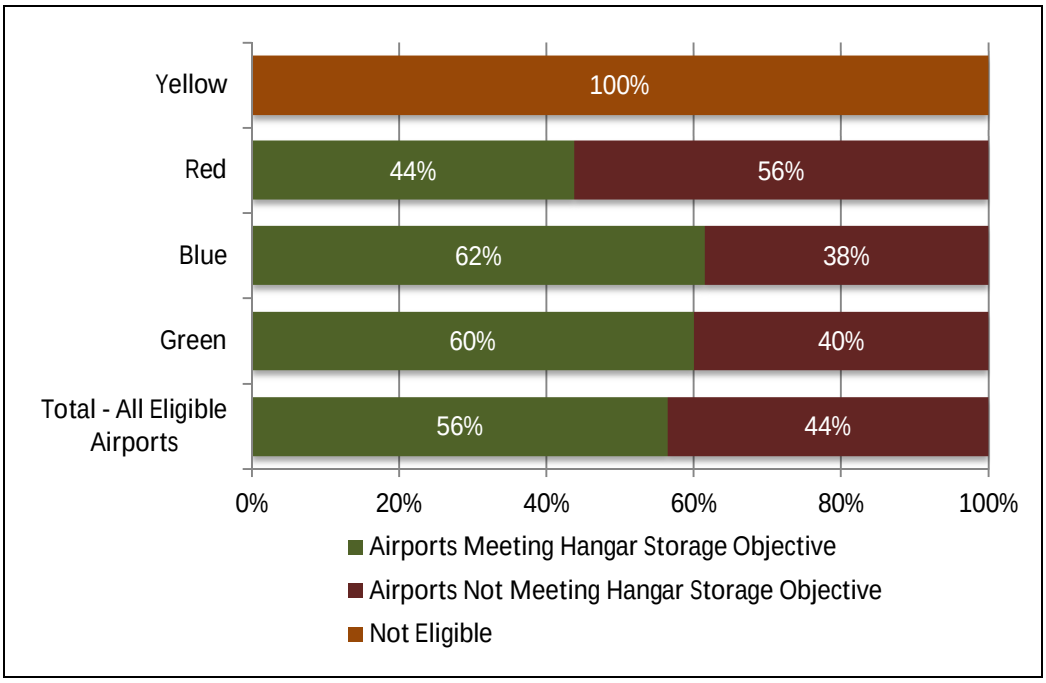
As part of the inventory collection process, an effort was made to collect detailed hangar storage data to evaluate each airport for the ability to provide aircraft storage that is sufficient to support the airport's role grouping in the North Carolina system. Each airport was asked to provide information related to the number of hangar spaces provided by type of hangar (t-hangar, box, corporate, portables/other, and transient), as well as the square footage of the hangars and the percent occupied of hangar spaces.

As part of the NCASP, the ADP was updated to now include Category 1900: Hangars. The system objectives for hangar storage by role grouping are as follows:

- Yellow: Commercial service airports are not eligible for funding and therefore no objective has been developed
- Red: 75% of Based Aircraft
- Blue: 75% of Based Aircraft
- Green: 50% of Based Aircraft

An analysis of hangar storage for each airport is presented in Table 5.28. In addition to existing hangar spaces available as reported by each airport, analysis also includes those airports that report 100% hangar occupancy. Airports that have less existing hangar spaces than the hangar space objective are considered meeting the objective if they reported having less than 100% hangar occupancy. Figure 5.30 shows that only 56% of eligible system airports (excluding the 10 Yellow airports) currently meet their hangar storage objectives.

Figure 5.30: 1900: Existing Hangars



Source: Airport Inventory and Data Survey 2012

The following airports do not meet their hangar objectives:

RED	BLUE	GREEN
• Michael J. Smith Field • Burlington-Alamance Regional • Currituck County Regional • Macon County • Davidson County • Charlotte-Monroe Executive • Cape Fear Regional Jetport • Rocky Mount-Wilson Regional • Rowan County • Raleigh Exec Jetport at Sanford-Lee County • Johnston County • Statesville Regional • Smith Reynolds	• Western Carolina Regional • Elizabeth City CG Air Station/Regional • Wayne Executive Jetport • Ashe County • Duplin County • Kinston Regional Jetport at Stallings Field • Lincolnton Lincoln County Regional • Triangle North Executive • Lumberton Regional • Laurinburg-Maxton • Foothills Regional • Mount Airy/Surry County • Wilkes County • Henderson-Oxford • Person County • Rutherford County-Marchman Field • Shelby-Cleveland County Regional • Siler City Municipal • Henderson Field	• Tri-County • Clinton-Sampson County • Elkin Municipal • Odell Williamson Municipal • Columbus County Municipal

2000: Airfield Maintenance Equipment & Storage Building

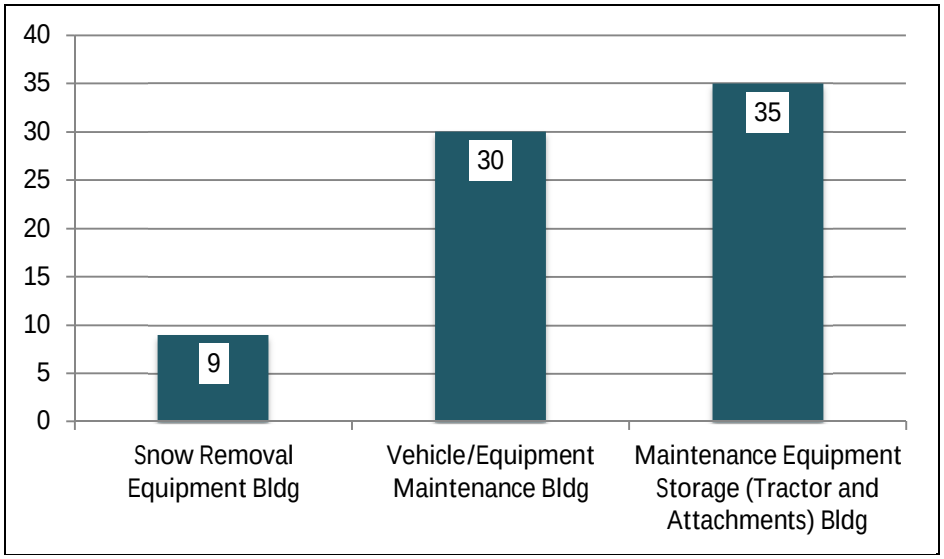
In addition to the airside and landside facilities that have been discussed previously, system objectives have been established in the ADP related to airfield maintenance equipment and storage buildings. Maintenance equipment is used by airport staff to maintain the airport properly and is used for activities such as grass mowing, snow removal, building maintenance, and overall maintenance of both paved and unpaved areas at each airport.

As part of the inventory collection process for the NCASP, an effort was made to collect necessary equipment building and storage building data to evaluate each airport, as well as the system as a whole, for the ability of each airport to provide equipment that is sufficient to support the airport's role grouping in the North Carolina system. Each airport was asked to provide information related to the type of equipment and storage infrastructure that they currently have.

Figure 5.31 summarizes the number of airports that reported having a snow removal equipment (SRE) building, vehicle/equipment maintenance building, and a

maintenance equipment storage building for a tractor and the necessary attachments.

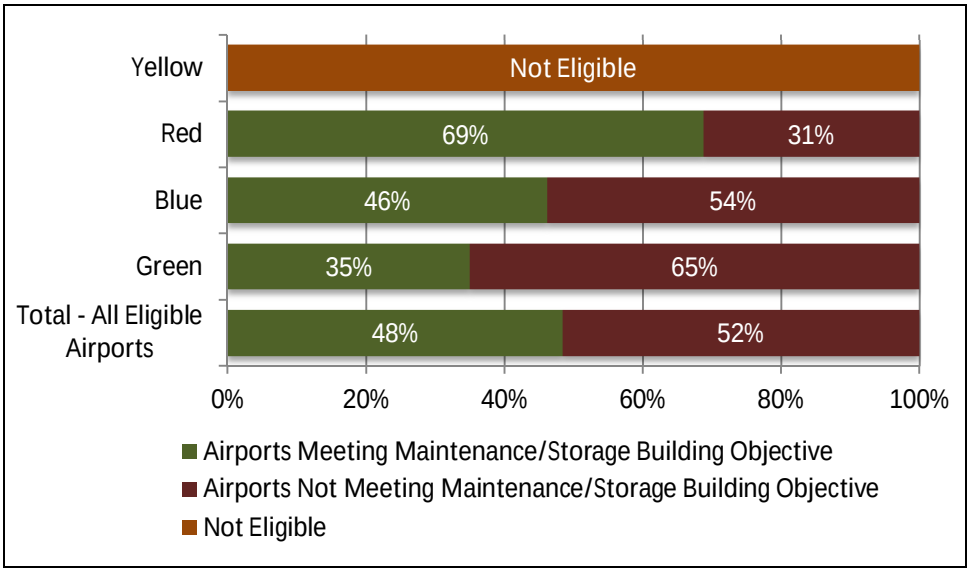
Figure 5.31: 2000: Number of Airports with Airfield Maintenance Equipment & Storage Buildings



Source: Airport Inventory and Data Survey 2012

Table 5.29 provides a summary of existing equipment buildings by type at each airport in North Carolina. Figure 5.32 shows that 48% of eligible system airports (62 of 72) have a designated building to store equipment. It is important to note that while Yellow airports are not eligible for equipment/storage building funding through the ADP, all Yellow airports do provide storage infrastructure for their airfield maintenance equipment.

Figure 5.32: 2000: Existing Maintenance Equipment & Storage (Tractor and Attachments) Compliance



Source: Airport Inventory and Data Survey 2012

The following airports do not currently meet their maintenance/storage building objectives:

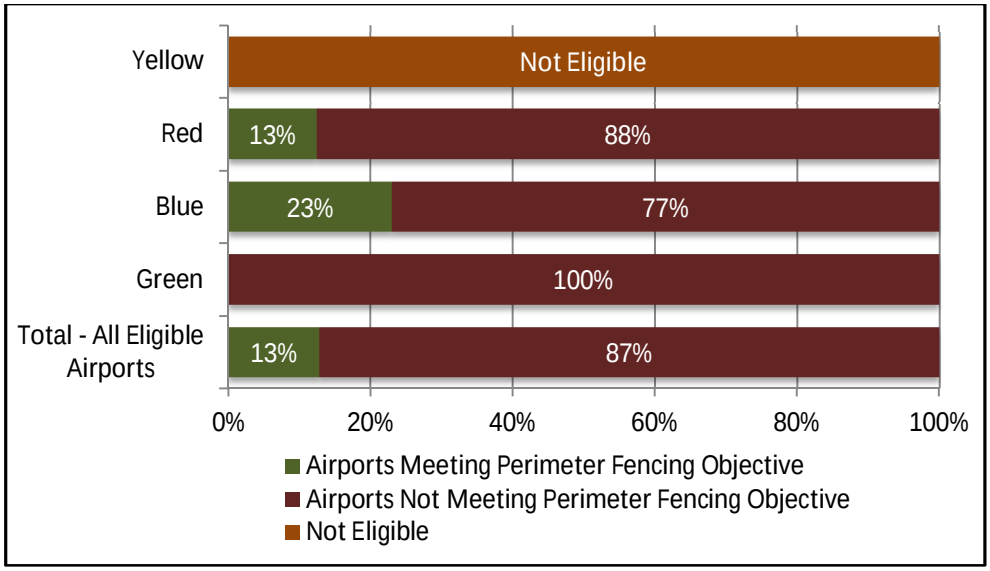
RED	BLUE	GREEN
• Currituck County Regional	• Stanly County	• Tri-County
• Macon County	• Western Carolina Regional	• Clinton-Sampson County
• Davidson County	• Curtis L Brown Jr Field	• Elkin Municipal
• Charlotte-Monroe Executive	• Gastonia Municipal	• Hyde County
• Raleigh Exec Jetport at Sanford-Lee County	• Wayne Executive Jetport	• Billy Mitchell
	• Duplin County	• First Flight
	• Triangle North Executive	• Mount Olive Municipal
	• Foothills Regional	• Ocracoke Island
	• Mount Airy/Surry County	• Plymouth Municipal
	• Rockingham County NC Shiloh	• Halifax-Northampton Regional
	• Rutherford County-Marchman Field	• Jackson County
	• Shelby-Cleveland County Regional	• Tarboro-Edgecombe
	• Siler City Municipal	
	• Henderson Field	

2100: Perimeter Fencing

Perimeter fencing serves dual roles. It increases safety around the airport by deterring wildlife from gaining access to the airfield causing possible runway incidents. Perimeter fencing also provides security to the airfield by deterring the public and unauthorized people from the airfield. The system objectives for perimeter fencing to deter wildlife are to have all Red, Blue, and Green airports have full perimeter fencing. Yellow airports are not eligible for funding for fencing within the ADP, but are required to have fencing due to their presence of commercial airline service. It is important to note that in addition to having complete perimeter fencing to deter wildlife from accessing the airfield, it is paramount to ensure that the fencing is a minimum of 8 feet tall to ensure wildlife cannot jump over the barrier.

Table 5.30 presents information regarding perimeter fencing at airports in North Carolina. As shown in Figure 5.33 only 13% of eligible airports (not including Yellow airports) meet the objective.

Figure 5.33: 2100: Existing Perimeter Fencing Compliance



Source: Airport Inventory and Data Survey 2012

The following airports need to complete perimeter fencing around their airfield and/or install 8-foot high fencing to meet the objective:

RED	BLUE	GREEN
• Michael J. Smith Field	• Stanly County	• Tri-County
• Burlington-Alamance Regional	• Western Carolina Regional	• Clinton-Sampson County
• Currituck County Regional	• Curtis L Brown Jr Field	• Northeastern Regional
• Macon County	• Gastonia Municipal	• Elkin Municipal
• Hickory Regional	• Wayne Executive Jetport	• Hyde County
• Davidson County	• Ashe County	• Billy Mitchell
• Dare County Regional	• Duplin County	• First Flight
• Charlotte-Monroe Executive	• Lincolnton Lincoln County Regional	• Mount Olive Municipal
• Cape Fear Regional Jetport	• Triangle North Executive	• Odell Williamson Municipal
• Rocky Mount Wilson Regional	• Lumberton Regional	• Ocracoke Island
• Rowan County	• Laurinburg-Maxton	• Plymouth Municipal
• Raleigh Executive	• Foothills Regional	• Halifax-Northampton Regional
• Johnston County	• Mount Airy/Surry County	• Richmond County
• Statesville Regional	• Wilkes County	• Avery County/Morrison Field
	• Rockingham County NC Shiloh	• Montgomery County
	• Person County	• Jackson County
	• Rutherford County-Marchman Field	• Tarboro-Edgecombe
	• Shelby-Cleveland County Regional	• Anson County-Jeff Cloud Field
	• Henderson Field	• Columbus County Municipal
		• Martin County

2200: Fuel Facilities

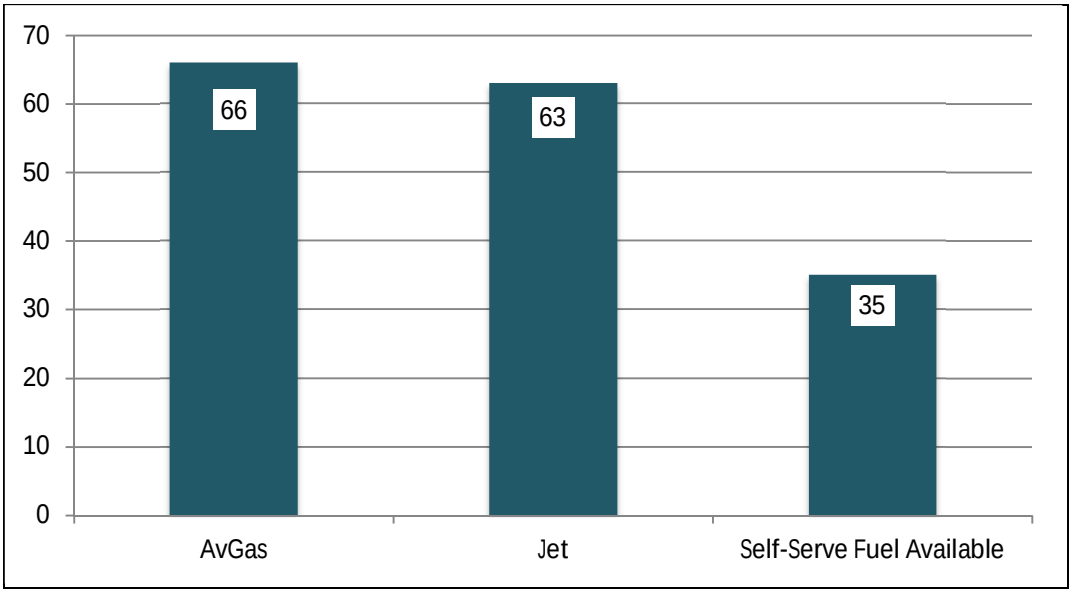
Fueling services are an important source of revenue for any airport and often the largest source of revenue next to hangar revenues. Aviation gasoline (AvGas) is a high-octane fuel used in piston-engine aircraft; jet aircraft and turboprops use kerosene-based Jet A fuel. As part of the NCASP, the ADP was updated to include fuel facilities under Category 2200: Fuel Facilities. The system objectives established by airport grouping are as follows:

- Yellow: Not eligible
- Red, Blue, Green: Based on demand

While fuel facilities were added to the ADP, these facilities will only be considered for funding for Red, Blue, and Green airports when all airside safety needs have been met.

Table 5.31 provides information for all system airports and indicates if the airport has AvGas (100LL) or Jet A fuel, the capacity of each type of fuel, and whether or not self-service is available. Figure 5.34 summarizes the information for the system.

Figure 5.34: 2200: Number of Airports with Fuel Facilities



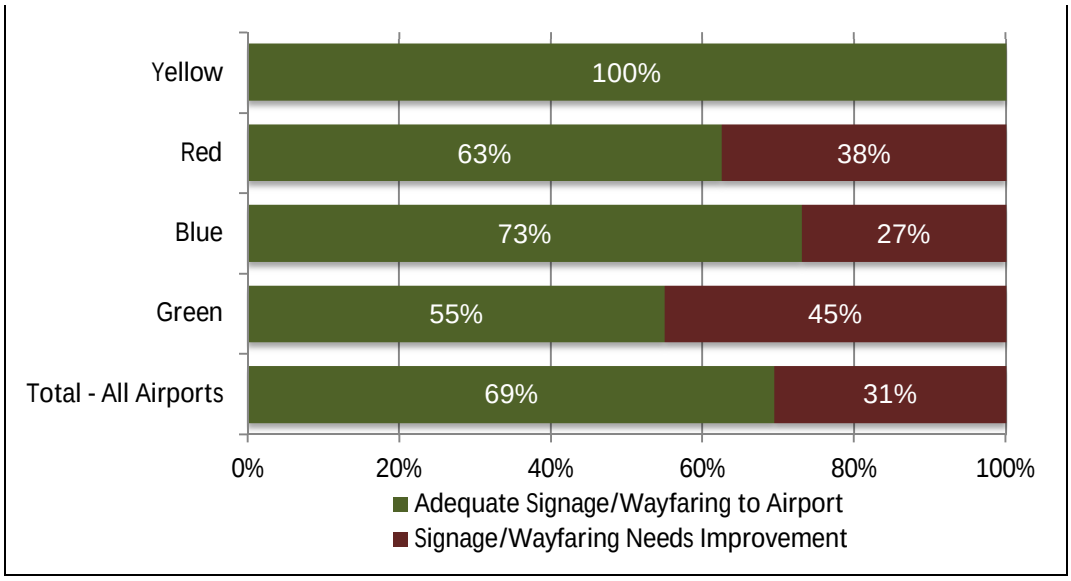
Source: Airport Inventory and Data Survey 2012

Percent of system airports that are adequately accessible in terms of signage and wayfinding

DOA recognizes that in order to truly have an accessible airport system, airport users should be able to easily find and locate airports from the nearby towns utilizing U.S., state, and local roadways. During the inventory effort of the NCASP, signage and wayfinding to each airport (excluding CLT, RDU, and GSO) was identified. In addition, airport managers/sponsors were asked if the existing signage to reach their airports was adequate. The airport managers are often the ones that hear if a user had a difficult time finding their airport.

Signage and wayfinding data for each airport is detailed in Table 5.32 including whether or not there was a sign noting the directions to the airport from a major road, the type of road, and the number of signs followed to reach the airport. Figure 5.35 presents if adequate signage was noted by airport managers. As shown, 69% of airport managers noted that existing signage is adequate, while 31% of managers noted signage was not adequate.

Figure 5.35: Percent of Airports with Adequate Signage and Wayfinding



Source: Airport Inventory and Data Survey 2012, FAA AC150/5300-13A, Change 1
Note: Data for CLT, RDU, and GSO was not available, but it was assumed that they have adequate signage.

The following airport managers or sponsors noted that improved signage and wayfinding to the airport was needed from nearby roads:

RED	BLUE	GREEN
• Macon County • Hickory Regional • Rocky Mount-Wilson Regional • Rowan County • Raleigh Exec Jetport at Sanford-Lee County • Johnston County	• Harnett Regional • Laurinburg- Maxton • Foothills Regional • Wilkes County • Person County • Shelby-Cleveland County Regional • Warren Field	• Tri-County • Northeastern Regional • Hyde County • Richmond County • Avery County/Morrison Field • Jackson County • Tarboro-Edgecombe • Anson County-Jeff Cloud Field • Martin County

Mobility

The third goal category of mobility evaluates how accessible and convenient various facets of the airport system are to aviation users. People and businesses use aviation to decrease their travel time and to improve their efficiency. A well distributed and diverse system of airports is an important feature in an overall transportation system. Given that North Carolina has distinctly varied geographic characteristics and widely distributed population, sufficient access to commercial service and general aviation airports is critical. For an airport system to adequately serve a state, it should provide the level of facilities necessary to accommodate demand from both current and future users. These users include the traveling public, as well as individual aircraft operators including those that use air travel for business and pleasure.

Airports should work closely with their local communities to ensure that they understand the important role the airport plays in providing access to local and visiting businesses and that the airport is a key economic driver to an area's prosperity. The performance measures used to evaluate North Carolina airports' mobility include the following:

- Percent of population within 30 minutes of a system airport by role grouping
- Percent of total employment/businesses within 30 minutes of a system airport
- Percent of system airports with a published instrument approach procedure
- 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)
- Percent of population within 60 minutes of a system airport with commercial airline service by at least one airline
- Percent of system airports that provide intermodal options for their community, including public transportation interfaces at the airports
- Percent of system airports with 24/7 fueling
- Percent of system airports with Jet Fuel
- Percent of system airports operating below 60% operational capacity levels
- Percent of system airports meeting service objectives (FBO, pilot training, maintenance, charter/aircraft rental, terminal amenities)
- Percent of system airports that are incorporated in local comprehensive transportation plans

The results of the system evaluation for these performance measures related to the mobility goal category are discussed in the following sections.

Percent of population within 30 minutes of a system airport by role grouping

The NPIAS contains criteria that FAA uses to establish the national airport system. One of the criteria is a 30-minute drive time for establishing the airport's service area. While this guideline is applicable primarily to general aviation airports, for this performance measure, GIS analysis was undertaken to determine the percent of North Carolina's population that are within a 30-minute drive time of any system airport. This benchmark is primarily informational in nature and helps DOA better understand the accessibility of the airport system. Analysis completed as part of this measure also provides DOA with information that shows were there are overlapping service areas among system airports. Overlaps or redundancies within the system are considered in the assignment of future airport groupings and will be evaluated in subsequent analyses.

GIS analysis presented in the maps below shows that, when all 72 system airports are considered, over 94 percent of North Carolina's population is within a 30-minute drive of at least one and, in some cases, multiple system airports. The GIS analysis was then conducted for the airports in each of the five role groupings to determine the percentage of the statewide population within a 30-minute drive time of the different airport groupings.

Table 5.33 shows the percentage of North Carolina's population that is located within a 30-minute drive time of any airport in each grouping. Fifty-two percent of the population is within a 30-minute drive time of a Yellow Airport.

Table 5.33: Percent of Statewide Population within a 30-Minute Drive Time of System Airports, by Role Grouping

Airport Group	% of Population Coverage by Individual Grouping	% of Cumulative Population Coverage
All System Airports	94%	
Yellow	52%	52% (Yellow Only)
Red	45%	73% (Yellow + Red)
Blue	33%	89% (Yellow + Red + Blue)
Green	11%	94% (Yellow + Red + Blue + Green)

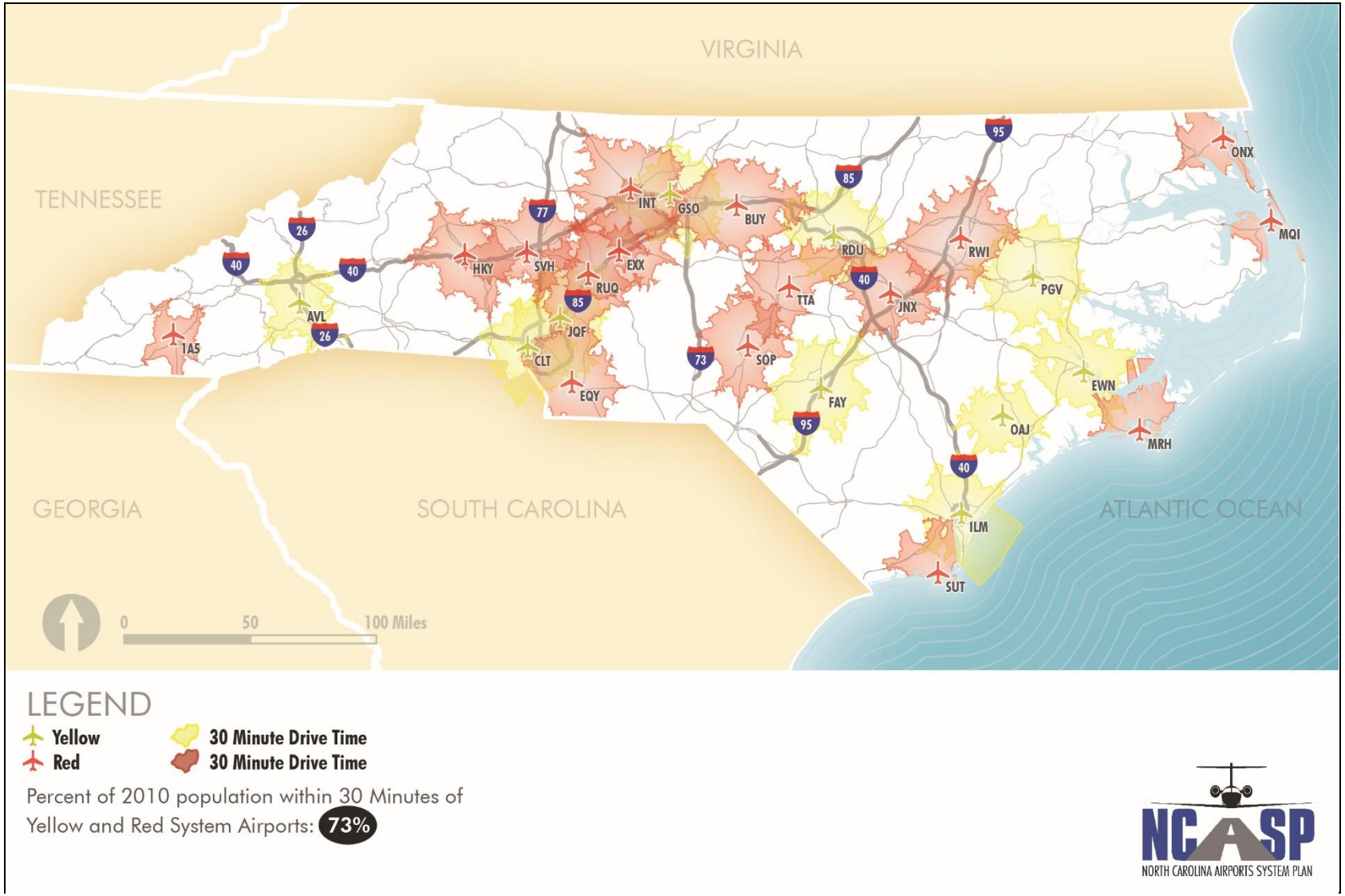
Source: Parsons Brinkerhoff GIS Analysis

This coverage of Yellow airports is graphically depicted in Figure 5.36. When 30-minute drive times of Red airports are added to the coverage provided by Yellow airports, 73% of the state population is now covered (see Figure 5.37). Figure 5.38 presents the coverage provided by system airports when the 30-minute drive times of Blue airports are added. Eighty-nine percent of the state population is located within a 30-minute drive time of Yellow, Red, and Blue airports. When the Green airport drive times are included, 94% of the statewide population is covered by 30-minute drive times of the 72-airport North Carolina system. Figure 5.39 graphically depicts the 30-minute drive time coverage for all system airports. As shown in the maps, there is significant overlap of these drive time areas for population coverage, particularly in the state's metropolitan areas and along major highways.

Figure 5.36: 30-Minute Drive Times of Yellow Airports

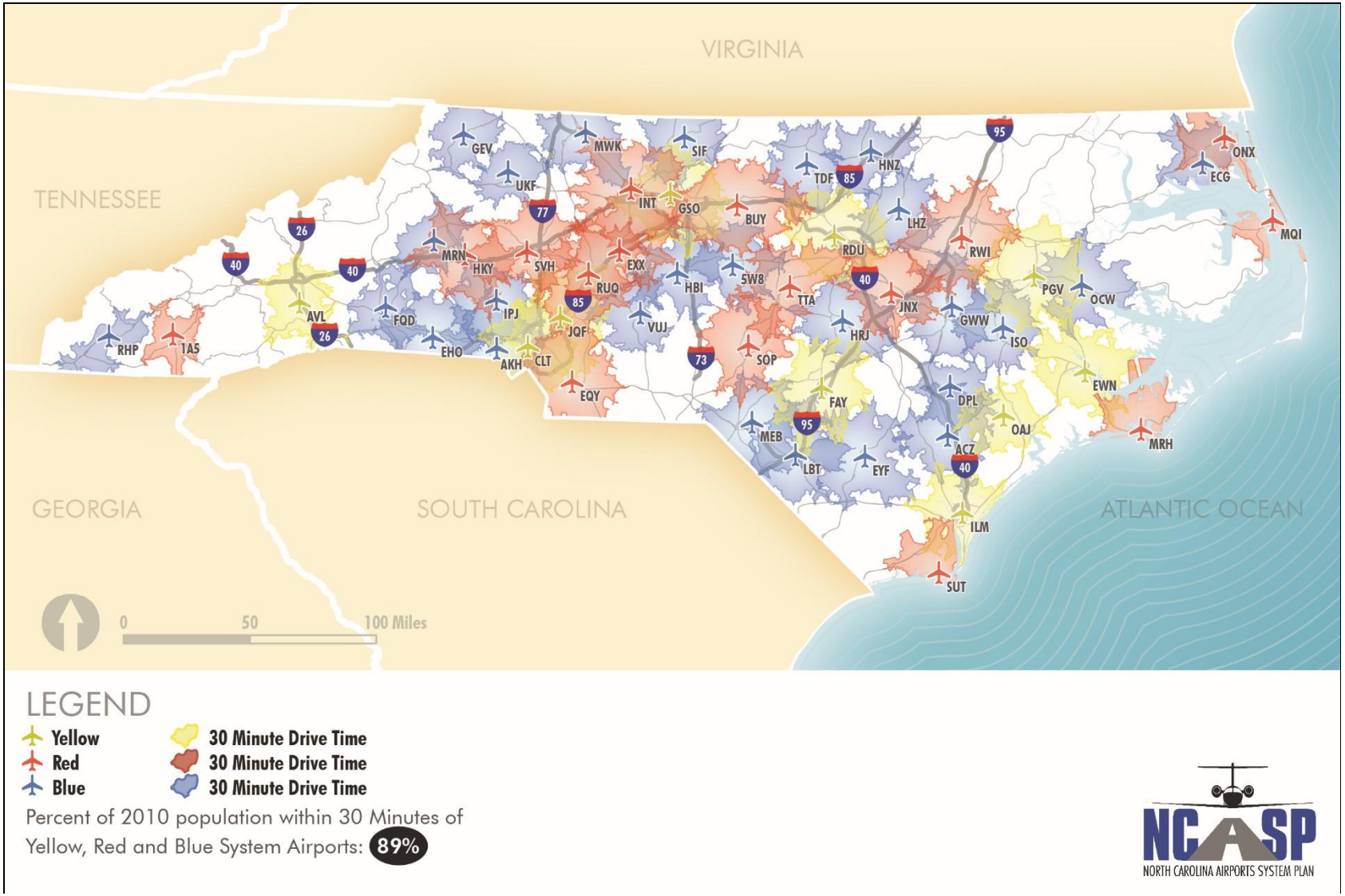
Source: Parsons Brinckerhoff GIS Analysis

Figure 5.37: 30-Minute Drive Times of Yellow and Red Airports



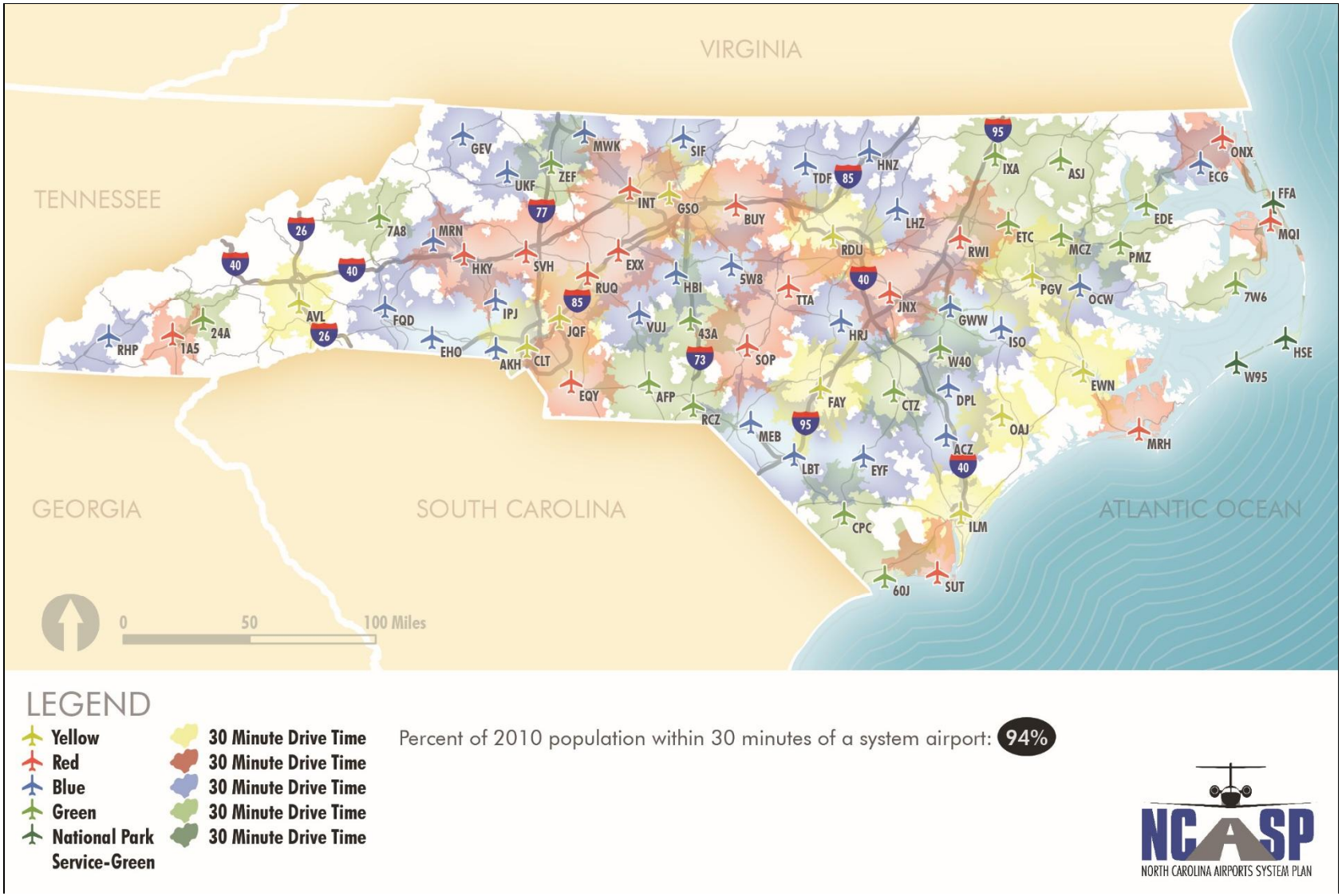
Source: Parsons Brinckerhoff GIS Analysis

Figure 5.38: 30-Minute Drive Times of Yellow, Red, and Blue Airports



Source: Parsons Brinckerhoff GIS Analysis

Figure 5.39: 30-Minute Drive Times of Yellow, Red, Blue, and Green Airports



Source: Parsons Brinckerhoff GIS Analysis

Percent of total employment/businesses within 30 minutes of a system airport

Providing air access to employment centers and businesses is another key component of a well-rounded and accessible airport system. Table 5.34 presents the percent of statewide employment that is within a 30-minute drive time of a system airport by each airport group Statewide employment was data was provided by the U.S. Census Bureau's *OnTheMap*, a web-based mapping and reporting application that shows where workers are employed and where they live.

Table 5.34: Percent of Statewide Employment within a 30-Minute Drive Time of System Airports, by Airport Group

Airport Grouping	% of Employment Coverage by Individual Grouping
All System Airports	97%
Yellow	66%
Red	52%
Blue	32%
Green	10%

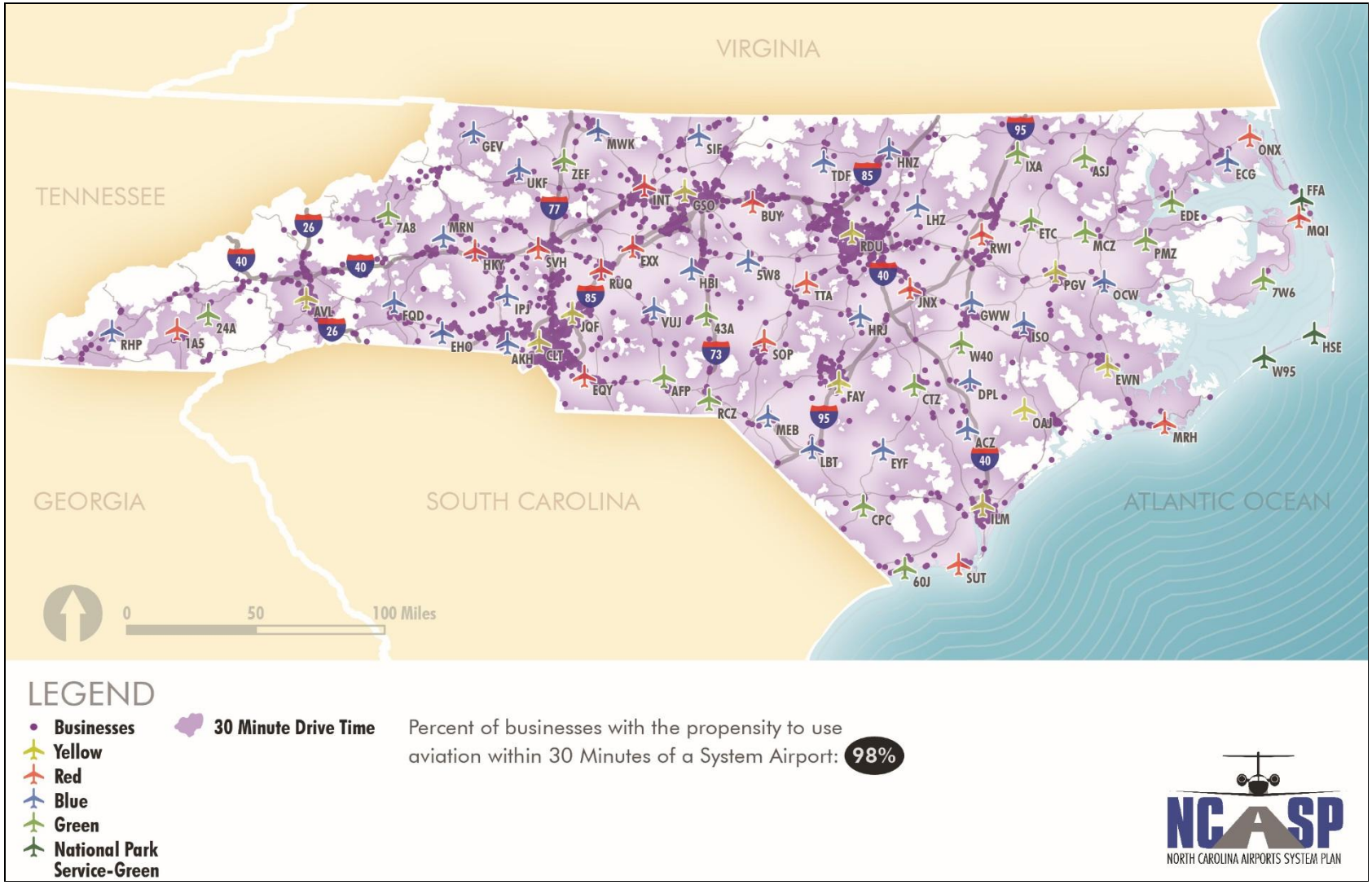
Source: Parsons Brinkerhoff GIS Analysis, 2011 U.S. Census Bureau OnTheMap

In addition to the total statewide employment or workers, noted in Table 5.34, businesses within the state with a propensity to utilize aviation were also identified in order to assess business-related demand on North Carolina's airport system. Businesses in specific North American Industry Classification System (NAICS) codes were obtained for North Carolina to determine their locations relative to system airports. Limiting this analysis to businesses having a minimum number of employees within the NAICS codes helps to identify businesses that are most likely to place measurable demand on North Carolina's system of airports. Over 3,900 businesses within the following NAICS codes that employ at least 20 employees were identified for inclusion in this analysis:

- Mining
- Heavy Construction
- Manufacturing
- Transportation (Motor Freight)
- Wholesale
- Engineering
- Business Services
- Health Services (General Medical and Specialty)
- Legal Services
- Education (Colleges)

Figure 5.40 depicts the location of these 3,900 businesses in relation to North Carolina's airports. Thirty-minute drive time market areas for the airports are also shown. As would be expected, the majority of these businesses are located in the major urban areas of the state. Of these 3,900 businesses, only 86 are located outside of these 30-minute drive time areas. This accounts for less than 2% of North Carolina businesses which have the propensity to use aviation.

Figure 5.40: Percent of Businesses with the Propensity to Use Aviation within a 30-Minute Drive Time of a System Airport

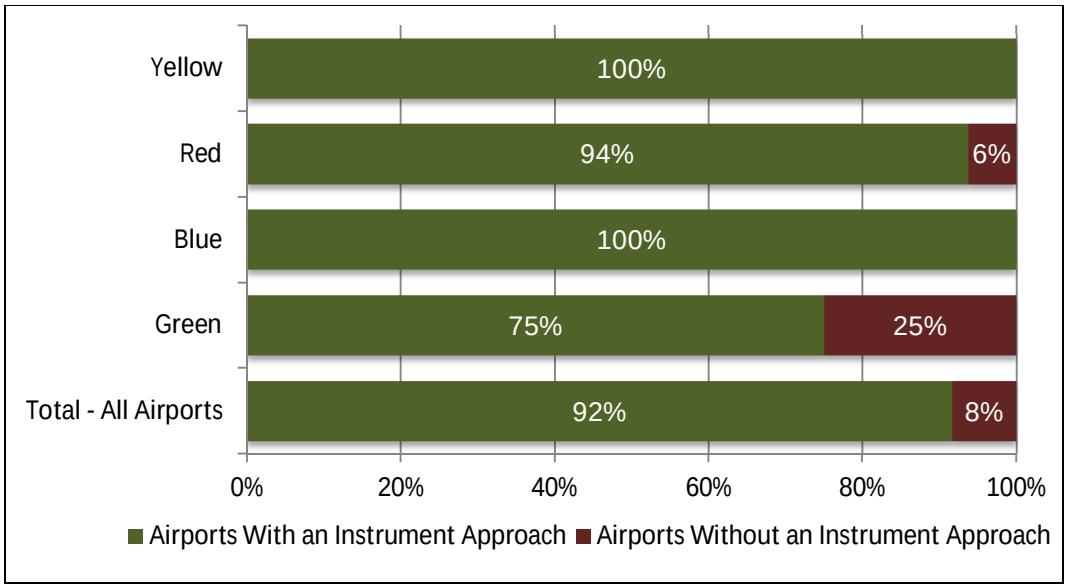


Source: Parsons Brinckerhoff GIS Analysis

Percent of system airports with a published instrument approach procedure

All types of instrument approaches, precision, near precision with vertical guidance, and non-precision, help to provide safe access to airports during instrument meteorological conditions (IMC). The most demanding published instrument approach procedure found at each system airport, if available, is presented in Table 5.35. Based on ADP objectives, all system airports should have some form of an instrument approach. As shown in Figure 5.41, 92% of system airports currently have a published instrument approach procedure, including all Yellow and Blue airports.

Figure 5.41: Percent of Airports with a Published Instrument Approach Procedure



Source: Airport Inventory and Data Survey 2012. FAA Approach Plates April 2014

The following airports do not currently have a published instrument approach procedure in place.

RED	GREEN
• Macon County (Circling approach only)	• Hyde County • First Flight • Odell Williamson Municipal • Avery County/Morrison Field • Montgomery County

Percent of population within 30 minutes of a system airport meeting business user needs (5,000' runway, jet fuel, approach (250' & 3/4m minimums), and ground transportation)

Businesses users must not only have reasonable access to airports as discussed previously in Section 4.4.2, but those airports must also meet the specific needs that business aviation presents. For the purpose of this study, the following business user needs are used to evaluate the North Carolina airport system:

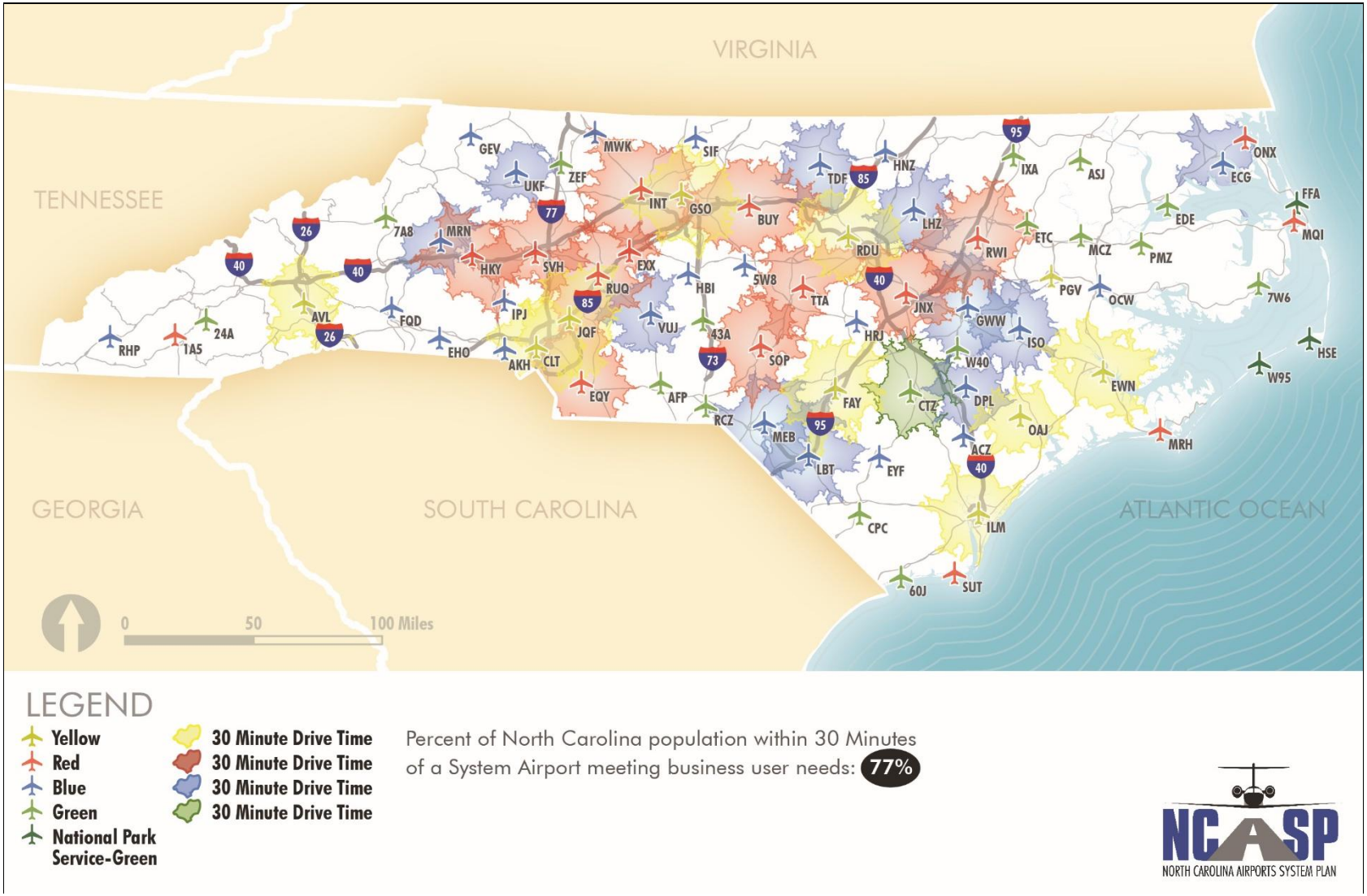
- 5,000' runway length
- Instrument approach with 250' and ¾ mile minimums
- Jet fuel
- Ground transportation (onsite rental car or access to rental car)

Figure 5.42 presents airports that meet the specific needs of business aviation and their respective 30-minute drive time market areas. These areas cover 77% of the total statewide population.

Percent of population within 60 minutes of a system airport with commercial airline service by at least one airline

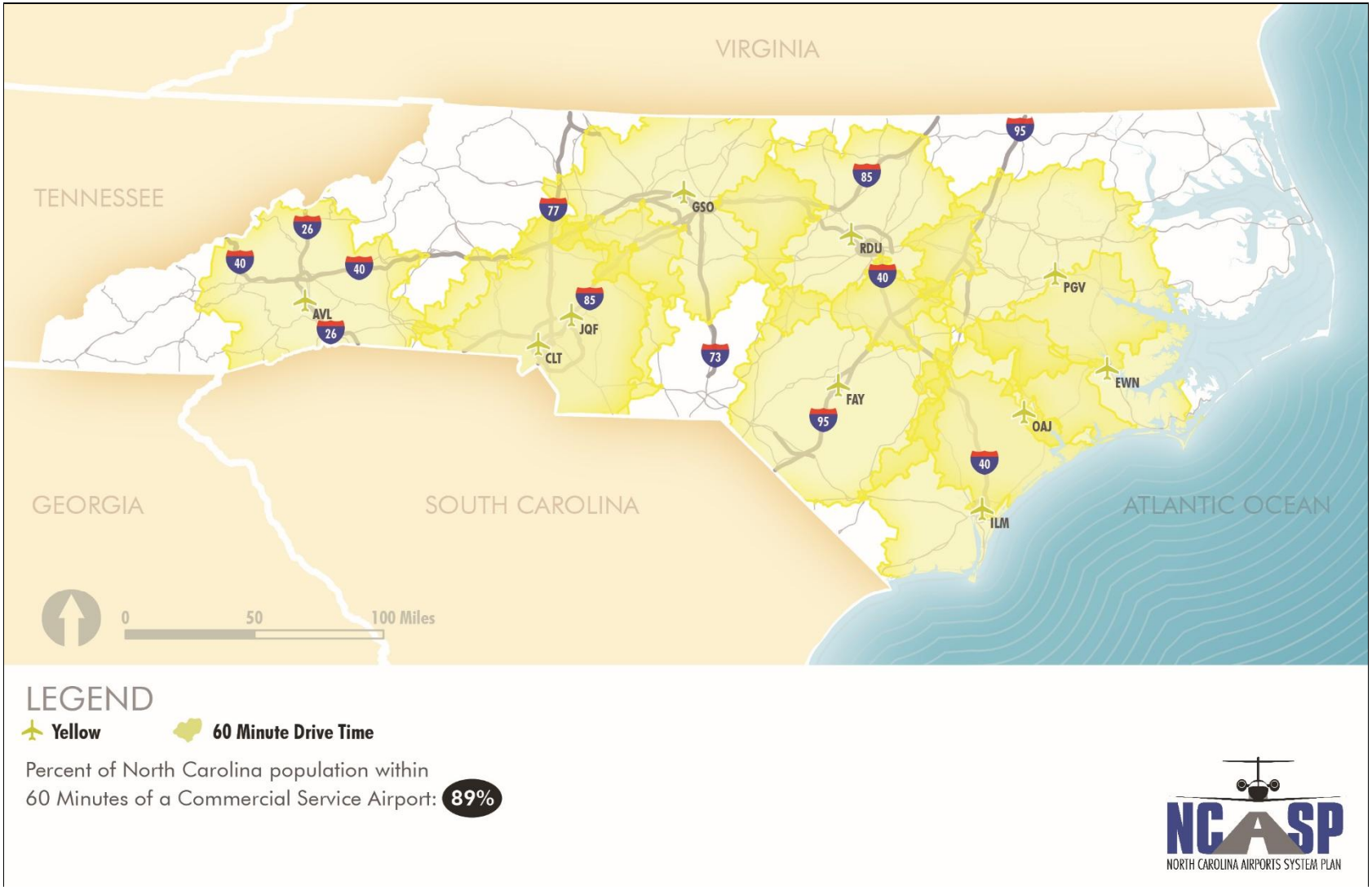
Access to an airport with commercial air service is essential to North Carolina residents, visitors, and businesses. There are presently 10 airports in North Carolina with scheduled commercial service as of April 2014. These airports comprise the Yellow group of airports in the NCASP. Figure 5.43 shows the 60-minute drive times of Yellow airports. Currently, 89% of the statewide population is within a 60-minute drive time of a Yellow airport with commercial airline service.

Figure 5.42: Percent of population within 30 minutes of a system airport meeting business user needs (5,000' runway, jet fuel, approach (250' & ¾ mile minimums), and ground transportation)



Source: Parsons Brinckerhoff GIS Analysis

Figure 5.43: Percent of Population within a 60-Minute Drive Time of an Airport with Commercial Airline Service (Yellow Airport)



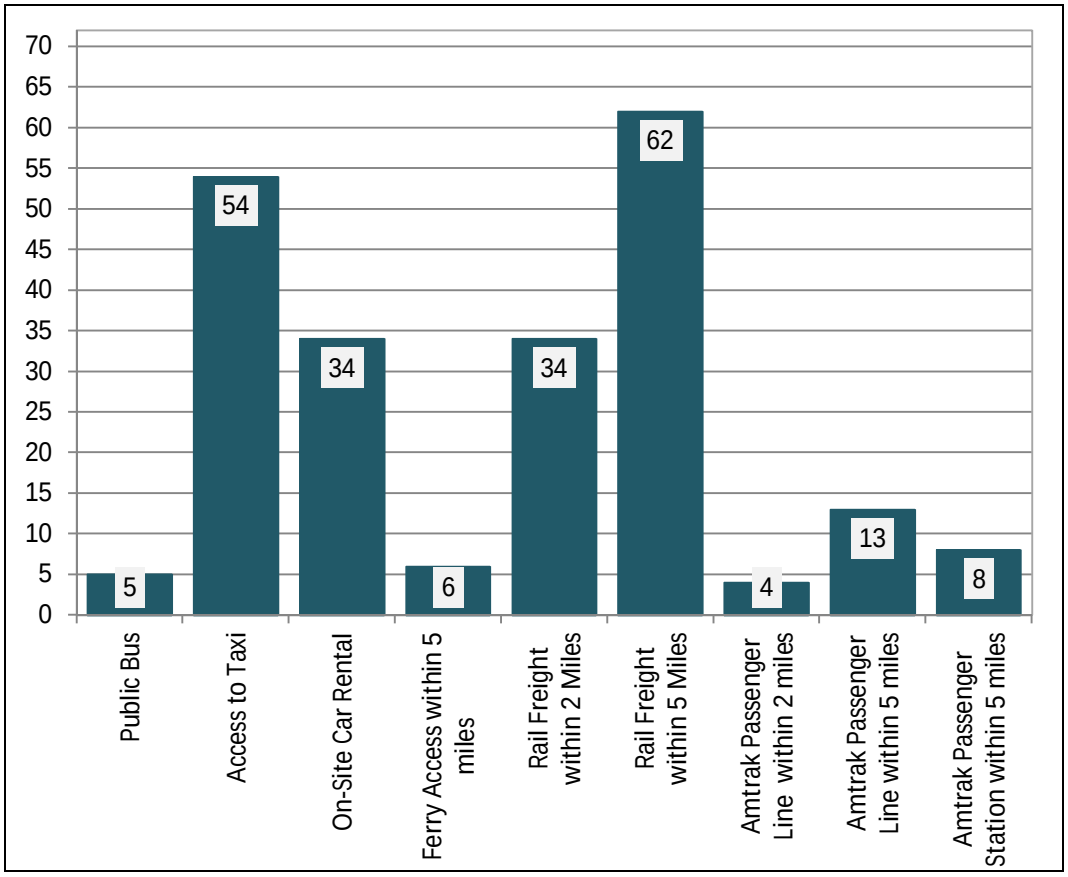
Source: Parsons Brinckerhoff GIS Analysis

Percent of system airports that provide intermodal options for their community, including public transportation interfaces at the airports

Public transportation provides easy, affordable access to visitors and employees arriving at or departing from North Carolina's airports. Just as important as courtesy car and rental car service, bus or rail modes of public transportation provide viable economic benefits to local communities. While it may not be feasible for all airports to accommodate public transportation, especially those in rural locations, the presence of an integrated public transportation system is an important asset for future growth and development.

Table 5.36 presents the airports by grouping with access to other intermodal options including public bus, taxi, rental car, ferry, rail freight, and Amtrak passenger rail lines. Figure 5.44 shows the number of airports that have access to public transportation.

Figure 5.44: Airports with Access to Intermodal Options

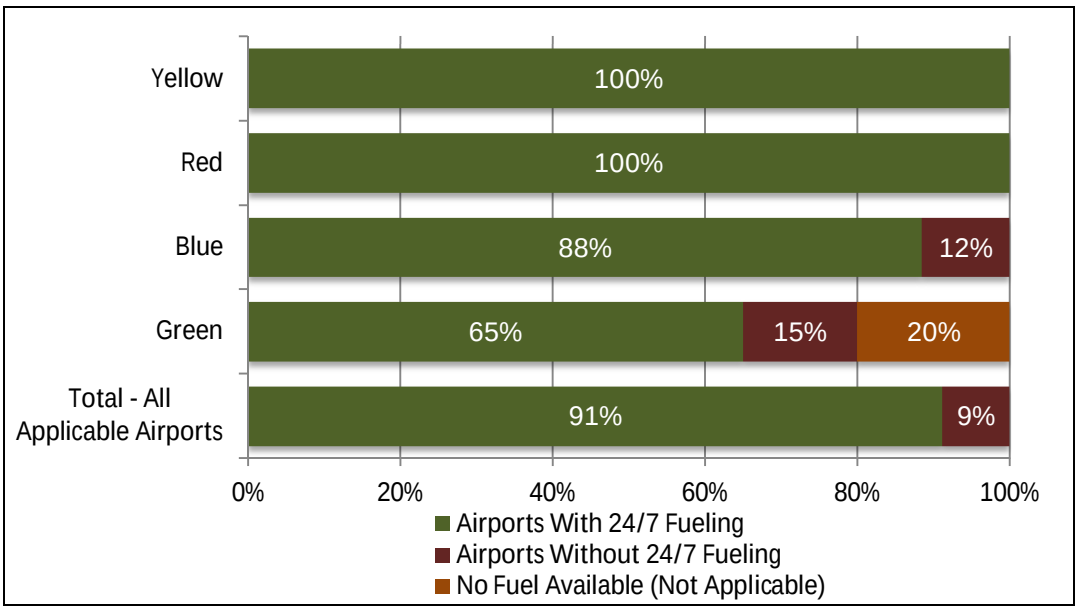


Source: Airport Inventory and Data Survey 2012, and North Carolina DOT

Percent of system airports with 24/7 fueling

The availability of fuel 24 hours a day, 7 days a week is important to general aviation pilots flying at non-peak hours or those needing emergency fuel. This 24/7 fuel may be either AvGas or Jet A fuel, and the method of distribution, such as self-serve or 24-hour on site or call-out FBO-fueling, does not matter. A system airport fulfills this measure as long as it has any type of aviation fuel available at any time. Figure 5.45 displays airports with fuel available 24/7 (either 100LL or jet fuel) by role grouping. In total, 91% of system airports that offer fuel (four system airports do not have fuel) have it available to the public 24/7. Table 5.37 presents which airports have 24/7 fueling.

Figure 5.45: Percent of Airports with 24/7 Fueling



Source: Airport Inventory and Data Survey 2012

The following airports do not currently have fuel available 24/7:

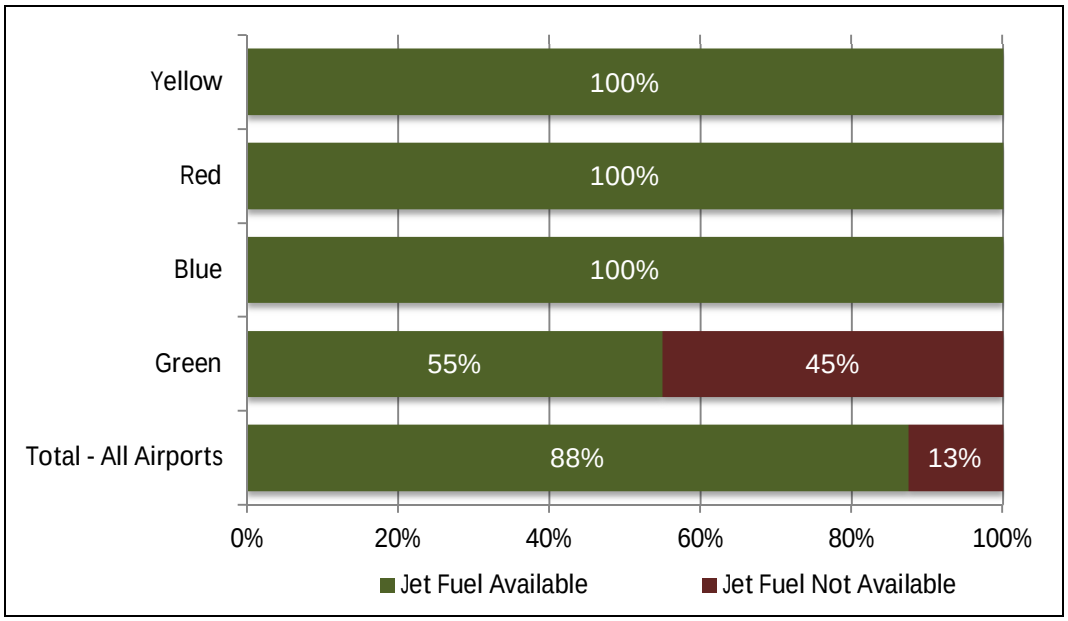
BLUE	GREEN
• Gastonia Municipal	• Tri-County
• Triangle North Executive	• Montgomery County
• Mount Airy/Surry County	• Martin County

In addition to 24/7 fueling, 48% of system airports (34) have some type of self-service fueling with a credit card reader. Half of these airports (17) provide self-service options for jet fuel and avgas. The other half offer self-service fueling for avgas only. The airports that offer self-service fueling are presented in Table 5.37.

Percent of system airports with jet fuel

Jet fuel is important not only to commercial aviation, but to corporate, charter, and many other types of general aviation operators. Jet aircraft operators, agricultural sprayers, rotary wing operators, and many other aircraft operators require Jet A fuel. Figure 5.46 provides the percentages of airports having jet fuel available to the public by role grouping. Overall, 88% of system airports offer jet fuel. All Yellow, Red, and Blue airports have jet fuel. Table 5.37 presents the airports that have jet fuel.

Figure 5.46: Percent of Airports with Jet Fuel



Source: Airport Inventory and Data Survey 2012

The following airports currently do not offer jet fuel:

GREEN

- Hyde County
- Billy Mitchell
- First Flight
- Odell Williamson
- Ocracoke Island
- Montgomery County
- Jackson County
- Tarboro-Edgecombe
- Martin County

Percent of system airports operating below 60% operational capacity

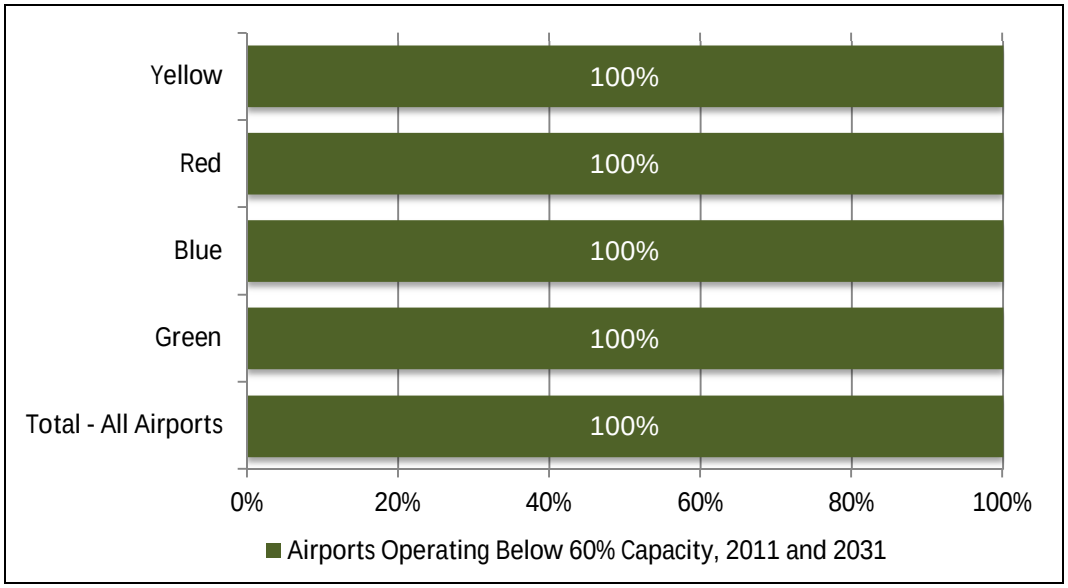
It is important for North Carolina's airport system to provide sufficient airfield operational capacity to accommodate current and future demand levels and provide efficient operations throughout the state. By comparing the annual operational demand to an airport's airfield capacity, each airport's current and forecasted demand/capacity ratio is established. This level of evaluation is appropriate for system planning needs, but it is important to note that for most large commercial airports and even some more active general aviation airports, capacity should be evaluated based on hourly conditions and not annual activity.

To examine annual capacity, each airport's Annual Service Volume (ASV) was calculated. ASV is a measure of an airport's ability to process annual operational activity based on airport characteristics such as airfield configuration, fleet mix, and instrument approach facilities. Each airport's current airfield facilities and availability of an air traffic control tower were examined and assumptions were made regarding operational fleet mix, percentage of training activity, and weather conditions (percent of time airports operate under IMC). Each airport's ASV was either calculated or obtained from a recent airport master plan. For calculations, the Airport Cooperative Research Program (ACRP) Airfield Capacity Spreadsheet Model was used.[14] This spreadsheet provides the most up-to-date method for calculating capacity and ASV as it allows for evaluation of each airport's individual conditions in a quick manner, but with more specificity than previous FAA methods such as look-up tables. The calculated ASV results from the model and the comparison to the forecasts of demand were used to develop the demand/capacity ratios. These results for each airport are depicted in Table 5.38 and summarized in Figure 5.47. This analysis was not conducted for Charlotte Douglas International, Raleigh Durham International and Piedmont Triad International airports as part of the NCASP. These airports calculate capacity and demand on an hourly basis (not annual) and for internal planning only.

For long-range planning purposes, the FAA recommends that airports that are operating at 60% of their annual capacity should begin to consider capacity-enhancing projects into their plans. When demand approaches 80% of the airport's capacity, these projects should then be implemented. Currently, there are no airports within the North Carolina system that are operating at or above 60% of their capacity, although there are a few that are projected to be close to that mark in the 20-year horizon based on 2031 operations projections.

[14] Airport Cooperative Research Program Report 79, "Evaluating Airfield Capacity", 2012.

Figure 5.47: Percent of Airports Operating Below 60% Operational Capacity in 2011 and 2031



Source: Airport Inventory and Data Survey 2012, NCASP Demand Projections
Note: Data for CLT, RDU, and GSO was not available and therefore not included in compliance calculations.

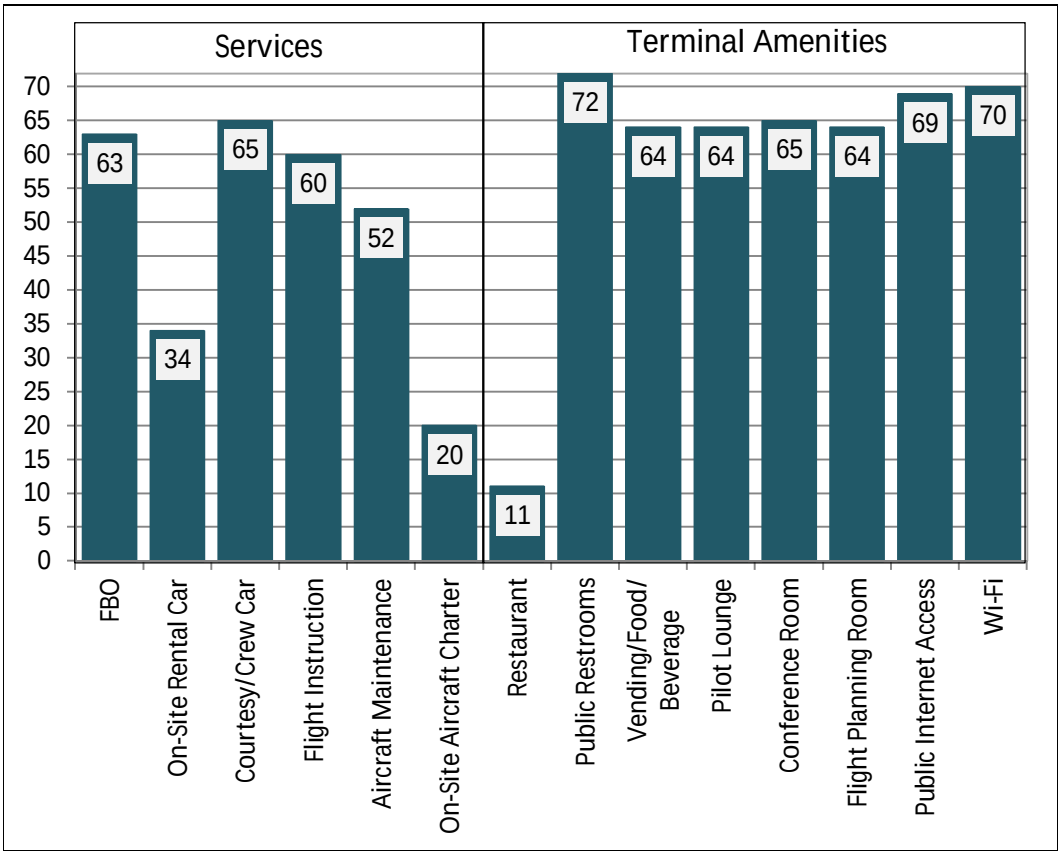
Percent of system airports meeting service objectives (FBO, pilot training, maintenance, charter, terminal amenities)

Services which are available to local pilots and tenants, as well as transient pilots are often expected necessities. Basic services that are typically welcomed at airports by pilots include public restrooms, vending or other food and beverages, and either public access to a wireless network or internet access. Additional terminal amenities such as a pilot lounge, flight planning room, and a conference room can help make a positive experience for an airport user.

The presence of a fixed base operator (FBO), which provides aviation services at an airport, is a service provided to both local and transient users. An FBO, as well as a designated maintenance facility and/or hangar, onsite charter service, and flight instruction are important services that airports can provide that are beneficial to all members of the aviation community. These services are a mechanism that airports use to be self-sufficient while conducting business and adding jobs to the economic base of the local community, region, and state. Additionally, when aircraft owners fly into an airport either for business or discretionary purposes, it is often important to have access to transportation services. Users my require onsite rental car service or access to off-site rental car service, while other times a courtesy car is acceptable to meet this demand.

Table 5.39 presents which services and terminal amenities are available at each system airport. Figure 5.48 summarizes the number of airports with each service or terminal amenity.

Figure 5.48: Airports Meeting Service Objectives

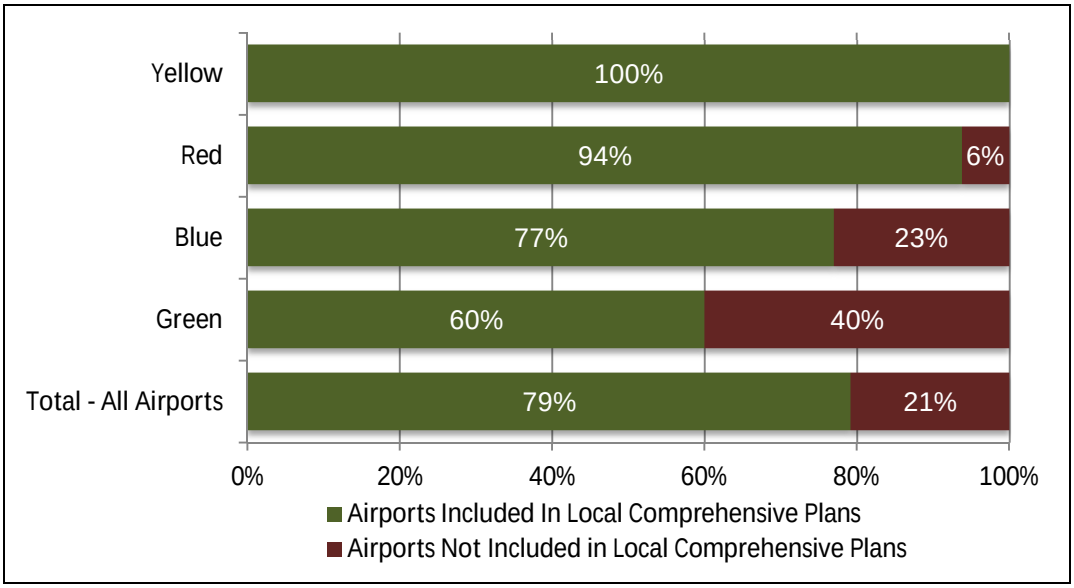


Source: Airport Inventory and Data Survey 2012

Percent of system airports that are incorporated in local comprehensive plans

Local comprehensive plans are a good indication of a host community's support and compatibility with its respective airport. If the airport is identified and approved in these plans, this tends to increase the airport's long-term viability and potential to meet future needs. As part of the inventory effort, airports were asked whether or not they were included in local comprehensive plans. An airport's inclusion in local transportation plans or regional transportation plans was not asked, but inclusion in these planning documents is a key component in protecting and promoting airports. Figure 5.49 shows that 79% of system airports are included in local comprehensive plans. The airports that are included in local comprehensive plans are depicted in Table 5.40.

Figure 5.49: Percent of Airports that are Incorporated in Local Comprehensive Plans



Source: Airport Inventory and Data Survey 2012

The following airports are currently not included in local comprehensive plans:

RED	BLUE	GREEN
• Raleigh Exec Jetport	• Stanly County • Gastonia Municipal • Lincolnton Lincoln County Regional • Wilkes County • Henderson-Oxford • Siler City Municipal	• Billy Mitchell • First Flight • Odell Williamson Municipal • Ocracoke Island • Plymouth Municipal • Halifax-Northampton Regional • Avery County/Morrison Field • Martin County

Summary

This chapter has examined the current performance of North Carolina's airport system according to the airport groupings and performance measures established in previous chapters. An adequate airport system supports the goals of safety, infrastructure health, and mobility. These goal characteristics have been used to evaluate the North Carolina's airport system's current performance. Information from this chapter coupled with analysis in the next chapter provides a basis for recommendations for the North Carolina airport system that will help to achieve a balanced, viable, effective, and efficient system of general aviation and commercial airports. The next chapter analyzes where the airport system can improve and recommendations on how this can be accomplished.

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Current System Performance

Chapter Tables

Table 5.1: Airport Control of Runway Protection Zones

Associated City	Airport Name	ID	Primary			Secondary			Meets Objective
			Primary RW	RW End	RW End	Second RW	RW End	RW End	
Yellow Airports									
Asheville	Asheville Regional	AVL	16/34	Yes	Yes				Yes
Charlotte	Charlotte/Douglas Int'l[1]	CLT	18C/36C	Partial	Partial	18L/36R	Partial	Partial	No
Concord	Concord Regional	JQF	02/20	Partial	Yes				No
Fayetteville	Fayetteville Regional/Grannis Field	FAY	04/22	Partial	Yes	10/28	Yes	Yes	No
Greensboro	Piedmont Triad Int'l[3]	GSO	5L/23R	Partial	Partial	5R/23L	Partial	Partial	No
Greenville	Pitt-Greenville	PGV	02/20	Yes	Yes	08/26	Yes	Yes	Yes
Jacksonville	Albert J. Ellis	OAJ	05/23	Yes	Yes				Yes
New Bern	Coastal Carolina Regional	EWN	04/22	Yes	Yes	14/32	Partial	Yes	No
Raleigh	Raleigh-Durham Int'l[3]	RDU	5L/23R	Partial	Partial	5R/23L	Partial	Partial	No
Wilmington	Wilmington Int'l	ILM	06/24	Partial	Partial	17/35	Partial	Partial	No
Red Airports									
Beaufort	Michael J. Smith Field[4]	MRH	08/26	Partial	Partial	03/21	Unknow	Unknow	No
Burlington	Burlington-Alamance Regional	BUY	06/24	Yes	Yes				Yes
Currituck	Currituck County Regional	ONX	05/23	Yes	Yes				Yes
Franklin	Macon County	1A5	07/25	Partial	Partial				No
Hickory	Hickory Regional	HKY	06/24	Yes	Partial	01/19	Partial	Partial	No
Lexington	Davidson County	EXX	06/24	Partial	Partial				No
Manteo	Dare County Regional	MQI	05/23	Partial	Partial	17/35	Partial	Partial	No
Monroe	Charlotte-Monroe Executive	EQY	05/23	Yes	Yes				Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	05/23	Yes	Partial				No
Pinehurst/Southern	Moore County	SOP	05/23	Partial	Partial				No
Rocky Mount	Rocky Mount-Wilson Regional	RWI	04/22	Yes	Yes				Yes
Salisbury	Rowan County	RUQ	02/20	Partial	Partial				No
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	03/21	Yes	Yes				Yes
Smithfield	Johnston County	JNX	03/21	Yes	Partial				No
Statesville	Statesville Regional	SVH	10/28	Partial	Partial				No
Winston-Salem	Smith Reynolds	INT	15/33	Partial	Partial	04/22	Yes	Partial	No

Table 5.1: Airport Control of Runway Protection Zones (Cont.)

Associated City	Airport Name	ID	Primary			Secondary			Meets Objective
			Primary RW	RW End	RW End	Second RW	RW End	RW End	
Blue Airports									
Albemarle	Stanly County	VUJ	04/22L	Partial	Partial	04/22R	Yes	Yes	No
Andrews	Western Carolina Regional	RHP	08/26	Partial	Yes				No
Asheboro	Asheboro Regional	HBI	03/21	Partial	Partial				No
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	10/28	Yes	Yes	01/19	Yes	Yes	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	15/33	Yes	Yes				Yes
Erwin	Harnett Regional Jetport	HRJ	05/23	Yes	Partial				No
Gastonia	Gastonia Municipal	AKH	03/21	Yes	Partial				No
Goldsboro	Wayne Executive Jetport	GWW	05/23	Partial	Partial				No
Jefferson	Ashe County	GEV	10/28	Yes	Partial				No
Kenansville	Duplin County	DPL	05/23	Yes	Yes				Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	05/23	Yes	Yes				Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	05/23	Yes	Yes				Yes
Louisburg	Triangle North Executive	LHZ	05/23	Partial	Partial				No
Lumberton	Lumberton Regional	LBT	05/23	Yes	Yes	13/31	Partial	Partial	No
Maxton	Laurinburg-Maxton	MEB	05/23	Yes	Yes	13/31	Yes	Yes	Yes
Morganton	Foothills Regional	MRN	03/21	Yes	Partial				No
Mount Airy	Mount Airy/Surry County	MWK	18/36	Partial	Yes				No
North Wilkesboro	Wilkes County	UKF	01/19	Yes	Yes				Yes
Oxford	Henderson-Oxford	HNZ	06/24	Partial	Partial				No
Reidsville	Rockingham County NC Shiloh	SIF	13/31	Yes	Yes				Yes
Roxboro	Person County	TDF	06/24	Yes	Yes				Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	01/19	Partial	Partial				No
Shelby	Shelby-Cleveland County Regional	EHO	05/23	Partial	Partial				No
Siler City	Siler City Municipal	5W8	04/22	Yes	Yes				Yes
Wallace	Henderson Field	ACZ	09/27	Partial	Partial				No
Washington	Warren Field	OCW	05/23	Yes	Yes	17/35	Yes	Yes	Yes

Table 5.1: Airport Control of Runway Protection Zones (Cont.)

Associated City	Airport Name	ID	Primary			Secondary			Meets Objective
			Primary RW	RW End	RW End	Second RW	RW End	RW End	
Green Airports									
Ahoskie	Tri-County	ASJ	01/19	Yes	Yes				Yes
Clinton	Clinton-Sampson County	CTZ	06/24	Yes	Yes				Yes
Edenton	Northeastern Regional	EDE	01/19	Yes	Yes				Yes
Elkin	Elkin Municipal	ZEF	07/25	Yes	Yes				Yes
Engelhard	Hyde County	7W6	11/29	Yes	Yes				Yes
Hatteras	Billy Mitchell (NPS)	HSE	07/25	No	Yes				No
Kill Devil Hills	First Flight (NPS)	FFA	04/20	Unkno	Partial				No
Mount Olive	Mount Olive Municipal	W40	05/23	Yes	Yes				Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	06/24	Partial	Partial				No
Ocracoke	Ocracoke Island Airport (NPS)	W95	06/24	No	No				No
Plymouth	Plymouth Municipal	PMZ	03/21	Partial	Yes				No
Roanoke Rapids	Halifax-Northampton Regional	IXA	02/20	Yes	Yes				Yes
Rockingham	Richmond County	RCZ	14/32	Yes	Yes	04/22	Yes	Yes	Yes
Spruce Pine	Avery County/Morrison Field	7A8	17/35	Partial	Partial				No
Star	Montgomery County	43A	03/21	Yes	Partial				No
Sylva	Jackson County	24A	15/33	Yes	Yes				Yes
Tarboro	Tarboro-Edgecombe	ETC	09/27	Yes	Partial				No
Wadesboro	Anson County-Jeff Cloud Field	AFP	16/34	Partial	Yes				No
Whiteville	Columbus County Municipal	CPC	06/24	Yes	Yes				Yes
Williamston	Martin County	MCZ	03/21	Partial	Yes				No

Source: NCASP Inventory Data, 2011

Notes:

1. Charlotte Douglas International has 2 additional runways (18R/36L and 05/23) that are not listed. The airport has partial control of each of the runway end's RPZs.
2. Piedmont Triad International has a third runway (14/32) that is not listed in this table. The Piedmont Triad Airport Authority (PTAA) has partial controlling interest in over each runway end.
3. Raleigh-Durham International has a third runway (14/32) that is not listed in table. The airport has full fee simple ownership of the runway RPZ.
4. Michael J. Smith Field has a third runway (14/32) that is not listed in this table. It is unknown whether or not the airport has controlling interest in 14/32 runway ends.

Table 5.2: Airport Wildlife Hazard Evaluations

Associated City	Airport Name	ID	Wildlife Hazard Site Visit Date	Wildlife Hazard Assessment Date	Wildlife Hazard Mgmt Plan Date
Yellow Airports					
Asheville	Asheville Regional	AVL		March 2010	January 2010
Charlotte	Charlotte/Douglas Int'l	CLT		Update in progress	Update in progress
Concord	Concord Regional	JQF	September 2005	April 2007	
Fayetteville	Fayetteville Regional/Grannis Field	FAY	May 2003	September 2008	January 2010
Greensboro	Piedmont Triad Int'l	GSO	November 2002		Update in Progress
Greenville	Pitt-Greenville	PGV		August 2010	September 2010
Jacksonville	Albert J. Ellis	OAJ	April 2006	February 2012	July 2012
New Bern	Coastal Carolina Regional	EWN	August 2007	March 2010	
Raleigh	Raleigh-Durham Int'l	RDU	March 2005		April 2014 (Review of 2012 Approved Plan)
Wilmington	Wilmington Int'l	ILM		November 2007	June 2009
Red Airports					
Beaufort	Michael J. Smith Field	MRH	August 2009		
Burlington	Burlington-Alamance Regional	BUY	January 2008		
Currituck	Currituck County Regional	ONX	February 2007		
Franklin	Macon County	1A5	June 2013		
Hickory	Hickory Regional	HKY	September 2005		January 2015
Lexington	Davidson County	EXX	January 2007		
Manteo	Dare County Regional	MQI	January 2006		
Monroe	Charlotte-Monroe Executive	EQY	December 2011		
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	September 2005		
Pinehurst/Southern Pines	Moore County	SOP	November 2011		January 2015
Rocky Mount	Rocky Mount-Wilson Regional	RWI	June 2006	In progress	
Salisbury	Rowan County	RUQ	January 2007		
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	November 2008		
Smithfield	Johnston County	JNX	November 2007		
Statesville	Statesville Regional	SVH	June 2007		
Winston-Salem	Smith Reynolds	INT	January 2006	March 2013	April 2013

Table 5.2: Airport Wildlife Hazard Evaluations (Cont.)

Associated City	Airport Name	ID	Wildlife Hazard Site Visit Date	Wildlife Hazard Assessment Date	Wildlife Hazard Mgmt Plan Date
Blue Airports					
Albemarle	Stanly County	VUJ	May 2005		
Andrews	Western Carolina Regional	RHP	January 2006		
Asheboro	Asheboro Regional	HBI	August 2011		
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	October 2009		
Elizabethtown	Curtis L Brown Jr Field	EYF	January 2006		
Erwin	Harnett Regional Jetport	HRJ	August 2007		
Gastonia	Gastonia Municipal	AKH	April 2009		
Goldsboro	Wayne Executive Jetport	GWW	September 2009		
Jefferson	Ashe County	GEV	January 2008		
Kenansville	Duplin County	DPL	January 2006		
Kinston	Kinston Regional Jetport at Stallings Field	ISO	November 2007	March 2012	October 2012
Lincolnton	Lincolnton Lincoln County Regional	IPJ	January 2006		
Louisburg	Triangle North Executive	LHZ	June 2013		
Lumberton	Lumberton Regional	LBT	January 2007		
Maxton	Laurinburg-Maxton	MEB	June 2013		
Morganton	Foothills Regional	MRN	November 2011		
Mount Airy	Mount Airy/Surry County	MWK	May 2009		
North Wilkesboro	Wilkes County	UKF	May 2012		
Oxford	Henderson-Oxford	HNZ	June 2013		
Reidsville	Rockingham County NC Shiloh	SIF	June 2013		
Roxboro	Person County	TDF	November 2012		
Rutherfordton	Rutherford County-Marchman Field	FQD	January 2008		
Shelby	Shelby-Cleveland County Regional	EHO	April 2009		
Siler City	Siler City Municipal	5W8	March 2010		
Wallace	Henderson Field	ACZ	November 2007		
Washington	Warren Field	OCW	January 2006		

Table 5.2: Airport Wildlife Hazard Evaluations (Cont.)

Associated City	Airport Name	ID	Wildlife Hazard Site Visit Date	Wildlife Hazard Assessment Date	Wildlife Hazard Mgmt Plan Date
Green Airports					
Ahoskie	Tri-County	ASJ	February 2010		
Clinton	Clinton-Sampson County	CTZ	February 2012		
Edenton	Northeastern Regional	EDE	October 2009		
Elkin	Elkin Municipal	ZEF	July 2005		
Engelhard	Hyde County	7W6	April 2009		
Hatteras	Billy Mitchell (NPS)	HSE	January 2008		
Kill Devil Hills	First Flight (NPS)	FFA	October 2011		
Mount Olive	Mount Olive Municipal	W40	October 2009		
Ocean Isle Beach	Odell Williamson Municipal	60J	June 2012		
Ocracoke	Ocracoke Island Airport (NPS)	W95	January 2008		
Plymouth	Plymouth Municipal	PMZ	December 2007		
Roanoke Rapids	Halifax-Northampton Regional	IXA	June 2013		
Rockingham	Richmond County	RCZ	June 2010		
Spruce Pine	Avery County/Morrison Field	7A8	June 2013		
Star	Montgomery County	43A	January 2008		
Sylva	Jackson County	24A	June 2013		
Tarboro	Tarboro-Edgecombe	ETC	November 2008		
Wadesboro	Anson County-Jeff Cloud Field	AFP	October 2011		
Whiteville	Columbus County Municipal	CPC	February 2007		
Williamston	Martin County	MCZ	December 2009		

Source: NC DOA

Table 5.3: Airports with an Airport Emergency Plan, General Aviation Security Plan and that Support Search and Rescue

Associated City	Airport Name	ID	Airport Emergency Plan	General Aviation Security Plan	Support Search and Rescue
Yellow Airports					
Asheville	Asheville Regional	AVL	Yes	NA	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	Yes	NA	Yes
Concord	Concord Regional	JQF	Yes	NA	No
Fayetteville	Fayetteville Regional/Grannis Field	FAY	Yes	NA	Yes
Greensboro	Piedmont Triad Int'l	GSO	Yes	NA	Yes
Greenville	Pitt-Greenville	PGV	Yes	NA	No
Jacksonville	Albert J. Ellis	OAJ	Yes	NA	Yes
New Bern	Coastal Carolina Regional	EWN	Yes	NA	Yes
Raleigh	Raleigh-Durham Int'l	RDU	Yes	NA	Yes
Wilmington	Wilmington Int'l	ILM	Yes	NA	Yes
Red Airports					
Beaufort	Michael J. Smith Field	MRH	Yes	No	Yes
Burlington	Burlington-Alamance Regional	BUY	No	No	Yes
Currituck	Currituck County Regional	ONX	Yes	No	No
Franklin	Macon County	1A5	No	No	Yes
Hickory	Hickory Regional	HKY	Yes	Yes	No
Lexington	Davidson County	EXX	No	No	No
Manteo	Dare County Regional	MQI	Yes	Yes	No
Monroe	Charlotte-Monroe Executive	EQY	Yes	Yes	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	Yes	Yes	Yes
Pinehurst/Southern Pines	Moore County	SOP	Yes	Yes	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	Yes	No	Yes
Salisbury	Rowan County	RUQ	Yes	Yes	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	Yes	Yes	Yes
Smithfield	Johnston County	JNX	Yes	No	Yes
Statesville	Statesville Regional	SVH	Yes	No	No
Winston-Salem	Smith Reynolds	INT	Yes	No	Yes

Table 5.3: Airports with an Airport Emergency Plan, General Aviation Security Plan and that Support Search and Rescue (Cont.)

Associated City	Airport Name	ID	Airport Emergency Plan	General Aviation Security Plan	Support Search and Rescue
Blue Airports					
Albemarle	Stanly County	VUJ	No	No	No
Andrews	Western Carolina Regional	RHP	No	No	Yes
Asheboro	Asheboro Regional	HBI	Yes	No	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	Yes	Yes	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	No	No	No
Erwin	Harnett Regional Jetport	HRJ	No	No	No
Gastonia	Gastonia Municipal	AKH	Yes	Yes	No
Goldsboro	Wayne Executive Jetport	GWW	Yes	Yes	Yes
Jefferson	Ashe County	GEV	Yes	Yes	Yes
Kenansville	Duplin County	DPL	No	No	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	Yes	Yes	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	Yes	No	Yes
Louisburg	Triangle North Executive	LHZ	No	No	No
Lumberton	Lumberton Regional	LBT	No	No	Yes
Maxton	Laurinburg-Maxton	MEB	Yes	Yes	Yes
Morganton	Foothills Regional	MRN	No	No	Yes
Mount Airy	Mount Airy/Surry County	MWK	No	No	Yes
North Wilkesboro	Wilkes County	UKF	Yes	No	No
Oxford	Henderson-Oxford	HNZ	No	No	No
Reidsville	Rockingham County NC Shiloh	SIF	No	Yes	No
Roxboro	Person County	TDF	Yes	No	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	No	No	No
Shelby	Shelby-Cleveland County Regional	EHO	Yes	No	Yes
Siler City	Siler City Municipal	5W8	Yes	No	Yes
Wallace	Henderson Field	ACZ	Yes	No	No
Washington	Warren Field	OCW	Yes	No	No

Table 5.3: Airports with an Airport Emergency Plan, General Aviation Security Plan and that Support Search and Rescue (Cont.)

Associated City	Airport Name	ID	Airport Emergency Plan	General Aviation Security Plan	Support Search and Rescue
Green Airports					
Ahoskie	Tri-County	ASJ	No	No	No
Clinton	Clinton-Sampson County	CTZ	No	No	Yes
Edenton	Northeastern Regional	EDE	Yes	Yes	Yes
Elkin	Elkin Municipal	ZEF	No	No	No
Engelhard	Hyde County	7W6	No	No	No
Hatteras	Billy Mitchell (NPS)	HSE	No	No	Yes
Kill Devil Hills	First Flight (NPS)	FFA	No	No	No
Mount Olive	Mount Olive Municipal	W40	No	No	No
Ocean Isle Beach	Odell Williamson Municipal	60J	No	No	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95	No	No	Yes
Plymouth	Plymouth Municipal	PMZ	Yes	No	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	No	No	Yes
Rockingham	Richmond County	RCZ	No	Yes	Yes
Spruce Pine	Avery County/Morrison Field	7A8	Yes	No	Yes
Star	Montgomery County	43A	No	No	No
Sylva	Jackson County	24A	No	No	No
Tarboro	Tarboro-Edgecombe	ETC	No	No	No
Wadesboro	Anson County-Jeff Cloud Field	AFP	No	No	No
Whiteville	Columbus County Municipal	CPC	No	No	Yes
Williamston	Martin County	MCZ	Yes	No	No

Source: NCASP Inventory Data, 2012

Table 5.4: Airports Meeting 2013 FAA Taxiway Geometry Standards

Associated City	Airport Name	Existing Taxiway	Direct Access	Three Node	Wide Expanse
Yellow Airports:					
Asheville	Asheville Regional	Full Parallel			
Charlotte	Charlotte/Douglas Int'l	Full Parallel	13	3	1
Concord	Concord Regional	Full Parallel	2		
Fayetteville	Fayetteville Regional/Grannis Field	Full Parallel	3		
Greensboro	Piedmont Triad Int'l	Full Parallel	6		
Greenville	Pitt-Greenville	Full Parallel	2		
Jacksonville	Albert J. Ellis	Full Parallel	1		
New Bern	Coastal Carolina Regional	Full Parallel	4		
Raleigh	Raleigh-Durham Int'l	Full Parallel	7		2
Wilmington	Wilmington Int'l	Full Parallel	4	1	
Red Airports:					
Beaufort	Michael J. Smith Field	Partial Parallel			
Burlington	Burlington-Alamance Regional	Full Parallel	5		
Currituck	Currituck County Regional	Connector	2		
Franklin	Macon County	Full Parallel	1		
Hickory	Hickory Regional	Full Parallel	4	1	
Lexington	Davidson County	Full Parallel	2		
Manteo	Dare County Regional	Full Parallel	3		
Monroe	Charlotte-Monroe Executive	Full Parallel	3		
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	Full Parallel	2		
Pinehurst/Southern Pines	Moore County	Full Parallel	2		
Rocky Mount	Rocky Mount-Wilson Regional	Full Parallel	2		
Salisbury	Rowan County	Full Parallel	3		
Sanford	Raleigh Exec Jetport at Sanford-Lee County	Full Parallel	2		
Smithfield	Johnston County	Full Parallel	4		
Statesville	Statesville Regional	Full Parallel	2		
Winston-Salem	Smith Reynolds	Full Parallel	7		

Table 5.4: Airports Meeting 2013 FAA Taxiway Geometry Standards (Cont.)

Associated City	Airport Name	Existing Taxiway	Direct Access	Three Node	Wide Expanse
Blue Airports					
Albemarle	Stanly County	Full Parallel	5		
Andrews	Western Carolina Regional	Partial Parallel	3		
Asheboro	Asheboro Regional	Full Parallel	2		
Elizabeth City	Elizabeth City CG Air Station/Regional	Turnarounds on Both Ends	6		
Elizabethtown	Curtis L Brown Jr Field	Full Parallel	1		
Erwin	Harnett Regional Jetport	Full Parallel	2		
Gastonia	Gastonia Municipal	Full Parallel	3		
Goldsboro	Wayne Executive Jetport	Full Parallel	2		
Jefferson	Ashe County	Connector	1		
Kenansville	Duplin County	Full Parallel	1		
Kinston	Kinston Regional Jetport at Stallings Field	Full Parallel	2		
Lincolnton	Lincolnton Lincoln County Regional	Full Parallel	2		
Louisburg	Triangle North Executive	Full Parallel	1		
Lumberton	Lumberton Regional	Partial Parallel	2		
Maxton	Laurinburg-Maxton	Full Parallel	5		
Morganton	Foothills Regional	Partial Parallel	2		
Mount Airy	Mount Airy/Surry County	Partial Parallel	3		
North Wilkesboro	Wilkes County	Full Parallel	1		
Oxford	Henderson-Oxford	Full Parallel	1		
Reidsville	Rockingham County NC Shiloh	Full Parallel	3		
Roxboro	Person County	Full Parallel	1		
Rutherfordton	Rutherford County-Marchman Field	Full Parallel	1		
Shelby	Shelby-Cleveland County Regional	Full Parallel	2		
Siler City	Siler City Municipal	Turnarounds on Both Ends	1		
Wallace	Henderson Field	Stubs on Both Ends	1		
Washington	Warren Field	Full Parallel	2		

Table 5.4: Airports Meeting 2013 FAA Taxiway Geometry Standards (Cont.)

Associated City	Airport Name	Existing Taxiway	Direct Access	Three Node	Wide Expanse
Green Airports:					
Ahoskie	Tri-County	Partial Parallel	2		
Clinton	Clinton-Sampson County	Full Parallel	1		
Edenton	Northeastern Regional	Full Parallel	1		
Elkin	Elkin Municipal	Connector	1		
Engelhard	Hyde County	Connector	1		
Hatteras	Billy Mitchell (NPS)	Connector and Turnaround	2		
Kill Devil Hills	First Flight (NPS)	Turnarounds on Both Ends	1		
Mount Olive	Mount Olive Municipal	Connector	1		
Ocean Isle Beach	Odell Williamson Municipal	Connector	1		
Ocracoke	Ocracoke Island Airport (NPS)	Turnarounds on Both Ends	2		
Plymouth	Plymouth Municipal	Connector	1		
Roanoke Rapids	Halifax-Northampton Regional	Full Parallel	1		
Rockingham	Richmond County	Full Parallel	1		
Spruce Pine	Avery County/Morrison Field	Stubs on Both Ends	2		
Star	Montgomery County	Turnaround and Connector	2		
Sylva	Jackson County	Stubs on Both Ends	1		
Tarboro	Tarboro-Edgecombe	Turnaround and Connector	1		
Wadesboro	Anson County-Jeff Cloud Field	Full Parallel	1		
Whiteville	Columbus County Municipal	Turnaround and Connector	1		
Williamston	Martin County	Turnaround and Connector	1		

Source: NCASP Inventory Data, 2012, Google Earth, Landrum & Brown

Table 5.5: Airports Meeting FAA Threshold Siting Surface Requirements

Associated City	Airport Name	Existing Instrument Approach	Lowest Existing Approach Minimums (Decision Altitude - DA)	Height Above Touchdown (HAT)	Visibility (sm or RVR)	Date of Most Recent 18-B Survey	C/D Category Aircraft Approach	Night Approach
Yellow Airports: PA <250' and <3/4 mile								
Asheville	Asheville Regional	Precision	2340/24	200	1/2	4/11/00	Both	Yes
Charlotte	Charlotte/Douglas Int'l	Precision	106/12 (CAT II)	100	1200	2/18/06	Both	Yes
Concord	Concord Regional	Precision	905-1/2	200	1/2	3/04/05	Both	Yes
Fayetteville	Fayetteville Regional/Grannis Field	Precision	384/24	200	1/2	12/01/06	Both	Yes
Greensboro	Piedmont Triad Int'l	Precision	106/12 (CAT II)	100	989	12/14/08	Both	Yes
Greenville	Pitt-Greenville	Precision	319- 3/4	294	3/4	11/22/06	Both	Yes
Jacksonville	Albert J. Ellis	Precision	289-1/2	200	1/2	5/19/09	Both	Yes
New Bern	Coastal Carolina Regional	Precision	267-3/4	250	3/4	1/05/11	Both	Yes
Raleigh	Raleigh-Durham Int'l	Precision	105/12 (CAT II)	100	1200	4/21/01	Both	Yes
Wilmington	Wilmington Int'l	Precision	220/24	200	2400	5/27/10	Both	Yes
Red Airports: AVP 250' and 3/4 mile								
Beaufort	Michael J. Smith Field	RNAV LPV	360-1	354	1	10/31/07	Both	No
Burlington	Burlington-Alamance Regional	Precision	866-3/4	250	3/4	8/12/08	Both	Yes
Currituck	Currituck County Regional	RNAV LPV	343-1 1/4	325	1 1/4	7/27/07	Both	Yes
Franklin	Macon County	Non-Precision (Circling)	3620-1 1/4 (A) 3620-1 1/2 (B)	1600	1 1/4	None	C Only	No
Hickory	Hickory Regional	Precision	1390-1/2	200	1/2	4/09/08	Both	Yes
Lexington	Davidson County	Precision	982-7/8	250	7/8	2/19/09	C Only	Yes
Manteo	Dare County Regional	RNAV LPV	259-3/4	250	3/4	10/13/08	C Only	Yes
Monroe	Charlotte-Monroe Executive	Precision	878-1/2	200	1/2	None	Both	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	RNAV LPV	283-1	258	1	8/19/10	C Only	No
Pinehurst/ Southern Pines	Moore County	Precision	655-1/2	200	1/2	4/15/11	Both	Yes
Rocky Mount	Rocky Mount-Wilson Regional	Precision	409 3/4	250	3/4	9/27/11	Both	Yes
Salisbury	Rowan County	Precision	966 1/2	200	1/2	3/13/09	Both	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	Precision	446-1/2	200	1/2	2/05/09	Both	Yes
Smithfield	Johnston County	Precision	347-1/2	200	1/2	12/15/09	Both	Yes

Table 5.5: Airports Meeting FAA Threshold Siting Surface Requirements (Cont.)

Associated City	Airport Name	Existing Instrument Approach	Lowest Existing Approach Minimums (Decision Altitude - DA)	Height Above Touchdown (HAT)	Visibility (sm or RVR)	Date of Most Recent 18-B Survey	C/D Category Aircraft Approach	Night Approach
Red Airports: AVP 250' and 3/4 mile								
Statesville	Statesville Regional	Precision	1166-1/2	200	1/2	9/16/11	Both	Yes
Winston-Salem	Smith Reynolds	Precision	1141/24	200	24	12/10/99	Both	Yes
Blue Airports: AVP 250' and 3/4 mile								
Albemarle	Stanly County	Precision	784-3/4	200	3/4	10/26/08	Both	Yes
Andrews	Western Carolina Regional	RNAV LPV	4020-1 1/4 (A), 4020-1 1/2 (B)	2329	1 1/4	None	C Only	Yes
Asheboro	Asheboro Regional	RNAV LPV	1220-1	547	1	9/20/11	Both	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	Precision	211-3/4	200	3/4	5/15/05	Both	Yes
Elizabethtown	Curtis L Brown Jr Field	RNAV LPV	331-3/4	200	3/4	5/27/09	Both	Yes
Erwin	Harnett Regional Jetport	RNAV LPV	474-1	279	1	8/30/05	C Only	Yes
Gastonia	Gastonia Municipal	RNAV LPV	1111-1 1/4	313	1 1/4	11/03/05	C Only	Yes
Goldsboro	Wayne Executive Jetport	Precision	333-5/8	200	5/8	2/26/09	Both	Yes
Jefferson	Ashe County	LNAV	4160-1 1/4 (A), 4160-1 1/2 (B)	1004	1 1/4	1/22/10	Both	Yes
Kenansville	Duplin County	RNAV LPV	335-3/4	200	3/4	8/24/07	Both	Yes
Kinston	Kinston Regional Jetport at Stallings Field	Precision	294 1/2	200	1/2	2/23/06	Both	Yes
Lincolnton	Lincolnton Lincoln County Regional	RNAV LPV	1187-1 1/4	315	1 1/4	6/17/07	Both	Yes
Louisburg	Triangle North Executive	Precision	598-1/2	200	1/2	2/12/09	Both	Yes
Lumberton	Lumberton Regional	Precision	360-3/4	236	3/4	3/06/09	C Only	Yes
Maxton	Laurinburg-Maxton	Precision	415-1/2	200	1/2	2/18/09	Both	Yes
Morganton	Foothills Regional	RNAV LPV	1430-3/4	200	3/4	9/23/08	Both	Yes
Mount Airy	Mount Airy/Surry County	RNAV LPV	1533-1 1/4	305	1 1/4	1/22/08	Both	Yes*
North Wilkesboro	Wilkes County	Precision	1477-1/2	200	1/2	Unknown	Both	Yes
Oxford	Henderson-Oxford	RNAV LPV	773-1	250	1	7/25/07	Both	Yes
Reidsville	Rockingham County NC Shiloh	LNAV	1060-1	392	1	7/27/07	Both	Yes
Roxboro	Person County	Precision	801-1/2	200	1/2	2/23/07	Both	Yes
Rutherfordton	Rutherford County-Marchman Field	RNAV LPV	1561-1 3/4	502	1 3/4	11/20/07	Both	Yes

Table 5.5: Airports Meeting FAA Threshold Siting Surface Requirements (Cont.)

Associated City	Airport Name	Existing Instrument Approach	Lowest Existing Approach Minimums (Decision Altitude - DA)	Height Above Touchdown (HAT)	Visibility (sm or RVR)	Date of Most Recent 18-B Survey	C/D Category Aircraft Approach	Night Approach
Blue Airports: AVP 250' and 3/4 mile								
Shelby	Shelby-Cleveland County Regional	RNAV LPV	1084-1	250	1	8/14/07	Both	Yes
Siler City	Siler City Municipal	LNAV	1240-1	626	1	Unknown	C Only	No
Wallace	Henderson Field	Non-Precision	500-1	461	1	Unknown	Both	Yes
Washington	Warren Field	RNAV LPV	359-1 1/4	324	1 1/4	9/07/07	Both	Yes**
Green Airports: AVP 400' and 1 mile								
Ahoskie	Tri-County	Non-Precision	440-1	372	1	Unknown	Both	No
Clinton	Clinton-Sampson County	RNAV LPV	330-3/4	200	3/4	8/21/07	Both	Yes
Edenton	Northeastern Regional	Precision	219-3/4	200	3/4	8/27/05	Both	Yes
Elkin	Elkin Municipal	Non-Precision	1700-1	635	1	1/19/10	Both	Yes*
Engelhard	Hyde County	Visual						
Hatteras	Billy Mitchell (NPS)	LNAV	500-1	485	1	Unknown	C Only	No
Kill Devil Hills	First Flight (NPS)	Visual						
Mount Olive	Mount Olive Municipal	RNAV LPV	452-1	286	1	12/18/09	C Only	No
Ocean Isle Beach	Odell Williamson Municipal	Visual						
Ocracoke	Ocracoke Island Airport (NPS)	LNAV	500-1	495	1	Unknown	None	No
Plymouth	Plymouth Municipal	LP	440-1	404	1	3/11/09	C Only	Yes*
Roanoke Rapids	Halifax-Northampton Regional	RNAV LPV	339-3/4	200	3/4	9/30/09	Both	Yes
Rockingham	Richmond County	RNAV LPV	632-1	277	1	7/19/09	Both	No
Spruce Pine	Avery County/Morrison Field	Visual						
Star	Montgomery County	Visual						
Sylva	Jackson County	Visual						
Tarboro	Tarboro-Edgecombe	Non-Precision	760-1	710	1	11/01/11	Both	Yes
Wadesboro	Anson County-Jeff Cloud Field	Precision	556-7/8	259	7/8	8/27/05	Both	Yes
Whiteville	Columbus County Municipal	LNAV	500-1	401	1	9/28/10	Both	Yes**
Williamston	Martin County	LNAV	480-1	404	1	11/14/11	Both	No

Source: Woolpert, FAA Digital Terminal Procedures Effective June 26, 2014 to July 24, 2014, FAA NOTAMS System
Note: *When VGSI are inoperable, night operations are not available.
**Night landing for Category C/D aircraft is not available.

Table 5.6: Airport Runway-Taxiway Separation

Associated City	Airport Name	ID	ARC	FAA Required RW-TW Separation Based on ARC	Existing RW-TW Separation	Meets Objective
Yellow Airports						
Asheville	Asheville Regional*	AVL	C-III	400	325	No
Charlotte	Charlotte/Douglas Int'l	CLT	D-V	500	600	Yes
Concord	Concord Regional	JQF	D-II	300	400	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	C-III	400	400	Yes
Greensboro	Piedmont Triad Int'l	GSO	D-V	500	650	Yes
Greenville	Pitt-Greenville	PGV	C-III	400	400	Yes
Jacksonville	Albert J. Ellis	OAJ	C-III	400	400	Yes
New Bern	Coastal Carolina Regional	EWN	C-III	400	400	Yes
Raleigh	Raleigh-Durham Int'l	RDU	D-IV	400	400	Yes
Wilmington	Wilmington Int'l	ILM	C-III	400	500	Yes
Red Airports						
Beaufort	Michael J. Smith Field	MRH	B-II	275	300	No
Burlington	Burlington-Alamance Regional	BUY	C-II	300	300	Yes
Currituck	Currituck County Regional*	ONX	A-II	240	300	Yes
Franklin	Macon County	1A5	B-II	240	240	Yes
Hickory	Hickory Regional	HKY	C-II	300	300	Yes
Lexington	Davidson County	EXX	C-II	300	300	Yes
Manteo	Dare County Regional	MQI	B-II	240	300	Yes
Monroe	Charlotte-Monroe Executive	EQY	C-II	300	300	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	B-II	240	240	Yes
Pinehurst/Southern Pines	Moore County	SOP	C-II	300	400	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	C-II	300	400	Yes
Salisbury	Rowan County	RUQ	B-II	240	300	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	D-II	300	400	Yes
Smithfield	Johnston County	JNX	C-II	300	400	Yes
Statesville	Statesville Regional	SVH	C-II	300	300	Yes
Winston-Salem	Smith Reynolds	INT	C-III	400	275	No

Table 5.6: Airport Runway-Taxiway Separation (Cont.)

Associated City	Airport Name	ID	ARC	FAA Required RW-TW Separation Based on ARC	Existing RW-TW Separation	Meets Objective
Blue Airports						
Albemarle	Stanly County	VUJ	C-III	400	325	No
Andrews	Western Carolina Regional	RHP	B-II	240	300	Yes
Asheboro	Asheboro Regional	HBI	B-II	240	300	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	C-IV	No Parallel Taxiway		NA
Elizabethtown	Curtis L Brown Jr Field	EYF	B-II	240	300	Yes
Erwin	Harnett Regional Jetport	HRJ	B-II	240	300	Yes
Gastonia	Gastonia Municipal	AKH	A-II	240	225	No
Goldsboro	Wayne Executive Jetport	GWW	C-II	300	400	Yes
Jefferson	Ashe County	GEV	B-II	No Parallel Taxiway		NA
Kenansville	Duplin County	DPL	C-II	300	385	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	D-IV	400	400	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	B-II	240	300	Yes
Louisburg	Triangle North Executive	LHZ	C-II	300	325	Yes
Lumberton	Lumberton Regional	LBT	D-II	300	325	Yes
Maxton	Laurinburg-Maxton	MEB	D-II	300	520	Yes
Morganton	Foothills Regional	MRN	B-II	240	325	Yes
Mount Airy	Mount Airy/Surry County	MWK	B-II	240	240	Yes
North Wilkesboro	Wilkes County	UKF	C-II	300	400	Yes
Oxford	Henderson-Oxford	HNZ	C-II	300	201	No
Reidsville	Rockingham County NC Shiloh	SIF	B-II	240	300	Yes
Roxboro	Person County	TDF	C-II	300	300	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	B-II	240	200	No
Shelby	Shelby-Cleveland County Regional	EHO	B-II	240	300	Yes
Siler City	Siler City Municipal	5W8	B-II	No Parallel Taxiway		NA
Wallace	Henderson Field	ACZ	B-II	No Parallel Taxiway		NA
Washington	Warren Field	OCW	B-II	240	550	Yes

Table 5.6: Airport Runway-Taxiway Separation (Cont.)

Associated City	Airport Name	ID	ARC	FAA Required RW-TW Separation Based on ARC	Existing RW-TW Separation	Meets Objective
Green Airports						
Ahoskie	Tri-County	ASJ	B-II	240	300	Yes
Clinton	Clinton-Sampson County	CTZ	B-II	240	240	Yes
Edenton	Northeastern Regional	EDE	C-II	300	650	Yes
Elkin	Elkin Municipal	ZEF	B-II	No Parallel Taxiway		NA
Engelhard	Hyde County	7W6	B-II	No Parallel Taxiway		NA
Hatteras	Billy Mitchell (NPS)	HSE	A-I	No Parallel Taxiway		NA
Kill Devil Hills	First Flight (NPS)	FFA	A-I	No Parallel Taxiway		NA
Mount Olive	Mount Olive Municipal	W40	B-II	240	240	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	B-I	150	150	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95	B-I	No Parallel Taxiway		NA
Plymouth	Plymouth Municipal	PMZ	C-II	300	400	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	D-II	300	400	Yes
Rockingham	Richmond County	RCZ	B-II	240	300	Yes
Spruce Pine	Avery County/Morrison Field	7A8	B-I	No Parallel Taxiway		NA
Star	Montgomery County	43A	B-I	No Parallel Taxiway		NA
Sylva	Jackson County	24A	B-I	No Parallel Taxiway		NA
Tarboro	Tarboro-Edgecombe	ETC	B-I	No Parallel Taxiway		NA
Wadesboro	Anson County-Jeff Cloud Field	AFP	B-II	240	400	Yes
Whiteville	Columbus County Municipal*	CPC	B-II	240	300	Yes
Williamston	Martin County	MCZ	B-II	No Parallel Taxiway		NA

Source: NCASP Inventory Data, 2012, FAA, Airport ALPs, Google Earth
Note: *Taxiway project underway.

Table 5.8: Airport Compliance with Mandatory Items

Associated City	Airport Name	ID	ALP Year	Current ALP (yes/ no)	Adopted Part 77 Zoning Ordinance	Minimum Operating Agreement	Rules and Regs	Clear Approach	Fire Extingu -isher	Meets All Mandatory Items
Yellow Airports										
Asheville	Asheville Regional	AVL	2007	Yes	Yes	Yes	Yes	NA	Yes	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	2012	Yes	Yes	Yes	YEs	NA	Yes	Yes
Concord	Concord Regional	JQF	2012	Yes	Yes	Yes	Yes	NA	Yes	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	2005	Yes	Yes	Yes	Yes	NA	Yes	Yes
Greensboro	Piedmont Triad Int'l	GSO	2010	Yes	Yes	Yes	Yes	NA	Yes	Yes
Greenville	Pitt-Greenville	PGV	2008	Yes	Yes	No	No	NA	Yes	No
Jacksonville	Albert J. Ellis	OAJ	2009	Yes	Yes	No	No	NA	Yes	No
New Bern	Coastal Carolina Regional	EWN	2013	Yes	Yes	Yes	Yes	NA	Yes	Yes
Raleigh	Raleigh-Durham Int'l	RDU	2005	Yes	Yes	No	Yes	NA	Yes	No
Wilmington	Wilmington Int'l	ILM	2005	Yes	Yes	Yes	Yes	NA	Yes	Yes
Red Airports										
Beaufort	Michael J. Smith Field	MRH	2012	Yes	Yes	Yes	Yes	NA	Yes	Yes
Burlington	Burlington-Alamance Regional	BUY	1997	No	Yes	Yes	Yes	NA	Yes	No
Currituck	Currituck County Regional	ONX	2002	No	Yes	Yes	Yes	NA	Yes	No
Franklin	Macon County	1A5	UK	No	Yes	No	No	NA	Yes	No
Hickory	Hickory Regional	HKY	2002	No	Yes	Yes	Yes	NA	Yes	No
Lexington	Davidson County	EXX	2004	Yes	Yes	Yes	Yes	NA	Yes	Yes
Manteo	Dare County Regional	MQI	2005	Yes	Yes	Yes	Yes	NA	Yes	Yes
Monroe	Charlotte-Monroe Executive	EQY	2007	Yes	Yes	Yes	Yes	NA	Yes	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	2005	Yes	Yes	Yes	Yes	NA	Yes	Yes
Pinehurst/ Southern Pines	Moore County	SOP	2011	Yes	Yes	Yes	Yes	NA	Yes	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	2003	Yes	Yes	Yes	Yes	NA	Yes	Yes
Salisbury	Rowan County	RUQ	2008	Yes	Yes	Yes	Yes	NA	Yes	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	2007	Yes	Yes	Yes	Yes	NA	Yes	Yes
Smithfield	Johnston County	JNX	2007	Yes	Yes	Yes	Yes	NA	Yes	Yes
Statesville	Statesville Regional	SVH	2004	Yes	Yes	Yes	Yes	NA	Yes	Yes
Winston-Salem	Smith Reynolds	INT	2012	Yes	Yes	Yes	Yes	NA	Yes	Yes

Table 5.8: Airport Compliance with Mandatory Items (Cont.)

Associated City	Airport Name	ID	ALP Year	Current ALP (yes/ no)	Adopted Part 77 Zoning Ordinance	Minimum Operating Agreement	Rules and Regs	Clear Approach	Fire Extingu -isher	Meets All Mandatory Items
Blue Airports										
Albemarle	Stanly County	VUJ	2000	No	Yes	Yes	Yes	NA	Yes	No
Andrews	Western Carolina Regional	RHP	2000	No	No	Yes	Yes	NA	Yes	No
Asheboro	Asheboro Regional	HBI	2005	Yes	Yes	Yes	Yes	NA	Yes	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	2007	Yes	Yes	Yes	Yes	NA	Yes	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	2010	Yes	Yes	Yes	Yes	NA	Yes	Yes
Erwin	Harnett Regional Jetport	HRJ	2005	Yes	Yes	Yes	Yes	NA	Yes	Yes
Gastonia	Gastonia Municipal	AKH	Unknown	No	No	Yes	Yes	NA	Yes	No
Goldsboro	Wayne Executive Jetport	GWW	2006	Yes	Yes	Yes	Yes	NA	Yes	Yes
Jefferson	Ashe County	GEV	2002	No	Yes	Yes	Yes	NA	Yes	No
Kenansville	Duplin County	DPL	2010	Yes	Yes	Yes	Yes	NA	Yes	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	1995	No	Yes	Yes	Yes	NA	Yes	No
Lincolnton	Lincolnton Lincoln County Regional	IPJ	1995	No	Yes	Yes	Yes	NA	Yes	No
Louisburg	Triangle North Executive	LHZ	2010	Yes	Yes	Yes	Yes	NA	Yes	Yes
Lumberton	Lumberton Regional	LBT	2003	Yes	Yes	Yes	Yes	NA	Yes	Yes
Maxton	Laurinburg-Maxton	MEB	2013	Yes	Yes	Yes	Yes	NA	Yes	Yes
Morganton	Foothills Regional	MRN	2004	Yes	Yes	Yes	Yes	NA	Yes	Yes
Mount Airy	Mount Airy/Surry County	MWK	2005	Yes	Yes	Yes	Yes	NA	Yes	Yes
North Wilkesboro	Wilkes County	UKF	2005	Yes	Yes	Yes	Yes	NA	Yes	Yes
Oxford	Henderson-Oxford	HNZ	Unknown	No	Unknown	No	No	NA	Yes	No
Reidsville	Rockingham County NC Shiloh	SIF	1999	No	No	No	No	NA	Yes	No
Roxboro	Person County	TDF	1987	No	Yes	Yes	Yes	NA	Yes	No
Rutherfordton	Rutherford County-Marchman Field	FQD	2010	Yes	Yes	Yes	Yes	NA	Yes	Yes
Shelby	Shelby-Cleveland County Regional	EHO	2007	Yes	Yes	Yes	Yes	NA	Yes	Yes
Siler City	Siler City Municipal	5W8	1999	No	Yes	No	No	NA	Yes	No
Wallace	Henderson Field	ACZ	2010	Yes	Yes	Yes	Yes	NA	Yes	No
Washington	Warren Field	OCW	2003	Yes	Yes	Yes	Yes	NA	Yes	Yes

Table 5.8: Airport Compliance with Mandatory Items (Cont.)

Associated City	Airport Name	ID	ALP Year	Current ALP (yes/ no)	Adopted Part 77 Zoning Ordinance	Minimum Operating Agreement	Rules and Regs	Clear Approach	Fire Extingu-isher	Meets All Mandatory Items
Green Airports										
Ahoskie	Tri-County	ASJ	2004	Yes	No	Unknown	Unk	NA	NA	NA
Clinton	Clinton-Sampson County	CTZ	2009	Yes	Yes	Yes	Yes	NA	NA	NA
Edenton	Northeastern Regional	EDE	2004	Yes	Yes	Yes	Yes	NA	NA	NA
Elkin	Elkin Municipal	ZEF	2005	Yes	Yes	Yes	Yes	NA	NA	NA
Engelhard	Hyde County	7W6	2005	Yes	Yes	No	No	NA	NA	NA
Hatteras	Billy Mitchell (NPS)	HSE	2014	Yes	No	No	No	NA	NA	NA
Kill Devil Hills	First Flight (NPS)	FFA	2014	Yes	No	No	No	NA	NA	NA
Mount Olive	Mount Olive Municipal	W40	2004	Yes	Yes	Yes	Yes	NA	NA	NA
Ocean Isle Beach	Odell Williamson Municipal	60J	2003	Yes	Yes	Yes	Yes	NA	NA	NA
Ocracoke	Ocracoke Island Airport (NPS)	W95	2013	Yes	Yes	No	No	NA	NA	NA
Plymouth	Plymouth Municipal	PMZ	2010	Yes	Yes	Yes	Yes	NA	NA	NA
Roanoke Rapids	Halifax-Northampton Regional	IXA	2004	Yes	Yes	No	No	NA	NA	NA
Rockingham	Richmond County	RCZ	2010	Yes	Yes	Yes	Yes	NA	NA	NA
Spruce Pine	Avery County/Morrison Field	7A8	2014	Yes	Yes	Yes	Yes	NA	NA	NA
Star	Montgomery County	43A	2005	Yes	Yes	No	No	NA	NA	NA
Sylva	Jackson County	24A	2004	Yes	Yes	No	No	NA	NA	NA
Tarboro	Tarboro-Edgecombe	ETC	2006	Yes	Yes	No	No	NA	NA	NA
Wadesboro	Anson County-Jeff Cloud Field	AFP	2010	Yes	Yes	Yes	Yes	NA	NA	NA
Whiteville	Columbus County Municipal	CPC	2005	Yes	Yes	Yes	Yes	NA	NA	NA
Williamston	Martin County	MCZ	2011	Yes	Yes	Yes	Yes	NA	NA	NA

Source: NCASP Inventory Data, 2012

Table 5.10: 100: Runway Approach Compliance

Associated City	Airport Name	Existing Instrument Approach	Lowest Existing Approach Minimums (Decision Altitude - DA)	Height Above Touchdown (HAT)	Visibility (sm or RVR)	Date of Most Recent 18-B Survey	C/D Category Aircraft Approach	Night Approach
Yellow Airports: Clear TSS on all runway ends								
Asheville	Asheville Regional	Precision	2340/24	200	1/2	4/11/00	Both	Yes
Charlotte	Charlotte/Douglas Int'l	Precision	106/12 (CAT II)	100	1200	2/18/06	Both	Yes
Concord	Concord Regional	Precision	905-1/2	200	1/2	3/04/05	Both	Yes
Fayetteville	Fayetteville Regional/Grannis Field	Precision	384/24	200	1/2	12/01/06	Both	Yes
Greensboro	Piedmont Triad Int'l	Precision	106/12 (CAT II)	100	989	12/14/08	Both	Yes
Greenville	Pitt-Greenville	Precision	319- 3/4	294	3/4	11/22/06	Both	Yes
Jacksonville	Albert J. Ellis	Precision	289-1/2	200	1/2	5/19/09	Both	Yes
New Bern	Coastal Carolina Regional	Precision	267-3/4	250	3/4	1/05/11	Both	Yes
Raleigh	Raleigh-Durham Int'l	Precision	105/12 (CAT II)	100	1200	4/21/01	Both	Yes
Wilmington	Wilmington Int'l	Precision	220/24	200	2400	5/27/10	Both	Yes
Red Airports: Clear TSS on primary runway ends								
Beaufort	Michael J. Smith Field	RNAV LPV	360-1	354	1	10/31/07	Both	No
Burlington	Burlington-Alamance Regional	Precision	866-3/4	250	3/4	8/12/08	Both	Yes
Currituck	Currituck County Regional	RNAV LPV	343-1 1/4	325	1 1/4	7/27/07	Both	Yes
Franklin	Macon County	Non-Precision (Circling)	3620-1 1/4 (A) 3620-1 1/2 (B)	1600	1 1/4	None	C Only	No
Hickory	Hickory Regional	Precision	1390-1/2	200	1/2	4/09/08	Both	Yes
Lexington	Davidson County	Precision	982-7/8	250	7/8	2/19/09	C Only	Yes
Manteo	Dare County Regional	RNAV LPV	259-3/4	250	3/4	10/13/08	C Only	Yes
Monroe	Charlotte-Monroe Executive	Precision	878-1/2	200	1/2	None	Both	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	RNAV LPV	283-1	258	1	8/19/10	C Only	No

Table 5.10: 100: Runway Approach Compliance (Cont.)

Associated City	Airport Name	Existing Instrument Approach	Lowest Existing Approach Minimums (Decision Altitude - DA)	Height Above Touchdown (HAT)	Visibility (sm or RVR)	Date of Most Recent 18-B Survey	C/D Category Aircraft Approach	Night Approach
Red Airports: Clear TSS on primary runway ends								
Pinehurst/Southern Pines	Moore County	Precision	655-1/2	200	1/2	4/15/11	Both	Yes
Rocky Mount	Rocky Mount-Wilson Regional	Precision	409 3/4	250	3/4	9/27/11	Both	Yes
Salisbury	Rowan County	Precision	966 1/2	200	1/2	3/13/09	Both	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	Precision	446-1/2	200	1/2	2/05/09	Both	Yes
Smithfield	Johnston County	Precision	347-1/2	200	1/2	12/15/09	Both	Yes
Statesville	Statesville Regional	Precision	1166-1/2	200	1/2	9/16/11	Both	Yes
Winston-Salem	Smith Reynolds	Precision	1141/24	200	24	12/10/99	Both	Yes
Blue Airports: Clear TSS on primary runway ends								
Albemarle	Stanly County	Precision	784-3/4	200	3/4	10/26/08	Both	Yes
Andrews	Western Carolina Regional	RNAV LPV	4020-1 1/4 (A) 4020-1 1/2 (B)	2329	1 1/4	None	C Only	Yes
Asheboro	Asheboro Regional	RNAV LPV	1220-1	547	1	9/20/11	Both	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	Precision	211-3/4	200	3/4	5/15/05	Both	Yes
Elizabethtown	Curtis L Brown Jr Field	RNAV LPV	331-3/4	200	3/4	5/27/09	Both	Yes
Erwin	Harnett Regional Jetport	RNAV LPV	474-1	279	1	8/30/05	C Only	Yes
Gastonia	Gastonia Municipal	RNAV LPV	1111-1 1/4	313	1 1/4	11/03/05	C Only	Yes
Goldsboro	Wayne Executive Jetport	Precision	333-5/8	200	5/8	2/26/09	Both	Yes
Jefferson	Ashe County	LNAV	4160-1 1/4 (A) 4160-1 1/2 (B)	1004	1 1/4	1/22/10	Both	Yes
Kenansville	Duplin County	RNAV LPV	335-3/4	200	3/4	8/24/07	Both	Yes
Kinston	Kinston Regional Jetport at Stallings Field	Precision	294 1/2	200	1/2	2/23/06	Both	Yes
Lincolnton	Lincolnton Lincoln County Regional	RNAV LPV	1187-1 1/4	315	1 1/4	6/17/07	Both	Yes

Table 5.10: 100: Runway Approach Compliance (Cont.)

Associated City	Airport Name	Existing Instrument Approach	Lowest Existing Approach Minimums (Decision Altitude - DA)	Height Above Touchdown (HAT)	Visibility (sm or RVR)	Date of Most Recent 18-B Survey	C/D Category Aircraft Approach	Night Approach
Blue Airports: Clear TSS on primary runway ends								
Louisburg	Triangle North Executive	Precision	598-1/2	200	1/2	2/12/09	Both	Yes
Lumberton	Lumberton Regional	Precision	360-3/4	236	3/4	3/06/09	C Only	Yes
Maxton	Laurinburg-Maxton	Precision	415-1/2	200	1/2	2/18/09	Both	Yes
Morganton	Foothills Regional	RNAV LPV	1430-3/4	200	3/4	9/23/08	Both	Yes
Mount Airy	Mount Airy/Surry County	RNAV LPV	1533-1 1/4	305	1 1/4	1/22/08	Both	Yes*
North Wilkesboro	Wilkes County	Precision	1477-1/2	200	1/2	Unknown	Both	Yes
Oxford	Henderson-Oxford	RNAV LPV	773-1	250	1	7/25/07	Both	Yes
Reidsville	Rockingham County NC Shiloh	LNAV	1060-1	392	1	7/27/07	Both	Yes
Roxboro	Person County	Precision	801-1/2	200	1/2	2/23/07	Both	Yes
Rutherfordton	Rutherford County-Marchman Field	RNAV LPV	1561-1 3/4	502	1 3/4	11/20/07	Both	Yes
Shelby	Shelby-Cleveland County Regional	RNAV LPV	1084-1	250	1	8/14/07	Both	Yes
Siler City	Siler City Municipal	LNAV	1240-1	626	1	Unknown	C Only	No
Wallace	Henderson Field	Non-Precision	500-1	461	1	Unknown	Both	Yes
Washington	Warren Field	RNAV LPV	359-1 1/4	324	1 1/4	9/07/07	Both	Yes**
Green Airports: Clear TSS on primary runway ends								
Ahoskie	Tri-County	Non-Precision	440-1	372	1	Unknown	Both	No
Clinton	Clinton-Sampson County	RNAV LPV	330-3/4	200	3/4	8/21/07	Both	Yes
Edenton	Northeastern Regional	Precision	219-3/4	200	3/4	8/27/05	Both	Yes
Elkin	Elkin Municipal	Non-Precision	1700-1	635	1	1/19/10	Both	Yes*
Engelhard	Hyde County	Visual						
Hatteras	Billy Mitchell (NPS)	LNAV	500-1	485	1	Unknown	C Only	No
Kill Devil Hills	First Flight (NPS)	Visual						
Mount Olive	Mount Olive Municipal	RNAV LPV	452-1	286	1	12/18/09	C Only	No
Ocean Isle Beach	Odell Williamson Municipal	Visual						

Table 5.10: 100: Runway Approach Compliance (Cont.)

Associated City	Airport Name	Existing Instrument Approach	Lowest Existing Approach Minimums (Decision Altitude - DA)	Height Above Touchdown (HAT)	Visibility (sm or RVR)	Date of Most Recent 18-B Survey	C/D Category Aircraft Approach	Night Approach
Green Airports: Clear TSS on primary runway ends								
Ocracoke	Ocracoke Island Airport (NPS)	LNAV	500-1	495	1	Unknown	None	No
Plymouth	Plymouth Municipal	LP	440-1	404	1	3/11/09	C Only	Yes*
Roanoke Rapids	Halifax-Northampton Regional	RNAV LPV	339-3/4	200	3/4	9/30/09	Both	Yes
Rockingham	Richmond County	RNAV LPV	632-1	277	1	7/19/09	Both	No
Spruce Pine	Avery County/Morrison Field	Visual						
Star	Montgomery County	Visual						
Sylva	Jackson County	Visual						
Tarboro	Tarboro-Edgecombe	Non-Precision	760-1	710	1	11/01/11	Both	Yes
Wadesboro	Anson County-Jeff Cloud Field	Precision	556-7/8	259	7/8	8/27/05	Both	Yes
Whiteville	Columbus County Municipal	LNAV	500-1	401	1	9/28/10	Both	Yes**
Williamston	Martin County	LNAV	480-1	404	1	11/14/11	Both	No

Source: Woolpert, FAA Digital Terminal Procedures Effective June 26, 2014 to July 24, 2014, FAA NOTAMS System
Note: *When VGSI are inoperable, night operations are not available.
**Night landing for Category C/D aircraft is not available.

Table 5.11: 200: Runway Safety Area (RSA) Compliance

Associated City	Airport Name	ID	RDC	FAA Standard Length (feet)	Current Extended RSA Length (feet)	Meets Objective
Yellow Airports: Meet RDC						
Asheville	Asheville Regional	AVL	C-III	1,000	1,000	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	D-IV	1,000	1,000	Yes
Concord	Concord Regional	JQF	D-II	1,000	1,000	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	C-III	1,000	1,000	Yes
Greensboro	Piedmont Triad Int'l	GSO	D-IV	1,000	800	No
Greenville	Pitt-Greenville	PGV	C-III	1,000	1,000	Yes
Jacksonville	Albert J. Ellis	OAJ	C-III	1,000	1,000	Yes
New Bern	Coastal Carolina Regional	EWN	C-III	1,000	1,000	Yes
Raleigh	Raleigh-Durham Int'l	RDU	D-IV	1,000	1,000	Yes
Wilmington	Wilmington Int'l	ILM	C-III	1,000	1,000	Yes
Red Airports: Meet RDC						
Beaufort	Michael J. Smith Field	MRH	B-II	300	300	Yes
Burlington	Burlington-Alamance Regional	BUY	C-II	1,000	Non-Compliant	No
Currituck	Currituck County Regional	ONX	A-II	300	300	Yes
Franklin	Macon County	1A5	B-II	300	300	Yes
Hickory	Hickory Regional	HKY	C-II	1,000	1,000	Yes
Lexington	Davidson County	EXX	C-II	1,000	Non-Compliant	No
Manteo	Dare County Regional	MQI	B-II	300	300	Yes
Monroe	Charlotte-Monroe Executive	EQY	C-II	1,000	Non-Compliant	No
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	B-II	300	300	Yes
Pinehurst/Southern Pines	Moore County	SOP	C-II	1,000	1,000	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	C-II	1,000	Non-Compliant	No
Salisbury	Rowan County	RUQ	B-II	300	300	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	D-II	1,000	1,000	Yes
Smithfield	Johnston County	JNX	C-II	1,000	1,000	Yes
Statesville	Statesville Regional	SVH	C-II	1,000	1,000	Yes
Winston-Salem	Smith Reynolds	INT	C-III	1,000	1,000	Yes

Table 5.11: 200: Runway Safety Area (RSA) Compliance (Cont.)

Associated City	Airport Name	ID	RDC	FAA Standard Length (feet)	Current Extended RSA Length (feet)	Meets Objective
Blue Airports: Meet RDC						
Albemarle	Stanly County	VUJ	C-III	1,000	Non-Compliant	No
Andrews	Western Carolina Regional	RHP	B-II	300	300	Yes
Asheboro	Asheboro Regional	HBI	B-II	300	300	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	C-IV	1,000	Non-Compliant	No
Elizabethtown	Curtis L Brown Jr Field	EYF	B-II	300	300	Yes
Erwin	Harnett Regional Jetport	HRJ	B-II	300	300	Yes
Gastonia	Gastonia Municipal	AKH	A-II	300	300	Yes
Goldsboro	Wayne Executive Jetport	GWW	C-II	1,000	1,000	Yes
Jefferson	Ashe County	GEV	B-II	300	300	Yes
Kenansville	Duplin County	DPL	C-II	1,000	Non-Compliant	No
Kinston	Kinston Regional Jetport at Stallings Field	ISO	D-IV	1,000	1,000	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	B-II	300	300	Yes
Louisburg	Triangle North Executive	LHZ	C-II	1,000	Non-Compliant	No
Lumberton	Lumberton Regional	LBT	D-II	1,000	1,000	Yes
Maxton	Laurinburg-Maxton	MEB	D-II	1,000	1,000	Yes
Morganton	Foothills Regional	MRN	B-II	300	300	Yes
Mount Airy	Mount Airy/Surry County	MWK	B-II	300	300	Yes
North Wilkesboro	Wilkes County	UKF	C-II	1,000	Non-Compliant	No
Oxford	Henderson-Oxford	HNZ	C-II	1,000	1,000	Yes
Reidsville	Rockingham County NC Shiloh	SIF	B-II	300	300	Yes
Roxboro	Person County	TDF	C-II	1,000	Non-Compliant	No
Rutherfordton	Rutherford County-Marchman Field	FQD	B-II	300	300	Yes
Shelby	Shelby-Cleveland County Regional	EHO	B-II	300	300	Yes
Siler City	Siler City Municipal	5W8	B-II	300	300	Yes
Wallace	Henderson Field	ACZ	B-II	300	300	Yes
Washington	Warren Field	OCW	B-II	300	300	Yes

Table 5.11: 200: Runway Safety Area (RSA) Compliance (Cont.)

Associated City	Airport Name	ID	RDC	FAA Standard Length (feet)	Current Extended RSA Length (feet)	Meets Objective
Green Airports: Meet RDC						
Ahoskie	Tri-County	ASJ	B-II	300	300	Yes
Clinton	Clinton-Sampson County	CTZ	B-II	300	300	Yes
Edenton	Northeastern Regional	EDE	C-II	1,000	1,000	Yes
Elkin	Elkin Municipal	ZEF	B-II	300	300	Yes
Engelhard	Hyde County	7W6	B-II	300	300	Yes
Hatteras	Billy Mitchell (NPS)	HSE	A-I	240	240	Yes
Kill Devil Hills	First Flight (NPS)	FFA	A-I	240	240	Yes
Mount Olive	Mount Olive Municipal	W40	B-II	300	300	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	B-I	240	240	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95	A-I	240	240	Yes
Plymouth	Plymouth Municipal	PMZ	C-II	1,000	1,000	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	D-II	1,000	1,000	Yes
Rockingham	Richmond County	RCZ	B-II	300	Non-Compliant	No
Spruce Pine	Avery County/Morrison Field	7A8	B-I	240	240	Yes
Star	Montgomery County	43A	B-I	240	240	Yes
Sylva	Jackson County	24A	B-II	300	300	Yes
Tarboro	Tarboro-Edgecombe	ETC	B-I	240	240	Yes
Wadesboro	Anson County-Jeff Cloud Field	AFP	B-II	300	300	Yes
Whiteville	Columbus County Municipal	CPC	B-II	300	200	No
Williamston	Martin County	MCZ	B-II	300	240	No

Source: NCASP Inventory Data, 2012

Table 5.12: 300: Runway Protection Zone (RPZ) Compliance

Associated City	Airport Name	ID	Primary			Secondary			Meets Objective
			Primary RW	RW End	RW End	Second RW	RW End	RW End	
Yellow Airports									
Asheville	Asheville Regional	AVL	16/34	Yes	Yes				Yes
Charlotte	Charlotte/Douglas Int'l[1]	CLT	18L/36R	Partial	Partial	18C/36C	Partial	Partial	No
Concord	Concord Regional	JQF	02/20	Partial	Yes				No
Fayetteville	Fayetteville Regional/Grannis Field	FAY	04/22	Partial	Yes	10/28	Yes	Yes	No
Greensboro	Piedmont Triad Int'l[3]	GSO	5L/23R	Partial	Partial	5R/23L	Partial	Partial	No
Greenville	Pitt-Greenville	PGV	02/20	Yes	Yes	08/26	Yes	Yes	Yes
Jacksonville	Albert J. Ellis	OAJ	05/23	Yes	Yes				Yes
New Bern	Coastal Carolina Regional	EWN	04/22	Yes	Yes	14/32	Partial	Yes	No
Raleigh	Raleigh-Durham Int'l[3]	RDU	5L/23R	Partial	Partial	5R/23L	Partial	Partial	No
Wilmington	Wilmington Int'l	ILM	06/24	Partial	Partial	17/35	Partial	Partial	No
Red Airports									
Beaufort	Michael J. Smith Field[1]	MRH	08/26	Partial	Partial	03/21	Unkno	Unknown	No
Burlington	Burlington-Alamance Regional	BUY	06/24	Yes	Yes				Yes
Currituck	Currituck County Regional	ONX	05/23	Yes	Yes				Yes
Franklin	Macon County	1A5	07/25	Partial	Partial				No
Hickory	Hickory Regional	HKY	06/24	Yes	Partial	01/19	Partial	Partial	No
Lexington	Davidson County	EXX	06/24	Partial	Partial				No
Manteo	Dare County Regional	MQI	05/23	Partial	Partial	17/35	Partial	Partial	No
Monroe	Charlotte-Monroe Executive	EQY	05/23	Yes	Yes				Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	05/23	Yes	Partial				No
Pinehurst/Southern Pines	Moore County	SOP	05/23	Partial	Partial				No
Rocky Mount	Rocky Mount-Wilson Regional	RWI	04/22	Yes	Yes				Yes
Salisbury	Rowan County	RUQ	02/20	Partial	Partial				No
Sanford	Raleigh Exec Jetport at Sanford-Lee	TTA	03/21	Yes	Yes				Yes
Smithfield	Johnston County	JNX	03/21	Yes	Partial				No
Statesville	Statesville Regional	SVH	10/28	Partial	Partial				No
Winston-Salem	Smith Reynolds	INT	15/33	Partial	Partial	04/22	Yes	Partial	No

Table 5.12: 300: Runway Protection Zone (RPZ) Compliance (Cont.)

Associated City	Airport Name	ID	Primary			Secondary			Meets Objective
			Primary RW	RW End	RW End	Second RW	RW End	RW End	
Blue Airports									
Albemarle	Stanly County	VUJ	04/22L	Partial	Partial	04/22R	Yes	Yes	No
Andrews	Western Carolina Regional	RHP	08/26	Partial	Yes				No
Asheboro	Asheboro Regional	HBI	03/21	Partial	Partial				No
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	10/28	Yes	Yes	01/19	Yes	Yes	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	15/33	Yes	Yes				Yes
Erwin	Harnett Regional Jetport	HRJ	05/23	Yes	Partial				No
Gastonia	Gastonia Municipal	AKH	03/21	Yes	Partial				No
Goldsboro	Wayne Executive Jetport	GWW	05/23	Partial	Partial				No
Jefferson	Ashe County	GEV	10/28	Yes	Partial				No
Kenansville	Duplin County	DPL	05/23	Yes	Yes				Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	05/23	Yes	Yes				Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	05/23	Yes	Yes				Yes
Louisburg	Triangle North Executive	LHZ	05/23	Partial	Partial				No
Lumberton	Lumberton Regional	LBT	05/23	Yes	Yes	13/31	Partial	Partial	No
Maxton	Laurinburg-Maxton	MEB	05/23	Yes	Yes	13/31	Yes	Yes	Yes
Morganton	Foothills Regional	MRN	03/21	Yes	Partial				No
Mount Airy	Mount Airy/Surry County	MWK	18/36	Partial	Yes				No
North Wilkesboro	Wilkes County	UKF	01/19	Yes	Yes				Yes
Oxford	Henderson-Oxford	HNZ	06/24	Partial	Partial				No
Reidsville	Rockingham County NC Shiloh	SIF	13/31	Yes	Yes				Yes
Roxboro	Person County	TDF	06/24	Yes	Yes				Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	01/19	Partial	Partial				No
Shelby	Shelby-Cleveland County Regional	EHO	05/23	Partial	Partial				No
Siler City	Siler City Municipal	5W8	04/22	Yes	Yes				Yes
Wallace	Henderson Field	ACZ	09/27	Partial	Partial				No
Washington	Warren Field	OCW	05/23	Yes	Yes	17/35	Yes	Yes	Yes

Table 5.12: 300: Runway Protection Zone (RPZ) Compliance (Cont.)

			Primary			Secondary			
Associated City	Airport Name	ID	Primary RW	RW End	RW End	Second RW	RW End	RW End	Meets Objective
Green Airports									
Ahoskie	Tri-County	ASJ	01/19	Yes	Yes				Yes
Clinton	Clinton-Sampson County	CTZ	06/24	Yes	Yes				Yes
Edenton	Northeastern Regional	EDE	01/19	Yes	Yes				Yes
Elkin	Elkin Municipal	ZEF	07/25	Yes	Yes				Yes
Engelhard	Hyde County	7W6	11/29	Yes	Yes				Yes
Hatteras	Billy Mitchell (NPS)	HSE	07/25	No	Yes				No
Kill Devil Hills	First Flight (NPS)	FFA	04/20	Unkno	Partial				No
Mount Olive	Mount Olive Municipal	W40	05/23	Yes	Yes				Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	06/24	Partial	Partial				No
Ocracoke	Ocracoke Island Airport (NPS)	W95	06/24	No	No				No
Plymouth	Plymouth Municipal	PMZ	03/21	Partial	Yes				No
Roanoke Rapids	Halifax-Northampton Regional	IXA	02/20	Yes	Yes				Yes
Rockingham	Richmond County	RCZ	14/32	Yes	Yes	04/22	Yes	Yes	Yes
Spruce Pine	Avery County/Morrison Field	7A8	17/35	Partial	Partial				No
Star	Montgomery County	43A	03/21	Yes	Partial				No
Sylva	Jackson County	24A	15/33	Yes	Yes				Yes
Tarboro	Tarboro-Edgecombe	ETC	09/27	Yes	Partial				No
Wadesboro	Anson County-Jeff Cloud Field	AFP	16/34	Partial	Yes				No
Whiteville	Columbus County Municipal	CPC	06/24	Yes	Yes				Yes
Williamston	Martin County	MCZ	03/21	Partial	Yes				No

Source: NCASP Inventory Data, 2012

Notes:

1. Charlotte Douglas International has 2 additional runways (18R/36L and 05/23) that are not listed. The airport has partial control of each of the runway end's RPZs.
2. Piedmont Triad International has a third runway (14/32) that is not listed in this table. The Piedmont Triad Airport Authority (PTAA) has partial controlling interest in over each runway end.
3. Raleigh-Durham International has a third runway (14/32) that is not listed in table. The airport has full fee simple ownership of the runway RPZ.
4. Michael J. Smith Field has a third runway (14/32) that is not listed in this table. It is unknown whether or not the airport has controlling interest in 14/32 runway ends.

Table 5.13: 400: Pavement Condition Compliance

Associated City	Airport Name	ID	2013 Weighted Average PCI					
			Primary Runway	Meets Objective	Apron	Meets Objective	Taxiways	Meets Objective
Yellow Airports: PCI ≥75								
Asheville	Asheville Regional	AVL	57	No	58	No	77	Yes
Charlotte	Charlotte/Douglas Int'l[1]	CLT	100	Yes	Unknown	Yes	73	No
Concord	Concord Regional	JQF	86	Yes	82	Yes	94	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	82	Yes	77	Yes	78	Yes
Greensboro	Piedmont Triad Int'l[2]	GSO	Not Available					
Greenville	Pitt-Greenville	PGV	54	No	72	No	63	No
Jacksonville	Albert J. Ellis	OAJ	78	Yes	66	No	71	No
New Bern	Coastal Carolina Regional	EWN	66	No	62	No	69	No
Raleigh	Raleigh-Durham Int'l[3]	RDU	82	Yes	Unknown	Yes	Unknown	Yes
Wilmington	Wilmington Int'l	ILM	83	Yes	87	Yes	87	Yes
Red Airports: PCI ≥75								
Beaufort	Michael J. Smith Field	MRH	100	Yes	60	No	39	No
Burlington	Burlington-Alamance Regional	BUY	84	Yes	89	Yes	89	Yes
Currituck	Currituck County Regional	ONX	90	Yes	49	No	62	No
Franklin	Macon County	1A5	85	Yes	100	Yes	83	Yes
Hickory	Hickory Regional	HKY	81	Yes	55	No	81	Yes
Lexington	Davidson County	EXX	77	Yes	86	Yes	88	Yes
Manteo	Dare County Regional	MQI	86	Yes	68	No	71	No
Monroe	Charlotte-Monroe Executive	EQY	90	Yes	80	Yes	91	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	99	Yes	68	No	97	Yes
Pinehurst/Southern Pines	Moore County	SOP	76	Yes	91	Yes	78	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	69	No	80	Yes	76	Yes
Salisbury	Rowan County	RUQ	87	Yes	79	Yes	87	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	64	No	84	Yes	66	No
Smithfield	Johnston County	JNX	83	Yes	92	Yes	96	Yes
Statesville	Statesville Regional	SVH	99	Yes	95	Yes	97	Yes
Winston-Salem	Smith Reynolds	INT	81	Yes	65	No	57	No

Table 5.13: 400: Pavement Condition Compliance (Cont.)

Associated City	Airport Name	ID	2013 Weighted Average PCI					
			Primary Runway	Meets Objective	Apron	Meets Objective	Taxiways	Meets Objective
Blue Airports: PCI ≥75								
Albemarle	Stanly County	VUJ	100	Yes	83	Yes	100	Yes
Andrews	Western Carolina Regional	RHP	85	Yes	91	Yes	93	Yes
Asheboro	Asheboro Regional	HBI	88	Yes	83	Yes	94	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	44	No	83	Yes	Unknown	No[4]
Elizabethtown	Curtis L Brown Jr Field	EYF	87	Yes	88	Yes	95	Yes
Erwin	Harnett Regional Jetport	HRJ	75	Yes	71	No	78	Yes
Gastonia	Gastonia Municipal	AKH	89	Yes	94	Yes	95	Yes
Goldsboro	Wayne Executive Jetport	GWW	100	Yes	96	Yes	100	Yes
Jefferson	Ashe County	GEV	65	No	75	Yes	51	No
Kenansville	Duplin County	DPL	93	Yes	76	Yes	97	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	61	No	64	No	72	No
Lincolnton	Lincolnton Lincoln County Regional	IPJ	82	Yes	89	Yes	90	Yes
Louisburg	Triangle North Executive	LHZ	78	Yes	69	No	84	Yes
Lumberton	Lumberton Regional	LBT	90	Yes	54	No	58	No
Maxton	Laurinburg-Maxton	MEB	100	Yes	20	No	52	No
Morganton	Foothills Regional	MRN	95	Yes	100	Yes	93	Yes
Mount Airy	Mount Airy/Surry County	MWK	76	Yes	59	No	78	Yes
North Wilkesboro	Wilkes County	UKF	72	No	69	No	84	Yes
Oxford	Henderson-Oxford	HNZ	74	No	67	No	82	Yes
Reidsville	Rockingham County NC Shiloh	SIF	80	Yes	83	Yes	79	Yes
Roxboro	Person County	TDF	76	Yes	77	Yes	82	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	77	Yes	82	Yes	81	Yes
Shelby	Shelby-Cleveland County Regional	EHO	91	Yes	97	Yes	99	Yes
Siler City	Siler City Municipal	5W8	60	No	71	No	60	No
Wallace	Henderson Field	ACZ	86	Yes	91	Yes	13	No
Washington	Warren Field	OCW	58	No	49	No	62	No

Table 5.13: 400: Pavement Condition Compliance (Cont.)

Associated City	Airport Name	ID	2013 Weighted Average PCI					
			Primary Runway	Meets Objective	Apron	Meets Objective	Taxiways	Meets Objective
Green Airports: PCI ≥75								
Ahoskie	Tri-County	ASJ	86	Yes	98	Yes	97	Yes
Clinton	Clinton-Sampson County	CTZ	85	Yes	82	Yes	95	Yes
Edenton	Northeastern Regional	EDE	85	Yes	70	No	88	Yes
Elkin	Elkin Municipal	ZEF	89	Yes	90	Yes	100	Yes
Engelhard	Hyde County	7W6	64	No	100	Yes	100	Yes
Hatteras	Billy Mitchell (NPS)	HSE	79	Yes	64	No	65	No
Kill Devil Hills	First Flight (NPS)	FFA	95	Yes	89	Yes	91	Yes
Mount Olive	Mount Olive Municipal	W40	74	No	64	No	67	No
Ocean Isle Beach	Odell Williamson Municipal	60J	96	Yes	93	Yes	100	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95	66	No	64	No	64	No
Plymouth	Plymouth Municipal	PMZ	95	Yes	98	Yes	90	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	97	Yes	98	Yes	100	Yes
Rockingham	Richmond County	RCZ	95	Yes	73	No	90	Yes
Spruce Pine	Avery County/Morrison Field	7A8	94	Yes	93	Yes	70	No
Star	Montgomery County	43A	100	Yes	99	Yes	97	Yes
Sylva	Jackson County	24A	86	Yes	86	Yes	96	Yes
Tarboro	Tarboro-Edgecombe	ETC	81	Yes	86	Yes	94	Yes
Wadesboro	Anson County-Jeff Cloud Field	AFP	89	Yes	75	Yes	84	Yes
Whiteville	Columbus County Municipal	CPC	67	No	63	No	73	No
Williamston	Martin County	MCZ	92	Yes	95	Yes	96	Yes

Source: North Carolina Pavement Management System Program, 2013, Charlotte Douglas International Airport, Piedmont Triad International Airport, and Raleigh Durham International Airport

Notes:

[1] From 2011 Airport Pavement Study; an average apron PCI is not available, but PCI was considered compliant with system plan objective.

[2] According to GSO, PCIs for all pavements was currently being evaluated by RD McQueen (as of June 2014) and no data was available for this analysis.

[3] Data provided by RDU based on 2009 PCI evaluation of the primary runway. No average PCIs were available for taxiways and aprons, but PCIs were considered compliant with system objectives.

[4] The PCI for taxiways at Elizabeth City CG Air Station/Regional Airport were not available. For the purpose of the NCASP, it was assumed that the PCI on the taxiways is less than an average of 75.

Table 5.14: 500: Runway Length and Width Compliance

Associated City	Airport Name	ID	Primary Runway Length			Primary Runway Width		
			Existing Runway Length (feet)	Runway Length Objective (feet)	Meets Objective	Existing Runway Width (feet)	Runway Width Objective (feet)	Meets Objective
Yellow Airports: 6,500' x 150'								
Asheville	Asheville Regional	AVL	8,001	6,500	Yes	150	150	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	10,000	6,500	Yes	150	150	Yes
Concord	Concord Regional	JQF	7,400	6,500	Yes	100	150	No
Fayetteville	Fayetteville Regional/Grannis Field	FAY	7,709	6,500	Yes	150	150	Yes
Greensboro	Piedmont Triad Int'l	GSO	10,001	6,500	Yes	150	150	Yes
Greenville	Pitt-Greenville	PGV	6,505	6,500	Yes	150	150	Yes
Jacksonville	Albert J. Ellis	OAJ	7,100	6,500	Yes	150	150	Yes
New Bern	Coastal Carolina Regional	EWN	6,153	6,500	No	150	150	Yes
Raleigh	Raleigh-Durham Int'l	RDU	10,000	6,500	Yes	150	150	Yes
Wilmington	Wilmington Int'l	ILM	8,016	6,500	Yes	150	150	Yes
Red Airports: 6,000' x 100'								
Beaufort	Michael J. Smith Field	MRH	5,002	6,000	No	100	100	Yes
Burlington	Burlington-Alamance Regional	BUY	6,405	6,000	Yes	100	100	Yes
Currituck	Currituck County Regional	ONX	5,500	6,000	No	150	100	Yes
Franklin	Macon County	1A5	5,000	6,000	No	100	100	Yes
Hickory	Hickory Regional	HKY	6,400	6,000	Yes	150	100	Yes
Lexington	Davidson County	EXX	5,004	6,000	No	100	100	Yes
Manteo	Dare County Regional	MQI	4,305	6,000	No	100	100	Yes
Monroe	Charlotte-Monroe Executive	EQY	7,000	6,000	Yes	100	100	Yes
Oak Island	Cape Fear Regional Jetport-Howie	SUT	5,505	6,000	No	100	100	Yes
Pinehurst/Southern	Moore County	SOP	5,503	6,000	No	150	100	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	7,099	6,000	Yes	150	100	Yes
Salisbury	Rowan County	RUQ	5,501	6,000	No	100	100	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee	TTA	6,500	6,000	Yes	100	100	Yes
Smithfield	Johnston County	JNX	5,500	6,000	No	100	100	Yes
Statesville	Statesville Regional	SVH	7,005	6,000	Yes	100	100	Yes
Winston-Salem	Smith Reynolds	INT	6,655	6,000	Yes	150	100	Yes

Table 5-14: 500: Runway Length and Width Compliance (Cont.)

Associated City	Airport Name	ID	Primary Runway Length			Primary Runway Width		
			Existing Runway Length (feet)	Runway Length Objective (feet)	Meets Objective	Existing Runway Width (feet)	Runway Width Objective (feet)	Meets Objective
Blue Airports: 5,000' x 100'								
Albemarle	Stanly County	VUJ	5,500	5,000	Yes	100	100	Yes
Andrews	Western Carolina Regional	RHP	5,500	5,000	Yes	100	100	Yes
Asheboro	Asheboro Regional	HBI	5,501	5,000	Yes	100	100	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	7,217	5,000	Yes	150	100	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	5,005	5,000	Yes	75	100	No
Erwin	Harnett Regional Jetport	HRJ	5,000	5,000	Yes	75	100	No
Gastonia	Gastonia Municipal	AKH	3,770	5,000	No	100	100	Yes
Goldsboro	Wayne Executive Jetport	GWW	5,500	5,000	Yes	100	100	Yes
Jefferson	Ashe County	GEV	4,296	5,000	No	75	100	No
Kenansville	Duplin County	DPL	6,002	5,000	Yes	75	100	No
Kinston	Kinston Regional Jetport at Stallings	ISO	11,500	5,000	Yes	150	100	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	5,504	5,000	Yes	100	100	Yes
Louisburg	Triangle North Executive	LHZ	5,498	5,000	Yes	100	100	Yes
Lumberton	Lumberton Regional	LBT	5,502	5,000	Yes	150	100	Yes
Maxton	Laurinburg-Maxton	MEB	6,503	5,000	Yes	150	100	Yes
Morganton	Foothills Regional	MRN	5,500	5,000	Yes	75	100	No
Mount Airy	Mount Airy/Surry County	MWK	4,301	5,000	No	75	100	No
North Wilkesboro	Wilkes County	UKF	6,200	5,000	Yes	100	100	Yes
Oxford	Henderson-Oxford	HNZ	5,002	5,000	Yes	97	100	No
Reidsville	Rockingham County NC Shiloh	SIF	5,199	5,000	Yes	100	100	Yes
Roxboro	Person County	TDF	6,005	5,000	Yes	100	100	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	5,000	5,000	Yes	100	100	Yes
Shelby	Shelby-Cleveland County Regional	EHO	5,002	5,000	Yes	100	100	Yes
Siler City	Siler City Municipal	5W8	5,000	5,000	Yes	75	100	No
Wallace	Henderson Field	ACZ	4,153	5,000	No	75	100	No
Washington	Warren Field	OCW	5,000	5,000	Yes	100	100	Yes

Table 5.14: 500: Runway Length and Width Compliance (Cont.)

Associated City	Airport Name	ID	Primary Runway Length			Primary Runway Width		
			Existing Runway Length (feet)	Runway Length Objective (feet)	Meets Objective	Existing Runway Width (feet)	Runway Width Objective (feet)	Meets Objective
Green Airports: 4,200' x 75'								
Ahoskie	Tri-County	ASJ	4,501	4,200	Yes	75	75	Yes
Clinton	Clinton-Sampson County	CTZ	5,010	4,200	Yes	75	75	Yes
Edenton	Northeastern Regional	EDE	6,000	4,200	Yes	100	75	Yes
Elkin	Elkin Municipal	ZEF	4,001	4,200	No	75	75	Yes
Engelhard	Hyde County	7W6	4,700	4,200	Yes	100	75	Yes
Hatteras	Billy Mitchell (NPS)	HSE	3,000	4,200	No	75	75	Yes
Kill Devil Hills	First Flight (NPS)	FFA	3,000	4,200	No	60	75	No
Mount Olive	Mount Olive Municipal	W40	5,255	4,200	Yes	75	75	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	4,198	4,200	Yes	75	75	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95	2,999	4,200	No	60	75	No
Plymouth	Plymouth Municipal	PMZ	5,500	4,200	Yes	75	75	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	5,500	4,200	Yes	101	75	Yes
Rockingham	Richmond County	RCZ	5,000	4,200	Yes	100	75	Yes
Spruce Pine	Avery County/Morrison Field	7A8	3,000	4,200	No	60	75	No
Star	Montgomery County	43A	4,002	4,200	No	75	75	Yes
Sylva	Jackson County	24A	3,200	4,200	No	60	75	No
Tarboro	Tarboro-Edgecombe	ETC	3,999	4,200	No	60	75	No
Wadesboro	Anson County-Jeff Cloud Field	AFP	5,498	4,200	Yes	100	75	Yes
Whiteville	Columbus County Municipal	CPC	5,500	4,200	Yes	75	75	Yes
Williamston	Martin County	MCZ	5,000	4,200	Yes	75	75	Yes

Source: NCASP Inventory Data, 2012 and FAA 5010s

Table 5.15: 600: Pavement Strength Compliance

Associated City	Airport Name	ID	Existing Pavement Strength	Meets Objective
Yellow Airports: Per PCN Analysis				
Asheville	Asheville Regional	AVL	120,000lbs SW 160,000lbs DW 260,000lbs DT	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	140,000lbs SW 200,000lbs DW 350,000lbs DT 650,000lbs DDTW	Yes
Concord	Concord Regional	JQF	37/F/C/X/T	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	100,000lbs SW 200,000lbs DW 350,000lbs DT 750,000lbs DDTW	Yes
Greensboro	Piedmont Triad Int'l	GSO	124,000lbs SW 170,000lbs DW 240,000lbs DT	Yes
Greenville	Pitt-Greenville	PGV	59,000lbs SW 95,000lbs DW	Yes
Jacksonville	Albert J. Ellis	OAJ	75,000lbs SW 175,000lbs DW 300,000lbs DT	Yes
New Bern	Coastal Carolina Regional	EWN	30,000lbs SW 62,000lbs DW 140,000lbs DT	Yes
Raleigh	Raleigh-Durham Int'l	RDU	75,000lbs SW 190,000lbs DW 355,000lbs DT 750,000lbs DDTW	Yes
Wilmington	Wilmington Int'l	ILM	100/F/A/X/T	Yes
Red Airports: >60,000lbs SW or DW or Per PCN Analysis if Part 139				
Beaufort	Michael J. Smith Field	MRH	60,000lbs DW	Yes
Burlington	Burlington-Alamance Regional	BUY	95,500lbs DW	Yes
Currituck	Currituck County Regional	ONX	20,000lbs SW 35,000lbs DW	No
Franklin	Macon County	1A5	30,000lbs SW	No

Table 5.15: 600: Pavement Strength Compliance (Cont.)

Associated City	Airport Name	ID	Existing Pavement Strength	Meets Objective
Hickory	Hickory Regional	HKY	32,000lbs SW 55,000lbs DW	No
Lexington	Davidson County	EXX	17,00lbs SW 60,000lbs DW	Yes
Manteo	Dare County Regional	MQI	48,000lbs SW	No
Monroe	Charlotte-Monroe Executive	EQY	68,500lbs DW	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	60,000lbs SW 80,000lbs DW	Yes
Pinehurst/Southern Pines	Moore County	SOP	30,000lbs SW 58,000lbs DW	No
Rocky Mount	Rocky Mount-Wilson Regional	RWI	62,000lbs SW 75,000lbs DW 140,000lbs DT	Yes
Salisbury	Rowan County	RUQ	45,000lbs SW 55,000lbs DW	No
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	30,000lbs SW 80,000lbs DW	Yes
Smithfield	Johnston County	JNX	30,000lbs SW 65,000lbs DW	Yes
Statesville	Statesville Regional	SVH	30,000lbs SW 100,000lbs DW	Yes
Winston-Salem	Smith Reynolds	INT	110,000lbs SW 135,000lbs DW 230,000lbs DT	Yes
Blue Airports: >30,000lbs SW or DW and <60,000lbs SW or DW or Per PCN Analysis if Part 139				
Albemarle	Stanly County	VUJ	130,000lbs DW	Yes
Andrews	Western Carolina Regional	RHP	25,000lbs SW 45,000lbs DW	Yes
Asheboro	Asheboro Regional	HBI	30,000lbs SW 60,000lbs DW	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	100,000lbs SW 200,000lbs DW 400,000lbs DT	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	30,000lbs SW 45,000lbs DW	Yes

Table 5.15: 600: Pavement Strength Compliance (Cont.)

Associated City	Airport Name	ID	Existing Pavement Strength	Meets Objective
Erwin	Harnett Regional Jetport	HRJ	13,000lbs SW	No
Gastonia	Gastonia Municipal	AKH	24,000lbs SW	No
Goldsboro	Wayne Executive Jetport	GWW	30,000lbs SW 42,000lbs DW	Yes
Jefferson	Ashe County	GEV	12,500lbs SW	No
Kenansville	Duplin County	DPL	30,000lbs SW 50,000lbs DW	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	90,000lbs SW 135,000lbs DW 260,000lbs DT	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	30,000lbs SW 60,000lbs DW	Yes
Louisburg	Triangle North Executive	LHZ	40,000lbs SW 60,000lbs DW	Yes
Lumberton	Lumberton Regional	LBT	80,000lbs SW	Yes
Maxton	Laurinburg-Maxton	MEB	25,000lbs SW 35,000lbs DW	Yes
Morganton	Foothills Regional	MRN	60,000lbs DW	Yes
Mount Airy	Mount Airy/Surry County	MWK	Unknown	No
North Wilkesboro	Wilkes County	UKF	45,000lbs SW 60,000lbs DW	Yes
Oxford	Henderson-Oxford	HNZ	30,000lbs SW	Yes
Reidsville	Rockingham County NC Shiloh	SIF	12,500lbs SW 24,000lbs DW	No
Roxboro	Person County	TDF	30,000lbs SW 67,000lbs DW	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	66,000lbs DW	Yes
Shelby	Shelby-Cleveland County Regional	EHO	21,000lbs SW 45,000lbs DW	Yes
Siler City	Siler City Municipal	5W8	25,000lbs SW	No
Wallace	Henderson Field	ACZ	12,500lbs SW	No
Washington	Warren Field	OCW	30,000lbs SW 38,000lbs DW	Yes

Table 5.15: 600: Pavement Strength Compliance (Cont.)

Associated City	Airport Name	ID	Existing Pavement Strength	Meets Objective
Green Airports: <30,000lbs SW or DW and >12,500lbs SW or DW				
Ahoskie	Tri-County	ASJ	35,000lbs SW 45,000lbs DW	Yes
Clinton	Clinton-Sampson County	CTZ	26,000lbs SW	Yes
Edenton	Northeastern Regional	EDE	60,000lbs SW 80,000lbs DW	Yes
Elkin	Elkin Municipal	ZEF	25,000lbs SW	Yes
Engelhard	Hyde County	7W6	30,000lbs SW 43,000lbs DW	Yes
Hatteras	Billy Mitchell (NPS)	HSE	30,000lbs SW	Yes
Kill Devil Hills	First Flight (NPS)	FFA	10,000lbs SW	No
Mount Olive	Mount Olive Municipal	W40	20,000lbs SW	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	12,000lbs SW	No
Ocracoke	Ocracoke Island Airport (NPS)	W95	30,000lbs SW	Yes
Plymouth	Plymouth Municipal	PMZ	60,000lbs SW	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	45,000lbs SW 65,000lbs DW	Yes
Rockingham	Richmond County	RCZ	30,000lbs SW	Yes
Spruce Pine	Avery County/Morrison Field	7A8	12,500lbs SW	Yes
Star	Montgomery County	43A	20,000lbs SW	Yes
Sylva	Jackson County	24A	12,500lbs SW	Yes
Tarboro	Tarboro-Edgecombe	ETC	12,500lbs SW	Yes
Wadesboro	Anson County-Jeff Cloud Field	AFP	12,000lbs SW 60,000lbs DW	Yes
Whiteville	Columbus County Municipal	CPC	24,000lbs SW 30,000lbs DW	Yes
Williamston	Martin County	MCZ	21,000lbs SW	Yes

Source: NCASP Inventory Data, 2012 and FAA 5010s

Table 5.16: 700: Visual Navigational Aids Compliance

Associated City	Airport Name	ID	Rotating Beacon	Lighted Wind Sock	VGSI	REILs	Meets Objective
Yellow Airports: Rotating Beacon, Lighted Wind Sock, PAPI-4							
Asheville	Asheville Regional	AVL	Yes	Yes	P4L/V4L	--/--	No
Charlotte	Charlotte/Douglas Int'l	CLT	Yes	Yes	P4R/P4L	--/--	Yes
Concord	Concord Regional	JQF	Yes	36" (3) lighted	P4L/P4L	Yes/--	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	Yes	18" (2), 36" lighted	P4R/P4L	--/Yes	Yes
Greensboro	Piedmont Triad Int'l	GSO	Yes	Yes	P4R/P4L	--/--	Yes
Greenville	Pitt-Greenville	PGV	Yes	18" (4) lighted, 36" lighted	P4L/P4L	Yes/No	Yes
Jacksonville	Albert J. Ellis	OAJ	Yes	18" lighted, 24" (2) lighted, 36" (3) lighted	P4L/P4L	--/Yes	Yes
New Bern	Coastal Carolina Regional	EWN	Yes	18" (3) lighted, 36" lighted	P4L/P4L	Yes/Yes	Yes
Raleigh	Raleigh-Durham Int'l	RDU	Yes	Yes	P4L/P4L	--/--	Yes
Wilmington	Wilmington Int'l	ILM	Yes	36" (5) lighted	P4R/P4L	Yes/Yes	Yes
Red Airports: Rotating Beacon, Lighted Wind Sock, PAPI-4							
Beaufort	Michael J. Smith Field	MRH	Yes	tetrahedron	P2L/P2R	--/--	No
Burlington	Burlington-Alamance Regional	BUY	Yes	36" lighted	P4L/P4L	Yes/Yes	Yes
Currituck	Currituck County Regional	ONX	Yes	36", 36" lighted	P2L/P2L	Yes/Yes	No
Franklin	Macon County	1A5	Yes	Yes	P2L/P2L	Yes/Yes	No
Hickory	Hickory Regional	HKY	Yes	36" lighted	V4L/P4L	Yes/--	No
Lexington	Davidson County	EXX	Yes	24" lighted	PL2/PL2	Yes/Yes	No
Manteo	Dare County Regional	MQI	Yes	18", 24", 36" lighted	P2L/P2L	Yes/--	No
Monroe	Charlotte-Monroe Executive	EQY	Yes	36" lighted	P2L/P2L	Yes/Yes	No
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	Yes	18" lighted	P2L/P2L	--/--	No
Pinehurst/Southern Pines	Moore County	SOP	Yes	18", 36" lighted	V4L/V4L	--/Yes	No
Rocky Mount	Rocky Mount-Wilson Regional	RWI	Yes	18" (2) lighted, 36" lighted	P4L/P4L	--/Yes	Yes
Salisbury	Rowan County	RUQ	Yes	18" lighted, 36" lighted	P2L/P2L	Yes/Yes	No
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	Yes	18", 36" lighted	P4L/P4L	--/Yes	Yes
Smithfield	Johnston County	JNX	Yes	18" (2) lighted, 36" lighted	P4L/P4L	--/Yes	Yes
Statesville	Statesville Regional	SVH	Yes	18" lighted	P2L/P2L	Yes/--	No
Winston-Salem	Smith Reynolds	INT	Yes	18" lighted, 36" lighted	P4L/P4R	Yes/No	Yes

Table 5.16: 700: Visual Navigational Aids Compliance (Cont.)

Associated City	Airport Name	ID	Rotating Beacon	Lighted Wind Sock	VGSI	REILs	Meets Objective
Blue Airports: Rotating Beacon, Lighted Wind Sock, PAPI-4, REILs (if no Airport Lighting System)							
Albemarle	Stanly County	VUJ	Yes	36" lighted	P2L/P2L	Yes/Yes	No
Andrews	Western Carolina Regional	RHP	Yes	18" lighted	P2L/P2L	Yes/--	No
Asheboro	Asheboro Regional	HBI	Yes	36" lighted	P2L/P2L	Yes/Yes	No
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	Yes	36" lighted	P4L/P4L	Yes/Yes	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	Yes	36" lighted	P2L/P2L	--/Yes	No
Erwin	Harnett Regional Jetport	HRJ	Yes	36" lighted	P2L/P2L	Yes/Yes	No
Gastonia	Gastonia Municipal	AKH	Yes	36" lighted	P2R/P2L	--/Yes	No
Goldsboro	Wayne Executive Jetport	GWW	Yes	24" (2), 36" lighted	P4L/P4L	Yes/Yes	Yes
Jefferson	Ashe County	GEV	Yes	24" lighted	--/V2L	--/Yes	No
Kenansville	Duplin County	DPL	Yes	18" lighted	P2L/P2L	Yes/Yes	No
Kinston	Kinston Regional Jetport at Stallings Field	ISO	Yes	18" (2) lighted	P4L/P4L	--/Yes	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	Yes	36", 36" lighted	P2L/P2L	Yes/Yes	No
Louisburg	Triangle North Executive	LHZ	Yes	36" lighted	P2L/P2L	No/Yes	No
Lumberton	Lumberton Regional	LBT	Yes	18" (2), 36" lighted	P4L/V4L	Yes/Yes	No
Maxton	Laurinburg-Maxton	MEB	Yes	36", 36" lighted	P4L/P4L	--/--	Yes
Morganton	Foothills Regional	MRN	Yes	18" lighted, 36" lighted	P4L/P4R	Yes/Yes	Yes
Mount Airy	Mount Airy/Surry County	MWK	Yes	24" lighted	P2L/P2L	Yes/Yes	No
North Wilkesboro	Wilkes County	UKF	Yes	36" lighted	P2L/P2L	No/Yes	No
Oxford	Henderson-Oxford	HNZ	Yes	36" lighted	P2L/P2L	Yes/--	No
Reidsville	Rockingham County NC Shiloh	SIF	Yes	36" (2) lighted	P2L/P2L	--/Yes	No
Roxboro	Person County	TDF	Yes	18" (2), 24" lighted	P2L/P2L	Yes/Yes	No
Rutherfordton	Rutherford County-Marchman Field	FQD	Yes	18" (2) lighted	P2L/P2L	Yes/--	No
Shelby	Shelby-Cleveland County Regional	EHO	Yes	36" lighted	P2L/P2L	--/--	No
Siler City	Siler City Municipal	5W8	Yes	Yes	P2L/P2L	--/--	No
Wallace	Henderson Field	ACZ	Yes	36" lighted	P2L/P2L	--/--	No
Washington	Warren Field	OCW	Yes	24", tetrahedron	P2L/P2L	Yes/Yes	No

Table 5.16: 700: Visual Navigational Aids Compliance (Cont.)

Associated City	Airport Name	ID	Rotating Beacon	Lighted Wind Sock	VGSI	REILs	Meets Objective
Green Airports: Rotating Beacon, Lighted Wind Sock, PAPI-2, REILs (if no Airport Lighting System)							
Ahoskie	Tri-County	ASJ	Yes	18" lighted	P2L/P2L	Yes/Yes	Yes
Clinton	Clinton-Sampson County	CTZ	Yes	18" (3) lighted, 24" (1)	P2L/--	Yes/Yes	No
Edenton	Northeastern Regional	EDE	Yes	36" lighted	P2L/P2R	Yes/Yes	Yes
Elkin	Elkin Municipal	ZEF	Yes	36" lighted	V2L/V2L	--/Yes	No
Engelhard	Hyde County	7W6	Yes	36" lighted	P2L/P2L	--/--	Yes
Hatteras	Billy Mitchell (NPS)	HSE	No	36" (2), 36" lighted	--/--	--/--	No
Kill Devil Hills	First Flight (NPS)	FFA	No	36" lighted	--/--	--/--	No
Mount Olive	Mount Olive Municipal	W40	Yes	36" lighted	P2L/P2L	--/--	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	No	Yes	P2L/P2L	--/--	No
Ocracoke	Ocracoke Island Airport (NPS)	W95	Yes	18", 18" lighted	--/--	--/--	No
Plymouth	Plymouth Municipal	PMZ	Yes	36" lighted	P2L/P2L	Yes/Yes	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	Yes	36" lighted	P2L/P2L	Yes/Yes	Yes
Rockingham	Richmond County	RCZ	Yes	18" lighted	P2L/P2L	--/--	Yes
Spruce Pine	Avery County/Morrison Field	7A8	No	Yes	--/--	--/--	No
Star	Montgomery County	43A	Yes	Yes	P2L/P2L	--/--	Yes
Sylva	Jackson County	24A	Yes	Yes	P2L/P2L	Yes/Yes	Yes
Tarboro	Tarboro-Edgecombe	ETC	Yes	18", 36" lighted	P2L/P2L	--/Yes	Yes
Wadesboro	Anson County-Jeff Cloud Field	AFP	Yes	36" lighted	P2L/P2L	Yes/Yes	Yes
Whiteville	Columbus County Municipal	CPC	Yes	18" lighted	P2L/P2L	No/Yes	Yes
Williamston	Martin County	MCZ	Yes	18" lighted	P2L/P2L	Yes/Yes	Yes

Source: NCASP Inventory Data, 2012 and FAA 5010s

Table 5.17: 800: Runway Edge Lighting Compliance

Associated City	Airport Name	ID	Existing Runway Edge Lighting	Meets Objective
Yellow Airports: HIRL				
Asheville	Asheville Regional	AVL	HIRL	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	HIRL	Yes
Concord	Concord Regional	JQF	HIRL	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	HIRL	Yes
Greensboro	Piedmont Triad Int'l	GSO	HIRL	Yes
Greenville	Pitt-Greenville	PGV	HIRL	Yes
Jacksonville	Albert J. Ellis	OAJ	HIRL	Yes
New Bern	Coastal Carolina Regional	EWN	HIRL	Yes
Raleigh	Raleigh-Durham Int'l	RDU	HIRL	Yes
Wilmington	Wilmington Int'l	ILM	HIRL	Yes
Red Airports: MIRL				
Beaufort	Michael J. Smith Field	MRH	MIRL	Yes
Burlington	Burlington-Alamance Regional	BUY	MIRL	Yes
Currituck	Currituck County Regional	ONX	MIRL	Yes
Franklin	Macon County	1A5	MIRL	Yes
Hickory	Hickory Regional	HKY	HIRL	Yes
Lexington	Davidson County	EXX	MIRL	Yes
Manteo	Dare County Regional	MQI	MIRL	Yes
Monroe	Charlotte-Monroe Executive	EQY	HIRL	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	MIRL	Yes
Pinehurst/Southern Pines	Moore County	SOP	MIRL	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	HIRL	Yes
Salisbury	Rowan County	RUQ	MIRL	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	HIRL	Yes
Smithfield	Johnston County	JNX	MIRL	Yes
Statesville	Statesville Regional	SVH	HIRL	Yes
Winston-Salem	Smith Reynolds	INT	HIRL	Yes

Table 5.17: 800: Runway Edge Lighting Compliance (Cont.)

Associated City	Airport Name	ID	Existing Runway Edge Lighting	Meets Objective
Blue Airports: MIRL				
Albemarle	Stanly County	VUJ	MIRL	Yes
Andrews	Western Carolina Regional	RHP	MIRL	Yes
Asheboro	Asheboro Regional	HBI	MIRL	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	HIRL	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	MIRL	Yes
Erwin	Harnett Regional Jetport	HRJ	MIRL	Yes
Gastonia	Gastonia Municipal	AKH	MIRL	Yes
Goldsboro	Wayne Executive Jetport	GWW	MIRL	Yes
Jefferson	Ashe County	GEV	MIRL	Yes
Kenansville	Duplin County	DPL	MIRL	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	HIRL	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	MIRL	Yes
Louisburg	Triangle North Executive	LHZ	MIRL	Yes
Lumberton	Lumberton Regional	LBT	MIRL	Yes
Maxton	Laurinburg-Maxton	MEB	HIRL	Yes
Morganton	Foothills Regional	MRN	MIRL	Yes
Mount Airy	Mount Airy/Surry County	MWK	MIRL	Yes
North Wilkesboro	Wilkes County	UKF	MIRL	Yes
Oxford	Henderson-Oxford	HNZ	MIRL	Yes
Reidsville	Rockingham County NC Shiloh	SIF	HIRL	Yes
Roxboro	Person County	TDF	MIRL	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	MIRL	Yes
Shelby	Shelby-Cleveland County Regional	EHO	MIRL	Yes
Siler City	Siler City Municipal	5W8	MIRL	Yes
Wallace	Henderson Field	ACZ	MIRL	Yes
Washington	Warren Field	OCW	MIRL	Yes

Table 5.17: 800: Runway Edge Lighting Compliance (Cont.)

Associated City	Airport Name	ID	Existing Runway Edge Lighting	Meets Objective
Green Airports: MIRL				
Ahoskie	Tri-County	ASJ	MIRL	Yes
Clinton	Clinton-Sampson County	CTZ	MIRL	Yes
Edenton	Northeastern Regional	EDE	HIRL	Yes
Elkin	Elkin Municipal	ZEF	MIRL	Yes
Engelhard	Hyde County	7W6	MIRL	Yes
Hatteras	Billy Mitchell (NPS)	HSE	None	No
Kill Devil Hills	First Flight (NPS)	FFA	None	No
Mount Olive	Mount Olive Municipal	W40	MIRL	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	HIRL	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95	None	No
Plymouth	Plymouth Municipal	PMZ	HIRL	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	MIRL	Yes
Rockingham	Richmond County	RCZ	MIRL	Yes
Spruce Pine	Avery County/Morrison Field	7A8	None	No
Star	Montgomery County	43A	MIRL	Yes
Sylva	Jackson County	24A	MIRL	Yes
Tarboro	Tarboro-Edgecombe	ETC	MIRL	Yes
Wadesboro	Anson County-Jeff Cloud Field	AFP	MIRL	Yes
Whiteville	Columbus County Municipal	CPC	MIRL	Yes
Williamston	Martin County	MCZ	MIRL	Yes

Source: NCASP Inventory Data, 2012 and FAA 5010s

Table 5.18: 900: Weather Reporting Capability Compliance

Associated City	Airport Name	ID	Existing Weather Reporting Capability	Estimated Purchase Date of Equipment	Meets Objective
Yellow Airports: AWOS-IIIP					
Asheville	Asheville Regional	AVL	ASOS		Yes
Charlotte	Charlotte/Douglas Int'l	CLT	ASOS		Yes
Concord	Concord Regional	JQF	AWOS IIIPT	Mar-06	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	ASOS		Yes
Greensboro	Piedmont Triad Int'l	GSO	ASOS		Yes
Greenville	Pitt-Greenville	PGV	AWOS IIIPT		Yes
Jacksonville	Albert J. Ellis	OAJ	AWOS III		Yes
New Bern	Coastal Carolina Regional	EWN	ASOS		Yes
Raleigh	Raleigh-Durham Int'l	RDU	ASOS		Yes
Wilmington	Wilmington Int'l	ILM	ASOS		Yes
Red Airports: AWOS-III					
Beaufort	Michael J. Smith Field	MRH	ASOS		Yes
Burlington	Burlington-Alamance Regional	BUY	ASOS		Yes
Currituck	Currituck County Regional	ONX	AWOS IIIP	Jan-04	Yes
Franklin	Macon County	1A5	AWOS IIIPT	Jul-03	Yes
Hickory	Hickory Regional	HKY	ASOS		Yes
Lexington	Davidson County	EXX	AWOS IIIP	~1999	Yes
Manteo	Dare County Regional	MQI	AWOS IIIP	Jul-97	Yes
Monroe	Charlotte-Monroe Executive	EQY	ASOS		Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	AWOS IIIP	Jun-01	Yes
Pinehurst/Southern Pines	Moore County	SOP	AWOS III		Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	ASOS		Yes
Salisbury	Rowan County	RUQ	AWOS IIIP	Oct-99	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	AWOS IIIP	~1999	Yes
Smithfield	Johnston County	JNX	AWOS IIIPT		Yes
Statesville	Statesville Regional	SVH	AWOS IIIP	Mar-98	Yes
Winston-Salem	Smith Reynolds	INT	ASOS		Yes

Table 5.18: 900: Weather Reporting Capability Compliance (Cont.)

Associated City	Airport Name	ID	Existing Weather Reporting Capability	Estimated Purchase Date of Equipment	Meets Objective
Blue Airports: AWOS-III					
Albemarle	Stanly County	VUJ	AWOS IIIPT		Yes
Andrews	Western Carolina Regional	RHP	AWOS IIIP	Nov-97	Yes
Asheboro	Asheboro Regional	HBI	AWOS IIIP	Mar-98	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	ASOS		Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	AWOS IIIP	Jan-02	Yes
Erwin	Harnett Regional Jetport	HRJ	AWOS IIIP	Oct-97	Yes
Gastonia	Gastonia Municipal	AKH	ASOS		Yes
Goldsboro	Wayne Executive Jetport	GWW	AWOS IIIP	Mar-02	Yes
Jefferson	Ashe County	GEV	AWOS IIIP	Oct-97	Yes
Kenansville	Duplin County	DPL	AWOS IIIP	Aug-97	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	AWOS IIIP	~1997	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	AWOS IIIP		Yes
Louisburg	Triangle North Executive	LHZ	AWOS IIIP		Yes
Lumberton	Lumberton Regional	LBT	ASOS		Yes
Maxton	Laurinburg-Maxton	MEB	ASOS		Yes
Morganton	Foothills Regional	MRN	AWOS IIIP		Yes
Mount Airy	Mount Airy/Surry County	MWK	AWOS IIIP	~1998	Yes
North Wilkesboro	Wilkes County	UKF	AWOS IIIPT		Yes
Oxford	Henderson-Oxford	HNZ	AWOS IIIP	May-01	Yes
Reidsville	Rockingham County NC Shiloh	SIF	AWOS IIIP	Aug-05	Yes
Roxboro	Person County	TDF	AWOS IIIPT	Dec-02	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	AWOS IIIPT	Nov-97	Yes
Shelby	Shelby-Cleveland County Regional	EHO	AWOS IIIP	Dec-03	Yes
Siler City	Siler City Municipal	5W8	AWOS IIIP	2012	Yes
Wallace	Henderson Field	ACZ	None		No
Washington	Warren Field	OCW	AWOS IIIP		Yes

Table 5.18: 900: Weather Reporting Capability Compliance (Cont.)

Associated City	Airport Name	ID	Existing Weather Reporting Capability	Estimated Purchase Date of Equipment	Meets Objective
Green Airports: AWOS-III					
Ahoskie	Tri-County	ASJ	AWOS IIIP	Oct-97	Yes
Clinton	Clinton-Sampson County	CTZ	AWOS IIIP	Aug-00	Yes
Edenton	Northeastern Regional	EDE	AWOS IIIP	Jun-97	Yes
Elkin	Elkin Municipal	ZEF	None		No
Engelhard	Hyde County	7W6	None		No
Hatteras	Billy Mitchell (NPS)	HSE	ASOS		Yes
Kill Devil Hills	First Flight (NPS)	FFA	AWOS IIIP	May-03	Yes
Mount Olive	Mount Olive Municipal	W40	None		No
Ocean Isle Beach	Odell Williamson Municipal	60J	None		No
Ocracoke	Ocracoke Island Airport (NPS)	W95	None		No
Plymouth	Plymouth Municipal	PMZ	None		No
Roanoke Rapids	Halifax-Northampton Regional	IXA	AWOS IIIP		Yes
Rockingham	Richmond County	RCZ	AWOS IIIP	Feb-04	Yes
Spruce Pine	Avery County/Morrison Field	7A8	SUPERAWOS		No
Star	Montgomery County	43A	None		No
Sylva	Jackson County	24A	SUPERAWOS		No
Tarboro	Tarboro-Edgecombe	ETC	AWOS IIIP		Yes
Wadesboro	Anson County-Jeff Cloud Field	AFP	AWOS IIIP	Feb-05	Yes
Whiteville	Columbus County Municipal	CPC	AWOS IIIP	Mar-02	Yes
Williamston	Martin County	MCZ	None		No

Source: North Carolina AWOS Survey, 2012

Table 5.19: 1000: Standard Instrument Approach Compliance

Associated City	Airport Name	ID	Existing Approach	Lowest Existing Approach Minimums (Decision Altitude - DA)	Height Above Touchdown (HAT)	Visibility (sm or RVR)	Meets Objective
Yellow Airports: Precision Approach <250' and <3/4 mile							
Asheville	Asheville Regional	AVL	Precision	2340/24	200	1/2	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	Precision	CAT IIIb		06	Yes
Concord	Concord Regional	JQF	Precision	905-1/2	200	1/2	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	Precision	384/24	200	1/2	Yes
Greensboro	Piedmont Triad Int'l	GSO	Precision	CAT IIIb		06	Yes
Greenville	Pitt-Greenville	PGV	Precision	319- 3/4	294	3/4	No
Jacksonville	Albert J. Ellis	OAJ	Precision	289-1/2	200	1/2	Yes
New Bern	Coastal Carolina Regional	EWN	Precision	267-3/4	250	3/4	Yes
Raleigh	Raleigh-Durham Int'l	RDU	Precision	CAT IIIb		06	Yes
Wilmington	Wilmington Int'l	ILM	Precision	220/24	200	1/2	Yes
Red Airports: Instrument Approach with Vertical Guidance 250' and 3/4 mile							
Beaufort	Michael J. Smith Field	MRH	RNAV LPV	360-1	354	1	No
Burlington	Burlington-Alamance Regional	BUY	Precision	866-3/4	250	3/4	Yes
Currituck	Currituck County Regional	ONX	RNAV LPV	343-1 1/4	325	1 1/4	No
Franklin	Macon County	1A5	Non-Precision (Circling)	3620-1 1/4 (A) 3620-1 1/2 (B)	1600	1 1/4	No
Hickory	Hickory Regional	HKY	Precision	1390-1/2	200	1/2	Yes
Lexington	Davidson County	EXX	Precision	982-7/8	250	7/8	No
Manteo	Dare County Regional	MQI	RNAV LPV	259-3/4	250	3/4	Yes
Monroe	Charlotte-Monroe Executive	EQY	Precision	878-1/2	200	1/2	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	RNAV LPV	283-1	258	1	No
Pinehurst/Southern Pines	Moore County	SOP	Precision	655-1/2	200	1/2	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	Precision	409 3/4	250	3/4	Yes
Salisbury	Rowan County	RUQ	Precision	966 1/2	200	1/2	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	Precision	446-1/2	200	1/2	Yes
Smithfield	Johnston County	JNX	Precision	347-1/2	200	1/2	Yes
Statesville	Statesville Regional	SVH	Precision	1166-1/2	200	1/2	Yes
Winston-Salem	Smith Reynolds	INT	Precision	1141/24	200	24	Yes

Table 5.19: 1000: Standard Instrument Approach Compliance (Cont.)

Associated City	Airport Name	ID	Existing Approach	Lowest Existing Approach Minimums (Decision Altitude - DA)	Height Above Touchdown (HAT)	Visibility (sm or RVR)	Meets Objective
Blue Airports: Instrument Approach with Vertical Guidance 250' and 3/4 mile							
Albemarle	Stanly County	VUJ	Precision	784-3/4	200	3/4	Yes
Andrews	Western Carolina Regional	RHP	RNAV LPV	4020-1 1/4 (A), 4020-1 1/2 (B)	2329	1 1/4	No
Asheboro	Asheboro Regional	HBI	RNAV LPV	1220-1	547	1	No
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	Precision	211-3/4	200	3/4	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	RNAV LPV	331-3/4	200	3/4	Yes
Erwin	Harnett Regional Jetport	HRJ	RNAV LPV	474-1	279	1	No
Gastonia	Gastonia Municipal	AKH	RNAV LPV	1111-1 1/4	313	1 1/4	No
Goldsboro	Wayne Executive Jetport	GWW	Precision	333-5/8	200	5/8	Yes
Jefferson	Ashe County	GEV	LNAV	4160-1 1/4 (A), 4160-1 1/2 (B)	1004	1 1/4	No
Kenansville	Duplin County	DPL	RNAV LPV	335-3/4	200	3/4	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	Precision	294 1/2	200	1/2	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	RNAV LPV	1187-1 1/4	315	1 1/4	No
Louisburg	Triangle North Executive	LHZ	Precision	598-1/2	200	1/2	Yes
Lumberton	Lumberton Regional	LBT	Precision	360-3/4	236	3/4	Yes
Maxton	Laurinburg-Maxton	MEB	Precision	415-1/2	200	1/2	Yes
Morganton	Foothills Regional	MRN	RNAV LPV	1430-3/4	200	3/4	Yes
Mount Airy	Mount Airy/Surry County	MWK	RNAV LPV	1533-1 1/4	305	1 1/4	No
North Wilkesboro	Wilkes County	UKF	Precision	1477-1/2	200	1/2	Yes
Oxford	Henderson-Oxford	HNZ	RNAV LPV	773-1	250	1	No
Reidsville	Rockingham County NC Shiloh	SIF	LNAV	1060-1	392	1	No
Roxboro	Person County	TDF	Precision	801-1/2	200	1/2	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	RNAV LPV	1561-1 3/4	502	1 3/4	No
Shelby	Shelby-Cleveland County Regional	EHO	RNAV LPV	1084-1	250	1	No
Siler City	Siler City Municipal	5W8	LNAV	1240-1	626	1	No
Wallace	Henderson Field	ACZ	Non-Precision	500-1	461	1	No
Washington	Warren Field	OCW	RNAV LPV	359-1 1/4	324	1 1/4	No

Table 5.19: 1000: Standard Instrument Approach Compliance (Cont.)

Associated City	Airport Name	ID	Existing Approach	Lowest Existing Approach Minimums (Decision Altitude - DA)	Height Above Touchdown (HAT)	Visibility (sm or RVR)	Meets Objective
Green Airports: Instrument Approach with Vertical Guidance 400' and 1 mile							
Ahoskie	Tri-County	ASJ	Non-Precision	440-1	372	1	Yes
Clinton	Clinton-Sampson County	CTZ	RNAV LPV	330-3/4	200	3/4	Yes
Edenton	Northeastern Regional	EDE	Precision	219-3/4	200	3/4	Yes
Elkin	Elkin Municipal	ZEF	Non-Precision	1700-1	635	1	No
Engelhard	Hyde County	7W6	Visual				No
Hatteras	Billy Mitchell (NPS)	HSE	LNAV	500-1	485	1	No
Kill Devil Hills	First Flight (NPS)	FFA	Visual				No
Mount Olive	Mount Olive Municipal	W40	RNAV LPV	452-1	286	1	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	Visual				No
Ocracoke	Ocracoke Island Airport (NPS)	W95	LNAV	500-1	495	1	No
Plymouth	Plymouth Municipal	PMZ	LP	440-1	404	1	No
Roanoke Rapids	Halifax-Northampton Regional	IXA	RNAV LPV	339-3/4	200	3/4	Yes
Rockingham	Richmond County	RCZ	RNAV LPV	632-1	277	1	Yes
Spruce Pine	Avery County/Morrison Field	7A8	Visual				No
Star	Montgomery County	43A	Visual				No
Sylva	Jackson County	24A	Visual				No
Tarboro	Tarboro-Edgecombe	ETC	Non-Precision	760-1	710	1	No
Wadesboro	Anson County-Jeff Cloud Field	AFP	Precision	556-7/8	259	7/8	Yes
Whiteville	Columbus County Municipal	CPC	LNAV	500-1	401	1	Yes
Williamston	Martin County	MCZ	LNAV	480-1	404	1	Yes

Source: FAA Digital Terminal Procedures Effective March 6, 2014 - April 3, 2014

Table 5.20: 1100: Taxiway Requirement Compliance

Associated City	Airport Name	ID	Existing Primary Taxiway	Meets Objective
Yellow Airports: Full Parallel				
Asheville	Asheville Regional	AVL	Full Parallel	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	Full Parallel	Yes
Concord	Concord Regional	JQF	Full Parallel	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	Full Parallel	Yes
Greensboro	Piedmont Triad Int'l	GSO	Full Parallel	Yes
Greenville	Pitt-Greenville	PGV	Full Parallel	Yes
Jacksonville	Albert J. Ellis	OAJ	Full Parallel	Yes
New Bern	Coastal Carolina Regional	EWN	Full Parallel	Yes
Raleigh	Raleigh-Durham Int'l	RDU	Full Parallel	Yes
Wilmington	Wilmington Int'l	ILM	Full Parallel	Yes
Red Airports: Full Parallel				
Beaufort	Michael J. Smith Field	MRH	Partial Parallel	No
Burlington	Burlington-Alamance Regional	BUY	Full Parallel	Yes
Currituck	Currituck County Regional	ONX	Connector	No
Franklin	Macon County	1A5	Full Parallel	Yes
Hickory	Hickory Regional	HKY	Full Parallel	Yes
Lexington	Davidson County	EXX	Full Parallel	Yes
Manteo	Dare County Regional	MQI	Full Parallel	Yes
Monroe	Charlotte-Monroe Executive	EQY	Full Parallel	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	Full Parallel	Yes
Pinehurst/Southern Pines	Moore County	SOP	Full Parallel	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	Full Parallel	Yes
Salisbury	Rowan County	RUQ	Full Parallel	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	Full Parallel	Yes
Smithfield	Johnston County	JNX	Full Parallel	Yes
Statesville	Statesville Regional	SVH	Full Parallel	Yes
Winston-Salem	Smith Reynolds	INT	Full Parallel	Yes

Table 5.20: 1100: Taxiway Requirement Compliance (Cont.)

Associated City	Airport Name	ID	Existing Primary Taxiway	Meets Objective
Blue Airports: Full Parallel				
Albemarle	Stanly County	VUJ	Full Parallel	Yes
Andrews	Western Carolina Regional	RHP	Partial Parallel	No
Asheboro	Asheboro Regional	HBI	Full Parallel	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	Turnarounds on Both Ends	No
Elizabethtown	Curtis L Brown Jr Field	EYF	Full Parallel	Yes
Erwin	Harnett Regional Jetport	HRJ	Full Parallel	Yes
Gastonia	Gastonia Municipal	AKH	Full Parallel	Yes
Goldsboro	Wayne Executive Jetport	GWW	Full Parallel	Yes
Jefferson	Ashe County	GEV	Connector	No
Kenansville	Duplin County	DPL	Full Parallel	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	Full Parallel	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	Full Parallel	Yes
Louisburg	Triangle North Executive	LHZ	Full Parallel	Yes
Lumberton	Lumberton Regional	LBT	Partial Parallel	No
Maxton	Laurinburg-Maxton	MEB	Full Parallel	Yes
Morganton	Foothills Regional	MRN	Partial Parallel	No
Mount Airy	Mount Airy/Surry County	MWK	Partial Parallel	No
North Wilkesboro	Wilkes County	UKF	Full Parallel	Yes
Oxford	Henderson-Oxford	HNZ	Full Parallel	Yes
Reidsville	Rockingham County NC Shiloh	SIF	Full Parallel	Yes
Roxboro	Person County	TDF	Full Parallel	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	Full Parallel	Yes
Shelby	Shelby-Cleveland County Regional	EHO	Full Parallel	Yes
Siler City	Siler City Municipal	5W8	Turnarounds on Both Ends	No
Wallace	Henderson Field	ACZ	Stubs on Both Ends	No
Washington	Warren Field	OCW	Full Parallel	Yes

Table 5.20: 1100: Taxiway Requirement Compliance (Cont.)

Associated City	Airport Name	ID	Existing Primary Taxiway	Meets Objective
Green Airports: Full Parallel				
Ahoskie	Tri-County	ASJ	Partial Parallel	No
Clinton	Clinton-Sampson County	CTZ	Full Parallel	Yes
Edenton	Northeastern Regional	EDE	Full Parallel	Yes
Elkin	Elkin Municipal	ZEF	Connector	No
Engelhard	Hyde County	7W6	Connector	No
Hatteras	Billy Mitchell (NPS)	HSE	Connector and Turnaround	No
Kill Devil Hills	First Flight (NPS)	FFA	Turnarounds on Both Ends	No
Mount Olive	Mount Olive Municipal	W40	Connector	No
Ocean Isle Beach	Odell Williamson Municipal	60J	Connector	No
Ocracoke	Ocracoke Island Airport (NPS)	W95	Turnarounds on Both Ends	No
Plymouth	Plymouth Municipal	PMZ	Partial Parallel	No
Roanoke Rapids	Halifax-Northampton Regional	IXA	Full Parallel	Yes
Rockingham	Richmond County	RCZ	Full Parallel	Yes
Spruce Pine	Avery County/Morrison Field	7A8	Stubs on Both Ends	No
Star	Montgomery County	43A	Turnaround and Connector	No
Sylva	Jackson County	24A	Stubs on Both Ends	No
Tarboro	Tarboro-Edgecombe	ETC	Turnaround and Connector	No
Wadesboro	Anson County-Jeff Cloud Field	AFP	Full Parallel	Yes
Whiteville	Columbus County Municipal	CPC	Turnaround and Connector	No
Williamston	Martin County	MCZ	Turnaround and Connector	No

Source: NCASP Inventory Data, 2012 and FAA 5010s

Table 5.21: 1200: Aircraft Apron Requirements Compliance

Associated City	Airport Name	ID	Existing General Aviation Apron Spaces	General Aviation Apron Space Objective	Meets Objective
Yellow Airports: 20% Based Aircraft + 20% Busy Day Transient GA					
Asheville	Asheville Regional	AVL	60	45	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	10	26	Yes*
Concord	Concord Regional	JQF	65	46	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	115	15	Yes
Greensboro	Piedmont Triad Int'l	GSO	82	31	Yes
Greenville	Pitt-Greenville	PGV	43	16	Yes
Jacksonville	Albert J. Ellis	OAJ	28	8	Yes
New Bern	Coastal Carolina Regional	EWN	67	24	Yes
Raleigh	Raleigh-Durham Int'l	RDU	110	46	Yes
Wilmington	Wilmington Int'l	ILM	85	25	Yes
Red Airports: 25% Based Aircraft + 20% Busy Day Transient					
Beaufort	Michael J. Smith Field	MRH	54	19	Yes
Burlington	Burlington-Alamance Regional	BUY	60	40	Yes
Currituck	Currituck County Regional	ONX	20	16	Yes
Franklin	Macon County	1A5	24	9	Yes
Hickory	Hickory Regional	HKY	28	27	Yes
Lexington	Davidson County	EXX	30	20	Yes
Manteo	Dare County Regional	MQI	60	14	Yes
Monroe	Charlotte-Monroe Executive	EQY	95	29	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	102	36	Yes
Pinehurst/Southern Pines	Moore County	SOP	68	19	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	50	10	Yes
Salisbury	Rowan County	RUQ	48	31	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	79	32	Yes
Smithfield	Johnston County	JNX	60	40	Yes
Statesville	Statesville Regional	SVH	34	29	Yes
Winston-Salem	Smith Reynolds	INT	12	35	No

Table 5.21: 1200: Aircraft Apron Requirements Compliance (Cont.)

Associated City	Airport Name	ID	Existing General Aviation Apron Spaces	General Aviation Apron Space Objective	Meets Objective
Blue Airports: 25% Based Aircraft + 20% Busy Day Transient					
Albemarle	Stanly County	VUJ	75	6	Yes
Andrews	Western Carolina Regional	RHP	25	16	Yes
Asheboro	Asheboro Regional	HBI	38	14	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	57	11	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	30	7	Yes
Erwin	Harnett Regional Jetport	HRJ	30	10	Yes
Gastonia	Gastonia Municipal	AKH	30	12	Yes
Goldsboro	Wayne Executive Jetport	GWW	50	18	Yes
Jefferson	Ashe County	GEV	17	10	Yes
Kenansville	Duplin County	DPL	16	9	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	250	12	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	45	29	Yes
Louisburg	Triangle North Executive	LHZ	46	31	Yes
Lumberton	Lumberton Regional	LBT	26	16	Yes
Maxton	Laurinburg-Maxton	MEB	26	9	Yes
Morganton	Foothills Regional	MRN	9	15	No
Mount Airy	Mount Airy/Surry County	MWK	18	16	Yes
North Wilkesboro	Wilkes County	UKF	30	10	Yes
Oxford	Henderson-Oxford	HNZ	14	18	No
Reidsville	Rockingham County NC Shiloh	SIF	18	16	Yes
Roxboro	Person County	TDF	16	17	No
Rutherfordton	Rutherford County-Marchman Field	FQD	50	10	Yes
Shelby	Shelby-Cleveland County Regional	EHO	17	12	Yes
Siler City	Siler City Municipal	5W8	33	13	Yes
Wallace	Henderson Field	ACZ	10	9	Yes
Washington	Warren Field	OCW	40	6	Yes

Table 5.21: 1200: Aircraft Apron Requirements Compliance (Cont.)

Associated City	Airport Name	ID	Existing General Aviation Apron Spaces	General Aviation Apron Space Objective	Meets Objective
Green Airports: 50% Based Aircraft + 20% Busy Day Transient					
Ahoskie	Tri-County	ASJ	10	7	Yes
Clinton	Clinton-Sampson County	CTZ	25	13	Yes
Edenton	Northeastern Regional	EDE	12	19	No
Elkin	Elkin Municipal	ZEF	5	12	No
Engelhard	Hyde County	7W6	12	1	Yes
Hatteras	Billy Mitchell (NPS)	HSE	39	2	Yes
Kill Devil Hills	First Flight (NPS)	FFA	11	5	Yes
Mount Olive	Mount Olive Municipal	W40	6	10	No
Ocean Isle Beach	Odell Williamson Municipal	60J	33	12	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95	23	1	Yes
Plymouth	Plymouth Municipal	PMZ	14	7	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	23	12	Yes
Rockingham	Richmond County	RCZ	20	9	Yes
Spruce Pine	Avery County/Morrison Field	7A8	8	17	No
Star	Montgomery County	43A	19	9	Yes
Sylva	Jackson County	24A	16	9	Yes
Tarboro	Tarboro-Edgecombe	ETC	9	2	Yes
Wadesboro	Anson County-Jeff Cloud Field	AFP	28	15	Yes
Whiteville	Columbus County Municipal	CPC	13	17	No
Williamston	Martin County	MCZ	8	5	Yes

Source: NCASP Inventory Data, 2012 and FAA 5010s
Note: Although they do not meet the NCASP objective, the choice to provide additional apron parking for general aviation aircraft is at the discretion of CLT. CLT relies heavily on reliever airports to accommodate general aviation activity.

Table 5.22: 1300: General Aviation Terminal Building Compliance

Associated City	Airport Name	ID	Existing General Aviation Terminal/Admin Building		Terminal Amenities				Auto Parking		Meets Objective
			Square Footage	Date Constructed, Updated or Modified	FBO	Flight Planning Area	Public Meeting Room	Restrooms	Adequate Existing Auto Parking	Auto Parking Objective	
Yellow Airports: Passenger Terminal-Not Eligible; GA Terminal Building/Parking Per Master Plan											
Asheville	Asheville Regional	AVL	35,000	1992	Yes	Yes	Yes	Yes	Yes	--	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	41,000	1985	Yes	Yes	Yes	Yes	Yes	--	Yes
Concord	Concord Regional	JQF	12,000	1994	Yes	Yes	Yes	Yes	No	--	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	82,000	2006	Yes	Yes	Yes	Yes	Yes	--	Yes
Greensboro	Piedmont Triad Int'l	GSO	22,000	1971	Yes	Yes	Yes	Yes	Yes	--	Yes
Greenville	Pitt-Greenville	PGV	20,000	2004	Yes	Yes	Yes	Yes	Yes	--	Yes
Jacksonville	Albert J. Ellis	OAJ	2,400	1975	Yes	Yes	Yes	Yes	No	--	Yes
New Bern	Coastal Carolina Regional	EWN	36,000	1999	Yes	No	Yes	Yes	No	--	Yes
Raleigh	Raleigh-Durham Int'l	RDU	22,000	2004	Yes	Yes	Yes	Yes	Yes	--	Yes
Wilmington	Wilmington Int'l	ILM	107,000	2011	Yes	Yes	Yes	Yes	Yes	--	Yes

Table 5.22: 1300: General Aviation Terminal Building Compliance (Cont.)

Associated City	Airport Name	ID	Existing General Aviation Terminal/Admin Building		Terminal Amenities				Auto Parking		Meets Objective
			Square Footage	Date Constructed, Updated or Modified	FBO	Flight Planning Area	Public Meeting Room	Restrooms	Adequate Existing Auto Parking	Auto Parking Objective	
Red Airports: 5,500 SF Terminal/Admin Bldg with FBO, public meeting room, restrooms and 1 auto space per based aircraft + 50% for visitors/employees											
Beaufort	Michael J. Smith Field	MRH	2,000	Early 1990s	Yes	Yes	Yes	Yes	No	105	No
Burlington	Burlington-Alamance Regional	BUY	3,500	2010	Yes	Yes	Yes	Yes	No	185	No
Currituck	Currituck County Regional	ONX	2,700	2003	Yes	Yes	Yes	Yes	Yes	62	No
Franklin	Macon County	1A5	5,000	2003	Yes	Yes	Yes	Yes	Yes	42	No
Hickory	Hickory Regional	HKY	Unknown	1989	Yes	Yes	Yes	Yes	Yes	101	No
Lexington	Davidson County	EXX	2,856	2000	Yes	Yes	Yes	Yes	Yes	114	No
Manteo	Dare County Regional	MQI	5,000	2003	Yes	Yes	Yes	Yes	Yes	74	No
Monroe	Charlotte-Monroe Executive	EQY	6,100	2013	Yes	Yes	Yes	Yes	Yes	129	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	2,000	1985	Yes	No	No	Yes	No	113	No
Pinehurst/Southern Pines	Moore County	SOP	8,400	1994	Yes	Yes	Yes	Yes	Yes	101	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	8,000	2006	Yes	Yes	Yes	Yes	Yes	18	Yes
Salisbury	Rowan County	RUQ	3,900	1991	Yes	Yes	Yes	Yes	Yes	137	No
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	2,500	1999	Yes	Yes	Yes	Yes	Yes	167	No
Smithfield	Johnston County	JNX	2,500	1978	Yes	Yes	Yes	Yes	No	168	No
Statesville	Statesville Regional	SVH	2,000	1989	Yes	Yes	Yes	Yes	Yes	140	No
Winston-Salem	Smith Reynolds	INT	7,600	1985	Yes	Yes	Yes	Yes	Yes	150	Yes

Table 5.22: 1300: General Aviation Terminal Building Compliance (Cont.)

Associated City	Airport Name	ID	Existing General Aviation Terminal/Admin Building		Terminal Amenities				Auto Parking		Meets Objective
			Square Footage	Date Constructed, Updated or Modified	FBO	Flight Planning Area	Public Meeting Room	Restrooms	Adequate Existing Auto Parking	Auto Parking Objective	
Blue Airports: 4,500 SF Terminal/Admin Bldg with FB), public meeting room, restrooms and 1 auto space per based aircraft + 50% for visitors/employees											
Albemarle	Stanly County	VUJ	9,000	2010	Yes	Yes	Yes	Yes	Yes	30	Yes
Andrews	Western Carolina Regional	RHP	2,000	1946	Yes	Yes	Yes	Yes	No	87	No
Asheboro	Asheboro Regional	HBI	2,486	1980	Yes	Yes	Yes	Yes	Yes	68	No
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	3,000	2011	Yes	Yes	Yes	Yes	Yes	45	No
Elizabethtown	Curtis L Brown Jr Field	EYF	2,520	1990	Yes	Yes	Yes	Yes	Yes	20	No
Erwin	Harnett Regional Jetport	HRJ	1,800	1981	Yes	No	Yes	Yes	No	26	No
Gastonia	Gastonia Municipal	AKH	2,000	2009	Yes	Yes	Yes	Yes	No	51	No
Goldsboro	Wayne Executive Jetport	GWW	4,007	1996	Yes	Yes	Yes	Yes	No	90	No
Jefferson	Ashe County	GEV	2,400	1980	Yes	Yes	No	Yes	Yes	48	No
Kenansville	Duplin County	DPL	6,200	2013	Yes	Yes	Yes	Yes	No	32	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	40,000	1978	Yes	Yes	Yes	Yes	Yes	59	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	7,000	2010	Yes	Yes	Yes	Yes	Yes	134	Yes
Louisburg	Triangle North Executive	LHZ	2,500	2009	Yes	Yes	Yes	Yes	Yes	146	No
Lumberton	Lumberton Regional	LBT	3,744	1968	Yes	No	Yes	Yes	No	69	No
Maxton	Laurinburg-Maxton	MEB	3,000	1989	Yes	Yes	Yes	Yes	Yes	30	No
Morganton	Foothills Regional	MRN	2,800	2005	Yes	Yes	Yes	Yes	Yes	75	No
Mount Airy	Mount Airy/Surry County	MWK	1,872	1996	Yes	Yes	Yes	Yes	Yes	80	No
North Wilkesboro	Wilkes County	UKF	3,000	1989	Yes	Yes	Yes	Yes	Yes	54	No
Oxford	Henderson-Oxford	HNZ	4,000	1974	Yes	Yes	Yes	Yes	Yes	75	No
Reidsville	Rockingham County NC Shiloh	SIF	3,600	2005	Yes	Yes	Yes	Yes	Yes	77	No
Roxboro	Person County	TDF	1,000	1987	Yes	Yes	Yes	Yes	Yes	63	No
Rutherfordton	Rutherford County-Marchman Field	FQD	5,000	2012	No	Yes	Yes	Yes	Yes	39	Yes

Table 5.22: 1300: General Aviation Terminal Building Compliance (Cont.)

Associated City	Airport Name	ID	Existing General Aviation Terminal/Admin Building		Terminal Amenities				Auto Parking		Meets Objective
			Square Footage	Date Constructed, Updated or Modified	FBO	Flight Planning Area	Public Meeting Room	Restrooms	Adequate Existing Auto Parking	Auto Parking Objective	
Blue Airports: 4,500 SF Terminal/Admin Bldg with FBO, public meeting room, restrooms and 1 auto space per based aircraft + 50% for visitors/employees											
Shelby	Shelby-Cleveland County Regional	EHO	5,200	2010	Yes	Yes	Yes	Yes	Yes	53	Yes
Siler City	Siler City Municipal	5W8	2,500	1988	Yes	Yes	Yes	Yes	Yes	42	No
Wallace	Henderson Field	ACZ	Unknown	2002	No	No	Yes	Yes	Yes	30	No
Washington	Warren Field	OCW	1,056	2012	Yes	Yes	Yes	Yes	Yes	26	No
Green Airports: 3,200 SF Terminal/Admin Bldg with FBO, public meeting room, restrooms and 1 auto space per based aircraft + 20% for visitors/employees											
Ahoskie	Tri-County	ASJ	2,250	1979	Yes	Yes	Yes	Yes	Yes	11	No
Clinton	Clinton-Sampson County	CTZ	2,663	1990	Yes	Yes	Yes	Yes	Yes	31	No
Edenton	Northeastern Regional	EDE	14,600	1992	No	Yes	Yes	Yes	No	40	Yes
Elkin	Elkin Municipal	ZEF	1,500	1965	Yes	Yes	Yes	Yes	Yes	24	No
Engelhard	Hyde County	7W6	1,000	2009	No	Yes	Yes	Yes	Yes	0	No
Hatteras	Billy Mitchell (NPS)	HSE	1,200	1986	No	Yes	No	Yes	Yes	0	No
Kill Devil Hills	First Flight (NPS)	FFA	1,500	2003	No	Yes	No	Yes	Yes	0	No
Mount Olive	Mount Olive Municipal	W40	1,250	1988	Yes	Yes	Yes	Yes	Yes	20	No
Ocean Isle Beach	Odell Williamson Municipal	60J	9,700	2007	Yes	No	Yes	Yes	Yes	19	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95	10,000	1986	No	Yes	No	Yes	Yes	0	Yes
Plymouth	Plymouth Municipal	PMZ	2,500	2012	No	Yes	Yes	Yes	No	13	No
Roanoke Rapids	Halifax-Northampton Regional	IXA	4,000	2009	Yes	Yes	Yes	Yes	Yes	26	Yes
Rockingham	Richmond County	RCZ	3,000	2006	Yes	Yes	Yes	Yes	Yes	17	No
Spruce Pine	Avery County/Morrison Field	7A8	1,400	1969	Yes	Yes	Yes	Yes	No	38	No
Star	Montgomery County	43A	None	NA	Yes	No	No	Yes	No	19	No

Table 5.22: 1300: General Aviation Terminal Building Compliance (Cont.)

Associated City	Airport Name	ID	Existing General Aviation Terminal/Admin Building		Terminal Amenities				Auto Parking		Meets Objective
			Square Footage	Date Constructed, Updated or Modified	FBO	Flight Planning Area	Public Meeting Room	Restrooms	Adequate Existing Auto Parking	Auto Parking Objective	
Green Airports: 3,200 SF Terminal/Admin Bldg with FBO, public meeting room, restrooms and 1 auto space per based aircraft + 20% for visitors/employees											
Sylva	Jackson County	24A	600	2006	No	No	Yes	Yes	Yes	19	No
Tarboro	Tarboro-Edgecombe	ETC	300	2000	Yes	Yes	No	Yes	Yes	2	No
Wadesboro	Anson County-Jeff Cloud Field	AFP	2,600	2006	Yes	Yes	Yes	Yes	Yes	31	No
Whiteville	Columbus County Municipal	CPC	1,600	1978	Yes	Yes	Yes	Yes	Yes	32	No
Williamston	Martin County	MCZ	900	1968	Yes	Yes	Yes	Yes	No	10	No

Source: NCASP Inventory Data, 2012

Table 5.23: 1400: Taxiway & Apron Edge Lighting Compliance

Associated City	Airport Name	ID	Existing Taxiway Edge Lighting	Meets Objective
Yellow Airports: MITL				
Asheville	Asheville Regional	AVL	HITL	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	HITL	Yes
Concord	Concord Regional	JQF	MITL	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	MITL	Yes
Greensboro	Piedmont Triad Int'l	GSO	HITL	Yes
Greenville	Pitt-Greenville	PGV	MITL	Yes
Jacksonville	Albert J. Ellis	OAJ	MITL	Yes
New Bern	Coastal Carolina Regional	EWN	MITL	Yes
Raleigh	Raleigh-Durham Int'l	RDU	HITL	Yes
Wilmington	Wilmington Int'l	ILM	MIRL	Yes
Red Airports: MITL				
Beaufort	Michael J. Smith Field	MRH	MITL	Yes
Burlington	Burlington-Alamance Regional	BUY	MITL	Yes
Currituck	Currituck County Regional	ONX	MITL	Yes
Franklin	Macon County	1A5	MITL	Yes
Hickory	Hickory Regional	HKY	MITL	Yes
Lexington	Davidson County	EXX	MITL	Yes
Manteo	Dare County Regional	MQI	MITL	Yes
Monroe	Charlotte-Monroe Executive	EQY	MITL	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	MITL	Yes
Pinehurst/Southern Pines	Moore County	SOP	MITL	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	MITL	Yes
Salisbury	Rowan County	RUQ	MITL	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	MITL	Yes
Smithfield	Johnston County	JNX	MITL	Yes
Statesville	Statesville Regional	SVH	MITL	Yes
Winston-Salem	Smith Reynolds	INT	MITL	Yes

Table 5.23: 1400: Taxiway & Apron Edge Lighting Compliance (Cont.)

Associated City	Airport Name	ID	Existing Taxiway Edge Lighting	Meets Objective
Blue Airports: MITL				
Albemarle	Stanly County	VUJ	MITL	Yes
Andrews	Western Carolina Regional	RHP	Reflectors	No
Asheboro	Asheboro Regional	HBI	MITL	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	HITL	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	None	No
Erwin	Harnett Regional Jetport	HRJ	MITL	Yes
Gastonia	Gastonia Municipal	AKH	None	No
Goldsboro	Wayne Executive Jetport	GWW	MITL	Yes
Jefferson	Ashe County	GEV	MITL	Yes
Kenansville	Duplin County	DPL	MITL	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	MITL	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	MITL	Yes
Louisburg	Triangle North Executive	LHZ	MITL	Yes
Lumberton	Lumberton Regional	LBT	MITL	Yes
Maxton	Laurinburg-Maxton	MEB	MITL	Yes
Morganton	Foothills Regional	MRN	MITL	Yes
Mount Airy	Mount Airy/Surry County	MWK	MITL	Yes
North Wilkesboro	Wilkes County	UKF	MITL	Yes
Oxford	Henderson-Oxford	HNZ	MITL	Yes
Reidsville	Rockingham County NC Shiloh	SIF	LED	Yes
Roxboro	Person County	TDF	MITL	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	MITL	Yes
Shelby	Shelby-Cleveland County Regional	EHO	MITL	Yes
Siler City	Siler City Municipal	5W8	None	No
Wallace	Henderson Field	ACZ	MITL	Yes
Washington	Warren Field	OCW	Reflectors	No

Table 5.23: 1400: Taxiway & Apron Edge Lighting Compliance (Cont.)

Associated City	Airport Name	ID	Existing Taxiway Edge Lighting	Meets Objective
Green Airports: Reflective Markers				
Ahoskie	Tri-County	ASJ	MITL	Yes
Clinton	Clinton-Sampson County	CTZ	MITL	Yes
Edenton	Northeastern Regional	EDE	HITL	Yes
Elkin	Elkin Municipal	ZEF	MITL	Yes
Engelhard	Hyde County	7W6	MITL	Yes
Hatteras	Billy Mitchell (NPS)	HSE	None	No
Kill Devil Hills	First Flight (NPS)	FFA	None	No
Mount Olive	Mount Olive Municipal	W40	None	No
Ocean Isle Beach	Odell Williamson Municipal	60J	HITL	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95	None	No
Plymouth	Plymouth Municipal	PMZ	HITL	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	MITL	Yes
Rockingham	Richmond County	RCZ	MITL	Yes
Spruce Pine	Avery County/Morrison Field	7A8	None	No
Star	Montgomery County	43A	MITL	Yes
Sylva	Jackson County	24A	MITL	Yes
Tarboro	Tarboro-Edgecombe	ETC	None	No
Wadesboro	Anson County-Jeff Cloud Field	AFP	Reflectors	Yes
Whiteville	Columbus County Municipal	CPC	MITL	Yes
Williamston	Martin County	MCZ	MITL	Yes

Source: NCASP Inventory Data, 2012

Table 5.24: 1500: Airfield Signage Compliance

Associated City	Airport Name	ID	Existing Airfield Signage				Meets Objective
			Runway Hold	Location	Guidance	Boundary	
Yellow Airports: Runway Hold Position, Location, Guidance, and Distance Remaining							
Asheville	Asheville Regional	AVL	Yes	Yes	Yes	Yes	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	Yes	Yes	Yes	Yes	Yes
Concord	Concord Regional	JQF	Yes	Yes	Yes	Yes	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	Yes	Yes	Yes	Yes	Yes
Greensboro	Piedmont Triad Int'l	GSO	Yes	Yes	Yes	Yes	Yes
Greenville	Pitt-Greenville	PGV	Yes	Yes	Yes	No	Yes
Jacksonville	Albert J. Ellis	OAJ	Yes	Yes	Yes	No	Yes
New Bern	Coastal Carolina Regional	EWN	Yes	Yes	Yes	No	Yes
Raleigh	Raleigh-Durham Int'l	RDU	Yes	Yes	Yes	Yes	Yes
Wilmington	Wilmington Int'l	ILM	Yes	Yes	Yes	Yes	Yes
Red Airports: Runway Hold Position, Location, Guidance, and Distance Remaining							
Beaufort	Michael J. Smith Field	MRH	Yes	Yes	Yes	No	Yes
Burlington	Burlington-Alamance Regional	BUY	No	Yes	Yes	No	No
Currituck	Currituck County Regional	ONX	No	Yes	Yes	No	No
Franklin	Macon County	1A5	Yes	Yes	Yes	No	Yes
Hickory	Hickory Regional	HKY	Yes	Yes	Yes	No	Yes
Lexington	Davidson County	EXX	Yes	Yes	Yes	No	Yes
Manteo	Dare County Regional	MQI	Yes	Yes	Yes	No	Yes
Monroe	Charlotte-Monroe Executive	EQY	Yes	Yes	Yes	No	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	No	Yes	Yes	No	No
Pinehurst/Southern Pines	Moore County	SOP	Yes	Yes	Yes	No	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	Yes	Yes	Yes	Yes	Yes
Salisbury	Rowan County	RUQ	No	Yes	Yes	No	No
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	No	Yes	Yes	No	No
Smithfield	Johnston County	JNX	Yes	Yes	Yes	Yes	Yes
Statesville	Statesville Regional	SVH	No	Yes	Yes	No	No
Winston-Salem	Smith Reynolds	INT	Yes	Yes	Yes	No	Yes

Table 5.24: 1500: Airfield Signage Compliance (Cont.)

Associated City	Airport Name	ID	Existing Airfield Signage				Meets Objective
			Runway Hold	Location	Guidance	Boundary	
Blue Airports: Runway Hold Position, Location, and Guidance							
Albemarle	Stanly County	VUJ	No	Yes	Yes	No	No
Andrews	Western Carolina Regional	RHP	Yes	Yes	Yes	No	Yes
Asheboro	Asheboro Regional	HBI	No	Yes	Yes	No	No
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	No	Yes	Yes	No	No
Elizabethtown	Curtis L Brown Jr Field	EYF	No	No	Yes	No	No
Erwin	Harnett Regional Jetport	HRJ	Yes	Yes	Yes	No	Yes
Gastonia	Gastonia Municipal	AKH	No	No	No	No	No
Goldsboro	Wayne Executive Jetport	GWW	Yes	Yes	Yes	No	Yes
Jefferson	Ashe County	GEV	No	No	No	No	No
Kenansville	Duplin County	DPL	No	Yes	Yes	No	No
Kinston	Kinston Regional Jetport at Stallings Field	ISO	Yes	Yes	Yes	No	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	Yes	Yes	Yes	No	Yes
Louisburg	Triangle North Executive	LHZ	Yes	Yes	Yes	No	Yes
Lumberton	Lumberton Regional	LBT	No	Yes	Yes	No	No
Maxton	Laurinburg-Maxton	MEB	No	Yes	Yes	No	No
Morganton	Foothills Regional	MRN	Yes	Yes	Yes	No	Yes
Mount Airy	Mount Airy/Surry County	MWK	Yes	Yes	Yes	No	Yes
North Wilkesboro	Wilkes County	UKF	Yes	Yes	Yes	Yes	Yes
Oxford	Henderson-Oxford	HNZ	Yes	Yes	Yes	No	Yes
Reidsville	Rockingham County NC Shiloh	SIF	Yes	Yes	Yes	No	Yes
Roxboro	Person County	TDF	Yes	Yes	Yes	Yes	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	Yes	Yes	No	No	No
Shelby	Shelby-Cleveland County Regional	EHO	No	Yes	Yes	No	No
Siler City	Siler City Municipal	5W8	No	No	No	No	No
Wallace	Henderson Field	ACZ	No	Yes	No	No	No
Washington	Warren Field	OCW	Yes	Yes	Yes	No	Yes

Table 5.24: 1500: Airfield Signage Compliance (Cont.)

Associated City	Airport Name	ID	Existing Airfield Signage				Meets Objective
			Runway Hold	Location	Guidance	Boundary	
Green Airports: Runway Hold Position, Location, and Guidance							
Ahoskie	Tri-County	ASJ	No	Yes	No	No	No
Clinton	Clinton-Sampson County	CTZ	No	Yes	Yes	No	No
Edenton	Northeastern Regional	EDE	No	Yes	Yes	No	No
Elkin	Elkin Municipal	ZEF	No	No	Yes	No	No
Engelhard	Hyde County	7W6	No	Yes	Yes	No	No
Hatteras	Billy Mitchell (NPS)	HSE	No	No	No	No	No
Kill Devil Hills	First Flight (NPS)	FFA	No	No	No	No	No
Mount Olive	Mount Olive Municipal	W40	Yes	No	Yes	No	No
Ocean Isle Beach	Odell Williamson Municipal	60J	Yes	No	Yes	Yes	No
Ocracoke	Ocracoke Island Airport (NPS)	W95	No	No	No	No	No
Plymouth	Plymouth Municipal	PMZ	No	Yes	Yes	No	No
Roanoke Rapids	Halifax-Northampton Regional	IXA	Yes	Yes	Yes	No	Yes
Rockingham	Richmond County	RCZ	Yes	Yes	Yes	No	Yes
Spruce Pine	Avery County/Morrison Field	7A8	No	No	No	No	No
Star	Montgomery County	43A	Yes	No	No	No	No
Sylva	Jackson County	24A	Yes	Yes	No	No	No
Tarboro	Tarboro-Edgecombe	ETC	No	Yes	Yes	No	No
Wadesboro	Anson County-Jeff Cloud Field	AFP	No	Yes	Yes	No	No
Whiteville	Columbus County Municipal	CPC	No	No	Yes	No	No
Williamston	Martin County	MCZ	Yes	Yes	Yes	Yes	Yes

Source: NCASP Inventory Data, 2012

Table 5.25: 1600: Ground Communications Compliance

Associated City	Airport Name	ID	Existing Ground Communication		Meets Objective
			UNICOM Frequency	RCO, GCO, or RTR	
Yellow Airports: UNICOM and a RCO or GCO					
Asheville	Asheville Regional	AVL	122.95	RTR	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	122.95	RCO	Yes
Concord	Concord Regional	JQF	123	RCO/RTR	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	122.7	RCO	Yes
Greensboro	Piedmont Triad Int'l	GSO	122.95	RCO	Yes
Greenville	Pitt-Greenville	PGV	122.8	RCO	Yes
Jacksonville	Albert J. Ellis	OAJ	123	RTR	Yes
New Bern	Coastal Carolina Regional	EWN	121.7	RCO/RTR	Yes
Raleigh	Raleigh-Durham Int'l	RDU	122.95	RCO	Yes
Wilmington	Wilmington Int'l	ILM	122.95	RCO/RTR	Yes
Red Airports: UNICOM and a RCO or GCO					
Beaufort	Michael J. Smith Field	MRH	122.8	RTR	Yes
Burlington	Burlington-Alamance Regional	BUY	122.975	RTR	Yes
Currituck	Currituck County Regional	ONX	122.95	None	No
Franklin	Macon County	1A5	123.05	None	No
Hickory	Hickory Regional	HKY	128.15	RCO	Yes
Lexington	Davidson County	EXX	122.8	RCO	Yes
Manteo	Dare County Regional	MQI	122.8	None	No
Monroe	Charlotte-Monroe Executive	EQY	122.7	RCO	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	123	RTR	Yes
Pinehurst/Southern Pines	Moore County	SOP	123.05	None	No
Rocky Mount	Rocky Mount-Wilson Regional	RWI	122.8	RCO	Yes
Salisbury	Rowan County	RUQ	122.8	RCO	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	123.075	GCO	Yes
Smithfield	Johnston County	JNX	122.8	RCO	Yes
Statesville	Statesville Regional	SVH	123.075	None	No
Winston-Salem	Smith Reynolds	INT	122.8	None	No

Table 5.25: 1600: Ground Communications Compliance (Cont.)

Associated City	Airport Name	ID	Existing Ground Communication		Meets Objective
			UNICOM Frequency	RCO, GCO, or RTR	
Blue Airports: UNICOM and a RCO or GCO					
Albemarle	Stanly County	VUJ	123	RCO	Yes
Andrews	Western Carolina Regional	RHP	122.8	RTR	Yes
Asheboro	Asheboro Regional	HBI	122.8	GCO	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	122.95	RCO	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	122.8	GCO	Yes
Erwin	Harnett Regional Jetport	HRJ	122.7	RCO	Yes
Gastonia	Gastonia Municipal	AKH	123	RCO	Yes
Goldsboro	Wayne Executive Jetport	GWW	122.7	RTR	Yes
Jefferson	Ashe County	GEV	122.8	GCO	Yes
Kenansville	Duplin County	DPL	122.95	None	No
Kinston	Kinston Regional Jetport at Stallings Field	ISO	122.8	RCO	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	123.05	GCO	Yes
Louisburg	Triangle North Executive	LHZ	123	GCO	Yes
Lumberton	Lumberton Regional	LBT	122.8	None	No
Maxton	Laurinburg-Maxton	MEB	122.8	GCO	Yes
Morganton	Foothills Regional	MRN	122.7	None	No
Mount Airy	Mount Airy/Surry County	MWK	123	GCO	Yes
North Wilkesboro	Wilkes County	UKF	122.7	RCO	Yes
Oxford	Henderson-Oxford	HNZ	122.8	None	No
Reidsville	Rockingham County NC Shiloh	SIF	122.8	RTR	Yes
Roxboro	Person County	TDF	122.7	None	No
Rutherfordton	Rutherford County-Marchman Field	FQD	122.8	RTR	Yes
Shelby	Shelby-Cleveland County Regional	EHO	122.8	GCO	Yes
Siler City	Siler City Municipal	5W8	122.7	None	No
Wallace	Henderson Field	ACZ	122.8	None	No
Washington	Warren Field	OCW	122.7	None	No

Table 5.25: 1600: Ground Communications Compliance (Cont.)

Associated City	Airport Name	ID	Existing Ground Communication		Meets Objective
			UNICOM Frequency	RCO, GCO, or RTR	
Green Airports: UNICOM and a RCO or GCO					
Ahoskie	Tri-County	ASJ	122.8	CTAF	No
Clinton	Clinton-Sampson County	CTZ	122.8	None	No
Edenton	Northeastern Regional	EDE	123	None	No
Elkin	Elkin Municipal	ZEF	123.05	None	No
Engelhard	Hyde County	7W6	122.7	None	No
Hatteras	Billy Mitchell (NPS)	HSE	122.9	RCO	Yes
Kill Devil Hills	First Flight (NPS)	FFA	122.9	None	No
Mount Olive	Mount Olive Municipal	W40	122.8	RTR	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	123	None	No
Ocracoke	Ocracoke Island Airport (NPS)	W95	122.9	CTAF	No
Plymouth	Plymouth Municipal	PMZ	122.8	None	No
Roanoke Rapids	Halifax-Northampton Regional	IXA	123.075	None	No
Rockingham	Richmond County	RCZ	122.8	None	No
Spruce Pine	Avery County/Morrison Field	7A8	123	None	No
Star	Montgomery County	43A	122.8	RTR	Yes
Sylva	Jackson County	24A	123	None	No
Tarboro	Tarboro-Edgecombe	ETC	122.9	CTAF	No
Wadesboro	Anson County-Jeff Cloud Field	AFP	122.8	None	No
Whiteville	Columbus County Municipal	CPC	122.8	None	No
Williamston	Martin County	MCZ	122.8	GCO	Yes

Source: NCASP Inventory Data, 2012 and FAA Airport/Facility Directory, Effective April 3, 2014 to May 29, 2014

Table 5.26: 1700: Approach Lighting Compliance

Associated City	Airport Name	ID	Existing Approach Lighting	Meets Objective
Yellow Airports: Airport Lighting System				
Asheville	Asheville Regional	AVL	MALSR	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	MALSR	Yes
Concord	Concord Regional	JQF	MALSR	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	MALSR	Yes
Greensboro	Piedmont Triad Int'l	GSO	MALSR	Yes
Greenville	Pitt-Greenville	PGV	MALSR	Yes
Jacksonville	Albert J. Ellis	OAJ	MALSR	Yes
New Bern	Coastal Carolina Regional	EWN	None	No
Raleigh	Raleigh-Durham Int'l	RDU	MALSR	Yes
Wilmington	Wilmington Int'l	ILM	MALSR	Yes
Red Airports: Airport Lighting System				
Beaufort	Michael J. Smith Field	MRH	None	No
Burlington	Burlington-Alamance Regional	BUY	None	No
Currituck	Currituck County Regional	ONX	None	No
Franklin	Macon County	1A5	None	No
Hickory	Hickory Regional	HKY	MALSR	Yes
Lexington	Davidson County	EXX	None	No
Manteo	Dare County Regional	MQI	None	No
Monroe	Charlotte-Monroe Executive	EQY	None	No
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	None	No
Pinehurst/Southern Pines	Moore County	SOP	None	No
Rocky Mount	Rocky Mount-Wilson Regional	RWI	MALSR	Yes
Salisbury	Rowan County	RUQ	MALSR	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	MALSR	Yes
Smithfield	Johnston County	JNX	MALSR	Yes
Statesville	Statesville Regional	SVH	MALSR	Yes
Winston-Salem	Smith Reynolds	INT	MALSR	Yes

Table 5.26: 1700: Approach Lighting Compliance (Cont.)

Associated City	Airport Name	ID	Existing Approach Lighting	Meets Objective
Blue Airports: Airport Lighting System				
Albemarle	Stanly County	VUJ	None	No
Andrews	Western Carolina Regional	RHP	None	No
Asheboro	Asheboro Regional	HBI	None	No
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	None	No
Elizabethtown	Curtis L Brown Jr Field	EYF	None	No
Erwin	Harnett Regional Jetport	HRJ	None	No
Gastonia	Gastonia Municipal	AKH	ODALS	Yes
Goldsboro	Wayne Executive Jetport	GWW	ODALS	Yes
Jefferson	Ashe County	GEV	None	No
Kenansville	Duplin County	DPL	None	No
Kinston	Kinston Regional Jetport at Stallings Field	ISO	MALSR	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	None	No
Louisburg	Triangle North Executive	LHZ	MALSR	Yes
Lumberton	Lumberton Regional	LBT	None	No
Maxton	Laurinburg-Maxton	MEB	MALSR	Yes
Morganton	Foothills Regional	MRN	None	No
Mount Airy	Mount Airy/Surry County	MWK	None	No
North Wilkesboro	Wilkes County	UKF	MALSR	Yes
Oxford	Henderson-Oxford	HNZ	None	No
Reidsville	Rockingham County NC Shiloh	SIF	None	No
Roxboro	Person County	TDF	MALSR	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	None	No
Shelby	Shelby-Cleveland County Regional	EHO	None	No
Siler City	Siler City Municipal	5W8	None	No
Wallace	Henderson Field	ACZ	None	No
Washington	Warren Field	OCW	None	No

Table 5.26: 1700: Approach Lighting Compliance (Cont.)

Associated City	Airport Name	ID	Existing Approach Lighting	Meets Objective
Green Airports: Airport Lighting System				
Ahoskie	Tri-County	ASJ	None	No
Clinton	Clinton-Sampson County	CTZ	None	No
Edenton	Northeastern Regional	EDE	None	No
Elkin	Elkin Municipal	ZEF	None	No
Engelhard	Hyde County	7W6	None	No
Hatteras	Billy Mitchell (NPS)	HSE	None	No
Kill Devil Hills	First Flight (NPS)	FFA	None	No
Mount Olive	Mount Olive Municipal	W40	None	No
Ocean Isle Beach	Odell Williamson Municipal	60J	None	No
Ocracoke	Ocracoke Island Airport (NPS)	W95	None	No
Plymouth	Plymouth Municipal	PMZ	None	No
Roanoke Rapids	Halifax-Northampton Regional	IXA	None	No
Rockingham	Richmond County	RCZ	None	No
Spruce Pine	Avery County/Morrison Field	7A8	None	No
Star	Montgomery County	43A	None	No
Sylva	Jackson County	24A	None	No
Tarboro	Tarboro-Edgecombe	ETC	None	No
Wadesboro	Anson County-Jeff Cloud Field	AFP	None	No
Whiteville	Columbus County Municipal	CPC	None	No
Williamston	Martin County	MCZ	None	No

Source: NCASP Inventory Data, 2012 and FAA 5010s

Table 5.27: 1800: ARFF Compliance

Associated City	Airport Name	ID	ARFF Equipment	Dedicated ARFF Building	Participates in ARFF Training	Mutual Aid Agreement with Emergency Responders
Yellow Airports: As required by Part 139						
Asheville	Asheville Regional	AVL	X	X	X	X
Charlotte	Charlotte/Douglas Int'l	CLT	X	X	X	X
Concord	Concord Regional	JQF	X	X	X	X
Fayetteville	Fayetteville Regional/Grannis Field	FAY	X	X	X	X
Greensboro	Piedmont Triad Int'l	GSO	X	X	X	X
Greenville	Pitt-Greenville	PGV	X	X	X	X
Jacksonville	Albert J. Ellis	OAJ	X	X	X	
New Bern	Coastal Carolina Regional	EWN	X	X	X	X
Raleigh	Raleigh-Durham Int'l	RDU	X	X	X	X
Wilmington	Wilmington Int'l	ILM	X	X	X	X
Red Airports: Case by Case						
Beaufort	Michael J. Smith Field	MRH				X
Burlington	Burlington-Alamance Regional	BUY			X	X
Currituck	Currituck County Regional	ONX	X			X
Franklin	Macon County	1A5			X	X
Hickory	Hickory Regional	HKY	X	X	X	
Lexington	Davidson County	EXX			X	X
Manteo	Dare County Regional	MQI	X	X	X	X
Monroe	Charlotte-Monroe Executive	EQY	X			X
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT			X	
Pinehurst/Southern Pines	Moore County	SOP	X	X	X	X
Rocky Mount	Rocky Mount-Wilson Regional	RWI	X	X	X	X
Salisbury	Rowan County	RUQ	X	X	X	X
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA				X
Smithfield	Johnston County	JNX				X
Statesville	Statesville Regional	SVH	X		X	X
Winston-Salem	Smith Reynolds	INT	X	X	X	X

Table 5.27: 1800: ARFF Compliance (Cont.)

Associated City	Airport Name	ID	ARFF Equipment	Dedicated ARFF Building	Participates in ARFF Training	Mutual Aid Agreement with Emergency Responders
Blue Airports: Case by Case						
Albemarle	Stanly County	VUJ	X	X	X	X
Andrews	Western Carolina Regional	RHP				X
Asheboro	Asheboro Regional	HBI				X
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	X	X	X	X
Elizabethtown	Curtis L Brown Jr Field	EYF				X
Erwin	Harnett Regional Jetport	HRJ				
Gastonia	Gastonia Municipal	AKH			X	X
Goldsboro	Wayne Executive Jetport	GWW				X
Jefferson	Ashe County	GEV				X
Kenansville	Duplin County	DPL				
Kinston	Kinston Regional Jetport at Stallings Field	ISO	X	X	X	X
Lincolnton	Lincolnton Lincoln County Regional	IPJ				X
Louisburg	Triangle North Executive	LHZ				
Lumberton	Lumberton Regional	LBT				
Maxton	Laurinburg-Maxton	MEB			X	X
Morganton	Foothills Regional	MRN				
Mount Airy	Mount Airy/Surry County	MWK				
North Wilkesboro	Wilkes County	UKF			X	
Oxford	Henderson-Oxford	HNZ				X
Reidsville	Rockingham County NC Shiloh	SIF	X		X	X
Roxboro	Person County	TDF				
Rutherfordton	Rutherford County-Marchman Field	FQD	X		X	X
Shelby	Shelby-Cleveland County Regional	EHO			X	X
Siler City	Siler City Municipal	5W8				X
Wallace	Henderson Field	ACZ				X
Washington	Warren Field	OCW				X

Table 5.27: 1800: ARFF Compliance (Cont.)

Associated City	Airport Name	ID	ARFF Equipment	Dedicated ARFF Building	Participates in ARFF Training	Mutual Aid Agreement with Emergency Responders
Green Airports: Case by Case						
Ahoskie	Tri-County	ASJ				
Clinton	Clinton-Sampson County	CTZ			X	X
Edenton	Northeastern Regional	EDE			X	X
Elkin	Elkin Municipal	ZEF				X
Engelhard	Hyde County	7W6				X
Hatteras	Billy Mitchell (NPS)	HSE				
Kill Devil Hills	First Flight (NPS)	FFA				
Mount Olive	Mount Olive Municipal	W40				
Ocean Isle Beach	Odell Williamson Municipal	60J				X
Ocracoke	Ocracoke Island Airport (NPS)	W95				
Plymouth	Plymouth Municipal	PMZ			X	X
Roanoke Rapids	Halifax-Northampton Regional	IXA				Unknown
Rockingham	Richmond County	RCZ			X	X
Spruce Pine	Avery County/Morrison Field	7A8				
Star	Montgomery County	43A				X
Sylva	Jackson County	24A				X
Tarboro	Tarboro-Edgecombe	ETC				
Wadesboro	Anson County-Jeff Cloud Field	AFP			X	
Whiteville	Columbus County Municipal	CPC				X
Williamston	Martin County	MCZ				

Source: NCASP Inventory Data, 2012 and Airports (CLT, GSO, RDU)

Table 5.28: 1900: Hangars Compliance

Associated City	Airport Name	ID	Existing Hangar Spaces	Designated Transient Hangar	Hangar Waiting List	100% Existing Hangar Occupancy	Hangar Space Objective	Meets Objective
Yellow Airports: Not Eligible								
Asheville	Asheville Regional	AVL	----	----	----	----	----	----
Charlotte	Charlotte/Douglas Int'l	CLT	----	----	----	----	----	----
Concord	Concord Regional	JQF	----	----	----	----	----	----
Fayetteville	Fayetteville Regional/Grannis Field	FAY	----	----	----	----	----	----
Greensboro	Piedmont Triad Int'l	GSO	----	----	----	----	----	----
Greenville	Pitt-Greenville	PGV	----	----	----	----	----	----
Jacksonville	Albert J. Ellis	OAJ	----	----	----	----	----	----
New Bern	Coastal Carolina Regional	EWN	----	----	----	----	----	----
Raleigh	Raleigh-Durham Int'l	RDU	----	----	----	----	----	----
Wilmington	Wilmington Int'l	ILM	----	----	----	----	----	----
Red Airports: 75% Based Aircraft								
Beaufort	Michael J. Smith Field	MRH	49	Yes	Yes	Yes	53	No
Burlington	Burlington-Alamance Regional	BUY	54	No	No	Yes	92	No
Currituck	Currituck County Regional	ONX	25	No	Yes	Yes	31	No
Franklin	Macon County	1A5	21	No	Yes	Yes	21	No
Hickory	Hickory Regional	HKY	98	Yes	No	No	50	Yes
Lexington	Davidson County	EXX	64	No	No	No	57	Yes
Manteo	Dare County Regional	MQI	55	Yes	No	No	37	Yes
Monroe	Charlotte-Monroe Executive	EQY	28	No	Yes	Yes	65	No
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	28	No	Yes	Yes	56	No
Pinehurst/Southern Pines	Moore County	SOP	88	No	Yes	No	50	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	10	No	No	Yes	9	Yes
Salisbury	Rowan County	RUQ	84	Yes	Yes	No	68	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	74	No	Yes	No	83	No
Smithfield	Johnston County	JNX	99	No	No	Yes	84	Yes

Table 5.28: 1900: Hangars Compliance (Cont.)

Associated City	Airport Name	ID	Existing Hangar Spaces	Designated Transient Hangar	Hangar Waiting List	100% Existing Hangar Occupancy	Hangar Space Objective	Meets Objective
Red Airports: 75% Based Aircraft								
Statesville	Statesville Regional	SVH	25	Yes	No	No	70	No
Winston-Salem	Smith Reynolds	INT	50	Yes	Yes	Yes	75	No
Blue Airports: 75% Based Aircraft								
Albemarle	Stanly County	VUJ	32	No	No	No	15	Yes
Andrews	Western Carolina Regional	RHP	51	No	Yes	No	44	Yes
Asheboro	Asheboro Regional	HBI	58	Yes	No	No	34	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	23	No	Yes	Yes	23	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	19	No	No	No	10	Yes
Erwin	Harnett Regional Jetport	HRJ	44	No	Yes	Yes	13	Yes
Gastonia	Gastonia Municipal	AKH	47	No	No	Yes	26	Yes
Goldsboro	Wayne Executive Jetport	GWW	43	No	Yes	No	45	No
Jefferson	Ashe County	GEV	20	Yes	Yes	Yes	24	No
Kenansville	Duplin County	DPL	11	No	Yes	Yes	16	No
Kinston	Kinston Regional Jetport at Stallings Field	ISO	18	No	Yes	Yes	29	No
Lincolnton	Lincolnton Lincoln County Regional	IPJ	49	No	Yes	No	67	No
Louisburg	Triangle North Executive	LHZ	54	Yes	Yes	Yes	73	No
Lumberton	Lumberton Regional	LBT	36	Yes	Yes	No	35	Yes
Maxton	Laurinburg-Maxton	MEB	19	No	No	No	15	Yes
Morganton	Foothills Regional	MRN	45	No	Yes	No	38	Yes
Mount Airy	Mount Airy/Surry County	MWK	41	No	Yes	Yes	40	Yes
North Wilkesboro	Wilkes County	UKF	12	No	No	No	27	No
Oxford	Henderson-Oxford	HNZ	45	No	Yes	No	38	Yes
Reidsville	Rockingham County NC Shiloh	SIF	53	No	Yes	No	38	Yes
Roxboro	Person County	TDF	32	No	Yes	Yes	32	Yes

Table 5.28: 1900: Hangars Compliance (Cont.)

Associated City	Airport Name	ID	Existing Hangar Spaces	Designated Transient Hangar	Hangar Waiting List	100% Existing Hangar Occupancy	Hangar Space Objective	Meets Objective
Blue Airports: 75% Based Aircraft								
Rutherfordton	Rutherford County-Marchman Field	FQD	18	Yes	Yes	Yes	20	No
Shelby	Shelby-Cleveland County Regional	EHO	10	No	Yes	Yes	26	No
Siler City	Siler City Municipal	5W8	11	No	Yes	Yes	21	No
Wallace	Henderson Field	ACZ	19	No	No	No	15	Yes
Washington	Warren Field	OCW	23	No	No	No	13	Yes
Green Airports: 50% Based Aircraft								
Ahoskie	Tri-County	ASJ	3	No	No	Yes	5	No
Clinton	Clinton-Sampson County	CTZ	0	No	No	----	13	No
Edenton	Northeastern Regional	EDE	21	No	Yes	Yes	17	Yes
Elkin	Elkin Municipal	ZEF	12	No	Yes	Yes	10	Yes
Engelhard	Hyde County	7W6	0	No	No	----	0	No
Hatteras	Billy Mitchell (NPS)	HSE	0	No	No	----	0	No
Kill Devil Hills	First Flight (NPS)	FFA	0	No	No	----	0	No
Mount Olive	Mount Olive Municipal	W40	10	No	No	Yes	9	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	6	No	No	Yes	8	No
Ocracoke	Ocracoke Island Airport (NPS)	W95	0	No	No	----	0	No
Plymouth	Plymouth Municipal	PMZ	10	No	Yes	No	6	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	23	No	Yes	Yes	11	Yes
Rockingham	Richmond County	RCZ	22	No	No	No	7	Yes
Spruce Pine	Avery County/Morrison Field	7A8	26	No	No	No	16	Yes
Star	Montgomery County	43A	9	No	Yes	Yes	8	Yes
Sylva	Jackson County	24A	9	No	Yes	Yes	8	Yes
Tarboro	Tarboro-Edgecombe	ETC	3	No	No	Yes	1	Yes
Wadesboro	Anson County-Jeff Cloud Field	AFP	20	No	Yes	Yes	13	Yes
Whiteville	Columbus County Municipal	CPC	8	No	No	Yes	14	No
Williamston	Martin County	MCZ	11	No	No	No	4	Yes

Source: NCASP Inventory Data, 2012

Table 5.29: 2000: Airfield Maintenance Equipment/Storage Building Compliance

Associated City	Airport Name	ID	Existing Equipment Buildings			Meets Objective
			Snow Removal Equipment Building	Vehicle/ Equipment Maintenance Building	Maintenance Equip Storage (Tractor and Attachments) Building	
Yellow Airports: Not Eligible						
Asheville	Asheville Regional	AVL		X	X	----
Charlotte	Charlotte/Douglas Int'l	CLT	X	X	X	----
Concord	Concord Regional	JQF		X	X	----
Fayetteville	Fayetteville Regional/Grannis Field	FAY	X		X	----
Greensboro	Piedmont Triad Int'l	GSO		X	X	----
Greenville	Pitt-Greenville	PGV		X		----
Jacksonville	Albert J. Ellis	OAJ	X	X		----
New Bern	Coastal Carolina Regional	EWN		X	X	----
Raleigh	Raleigh-Durham Int'l	RDU	X	X	X	----
Wilmington	Wilmington Int'l	ILM	X	X	X	----
Red Airports: Approved Tractor/Building						
Beaufort	Michael J. Smith Field	MRH		X	X	Yes
Burlington	Burlington-Alamance Regional	BUY		X	X	Yes
Currituck	Currituck County Regional	ONX				No
Franklin	Macon County	1A5				No
Hickory	Hickory Regional	HKY	X	X	X	Yes
Lexington	Davidson County	EXX				No
Manteo	Dare County Regional	MQI		X	X	Yes
Monroe	Charlotte-Monroe Executive	EQY				No
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT		X	X	Yes
Pinehurst/Southern Pines	Moore County	SOP			X	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI		X	X	Yes
Salisbury	Rowan County	RUQ	X	X	X	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA				No
Smithfield	Johnston County	JNX		X		Yes
Statesville	Statesville Regional	SVH		X	X	Yes
Winston-Salem	Smith Reynolds	INT	X	X	X	Yes

Table 5.29: 2000: Airfield Maintenance Equipment/Storage Building Compliance (Cont.)

Associated City	Airport Name	ID	Existing Equipment Buildings			Meets Objective
			Snow Removal Equipment Building	Vehicle/ Equipment Maintenance Building	Maintenance Equip Storage (Tractor and Attachments) Building	
Blue Airports: Approved Tractor/Building						
Albemarle	Stanly County	VUJ				No
Andrews	Western Carolina Regional	RHP				No
Asheboro	Asheboro Regional	HBI			X	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG		X	X	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF				No
Erwin	Harnett Regional Jetport	HRJ			X	Yes
Gastonia	Gastonia Municipal	AKH				No
Goldsboro	Wayne Executive Jetport	GWW				No
Jefferson	Ashe County	GEV		X	X	Yes
Kenansville	Duplin County	DPL				No
Kinston	Kinston Regional Jetport at Stallings Field	ISO		X	X	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ			X	Yes
Louisburg	Triangle North Executive	LHZ				No
Lumberton	Lumberton Regional	LBT		X	X	Yes
Maxton	Laurinburg-Maxton	MEB		X	X	Yes
Morganton	Foothills Regional	MRN				No
Mount Airy	Mount Airy/Surry County	MWK				No
North Wilkesboro	Wilkes County	UKF		X	X	Yes
Oxford	Henderson-Oxford	HNZ			X	Yes
Reidsville	Rockingham County NC Shiloh	SIF				No
Roxboro	Person County	TDF		X	X	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD				No
Shelby	Shelby-Cleveland County Regional	EHO				No
Siler City	Siler City Municipal	5W8				No
Wallace	Henderson Field	ACZ				No
Washington	Warren Field	OCW		X	X	Yes

Table 5.29: 2000: Airfield Maintenance Equipment/Storage Building Compliance (Cont.)

Associated City	Airport Name	ID	Existing Equipment Buildings			Meets Objective
			Snow Removal Equipment Building	Vehicle/ Equipment Maintenance Building	Maintenance Equip Storage (Tractor and Attachments) Building	
Green Airports: Approved Tractor/Building						
Ahoskie	Tri-County	ASJ				No
Clinton	Clinton-Sampson County	CTZ				No
Edenton	Northeastern Regional	EDE		X		Yes
Elkin	Elkin Municipal	ZEF				No
Engelhard	Hyde County	7W6				No
Hatteras	Billy Mitchell (NPS)	HSE				No
Kill Devil Hills	First Flight (NPS)	FFA				No
Mount Olive	Mount Olive Municipal	W40				No
Ocean Isle Beach	Odell Williamson Municipal	60J			X	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95				No
Plymouth	Plymouth Municipal	PMZ				No
Roanoke Rapids	Halifax-Northampton Regional	IXA				No
Rockingham	Richmond County	RCZ		X	X	Yes
Spruce Pine	Avery County/Morrison Field	7A8			X	Yes
Star	Montgomery County	43A				No
Sylva	Jackson County	24A				No
Tarboro	Tarboro-Edgecombe	ETC				No
Wadesboro	Anson County-Jeff Cloud Field	AFP			X	Yes
Whiteville	Columbus County Municipal	CPC			X	Yes
Williamston	Martin County	MCZ		X		Yes

Source: NCASP Inventory Data, 2012

Table 5.30: 2100: Perimeter Fencing Compliance

Associated City	Airport Name	ID	Existing Fencing	Height of Existing Fencing	Meets Objective
Yellow Airports: Not Eligible					
Asheville	Asheville Regional	AVL	Airfield Complete	----	----
Charlotte	Charlotte/Douglas Int'l	CLT	Airfield Complete	----	----
Concord	Concord Regional	JQF	Airfield Complete	----	----
Fayetteville	Fayetteville Regional/Grannis Field	FAY	Airfield Complete	----	----
Greensboro	Piedmont Triad Int'l	GSO	Airfield Complete	----	----
Greenville	Pitt-Greenville	PGV	Airfield Complete	----	----
Jacksonville	Albert J. Ellis	OAJ	Airfield Complete	----	----
New Bern	Coastal Carolina Regional	EWN	Airfield Complete	----	----
Raleigh	Raleigh-Durham Int'l	RDU	Airfield Complete	----	----
Wilmington	Wilmington Int'l	ILM	Airfield Complete	----	----
Red Airports: Perimeter					
Beaufort	Michael J. Smith Field	MRH	Partial	6'	No
Burlington	Burlington-Alamance Regional	BUY	Partial	7' with barbed wire	No
Currituck	Currituck County Regional	ONX	Complete	4' and 8'	No
Franklin	Macon County	1A5	Complete	6' with 3 strand barbed wire	Yes
Hickory	Hickory Regional	HKY	Complete	6' and 10'	No
Lexington	Davidson County	EXX	Complete	6' and 8' with barbed wire	No
Manteo	Dare County Regional	MQI	Partial	10'	No
Monroe	Charlotte-Monroe Executive	EQY	Complete	6' with 2' barbed wire	No
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	Partial	8' with 3 strand barbed wire	No
Pinehurst/Southern Pines	Moore County	SOP	Complete	8' and 2' in ground	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	Complete	6' and 8' with 3 strand barbed wire	Yes
Salisbury	Rowan County	RUQ	Complete	10' with barbed wire and 6' with barbed wire	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	Complete	6' with 1' barbed wire and 7' with 1' barbed wire	Yes
Smithfield	Johnston County	JNX	Partial	4' and 8' with 3 strand barbed wire	No
Statesville	Statesville Regional	SVH	Complete	6' and 4'	No
Winston-Salem	Smith Reynolds	INT	Complete	8'	Yes

Table 5.30: 2100: Perimeter Fencing Compliance (Cont.)

Associated City	Airport Name	ID	Existing Fencing	Height of Existing Fencing	Meets Objective
Blue Airports: Perimeter					
Albemarle	Stanly County	VUJ	Complete	6' with barbed wire	No
Andrews	Western Carolina Regional	RHP	None	----	No
Asheboro	Asheboro Regional	HBI	Complete	8' with 3 strand barb wire	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	Complete	8' with barbed wire	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	Complete	6'	No
Erwin	Harnett Regional Jetport	HRJ	Complete	8'	Yes
Gastonia	Gastonia Municipal	AKH	Partial	6'	No
Goldsboro	Wayne Executive Jetport	GWW	Complete	5'	No
Jefferson	Ashe County	GEV	Partial	6'	No
Kenansville	Duplin County	DPL	Partial	10' with 3 strand barbed wire	No
Kinston	Kinston Regional Jetport at Stallings Field	ISO	Complete	9'	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	Partial	6' with barbed wire	No
Louisburg	Triangle North Executive	LHZ	Complete	6'	No
Lumberton	Lumberton Regional	LBT	Partial	6' and 4'	No
Maxton	Laurinburg-Maxton	MEB	Partial	4'	No
Morganton	Foothills Regional	MRN	Partial	6' and 4'	No
Mount Airy	Mount Airy/Surry County	MWK	Complete	6' with barbed wire	No
North Wilkesboro	Wilkes County	UKF	Complete	6' with barbed wire	No
Oxford	Henderson-Oxford	HNZ	Complete	8' with 3 strand barb wire	Yes
Reidsville	Rockingham County NC Shiloh	SIF	Partial	6'	No
Roxboro	Person County	TDF	Complete	5' - 6' with barbed wire	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	Partial	8'	No
Shelby	Shelby-Cleveland County Regional	EHO	Partial	6' and 7'	No
Siler City	Siler City Municipal	5W8	Complete	4'	No
Wallace	Henderson Field	ACZ	Partial	6' and 8'	No
Washington	Warren Field	OCW	Complete	8' with 3 strand barb wire	Yes

Table 5.30: 2100: Perimeter Fencing Compliance (Cont.)

Associated City	Airport Name	ID	Existing Fencing	Height of Existing Fencing	Meets Objective
Green Airports: Perimeter					
Ahoskie	Tri-County	ASJ	Partial	4'	No
Clinton	Clinton-Sampson County	CTZ	Partial	8'	No
Edenton	Northeastern Regional	EDE	Partial	4' and 5'	No
Elkin	Elkin Municipal	ZEF	Partial	10' with barbed wire	No
Engelhard	Hyde County	7W6	Partial	8' with 1' of barbed wire	No
Hatteras	Billy Mitchell (NPS)	HSE	Partial	4'	No
Kill Devil Hills	First Flight (NPS)	FFA	Partial	4'	No
Mount Olive	Mount Olive Municipal	W40	Partial	8' with 3 string barbed wire	No
Ocean Isle Beach	Odell Williamson Municipal	60J	None	----	No
Ocracoke	Ocracoke Island Airport (NPS)	W95	Partial	4'	No
Plymouth	Plymouth Municipal	PMZ	None	----	No
Roanoke Rapids	Halifax-Northampton Regional	IXA	Partial	8' with barbed wire	No
Rockingham	Richmond County	RCZ	Complete	4', 6' and 8'	No
Spruce Pine	Avery County/Morrison Field	7A8	None	----	No
Star	Montgomery County	43A	None	----	No
Sylva	Jackson County	24A	Partial	6' and 8'	No
Tarboro	Tarboro-Edgecombe	ETC	Partial	8'	No
Wadesboro	Anson County-Jeff Cloud Field	AFP	None	----	No
Whiteville	Columbus County Municipal	CPC	Partial	4'	No
Williamston	Martin County	MCZ	Partial	4'	No

Source: NCASP Inventory Data, 2012

Table 5.31: 2200: Fuel Facilities Compliance

Associated City	Airport Name	ID	Fuel Type and Capacity				Self-Serve (Yes/No)
			AvGas	AvGas Capacity (gallons)	Jet A	Jet A Capacity (gallons)	
Yellow Airports: Not Eligible							
Asheville	Asheville Regional	AVL	Yes	12,000	Yes	80,000	No
Charlotte	Charlotte/Douglas Int'l	CLT	Yes	21,700	Yes	4,000,000	No
Concord	Concord Regional	JQF	Yes	30,000	Yes	45,000	No
Fayetteville	Fayetteville Regional/Grannis Field	FAY	Yes	14,000	Yes	39,200	No
Greensboro	Piedmont Triad Int'l	GSO	Yes	25,000	Yes	180,000	No
Greenville	Pitt-Greenville	PGV	Yes	12,000	Yes	20,000	No
Jacksonville	Albert J. Ellis	OAJ	Yes	10,000	Yes	20,000	No
New Bern	Coastal Carolina Regional	EWN	Yes	10,000	Yes	20,000	No
Raleigh	Raleigh-Durham Int'l	RDU	Yes	30,000	Yes	6,000,000	No
Wilmington	Wilmington Int'l	ILM	Yes	22,000	Yes	139,000	No
Red Airports: Based on Demand							
Beaufort	Michael J. Smith Field	MRH	Yes	12,000	Yes	12,000	No
Burlington	Burlington-Alamance Regional	BUY	Yes	34,000	Yes	22,000	No
Currituck	Currituck County Regional	ONX	Yes	10,000	Yes	12,000	Yes
Franklin	Macon County	1A5	Yes	10,000	Yes	10,000	Yes
Hickory	Hickory Regional	HKY	Yes	24,000	Yes	24,000	Yes
Lexington	Davidson County	EXX	Yes	12,000	Yes	12,000	No
Manteo	Dare County Regional	MQI	Yes	10,000	Yes	10,000	Yes
Monroe	Charlotte-Monroe Executive	EQY	yes	25,000	Yes	30,000	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	Yes	12,000	Yes	12,000	Yes
Pinehurst/Southern Pines	Moore County	SOP	Yes	16,000	Yes	36,000	No
Rocky Mount	Rocky Mount-Wilson Regional	RWI	Yes	10,000	Yes	10,000	No
Salisbury	Rowan County	RUQ	Yes	11,200	Yes	23,000	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	Yes	10,000	Yes	20,000	No
Smithfield	Johnston County	JNX	Yes	10,000	Yes	15,000	No
Statesville	Statesville Regional	SVH	Yes	12,000	Yes	12,000	No
Winston-Salem	Smith Reynolds	INT	Yes	18,000	Yes	50,000	Yes

Table 5.31: 2200: Fuel Facilities Compliance (Cont.)

Associated City	Airport Name	ID	Fuel Type and Capacity				Self-Serve (Yes/No)
			AvGas	AvGas Capacity (gallons)	Jet A	Jet A Capacity (gallons)	
Blue Airports: Based on Demand							
Albemarle	Stanly County	VUJ	Yes	12,000	Yes	12,000	Yes
Andrews	Western Carolina Regional	RHP	Yes	12,000	Yes	12,000	No
Asheboro	Asheboro Regional	HBI	Yes	10,000	Yes	10,000	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	Yes	12,000	Yes	12,000	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	Yes	10,000	Yes	10,000	Yes
Erwin	Harnett Regional Jetport	HRJ	Yes	10,000	Yes	12,000	Yes
Gastonia	Gastonia Municipal	AKH	Yes	10,000	Yes	10,000	No
Goldsboro	Wayne Executive Jetport	GWW	Yes	10,000	Yes	6,000	No
Jefferson	Ashe County	GEV	Yes	10,000	Yes	10,000	No
Kenansville	Duplin County	DPL	Yes	12,000	Yes	12,000	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	Yes	10,000	Yes	20,000	No
Lincolnton	Lincolnton Lincoln County Regional	IPJ	Yes	12,000	Yes	12,000	No
Louisburg	Triangle North Executive	LHZ	Yes	10,000	Yes	10,000	No
Lumberton	Lumberton Regional	LBT	Yes	12,000	Yes	12,000	Yes
Maxton	Laurinburg-Maxton	MEB	Yes	12,000	Yes	10,000	Yes
Morganton	Foothills Regional	MRN	Yes	11,000	Yes	11,000	No
Mount Airy	Mount Airy/Surry County	MWK	Yes	10,000	Yes	10,000	No
North Wilkesboro	Wilkes County	UKF	Yes	12,000	Yes	12,000	No
Oxford	Henderson-Oxford	HNZ	Yes	12,000	Yes	12,000	Yes
Reidsville	Rockingham County NC Shiloh	SIF	Yes	10,000	Yes	10,000	Yes
Roxboro	Person County	TDF	Yes	15,000	Yes	10,000	No
Rutherfordton	Rutherford County-Marchman Field	FQD	yes	10,000	Yes	12,000	No
Shelby	Shelby-Cleveland County Regional	EHO	Yes	10,000	Yes	6,200	Yes
Siler City	Siler City Municipal	5W8	Yes	11,000	Yes	11,000	Yes
Wallace	Henderson Field	ACZ	Yes	10,000	Yes	10,000	Yes
Washington	Warren Field	OCW	Yes	12,000	Yes	12,000	Yes

Table 5.31: 2200: Fuel Facilities Compliance (Cont.)

Associated City	Airport Name	ID	Fuel Type and Capacity				Self-Serve (Yes/No)
			AvGas	AvGas Capacity (gallons)	Jet A	Jet A Capacity (gallons)	
Green Airports: Based on Demand							
Ahoskie	Tri-County	ASJ	Yes	10,000	Yes	10,000	Yes
Clinton	Clinton-Sampson County	CTZ	Yes	4,000	Yes	9,000	No
Edenton	Northeastern Regional	EDE	Yes	8,000	Yes	8,000	Yes
Elkin	Elkin Municipal	ZEF	Yes	10,000	Yes	10,000	Yes
Engelhard	Hyde County	7W6	Yes	6,000	No	----	Yes
Hatteras	Billy Mitchell (NPS)	HSE	No	----	No	----	No
Kill Devil Hills	First Flight (NPS)	FFA	No	----	No	----	No
Mount Olive	Mount Olive Municipal	W40	Yes	3,000	Yes	10,000	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	Yes	5,000	No	----	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95	No	----	No	----	No
Plymouth	Plymouth Municipal	PMZ	Yes	12,000	Yes	12,000	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	Yes	12,000	Yes	12,000	Yes
Rockingham	Richmond County	RCZ	Yes	12,000	Yes	10,000	Yes
Spruce Pine	Avery County/Morrison Field	7A8	Yes	6,000	Yes	6,000	Yes
Star	Montgomery County	43A	Yes	3,500	No	----	No
Sylva	Jackson County	24A	Yes	10,000	No	----	Yes
Tarboro	Tarboro-Edgecombe	ETC	No	----	No	----	No
Wadesboro	Anson County-Jeff Cloud Field	AFP	Yes	10,000	Yes	12,000	Yes
Whiteville	Columbus County Municipal	CPC	Yes	12,000	Yes	12,000	Yes
Williamston	Martin County	MCZ	Yes	10,000	No	----	No

Source: NCASP Inventory Data, 2012

Table 5.32: Airport Signage

Associated City	Airport Name	ID	Sign Directing to Airport from Major Road?	Sign Show Distance to Airport?	Road Type	No. of Signs	Entrance Sign w/in close proximity?	Adequate Signage (according to airport mgmt)?
Yellow Airports								
Asheville	Asheville Regional	AVL	Yes	Yes	Interstate	NA	Yes	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	Yes	Yes	Interstate	NA	Yes	Yes
Concord	Concord Regional	JQF	Yes	No	Interstate	3	Yes	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	Yes	Yes	Interstate	NA	Yes	Yes
Greensboro	Piedmont Triad Int'l	GSO	Yes	Yes	Interstate	NA	Yes	Yes
Greenville	Pitt-Greenville	PGV	Yes	No	4-Lane State Hwy	2	Yes	Yes
Jacksonville	Albert J. Ellis	OAJ	Yes	Yes	Interstate	12	Yes	Yes
New Bern	Coastal Carolina Regional	EWN	Yes	No	4-Lane US Hwy	2	Yes	Yes
Raleigh	Raleigh-Durham Int'l	RDU	Yes	Yes	Interstate	NA	Yes	Yes
Wilmington	Wilmington Int'l	ILM	Yes	Yes	Interstate	4	Yes	Yes
Red Airports								
Beaufort	Michael J. Smith Field	MRH	Yes	No	2-Lane State Hwy	2	Yes	Yes
Burlington	Burlington-Alamance Regional	BUY	Yes	No	4-Lane US Hwy	2	Yes	Yes
Currituck	Currituck County Regional	ONX	Yes	No	2-Lane State Hwy	2	No	Yes
Franklin	Macon County	1A5	Yes	No	2-Lane State Hwy	3	Yes	No
Hickory	Hickory Regional	HKY	Yes	No	Interstate	8	Yes	No
Lexington	Davidson County	EXX	Yes	No	2-Lane State Hwy	1	Yes	Yes
Manteo	Dare County Regional	MQI	NA					Yes
Monroe	Charlotte-Monroe Executive	EQY	Yes	No	4-Lane US Hwy	4	Yes	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	Yes	No	2-Lane State Hwy	2	Yes	Yes
Pinehurst/ Southern Pines	Moore County	SOP	Yes	No	2-Lane State Hwy	6	Yes	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	Yes	No	Interstate	2	Yes	No
Salisbury	Rowan County	RUQ	Yes	No	Interstate	4	Yes	No
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	Yes	No	4-Lane US Hwy	5	Yes	No
Smithfield	Johnston County	JNX	Yes	No	4-Lane State Hwy	3	Yes	No

Table 5.32: Airport Signage (Cont.)

Associated City	Airport Name	ID	Sign Directing to Airport from Major Road?	Sign Show Distance to Airport?	Road Type	No. of Signs	Entrance Sign w/in close proximity?	Adequate Signage (according to airport mgmt)?
Statesville	Statesville Regional	SVH	Yes	No	Interstate	4	Yes	Yes
Winston-Salem	Smith Reynolds	INT	Yes	No	4-Lane US Hwy	3	Yes	Yes
Blue Airports								
Albemarle	Stanly County	VUJ	Yes	No	2-Lane State Hwy	2	Yes	Yes
Andrews	Western Carolina Regional	RHP	Yes	No	2-Lane State Hwy	3	Yes	Yes
Asheboro	Asheboro Regional	HBI	Yes	No	2-Lane State Hwy	3	Yes	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	Yes	No	2-Lane State Hwy	3	No	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	No			0	Yes	Yes
Erwin	Harnett Regional Jetport	HRJ	Yes	No	4-Lane State Hwy	2	Yes	No
Gastonia	Gastonia Municipal	AKH	Yes	No	2-Lane State Hwy	1	Yes	Yes
Goldsboro	Wayne Executive Jetport	GWW	Yes	No	2-Lane US Hwy	2	Yes	Yes
Jefferson	Ashe County	GEV	Yes	No	2-Lane US Hwy	4	No	Yes
Kenansville	Duplin County	DPL	Yes	Yes	2-Lane State Hwy	2	Yes	Yes
Kinston	Kinston Regional Jetport at Stallings	ISO	Yes	No	4-Lane State Hwy	3	Yes	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	Yes	No	2-Lane State Hwy	3	Yes	Yes
Louisburg	Triangle North Executive	LHZ	Yes	No	2-Lane US Hwy	3	Yes	Yes
Lumberton	Lumberton Regional	LBT	Yes	No	4-Lane State Hwy	5	Yes	Yes
Maxton	Laurinburg-Maxton	MEB	Yes	No	4-Lane State Hwy	5	Yes	No
Morganton	Foothills Regional	MRN	Yes	No	2-Lane US Hwy	5	Yes	No
Mount Airy	Mount Airy/Surry County	MWK	Yes	No	4-Lane US Hwy	3	Yes	Yes
North Wilkesboro	Wilkes County	UKF	Yes	No	2-Lane State Hwy	3	Yes	No
Oxford	Henderson-Oxford	HNZ	Yes	No	2-Lane State Hwy	3	Yes	Yes
Reidsville	Rockingham County NC Shiloh	SIF	Yes	No	2-Lane State Hwy	2	Yes	Yes
Roxboro	Person County	TDF	Yes	No	4-Lane State Hwy	3	Yes	No
Rutherfordton	Rutherford County-Marchman Field	FQD	No			0	Yes	Yes
Shelby	Shelby-Cleveland County Regional	EHO	No	No		0	Yes	No
Siler City	Siler City Municipal	5W8	Yes	No	4-Lane US Hwy	2	Yes	Yes
Wallace	Henderson Field	ACZ	Yes	No	2-Lane State Hwy	2	Yes	Yes
Washington	Warren Field	OCW	Yes	No	2-Lane State Hwy	3	Yes	No

Table 4.32: Airport Signage (Cont.)

Associated City	Airport Name	ID	Sign Directing to Airport from Major Road?	Sign Show Distance to Airport?	Road Type	No. of Signs	Entrance Sign w/in close proximity?	Adequate Signage (according to airport mgmt)?
Green Airports								
Ahoskie	Tri-County	ASJ	Yes	No	2-Lane State Hwy	2	Yes	No
Clinton	Clinton-Sampson County	CTZ	Yes	No	2-Lane State Hwy	1	No	Yes
Edenton	Northeastern Regional	EDE	Yes	No	2-Lane State Hwy	1	Yes	No
Elkin	Elkin Municipal	ZEF	Unknown				No	Yes
Engelhard	Hyde County	7W6	Yes	No	2-Lane State Hwy	2	No	No
Hatteras	Billy Mitchell (NPS)	HSE	Unknown					Yes
Kill Devil Hills	First Flight (NPS)	FFA	Unknown					Yes
Mount Olive	Mount Olive Municipal	W40	Yes	No	2-Lane State Hwy	3	Yes	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	No			0	FBO sign only	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95	Unknown					Yes
Plymouth	Plymouth Municipal	PMZ	Yes	No	2-Lane State Hwy	4	No	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	Yes	No	2-Lane State Hwy	2	Yes	No
Rockingham	Richmond County	RCZ	Yes	No	2-Lane State Hwy	3	Yes	Yes
Spruce Pine	Avery County/Morrison Field	7A8	Yes	No	2-Lane US Hwy	3	Yes	No
Star	Montgomery County	43A	Yes	No	2-Lane State Hwy	2	Yes	Yes
Sylva	Jackson County	24A	Yes	No	2-Lane State Hwy	2	Yes	No
Tarboro	Tarboro-Edgecombe	ETC	No	No	2-Lane State Hwy	2	Yes	No
Wadesboro	Anson County-Jeff Cloud Field	AFP	Yes	No	2-Lane State Hwy	1	No	No
Whiteville	Columbus County Municipal	CPC	Yes	No	2-Lane State Hwy	7	No	Yes
Williamston	Martin County	MCZ	Yes	No	2-Lane State Hwy	2	Yes	No

Source: NCASP Inventory Data, 2012

Table 5.35: Airport Approaches

Associated City	Airport Name	ID	Approach	Approach Category	Instrument Approach (Yes/No)
Yellow Airports					
Asheville	Asheville Regional	AVL	ILS	Precision	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	ILS	Precision	Yes
Concord	Concord Regional	JQF	ILS	Precision	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	ILS	Precision	Yes
Greensboro	Piedmont Triad Int'l	GSO	ILS	Precision	Yes
Greenville	Pitt-Greenville	PGV	ILS	Precision	Yes
Jacksonville	Albert J. Ellis	OAJ	ILS	Precision	Yes
New Bern	Coastal Carolina Regional	EWN	ILS	Precision	Yes
Raleigh	Raleigh-Durham Int'l	RDU	ILS	Precision	Yes
Wilmington	Wilmington Int'l	ILM	ILS	Precision	Yes
Red Airports					
Beaufort	Michael J. Smith Field	MRH	RNAV (GPS)	APV	Yes
Burlington	Burlington-Alamance Regional	BUY	ILS	Precision	Yes
Currituck	Currituck County Regional	ONX	RNAV (GPS)	APV	Yes
Franklin	Macon County	1A5	RNAV (GPS)	Non-Precision (Circling)	No
Hickory	Hickory Regional	HKY	ILS	Precision	Yes
Lexington	Davidson County	EXX	ILS	Precision	Yes
Manteo	Dare County Regional	MQI	RNAV (GPS)	APV	Yes
Monroe	Charlotte-Monroe Executive	EQY	ILS	Precision	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	RNAV (GPS)	APV	Yes
Pinehurst/Southern Pines	Moore County	SOP	ILS	Precision	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	ILS	Precision	Yes
Salisbury	Rowan County	RUQ	ILS	Precision	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	ILS	Precision	Yes
Smithfield	Johnston County	JNX	ILS	Precision	Yes
Statesville	Statesville Regional	SVH	ILS	Precision	Yes
Winston-Salem	Smith Reynolds	INT	ILS	Precision	Yes

Table 5.35: Airport Approaches (Cont.)

Associated City	Airport Name	ID	Approach	Approach Category	Instrument Approach (Yes/No)
Blue Airports					
Albemarle	Stanly County	VUJ	ILS	Precision	Yes
Andrews	Western Carolina Regional	RHP	RNAV (GPS)	APV	Yes
Asheboro	Asheboro Regional	HBI	RNAV (GPS)	APV	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	ILS	Precision	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	RNAV (GPS)	APV	Yes
Erwin	Harnett Regional Jetport	HRJ	RNAV (GPS)	APV	Yes
Gastonia	Gastonia Municipal	AKH	RNAV (GPS)	APV	Yes
Goldsboro	Wayne Executive Jetport	GWW	ILS	Precision	Yes
Jefferson	Ashe County	GEV	RNAV (GPS)	LNAV	Yes
Kenansville	Duplin County	DPL	RNAV (GPS)	APV	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	ILS	Precision	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	RNAV (GPS)	APV	Yes
Louisburg	Triangle North Executive	LHZ	ILS	Precision	Yes
Lumberton	Lumberton Regional	LBT	ILS	Precision	Yes
Maxton	Laurinburg-Maxton	MEB	ILS	Precision	Yes
Morganton	Foothills Regional	MRN	RNAV (GPS)	APV	Yes
Mount Airy	Mount Airy/Surry County	MWK	RNAV (GPS)	RNAV LPV	Yes
North Wilkesboro	Wilkes County	UKF	ILS	APV	Yes
Oxford	Henderson-Oxford	HNZ	RNAV (GPS)	APV	Yes
Reidsville	Rockingham County NC Shiloh	SIF	RNAV (GPS)	LNAV	Yes
Roxboro	Person County	TDF	ILS	Precision	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	RNAV (GPS)	APV	Yes
Shelby	Shelby-Cleveland County Regional	EHO	RNAV (GPS)	APV	Yes
Siler City	Siler City Municipal	5W8	RNAV (GPS)	LNAV	Yes
Wallace	Henderson Field	ACZ	GPS	Non-Precision	Yes
Washington	Warren Field	OCW	RNAV (GPS)	APV	Yes

Table 5.35: Airport Approaches (Cont.)

Associated City	Airport Name	ID	Approach	Approach Category	Instrument Approach (Yes/No)
Green Airports					
Ahoskie	Tri-County	ASJ	GPS	Non-Precision	Yes
Clinton	Clinton-Sampson County	CTZ	RNAV (GPS)	APV	Yes
Edenton	Northeastern Regional	EDE	ILS	Precision	Yes
Elkin	Elkin Municipal	ZEF	NDB or GPS	Non-Precision	Yes
Engelhard	Hyde County	7W6	None	Visual	No
Hatteras	Billy Mitchell (NPS)	HSE	RNAV (GPS)	LNAV	Yes
Kill Devil Hills	First Flight (NPS)	FFA	None	Visual	No
Mount Olive	Mount Olive Municipal	W40	RNAV (GPS)	APV	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	None	Visual	No
Ocracoke	Ocracoke Island Airport (NPS)	W95	RNAV (GPS)	LNAV	Yes
Plymouth	Plymouth Municipal	PMZ	RNAV (GPS)	LP	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	RNAV (GPS)	APV	Yes
Rockingham	Richmond County	RCZ	RNAV (GPS)	APV	Yes
Spruce Pine	Avery County/Morrison Field	7A8	None	Visual	No
Star	Montgomery County	43A	None	Visual	No
Sylva	Jackson County	24A	RNAV (GPS)	APV	Yes
Tarboro	Tarboro-Edgecombe	ETC	NDB	Non-Precision	Yes
Wadesboro	Anson County-Jeff Cloud Field	AFP	ILS	Precision	Yes
Whiteville	Columbus County Municipal	CPC	RNAV (GPS)	LNAV	Yes
Williamston	Martin County	MCZ	RNAV (GPS)	LNAV	Yes

Source: NCASP Inventory Data, 2012

Table 5.36: Intermodal Access at Airports

Associated City	Airport Name	ID	Public Bus	Access to Taxi	On-Site Car Rental	Ferry Access within 5 miles	Rail Freight Line		Amtrak Passenger		
							Within 2 miles	Within 5 miles	Line within 2 miles	Line within 5 miles	Station within 5 miles
Yellow Airports											
Asheville	Asheville Regional	AVL	X	X	X			X			
Charlotte	Charlotte/Douglas Int'l	CLT	X	X	X		X	X	X	X	
Concord	Concord Regional	JQF		X	X						
Fayetteville	Fayetteville Regional/Grannis Field	FAY		X	X			X		X	X
Greensboro	Piedmont Triad Int'l	GSO	X	X	X		X	X			
Greenville	Pitt-Greenville	PGV		X	X		X	X			
Jacksonville	Albert J. Ellis	OAJ		X	X						
New Bern	Coastal Carolina Regional	EWN		X	X		X	X			
Raleigh	Raleigh-Durham Int'l	RDU	X	X	X			X		X	
Wilmington	Wilmington Int'l	ILM		X	X		X	X			
Red Airports											
Beaufort	Michael J. Smith Field	MRH		X	X		X	X			
Burlington	Burlington-Alamance Regional	BUY		X	X			X		X	X
Currituck	Currituck County Regional	ONX	X	X	X	X		X			
Franklin	Macon County	1A5		X	X						
Hickory	Hickory Regional	HKY		X	X		X	X			
Lexington	Davidson County	EXX		X	X		X	X	X	X	X
Manteo	Dare County Regional	MQI		X	X	X					
Monroe	Charlotte-Monroe Executive	EQY		X	X		X	X			
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT		X	X	X		X			
Pinehurst/Southern Pines	Moore County	SOP		X	X			X		X	X
Rocky Mount	Rocky Mount-Wilson Regional	RWI		X	X			X		X	
Salisbury	Rowan County	RUQ		X			X	X	X	X	X
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA		X	X		X	X	X	X	
Smithfield	Johnston County	JNX		X				X		X	
Statesville	Statesville Regional	SVH		X	X		X	X			
Winston-Salem	Smith Reynolds	INT		X	X		X	X			X

Table 5.36: Intermodal Access at Airports (Cont.)

Associated City	Airport Name	ID	Public Bus	Access to Taxi	On-Site Car Rental	Ferry Access within 5 miles	Rail Freight Line		Amtrak Passenger		
							Within 2 miles	Within 5 miles	Line within 2 miles	Line within 5 miles	Station within 5 miles
Blue Airports											
Albemarle	Stanly County	VUJ					X	X			
Andrews	Western Carolina Regional	RHP		X	X		X	X			
Asheboro	Asheboro Regional	HBI		X	X			X			
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG		X	X		X	X			
Elizabethtown	Curtis L Brown Jr Field	EYF						X			
Erwin	Harnett Regional Jetport	HRJ						X			
Gastonia	Gastonia Municipal	AKH		X	X			X		X	X
Goldsboro	Wayne Executive Jetport	GWW		X			X	X			
Jefferson	Ashe County	GEV		X				X			
Kenansville	Duplin County	DPL									
Kinston	Kinston Regional Jetport at Stallings	ISO		X	X			X			
Lincolnton	Lincolnton Lincoln County Regional	IPJ		X			X	X			
Louisburg	Triangle North Executive	LHZ		X				X			
Lumberton	Lumberton Regional	LBT		X			X	X			
Maxton	Laurinburg-Maxton	MEB		X			X	X			
Morganton	Foothills Regional	MRN		X	X			X			
Mount Airy	Mount Airy/Surry County	MWK						X			
North Wilkesboro	Wilkes County	UKF		X				X			
Oxford	Henderson-Oxford	HNZ		X			X	X			
Reidsville	Rockingham County NC Shiloh	SIF			X			X			
Roxboro	Person County	TDF		X	X		X	X			
Rutherfordton	Rutherford County-Marchman Field	FQD		X			X	X			
Shelby	Shelby-Cleveland County Regional	EHO		X				X			
Siler City	Siler City Municipal	5W8		X	X			X			
Wallace	Henderson Field	ACZ					X	X			
Washington	Warren Field	OCW		X			X	X			

Table 5.36: Intermodal Access at Airports (Cont.)

Associated City	Airport Name	ID	Public Bus	Access to Taxi	On-Site Car Rental	Ferry Access within 5 miles	Rail Freight Line		Amtrak Passenger		
							Within 2 miles	Within 5 miles	Line within 2 miles	Line within 5 miles	Station within 5 miles
Green Airports											
Ahoskie	Tri-County	ASJ		X				X			
Clinton	Clinton-Sampson County	CTZ						X			
Edenton	Northeastern Regional	EDE		X			X	X			
Elkin	Elkin Municipal	ZEF					X	X			
Engelhard	Hyde County	7W6			X						
Hatteras	Billy Mitchell (NPS)	HSE			X						
Kill Devil Hills	First Flight (NPS)	FFA									
Mount Olive	Mount Olive Municipal	W40		X			X	X			
Ocean Isle Beach	Odell Williamson Municipal	60J		X							
Ocracoke	Ocracoke Island Airport (NPS)	W95			X						
Plymouth	Plymouth Municipal	PMZ		X			X	X			
Roanoke Rapids	Halifax-Northampton Regional	IXA						X		X	
Rockingham	Richmond County	RCZ					X	X		X	X
Spruce Pine	Avery County/Morrison Field	7A8						X			
Star	Montgomery County	43A					X	X			
Sylva	Jackson County	24A		X				X			
Tarboro	Tarboro-Edgecombe	ETC		X			X	X			
Wadesboro	Anson County-Jeff Cloud Field	AFP		X			X	X			
Whiteville	Columbus County Municipal	CPC		X				X			
Williamston	Martin County	MCZ					X	X			
Total System Airports			5	54	34	6	34	62	4	13	8

Source: NCASP Inventory Data, 2012, Parsons Brinckerhoff

Table 5.37: Fuel at Airports

Associated City	Airport Name	ID	Jet Fuel	24/7 Fuel	Self-Service Fuel
Yellow Airports					
Asheville	Asheville Regional	AVL	Yes	Yes	No
Charlotte	Charlotte/Douglas Int'l	CLT	Yes	Yes	No
Concord	Concord Regional	JQF	Yes	Yes	No
Fayetteville	Fayetteville Regional/Grannis Field	FAY	Yes	Yes	No
Greensboro	Piedmont Triad Int'l	GSO	Yes	Yes	No
Greenville	Pitt-Greenville	PGV	Yes	Yes	No
Jacksonville	Albert J. Ellis	OAJ	Yes	Yes	No
New Bern	Coastal Carolina Regional	EWN	Yes	Yes	No
Raleigh	Raleigh-Durham Int'l	RDU	Yes	Yes	No
Wilmington	Wilmington Int'l	ILM	Yes	Yes	No
Red Airports					
Beaufort	Michael J. Smith Field	MRH	Yes	Yes	No
Burlington	Burlington-Alamance Regional	BUY	Yes	Yes	No
Currituck	Currituck County Regional	ONX	Yes	Yes	Yes
Franklin	Macon County	1A5	Yes	Yes	Yes
Hickory	Hickory Regional	HKY	Yes	Yes	Yes (Avgas only)
Lexington	Davidson County	EXX	Yes	Yes	No
Manteo	Dare County Regional	MQI	Yes	Yes	Yes (Avgas only)
Monroe	Charlotte-Monroe Executive	EQY	Yes	Yes	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	Yes	Yes	Yes
Pinehurst/Southern Pines	Moore County	SOP	Yes	Yes	No
Rocky Mount	Rocky Mount-Wilson Regional	RWI	Yes	Yes	No
Salisbury	Rowan County	RUQ	Yes	Yes	Yes (Avgas only)
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	Yes	Yes	No
Smithfield	Johnston County	JNX	Yes	Yes	No
Statesville	Statesville Regional	SVH	Yes	Yes	No
Winston-Salem	Smith Reynolds	INT	Yes	Yes	Yes (Avgas only)

Table 5.37: Fuel at Airports (Cont.)

Associated City	Airport Name	ID	Jet Fuel	24/7 Fuel	Self-Service Fuel
Blue Airports					
Albemarle	Stanly County	VUJ	Yes	Yes	Yes (Avgas only)
Andrews	Western Carolina Regional	RHP	Yes	Yes	No
Asheboro	Asheboro Regional	HBI	Yes	Yes	Yes (Avgas only)
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	Yes	Yes	Yes (Avgas only)
Elizabethtown	Curtis L Brown Jr Field	EYF	Yes	Yes	Yes
Erwin	Harnett Regional Jetport	HRJ	Yes	Yes	Yes (Avgas only)
Gastonia	Gastonia Municipal	AKH	Yes	No	No
Goldsboro	Wayne Executive Jetport	GWW	Yes	Yes	No
Jefferson	Ashe County	GEV	Yes	Yes	No
Kenansville	Duplin County	DPL	Yes	Yes	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	Yes	Yes	No
Lincolnton	Lincolnton Lincoln County Regional	IPJ	Yes	Yes	No
Louisburg	Triangle North Executive	LHZ	Yes	No	No
Lumberton	Lumberton Regional	LBT	Yes	Yes	Yes (Avgas only)
Maxton	Laurinburg-Maxton	MEB	Yes	Yes	Yes (Avgas only)
Morganton	Foothills Regional	MRN	Yes	Yes	No
Mount Airy	Mount Airy/Surry County	MWK	Yes	No	No
North Wilkesboro	Wilkes County	UKF	Yes	Yes	No
Oxford	Henderson-Oxford	HNZ	Yes	Yes	Yes (Avgas only)
Reidsville	Rockingham County NC Shiloh	SIF	Yes	Yes	Yes (Avgas only)
Roxboro	Person County	TDF	Yes	Yes	No
Rutherfordton	Rutherford County-Marchman Field	FQD	Yes	Yes	No
Shelby	Shelby-Cleveland County Regional	EHO	Yes	Yes	Yes (Avgas only)
Siler City	Siler City Municipal	5W8	Yes	Yes	Yes (Avgas only)
Wallace	Henderson Field	ACZ	Yes	Yes	Yes
Washington	Warren Field	OCW	Yes	Yes	Yes

Table 5.37: Fuel at Airports (Cont.)

Associated City	Airport Name	ID	Jet Fuel	24/7 Fuel	Self-Service Fuel
Green Airports					
Ahoskie	Tri-County	ASJ	Yes	No	Yes
Clinton	Clinton-Sampson County	CTZ	Yes	Yes	No
Edenton	Northeastern Regional	EDE	Yes	Yes	Yes
Elkin	Elkin Municipal	ZEF	Yes	Yes	Yes
Engelhard	Hyde County	7W6	No	Yes	Yes (Avgas only)
Hatteras	Billy Mitchell (NPS)	HSE	No	NA	NA
Kill Devil Hills	First Flight (NPS)	FFA	No	NA	NA
Mount Olive	Mount Olive Municipal	W40	Yes	Yes	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	No	Yes	Yes
Ocracoke	Ocracoke Island Airport (NPS)	W95	No	NA	NA
Plymouth	Plymouth Municipal	PMZ	Yes	Yes	Yes
Roanoke Rapids	Halifax-Northampton Regional	IXA	Yes	Yes	Yes
Rockingham	Richmond County	RCZ	Yes	Yes	Yes (Avgas only)
Spruce Pine	Avery County/Morrison Field	7A8	Yes	Yes	Yes
Star	Montgomery County	43A	No	No	No
Sylva	Jackson County	24A	No	Yes	Yes (Avgas only)
Tarboro	Tarboro-Edgecombe	ETC	No	NA	NA
Wadesboro	Anson County-Jeff Cloud Field	AFP	Yes	Yes	No
Whiteville	Columbus County Municipal	CPC	Yes	Yes	Yes
Williamston	Martin County	MCZ	No	No	No

Source: NCASP Inventory Data, 2012

Table 5.38: Airport Operational Demand/Capacity

Associated City	Airport Name	ID	Demand		ASV	Demand/Capacity Ratio	
			2011	*2031*		*2011*	*2031*
Yellow Airports							
Asheville	Asheville Regional	AVL	63,164	65,548	121,272	52%	54%
Charlotte	Charlotte/Douglas Int'l[1]	CLT	NA	NA	NA	NA	NA
Concord	Concord Regional	JQF	60,500	73,800	209,400	29%	35%
Fayetteville	Fayetteville Regional/Grannis Field	FAY	49,948	55,261	200,000	25%	28%
Greensboro	Piedmont Triad Int'l	GSO	NA	NA	NA	NA	NA
Greenville	Pitt-Greenville	PGV	36,219	44,846	190,000	19%	24%
Jacksonville	Albert J. Ellis	OAJ	38,804	49,896	195,000	20%	26%
New Bern	Coastal Carolina Regional	EWN	33,408	36,312	200,000	17%	18%
Raleigh	Raleigh-Durham Int'l	RDU	NA	NA	NA	NA	NA
Wilmington	Wilmington Int'l	ILM	55,522	57,349	205,000	27%	28%
Red Airports							
Beaufort	Michael J. Smith Field	MRH	41,100	50,100	251,700	16%	20%
Burlington	Burlington-Alamance Regional	BUY	50,000	74,300	248,200	20%	30%
Currituck	Currituck County Regional	ONX	18,000	22,900	178,000	10%	13%
Franklin	Macon County	1A5	9,000	10,200	244,800	4%	4%
Hickory	Hickory Regional	HKY	40,100	48,900	241,400	17%	20%
Lexington	Davidson County	EXX	8,500	12,700	251,700	3%	5%
Manteo	Dare County Regional	MQI	16,800	20,500	191,300	9%	11%
Monroe	Charlotte-Monroe Executive	EQY	55,100	67,300	248,600	22%	27%
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	74,000	94,000	221,400	33%	42%
Pinehurst/Southern Pines	Moore County	SOP	8,900	10,900	211,400	4%	5%
Rocky Mount	Rocky Mount-Wilson Regional	RWI	29,300	35,700	214,800	14%	17%
Salisbury	Rowan County	RUQ	39,100	58,200	231,500	17%	25%
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	62,000	92,200	281,700	22%	33%
Smithfield	Johnston County	JNX	72,400	107,600	251,700	29%	43%
Statesville	Statesville Regional	SVH	36,000	53,500	248,200	15%	22%
Winston-Salem	Smith Reynolds	INT	42,600	51,900	228,500	19%	23%

Table 5.38: Airport Operational Demand/Capacity (Cont.)

Associated City	Airport Name	ID	Demand		ASV	Demand/Capacity Ratio	
			2011	2031		2011	2031
Blue Airports							
Albemarle	Stanly County	VUJ	17,100	19,200	250,600	7%	8%
Andrews	Western Carolina Regional	RHP	20,000	29,800	182,400	11%	16%
Asheboro	Asheboro Regional	HBI	15,000	19,100	187,700	8%	10%
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	16,200	18,200	185,100	9%	10%
Elizabethtown	Curtis L Brown Jr Field	EYF	14,000	17,800	169,400	8%	11%
Erwin	Harnett Regional Jetport	HRJ	44,300	54,100	195,400	23%	28%
Gastonia	Gastonia Municipal	AKH	50,000	61,100	206,000	24%	30%
Goldsboro	Wayne Executive Jetport	GWW	15,200	18,600	177,400	9%	10%
Jefferson	Ashe County	GEV	9,900	12,600	128,000	8%	10%
Kenansville	Duplin County	DPL	14,500	21,600	164,300	9%	13%
Kinston	Kinston Regional Jetport at Stallings Field	ISO	10,900	16,200	198,100	6%	8%
Lincolnton	Lincolnton Lincoln County Regional	IPJ	33,200	42,200	180,000	18%	23%
Louisburg	Triangle North Executive	LHZ	60,300	89,700	203,400	30%	44%
Lumberton	Lumberton Regional	LBT	23,000	29,200	174,700	13%	17%
Maxton	Laurinburg-Maxton	MEB	24,000	27,100	185,100	13%	15%
Morganton	Foothills Regional	MRN	16,500	24,600	142,000	12%	17%
Mount Airy	Mount Airy/Surry County	MWK	17,000	25,300	167,000	10%	15%
North Wilkesboro	Wilkes County	UKF	4,900	7,300	174,300	3%	4%
Oxford	Henderson-Oxford	HNZ	24,200	30,700	177,400	14%	17%
Reidsville	Rockingham County NC Shiloh	SIF	24,000	30,500	197,200	12%	15%
Roxboro	Person County	TDF	33,600	49,900	177,400	19%	28%
Rutherfordton	Rutherford County-Marchman Field	FQD	33,000	40,300	210,000	16%	19%
Shelby	Shelby-Cleveland County Regional	EHO	18,000	20,300	190,400	9%	11%
Siler City	Siler City Municipal	5W8	20,500	26,100	117,600	17%	22%
Wallace	Henderson Field	ACZ	14,700	16,600	122,700	12%	14%
Washington	Warren Field	OCW	12,000	13,600	198,100	6%	7%

Table 5.38: Airport Operational Demand/Capacity (Cont.)

Associated City	Airport Name	ID	Demand		ASV	Demand/Capacity Ratio	
			2011	2031		2011	2031
Green Airports							
Ahoskie	Tri-County	ASJ	13,000	14,700	116,900	11%	13%
Clinton	Clinton-Sampson County	CTZ	4,600	5,900	141,700	3%	4%
Edenton	Northeastern Regional	EDE	13,500	17,200	128,300	11%	13%
Elkin	Elkin Municipal	ZEF	13,000	14,700	96,400	13%	15%
Engelhard	Hyde County	7W6	3,600	3,800	88,900	4%	4%
Hatteras	Billy Mitchell (NPS)	HSE	9,100	9,700	90,200	10%	11%
Kill Devil Hills	First Flight (NPS)	FFA	37,000	39,300	96,000	39%	41%
Mount Olive	Mount Olive Municipal	W40	14,500	16,400	101,900	14%	16%
Ocean Isle Beach	Odell Williamson Municipal	60J	20,000	22,600	109,000	18%	21%
Ocracoke	Ocracoke Island Airport (NPS)	W95	6,100	6,500	92,100	7%	7%
Plymouth	Plymouth Municipal	PMZ	11,300	14,400	101,900	11%	14%
Roanoke Rapids	Halifax-Northampton Regional	IXA	2,600	3,000	126,300	2%	2%
Rockingham	Richmond County	RCZ	10,000	11,300	132,200	8%	9%
Spruce Pine	Avery County/Morrison Field	7A8	5,000	6,400	84,600	6%	8%
Star	Montgomery County	43A	2,800	3,200	90,200	3%	4%
Sylva	Jackson County	24A	4,300	4,800	86,600	5%	6%
Tarboro	Tarboro-Edgecombe	ETC	4,800	5,500	86,600	6%	6%
Wadesboro	Anson County-Jeff Cloud Field	AFP	6,500	8,300	120,800	5%	7%
Whiteville	Columbus County Municipal	CPC	15,700	20,000	82,700	19%	24%
Williamston	Martin County	MCZ	4,000	4,600	90,500	4%	5%

Sources: NCASP Inventory Data, 2012, Kimley-Horn and Associates
Note: NA= Not available. Due to differences in calculations and unavailability of data, the large commercial service airports (CLT/RDU/GSO) have not been included in this analysis.

Table 5.39: Services and Terminal Amenities

Associated City	Airport Name	ID	Services						Terminal Amenities							
			FBO	On-Site Rental Car	Courtesy/Crew Car	Flight Instruction	Aircraft Maintenance	On-Site Aircraft Charter	Restaurant	Public Restrooms	Vending or other Food/Beverage	Pilot Lounge	Conference Room	Flight Planning Room	Public Internet Access	Wi-Fi
Yellow Airports																
Asheville	Asheville Regional	AVL	1	X	X	X	X	X	X	X	X	X	X	X	X	X
Charlotte	Charlotte/Douglas Int'l	CLT	2	X	X	X	X	X	X	X	X	X	X	X	X	X
Concord	Concord Regional	JQF	1	X	X	X	X	X		X	X	X	X	X	X	X
Fayetteville	Fayetteville Regional/Grannis Field	FAY	1	X	X	X	X		X	X	X	X	X	X	X	X
Greensboro	Piedmont Triad Int'l	GSO	2	X	X	X	X	X	X	X	X	X	X	X	X	X
Greenville	Pitt-Greenville	PGV	2	X	X	X	X			X	X	X	X	X	X	X
Jacksonville	Albert J. Ellis	OAJ	1	X	X	X	X		X	X	X	X	X	X	X	X
New Bern	Coastal Carolina Regional	EWN	1	X	X	X	X		X	X	X		X		X	X
Raleigh	Raleigh-Durham Int'l	RDU	2	X	X	X	X	X	X	X	X	X	X	X	X	X
Wilmington	Wilmington Int'l	ILM	2	X	X	X	X	X	X	X	X	X	X	X	X	X
Red Airports																
Beaufort	Michael J. Smith Field	MRH	1	X	X	X	X			X	X	X	X	X	X	X
Burlington	Burlington-Alamance Regional	BUY	2	X	X	X	X	X		X	X	X	X	X	X	X
Currituck	Currituck County Regional	ONX	1	X	X	X				X	X	X	X	X	X	X
Franklin	Macon County	1A5	1	X	X	X				X	X	X	X	X	X	X
Hickory	Hickory Regional	HKY	1	X	X	X	X	X	X	X	X	X	X	X	X	X
Lexington	Davidson County	EXX	1	X	X	X	X			X	X	X	X	X		X
Manteo	Dare County Regional	MQI	1	X	X	X	X			X	X		X	X	X	X
Monroe	Charlotte-Monroe Executive	EQY	1	X	X	X	X	X		X	X	X	X	X	X	X
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	1	X	X	X	X	X		X		X			X	X
Pinehurst/Southern	Moore County	SOP	1	X	X	X	X			X	X	X	X	X	X	X
Rocky Mount	Rocky Mount-Wilson Regional	RWI	1	X	X	X	X	X		X	X	X	X	X	X	X
Salisbury	Rowan County	RUQ	1		X	X	X			X	X	X	X	X	X	X
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	1	X	X	X	X	X		X	X	X	X	X	X	X
Smithfield	Johnston County	JNX	1		X	X	X			X	X	X	X	X	X	X
Statesville	Statesville Regional	SVH	1	X	X	X	X	X		X	X	X	X	X	X	X

Table 5.39: Services and Terminal Amenities (Cont.)

Associated City	Airport Name	ID	Services						Terminal Amenities							
			FBO	On-Site Rental Car	Courtesy/Crew Car	Flight Instruction	Aircraft Maintenance	On-Site Aircraft Charter	Restaurant	Public Restrooms	Vending or other Food/Beverage	Pilot Lounge	Conference Room	Flight Planning Room	Public Internet Access	Wi-Fi
Winston-Salem	Smith Reynolds	INT	1	X	X	X	X	X		X	X	X	X	X	X	X
Blue Airports																
Albemarle	Stanly County	VUJ	1		X	X	X			X	X	X	X	X	X	X
Andrews	Western Carolina Regional	RHP	2	X	X	X	X			X	X	X	X	X	X	X
Asheboro	Asheboro Regional	HBI	1	X	X	X	X			X	X	X	X	X	X	X
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	1	X	X	X	X	X	X	X	X	X	X	X	X	X
Elizabethtown	Curtis L Brown Jr Field	EYF	1		X	X				X	X	X	X	X	X	X
Erwin	Harnett Regional Jetport	HRJ	1		X	X	X			X	X	X	X		X	X
Gastonia	Gastonia Municipal	AKH	1	X	X	X	X	X		X	X		X	X	X	X
Goldsboro	Wayne Executive Jetport	GWW	1		X	X	X	X		X	X	X	X	X	X	X
Jefferson	Ashe County	GEV	1		X	X	X			X	X			X	X	X
Kenansville	Duplin County	DPL	1		X		X			X	X	X	X	X	X	X
Kinston	Kinston Regional Jetport at Stallings Field	ISO	1	X	X	X	X	X		X	X	X	X	X	X	X
Lincolnton	Lincolnton Lincoln County Regional	IPJ	1		X	X	X			X	X	X	X	X	X	X
Louisburg	Triangle North Executive	LHZ	1		X	X	X			X	X	X	X	X	X	X
Lumberton	Lumberton Regional	LBT	1		X	X	X			X	X	X	X		X	X
Maxton	Laurinburg-Maxton	MEB	2		X	X	X			X	X	X	X	X	X	X
Morganton	Foothills Regional	MRN	1	X	X	X	X			X	X	X	X	X	X	X
Mount Airy	Mount Airy/Surry County	MWK	1		X	X	X			X	X	X	X	X	X	X
North Wilkesboro	Wilkes County	UKF	1		X	X	X			X	X	X	X	X	X	X
Oxford	Henderson-Oxford	HNZ	1		X	X	X			X	X	X	X	X	X	X
Reidsville	Rockingham County NC Shiloh	SIF	1	X	X					X	X	X	X	X	X	X
Roxboro	Person County	TDF	1	X	X	X	X			X	X	X	X	X	X	X
Rutherfordton	Rutherford County-Marchman Field	FQD	0		X	X	X		X	X	X	X	X	X	X	X
Shelby	Shelby-Cleveland County Regional	EHO	1		X	X	X			X	X	X	X	X	X	X
Siler City	Siler City Municipal	5W8	1	X	X	X	X	X		X	X	X	X	X	X	X

Table 5.39: Services and Terminal Amenities (Cont.)

Associated City	Airport Name	ID	Services						Terminal Amenities							
			FBO	On-Site Rental Car	Courtesy/Crew Car	Flight Instruction	Aircraft Maintenance	On-Site Aircraft Charter	Restaurant	Public Restrooms	Vending or other Food/Beverage	Pilot Lounge	Conference Room	Flight Planning Room	Public Internet Access	Wi-Fi
Wallace	Henderson Field	ACZ	0		X	X	X			X	X		X		X	X
Washington	Warren Field	OCW	1		X					X	X	X	X	X	X	X
Green Airports																
Ahoskie	Tri-County	ASJ	1		X	X				X	X	X	X	X	X	X
Clinton	Clinton-Sampson County	CTZ	1		X	X	X			X	X	X	X	X	X	X
Elkin	Elkin Municipal	ZEF	1		X	X				X	X	X	X	X	X	X
Engelhard	Hyde County	7W6	0							X			X	X	X	X
Hatteras	Billy Mitchell (NPS)	HSE	0							X		X		X	X	X
Kill Devil Hills	First Flight (NPS)	FFA	0							X		X		X	X	X
Mount Olive	Mount Olive Municipal	W40	1		X	X	X			X	X	X	X	X	X	X
Ocean Isle Beach	Odell Williamson Municipal	60J	1	X	X	X				X		X	X		X	X
Ocracoke	Ocracoke Island Airport (NPS)	W95	0							X		X		X	X	X
Plymouth	Plymouth Municipal	PMZ	0		X	X				X	X	X	X	X	X	X
Roanoke Rapids	Halifax-Northampton Regional	IXA	1		X					X	X	X	X	X	X	X
Rockingham	Richmond County	RCZ	1		X					X	X	X	X	X	X	X
Spruce Pine	Avery County/Morrison Field	7A8	1		X		X			X	X	X	X	X	X	X
Star	Montgomery County	43A	1			X	X	X		X	X	X			X	X
Sylva	Jackson County	24A	0							X		X	X			
Tarboro	Tarboro-Edgecombe	ETC	1							X	X			X		
Wadesboro	Anson County-Jeff Cloud Field	AFP	1		X	X				X	X	X	X	X	X	X
Whiteville	Columbus County Municipal	CPC	1		X	X				X	X	X	X	X	X	X
Williamston	Martin County	MCZ	1		X	X				X			X	X	X	X

Source: NCASP Inventory Data, 2012

Table 5.40: Airport Inclusion in Local Comprehensive Plans

Associated City	Airport Name	ID	Included in Local Comp Plan
Yellow Airports			
Asheville	Asheville Regional	AVL	Yes
Charlotte	Charlotte/Douglas Int'l	CLT	Yes
Concord	Concord Regional	JQF	Yes
Fayetteville	Fayetteville Regional/Grannis Field	FAY	Yes
Greensboro	Piedmont Triad Int'l	GSO	Yes
Greenville	Pitt-Greenville	PGV	Yes
Jacksonville	Albert J. Ellis	OAJ	Yes
New Bern	Coastal Carolina Regional	EWN	Yes
Raleigh	Raleigh-Durham Int'l	RDU	Yes
Wilmington	Wilmington Int'l	ILM	Yes
Red Airports			
Beaufort	Michael J. Smith Field	MRH	Yes
Burlington	Burlington-Alamance Regional	BUY	Yes
Currituck	Currituck County Regional	ONX	Yes
Franklin	Macon County	1A5	Yes
Hickory	Hickory Regional	HKY	Yes
Lexington	Davidson County	EXX	Yes
Manteo	Dare County Regional	MQI	Yes
Monroe	Charlotte-Monroe Executive	EQY	Yes
Oak Island	Cape Fear Regional Jetport-Howie Franklin Field	SUT	Yes
Pinehurst/Southern Pines	Moore County	SOP	Yes
Rocky Mount	Rocky Mount-Wilson Regional	RWI	Yes
Salisbury	Rowan County	RUQ	Yes
Sanford	Raleigh Exec Jetport at Sanford-Lee County	TTA	No
Smithfield	Johnston County	JNX	Yes
Statesville	Statesville Regional	SVH	Yes
Winston-Salem	Smith Reynolds	INT	Yes

Table 5.40: Airport Inclusion in Local Comprehensive Plans (Cont.)

Associated City	Airport Name	ID	Included in Local Comp Plan
Blue Airports			
Albemarle	Stanly County	VUJ	No
Andrews	Western Carolina Regional	RHP	Yes
Asheboro	Asheboro Regional	HBI	Yes
Elizabeth City	Elizabeth City CG Air Station/Regional	ECG	Yes
Elizabethtown	Curtis L Brown Jr Field	EYF	Yes
Erwin	Harnett Regional Jetport	HRJ	Yes
Gastonia	Gastonia Municipal	AKH	No
Goldsboro	Wayne Executive Jetport	GWW	Yes
Jefferson	Ashe County	GEV	Yes
Kenansville	Duplin County	DPL	Yes
Kinston	Kinston Regional Jetport at Stallings Field	ISO	Yes
Lincolnton	Lincolnton Lincoln County Regional	IPJ	No
Louisburg	Triangle North Executive	LHZ	Yes
Lumberton	Lumberton Regional	LBT	Yes
Maxton	Laurinburg-Maxton	MEB	Yes
Morganton	Foothills Regional	MRN	Yes
Mount Airy	Mount Airy/Surry County	MWK	Yes
North Wilkesboro	Wilkes County	UKF	No
Oxford	Henderson-Oxford	HNZ	No
Reidsville	Rockingham County NC Shiloh	SIF	Yes
Roxboro	Person County	TDF	Yes
Rutherfordton	Rutherford County-Marchman Field	FQD	Yes
Shelby	Shelby-Cleveland County Regional	EHO	Yes
Siler City	Siler City Municipal	5W8	No
Wallace	Henderson Field	ACZ	Yes
Washington	Warren Field	OCW	Yes

Table 5.40: Airport Inclusion in Local Comprehensive Plans (Cont.)

Associated City	Airport Name	ID	Included in Local Comp Plan
Green Airports			
Ahoskie	Tri-County	ASJ	Yes
Clinton	Clinton-Sampson County	CTZ	Yes
Edenton	Northeastern Regional	EDE	Yes
Elkin	Elkin Municipal	ZEF	Yes
Engelhard	Hyde County	7W6	Yes
Hatteras	Billy Mitchell (NPS)	HSE	No
Kill Devil Hills	First Flight (NPS)	FFA	No
Mount Olive5-	Mount Olive Municipal	W40	Yes
Ocean Isle Beach	Odell Williamson Municipal	60J	No
Ocracoke	Ocracoke Island Airport (NPS)	W95	No
Plymouth	Plymouth Municipal	PMZ	No
Roanoke Rapids	Halifax-Northampton Regional	IXA	No
Rockingham	Richmond County	RCZ	Yes
Spruce Pine	Avery County/Morrison Field	7A8	No
Star	Montgomery County	43A	Yes
Sylva	Jackson County	24A	Yes
Tarboro	Tarboro-Edgecombe	ETC	Yes
Wadesboro	Anson County-Jeff Cloud Field	AFP	Yes
Whiteville	Columbus County Municipal	CPC	Yes
Williamston	Martin County	MCZ	No

Source: NCASP Inventory Data, 2012

Chapter 6 – Future System Performance

Introduction

One of the primary purposes of the North Carolina Airports System Plan (NCASP) is to provide an extensive assessment of the condition of the current statewide airport system as well as a plan for meeting its future needs. The results of the NCASP will be used by the Division of Aviation (DOA) to determine how the North Carolina airport system should be developed to best respond to future challenges and to meet changes in demand.

Chapter 5, Current System Performance, evaluated the system's existing performance and established a baseline analysis of the individual system airports in North Carolina, as well as the statewide system. From this baseline, the future system needs can be evaluated and recommendations for development of the system identified.

This chapter identifies the alternative actions that are available and desirable to raise the overall level of system performance. Alternative actions are identified for each individual performance measure, as appropriate. Subsequent analysis will be performed to evaluate each airport and the relevant action or project that is recommended to increase the performance and meet the established targets.

Certain performance measures are considered to be informational. For example, the performance measure that analyzes the "percent of airports that support search and rescue operations" does not have a specific action or project associated with changing the future performance and is considered informational. Other measures offer the opportunity for an action or project to be undertaken to improve the performance in the future. For example, airports that do not have controlling interest over the FAA design standard Runway Protection Zones (RPZs) for each runway end can gain control through either purchase of land or avigation easements. The purchase would be considered an action to increase the performance.

The remainder of this chapter is organized similarly to the previous chapter, by goal category and its associated individual performance measures. Whereas the previous chapter established a baseline of current performance, this chapter focuses on the future airport system needs through 2031, including the need for certain airports to provide additional, improved, or modified facilities including runway extensions, taxiway additions, approach capability improvements, hangars, etc. This chapter builds upon the baseline analysis and identifies a target performance level based on the following airport considerations:

- If an airport has been noted to have definitive plans to improve a facility (for example, construct a taxiway), these projects are identified and are considered to be "complete" for purposes of the system's future performance. Definitive plans are defined as funding being appropriated and/or committed for the project or the project is currently in the design or construction phase

- If an airport has a man-made barrier, such as adjacent development, a public road or railroad, or another significant reason why they can't improve the facility relative to the performance measure, it was identified as not being able to meet the measure and the target future performance level was reduced to reflect this inability
- If an airport was thought to be capable of improving the facility from the viewpoint of the DOA staff and consultant team review, it was assumed that the project could be completed and the target future performance level could be increased. This determination does not mean that the airport will receive funding for a project to help meet a target. All projects must still be justified and identified as a need during the airport planning process

This chapter also considers the interrelationships between the various performance measures and Airport Development Plan (ADP) categories as identified and discussed in *Chapter 4, Airport Groupings Update and Airport Facilities Development*. For example, if an airport is identified as needing reduced visibility minimums under the system objectives for ADP category 1000: Standard Instrument Approach, the resulting impact of reducing the visibility minimums includes the following: 1) an increase in RPZ dimensions 2) an increase in threshold siting standards, and 3) a recommendation for a parallel taxiway. (DOA has included a parallel taxiway as an ADP objective for all airports based upon the FAA's recommendation for the taxiway to support the improved approach procedure and reduced visibility minimums.) Therefore, these interrelationships must be established and considered in evaluating the future system needs and the alternative actions available to improve North Carolina's airport system performance.

It is recognized that the responsibility for implementing projects and taking actions identified in the NCASP remains with the local airport owners and sponsors, in coordination with DOA and the Federal Aviation Administration (FAA). It is possible that local constraints, ranging from political or environmental to financial and man-made, may make it impossible or impractical for individual airports to proceed with the identified alternative actions, thereby reducing the ability of the overall system to achieve an established target for performance. The ability of each airport to meet each performance measure was examined independently on a high level with the assistance of DOA staff to determine the target performance level. The target performance can be defined as the potential level to be achieved assuming funding, environmental, and political issues are not barriers to implementation. These target performance levels are identified in the following sections, as appropriate, for action related measures.

Goal Category: Safety

The safety goal category evaluated eight performance measures. Table 6.1 lists these performance measures and identifies whether or not the measure has associated actions or is informational in nature.

Table 6.1: Performance Measures in the Safety Goal Category

Performance Measure	Informational/Action
Percent of airports with controlling interest over the FAA design standard Runway Protection Zones (RPZs) for each runway end	Action
Percent of system airports addressing wildlife issues	Action
Percent of system airports with an Airport Emergency Plan	Action
Percent of system airports with a General Aviation Security Plan	Action
Percent of system airports that support search and rescue operations	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	Action
Percent of system airports meeting 2013 FAA taxiway geometry standards	Action
Percent of system airports meeting FAA threshold siting surface requirements	Action

Source: NCASP analysis

The results of the future system evaluation for these performance measures related to the safety goal category are discussed in the following sections.

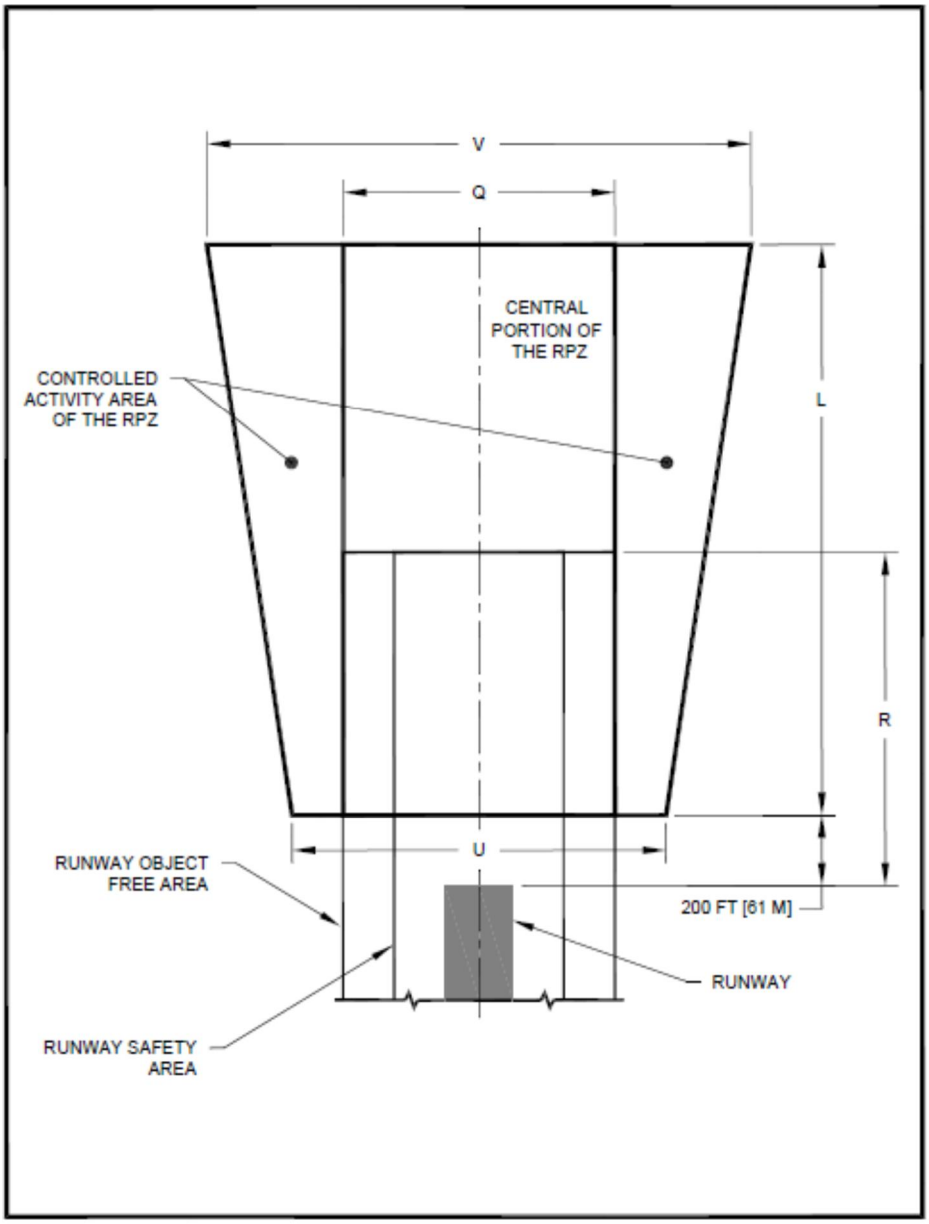
Percent of airports with controlling interest over the FAA design standard Runway Protection Zones (RPZs) for each runway end

Existing Statewide Performance
40%

Target Statewide Performance
100% of capable airports

In recent years, the FAA has placed higher emphasis on ownership, control, and land use compatibility within airport RPZs. The size of an RPZ will vary by airport and the type of aircraft it accommodates. Airports that accommodate smaller aircraft (Category A and B) will often require RPZs that include more about 8 acres of land. Airports that accommodate larger aircraft (Category C and D) require almost 30 acres of land dedicated to the RPZ for one runway end. While FAA desires fully compliant RPZs in terms of land uses and control, they draw a distinction between the central portion of the RPZ versus the controlled activity area. As identified by the FAA, the first priority for control should be the central portion of the RPZ. The central portion is defined as the extended object free area (OFA), while the controlled activity area is defined as the sides beyond the extended OFA that comprise the trapezoid shape of the RPZ. These areas are depicted in Figure 6.1. Information on ownership or control of these specific areas was not obtained during the inventory process.

Figure 6.1: Runway Protection Zone (RPZ)



Source: FAA. Advisory Circular (AC) 150/5300-13A, Change 1 (2014)

For this performance measure, the level of existing RPZ control was sought during the inventory process of the study. Airport managers/sponsors were asked if the airport controlled the existing RPZs for all runway ends. Information was not gathered regarding the type of control: whether fee simple (ownership) or by means of an avigation easement. Statewide, 40% of system airports completely control the existing RPZs at all runway ends. The control of the central portion was not identified during the inventory.

Interrelationship with ADP Category Objectives

As noted in Chapter 5, many airports are recommended to improve their approach capabilities by providing reduced minimums. To achieve an improved approach, there may be equipment related needs, a parallel taxiway, and/or the need to control a larger RPZ associated with the reduced visibility minimums. The airports identified as being able to improve their future approach capabilities, therefore having an associated larger RPZ are as follows:

YELLOW	RED	BLUE	GREEN
• Pitt-Greenville	• Michael J. Smith Field • Currituck County Regional • Davidson County • Cape Fear Regional Jetport	• Asheboro Regional • Harnett Regional Jetport • Lincolnton Lincoln County Regional • Mount Airy/Surry County • Henderson-Oxford • Rockingham County NC Shiloh • Rutherford County-Marchman Field • Shelby-Cleveland County Regional • Siler City Municipal • Henderson Field • Warren Field	• Elkin Municipal • Hyde County • Plymouth Municipal • Montgomery County • Tarboro-Edgecombe

In addition to approaches, numerous airports were identified as having the ability to extend their runway to meet the ADP objective for runway length. These longer runways would also affect the location of the RPZ, and if the runway length resulted in more sophisticated and larger aircraft being able to operate at the airport, it could also change the runway design code (RDC) of the runway, also potentially increasing the RPZ size. The following airports were identified as possible candidates to lengthen their runway and/or increase their RDC, and would have an associated change in their RPZ dimensions or locations:

YELLOW	RED	BLUE	GREEN
• Coastal Carolina Regional	• Rowan County • Burlington Alamance Regional • Charlotte Monroe Executive • Johnston County • Michael J Smith • Moore County	• Henderson Field • Ashe County • Mount Airy Surry County	• Montgomery County • Tarboro Edgecombe • Ocracoke Island • Elkin Municipal

These potential changes in approaches and/or runway length impact the ability of the airport system to improve performance related to control of RPZs. Given the existing low performance and the enhanced emphasis by the FAA on RPZ land uses and control, preliminary analyses were completed for airports that are anticipating projects that will change their RPZs (noted in the two lists above), as well as those airports identified as not having full control of their RPZs from the inventory effort.

These analyses involved viewing aerial images of every runway end at each airport which were overlaid with the boundaries of existing and future RPZs. Future RPZs took into account changes to airport runways and/or approaches that are either specifically identified as a planned project at the airport or that are identified in the NCASP as necessary projects to bring the airport into compliance with a performance measure or ADP objective. Examples of projects that would affect an airport's future RPZ include runway extensions, lower visibility minimums, or lower ARCs. Each aerial photograph was examined to see if there were any obstructions within the future RPZs, and an emphasis was put on obstructions within the central portion.

Future Target Performance

The target performance for this measure is 100% for those airports that are capable of meeting the current RPZ guidelines as provided by the FAA. It is recognized that reaching 100% compliance will take significant time and money in order to fully comply.

For some airports it may not be feasible to fully own their RPZs via fee simple ownership. For example, Michael J. Smith and Cape Fear Regional Jetport both have waterways located in their RPZs and are unable to own these portions. Each airport will need to review its ability to control the RPZs, starting with existing RPZs and evaluating future conditions as projects are considered related to facility expansion or changes that would impact the RPZs.

For alternatives related to RPZ performance, the options primarily focus on when to address the RPZ control and what means of control to use. A near-term option for airports that are unable to gain full control over their RPZs is the use of land-use compatibility tools that could be adopted by the local government in order to ensure that future uses within the RPZ are limited and appropriate. Some of these tools include Airport Overlay Zoning and Transfer of Development Rights. These tools can help reduce or eliminate the development of incompatible uses within the RPZ and can be essential for the safety of the airport personnel, its customers, and the

surrounding community until such time that outright acquisition of the land within the RPZ is possible.

Percent of system airports addressing wildlife issues

Existing Statewide Performance	Target Statewide Performance
100%	100%

Future Target Performance

The target performance for this measure is for all airports (100%) to have the appropriate plan in place that meets the anticipated wildlife guidelines from FAA in its ACs. The FAA's AC on wildlife study protocols are still in draft (AC 150/5200-XX, *Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plan*). The draft AC is expected to define when a site visit should be conducted and when an assessment must be conducted, but is not expected to provide specific guidance on how long is considered an acceptable time between initial site visits and initial assessments.

It is intended that the future airport system and the DOA will continue to address wildlife concerns and put forth appropriate plans to ensure safety to the aviation system users, the wildlife, and other public on the ground and in the air. Since the performance is already at 100% in terms of at least a site visit, no other alternatives are needed to improve performance but continued monitoring of airport wildlife planning and management. DOA intends to keep records of which airports have taken steps to implement the recommendations included in the Wildlife Hazard Site Visits, Assessments, or Management Plans

Percent of system airports with an Airport Emergency Plan

Existing Statewide Performance	Target Statewide Performance
57%	100%

The results of Chapter 5 showed that not all airports have or can confirm the existence of an Airport Emergency Plan (AEP), which should address essential emergency-related actions that ensure the safety of airport patrons and the community in which the airport is located. The analysis showed that 57% of the system airports identified that they have an AEP on file.

Future Target Performance

The target performance for this measure is 100% for the North Carolina airport system. This means that every airport should have an AEP that they will be able to identify and provide copies of when necessary.

AC 150/5200-31C, *Airport Emergency Plan*, provides guidance on how to develop and implement an AEP. An additional item required by all North Carolina airports for emergency planning is to have a fully-charged fire extinguisher available and easily accessible on the premise and documented in the AEP.[15] Further, as part of the AEP and in conjunction with the ADP 1800: Aircraft Rescue and Fire Fighting (ARFF) Equipment, formal mutual aid agreements with emergency responders will be required for compliance. All airports should have a written document indicating the provision of mutual assistance between the airport and local emergency responders in the case of an emergency at the airport or in the surrounding area. ARFF equipment will be required only for the Part 139 airports and is discussed further in ADP 1800: Aircraft Rescue & Fire Fighting (ARFF) Equipment.

Percent of system airports with a General Aviation Security Plan

Existing Statewide Performance	Target Statewide Performance
26%	100%

Future Target Performance

The target for this performance measure is that all GA airports within the North Carolina system (100%) have a GA Security Plan. Commercial Service airports, those designated as Yellow in this plan, are required to adhere to a different set of TSA guidelines that are mandatory and go above and beyond what is encouraged for GA airports. Given the different, stricter standards that must be followed, this performance measure is not applicable to North Carolina's commercial service (Yellow) airports, and thus they are not included in the target percentage that is calculated for performance.

There are limited options or alternatives available to general aviation airports in terms of having a GA Security Plan – either a plan is provided or it is not. TSA developed the document, *Recommended Security Guidelines for General Aviation Airports and Users*, updated in March 2013, which identifies federally-endorsed security enhancements and provides guidance in the creation and implementation of a GA Security Plan. Further, the Airport Cooperative Research Program (ACRP) provides guidance on GA security in their document titled *General Aviation Safety and Security Practices- A Synthesis of Airport Practice*, which identifies a range of safety management and security operations and share the practices that have been

[15] This requirement was included historically in North Carolina's General Aviation Airport Development Plan (GAADP) as a mandatory item for publicly owned and operated airports. While the mandatory items defined in the GAADP no longer exist, the individual items continue to be important and have been incorporated in other areas of the NCASP performance measures and the Airport Development Plan (ADP) objectives.

successful at different airports within the aviation community. These resources can provide guidance to airports on developing a security plan in order to achieve compliance with this measure.

Percent of system airports that support search and rescue operations

Existing Statewide Performance
61%

Target Statewide Performance
Informational

As calculated in Chapter 5, 61% of airports included in the NCASP reported accommodating some level of search and rescue activities, whether it involved hosting or supporting a local Civil Air Patrol chapter, providing a refueling stop, or providing transportation to medical facilities. It is possible that this percentage is actually higher as some airports may provide services after hours, which are not documented, or they may have the facilities to support emergency operations without knowing it.

With North Carolina's topography, including the coastal regions as well as various mountainous regions, aviation plays a pivotal role in search and rescue operations throughout the State. These missions include locating and rescuing people in remote locations or in distress and are important for disaster relief missions. Having many airports that can support search and rescue operations is beneficial to statewide health and wellness. Having reliable systems for search and rescue and disaster assistance is paramount for the emergency preparedness of the State and can ensure that its communities and visitors are provided with the fastest and most effective response during emergencies.

While there is no formal procedure or status for being compliant in this performance category since it is informational only, an airport's ability to support search and rescue operations and other operations that contribute to the quality of life of the residents of North Carolina is encouraged and that information should be documented and publicly available. There is no associated target performance level for this measure.

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

Existing Statewide Performance	Target Statewide Performance
89%	90%

In addition to search and rescue activities, airports in North Carolina also play an important role in serving emergency medical needs and the needs of medical personnel and physicians. These medical staff use aviation to reach patients in more rural areas of the State and use aviation to quickly transport patients to larger hospitals. Chapter 5 identified the location of 160 North Carolina hospitals and evaluated 30-minute drive times of North Carolina airports that have facilities appropriate to assist medical needs in all weather conditions[16]. These include: instrument meteorological conditions (IMC) capability, on-site weather reporting, and the availability of jet fuel. Statewide, 89% of all hospitals currently fall within a 30-minute drive time of at least one North Carolina airport that meets all of these criteria, leaving 18 hospitals out of the 160 outside the coverage of these capable airports.

Planned Projects that Will Improve Performance

It is anticipated that airports will continue to make improvements, including improvements that have been identified in the NCASP in order to meet an airport's associated ADP objectives. Some of these improvements include acquisition of facilities and devices needed to support emergency service aviation needs such as acquiring an approach (to accommodate IMC activities), on-site weather, and jet fuel. Through discussions with DOA staff and review of the airports that have been identified to be able to meet the ADP objectives, the airports listed below are anticipated to be able to serve hospital needs by obtaining an on-site weather reporting system, thus providing coverage to several additional hospitals. These airports include:

BLUE	GREEN
• Henderson Field	• Elkin Municipal • Mount Olive Municipal • Plymouth Municipal

When factoring in these additional four airports, one additional hospital will be within the 30-minute drive time, keeping this performance measure at 89%.

Out of State Airport Coverage to Improve Performance

[16] IMC refers to weather conditions that require pilots to fly primarily under instrument flight rules (IFR) such as bad weather or heavy cloud cover rather than under visual flight rules (VFR).

In addition to North Carolina serving its hospitals with airports within its borders, airports outside North Carolina that are within a 30-minute drive time of the border were also evaluated. Thirty-minute drive times were developed for those out-of-state airports who also met the identified criteria (IMC capability, on-site weather reporting, and the availability of jet fuel). The airports within adjacent states that could provide coverage to the hospitals outside current North Carolina coverage areas include:

South Carolina:

- Marlboro County Jetport- H.E. Avent Field (BBP)
- Cheraw Municipal / Lynch Bellinger Field (CQW)Lancaster County-MC Whirter Field (LKR)
- Marion County (MAO)
- Grand Strand (CRE)
- Rock Hill/York Co/Bryant Field (UZA)
- Spartanburg Downtown Memorial (SPA)

Tennessee:

- Greeneville-Greene County Municipal (GYC)
- Johnson County (6A4)

Virginia:

- Danville Regional (DAN)
- Emporia-Greensville Regional (EMV)
- Franklin Municipal-John Beverly Rose (FKN)
- Twin County (HLX)
- Blue Ridge (MTV)
- Chesapeake Regional (CPK)
- Mecklenburg-Brunswick Regional (AVC)
- Suffolk Executive (SFQ)

With the addition of the out-of-state airports, another additional hospital was covered within the 30-minute drive times. With this out-of-state coverage, a total of 144 of 160 hospitals are covered, which results in 90% performance as shown in Figure 6.2, and achieves the target established for this measure.

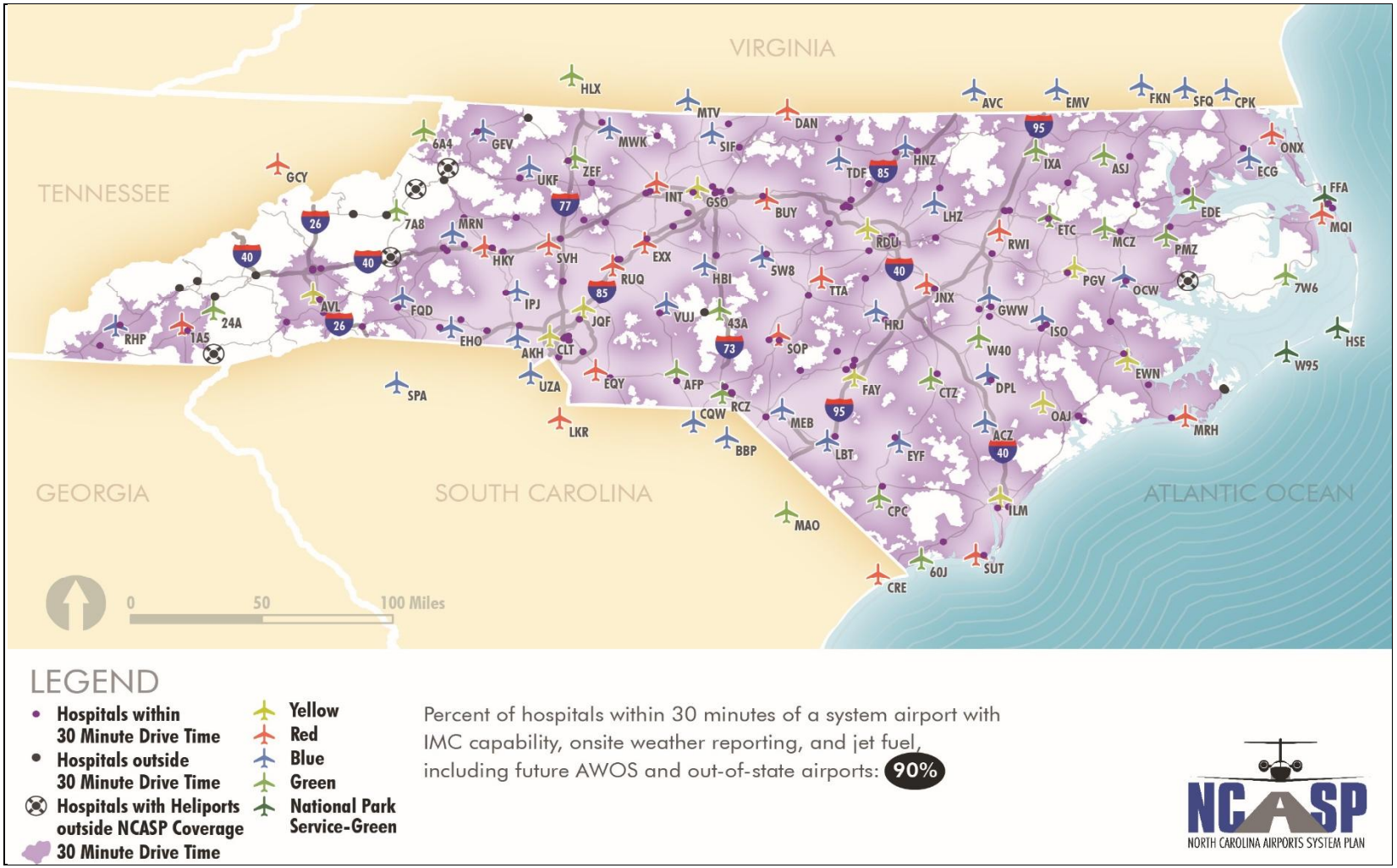
Hospital Helipad Availability to Complement Airport Coverage

To further examine how the 16 hospitals that still are beyond the 30-minute drive times of in and out-of-state airports can be served by the aviation system, the presence of a helipad or heliport at the hospitals was examined as an alternative to providing access via an existing airport. The following 5 of the 16 airports reported having a helipad or heliport and are designated as such in Figure 6.2:

- Watauga Medical Center
- Pungo District Hospital
- Highlands-Cashiers Hospital
- Charles A. Cannon Jr. Memorial Hospital
- The McDowell Hospital

If the location of these heliports/helipads is added, it increases the 30-minute drive time hospital coverage to almost 94% of hospitals having air access, either by fixed wing or helicopter. Further, most airports do have heliports or helipads that could allow them to assist in medical emergencies, although heliports/helipads are considered supplemental to runway/airport facilities if they are available.

Figure 6.2: North Carolina Hospitals within a 30-Minute Drive Time of a System or Out-of-State Airport with Instrument Meteorological Conditions (IMC) Capability, On-Site Weather Reporting, and Jet Fuel Availability



Source: Parsons Brinckerhoff GIS Analysis

Percent of system airports meeting 2013 FAA taxiway geometry standards

Existing Statewide Performance	Target Statewide Performance
3%	100%

Overall, the current compliance with the FAA's new taxiway standards is low amongst North Carolina airports, with only 3% of system airports meeting all three taxiway geometry standards based on the latest guidance. Chapter's 5 analysis revealed that larger airports (Yellow and Red) had more conflicts with respect to these criteria, as they have larger and more numerous taxiways based on their higher volumes of activity. Most of the airports in the North Carolina system had at least one occurrence of direct access and this includes many of the Green airports that do not have parallel taxiways and for which there is no other option for accessing the runway.

Future Target Performance

The target for this performance measure is that all airports within the North Carolina system (100%) meet the taxiway design standards over time. It is recognized that meeting this performance measure will take place over many years and it is possible that the FAA's design standards may change during that time, requiring reconsideration of taxiway design that is appropriate at the time of detailed planning and engineering design.

In order to comply with FAA standards and this performance measure, the following three types of actions or alternatives can be taken:

1. Modify the taxiway or taxiways for which the airport is not in compliance. This would likely require complete reconfiguration of many taxiways and would be very costly and require significant planning and design, indicating it will not be addressed quickly. It is unlikely that this kind of fix would be efficient, practical or feasible for many of the existing North Carolina airports in the near term.

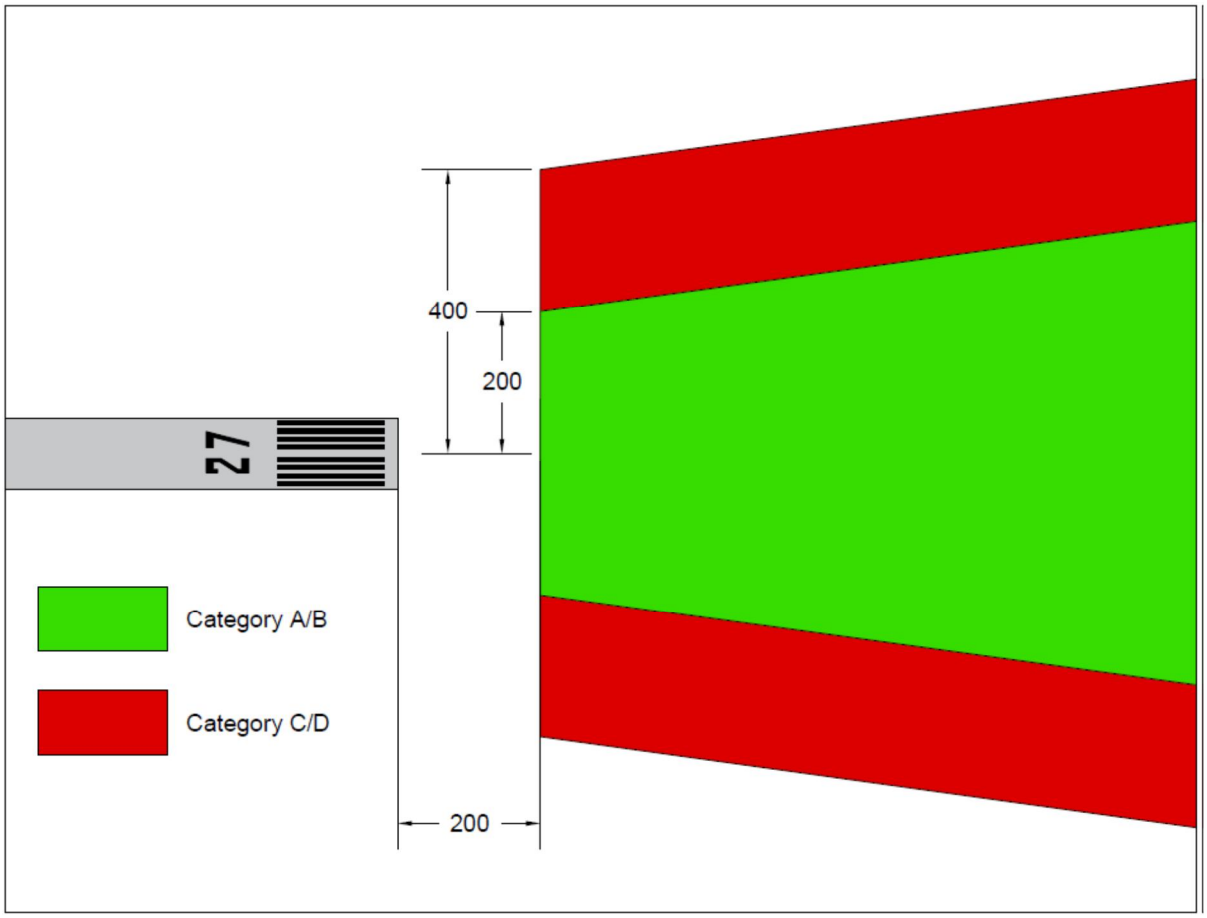
2. Incorporate the necessary taxiway modifications and improvements into the long-term planning and programming for the airport, where projects can be undertaken over time or in conjunction with other projects that might facilitate their implementation. For example, if pavement work is programmed, there may be an opportunity to relocate the existing direct access taxiway to a location that creates indirect access.

3. For those airports currently without a parallel taxiway, incorporate the standards discussed above during taxiway design. The NCASP analysis has assumed that any new taxiways will be designed to meet the FAA design standards in place at the time of design.

Percent of system airports meeting FAA threshold siting surface requirements

Airports with instrument approaches are required to keep their approaches clear of obstructions and other hazards. There are multiple sources of guidance on approach surfaces and protection of associated airspace, but as explained in detail in Chapter 5, current FAA guidance focuses on the 20:1 Visual Area Surface (VAS), which is the surface that protects the final, visual portion of an instrument approach. The dimensions of a runway's VAS is determined by the category of aircraft that the runway serves. Figure 6.3 shows the location and dimensions for a basic VAS.

Figure 6.3: Straight-In Visual Area Surface



Source: FAA Order 8260.3B

Given the current FAA guidance, the objective for this performance measure is that the 20:1 VAS for every runway is clear of obstructions. Current system performance was not available due to the recent changes to the respective guidance and the lack of existing, comprehensive data. However, the future target for this performance measure is that 100% of airports are in compliance and have all necessary approaches clear of obstructions.

In order to work towards reaching the objective, obstructions within the 20:1 surface will be identified at each airport by conducting aeronautical surveys, also referred to as 18b surveys, which uses a Surface Analysis and Visualization (SAV) tool developed by the FAA to analyze, review, edit, and mitigate surface penetrations. 18b surveys are currently being conducted at all airports, and the data will be used to help determine current compliance. Further, it will identify the obstructions that need to be mitigated, which can occur either by lowering them or lighting them. If mitigation is not possible, then approach minimums may be lowered and/or nighttime operations may be disallowed in order to put the airport into compliance.

Goal Category: Infrastructure Health

The infrastructure health goal category evaluated four performance measures. Table 6.2 lists these performance measures and identifies whether or not the measure has associated actions or is informational in nature. It is important to note that two of the performance measures relate to the previous GAADP that provided standards and guidelines to help preserve the investment in infrastructure. As previously identified in Chapter 4, the GAADP has been updated to reflect changes as a result of the 2013 Strategic Transportation Investment (STI) law and the NCASP's analysis and is referenced as the ADP throughout the document.

Table 6.2: Performance Measures in the Infrastructure Health Category

Performance Measure	Informational/Action
Percent of system airports that meet applicable FAA runway/taxiway separation design criteria on their runways for their current ARC	Action
Percent of airports meeting all mandatory items in ADP	Informational
Percent of airports meeting all system objectives in ADP	Action
Percent of system airports that are adequately accessible in terms of signage and wayfinding	Action

Source: NCASP analysis

The results of the future system evaluation for these performance measures related to the infrastructure health goal category are discussed in the following sections.

Percent of system airports that meet applicable FAA runway/taxiway separation design criteria on their runways for their current ARC

Existing Statewide Performance	Target Statewide Performance
88%	94%

Chapter's 5 existing conditions analysis found that 88% of the airports with a parallel taxiway met the runway/taxiway separation criteria. This includes 15 airports (out of 72) that do not currently have a parallel taxiway. One of the ADP objectives is for all airports to have a parallel taxiway, and it is anticipated that, in the future, all airports

within the North Carolina system, with the exception of Jackson County, should eventually have a parallel taxiway (see Section 6.3.3; Sub-section 1100 for more detail). It is anticipated that the other airports that do not currently have a parallel taxiway would have taxiways constructed in the future and these taxiways would meet the runway/taxiway separation standards. Any alternatives associated with this performance measure focus on the location of where the runways and taxiways are located and not whether or not they are designed to meet the applicable separation standards.

Planned Projects that Will Improve Performance

The following airports are currently undergoing projects or have projects programmed to construct parallel taxiways:

BLUE	GREEN
• Henderson Field	• Hyde County • Montgomery County • Columbus County

These airports are expected to construct the parallel taxiways to meet the standards for runway/taxiway separation.

Further, the following airports did not meet runway/taxiway separation standard in the existing conditions analysis are currently undergoing projects or have projects programmed that will result in compliance with the separation requirements in the near term:

YELLOW	RED	BLUE
• Asheville Regional	• Michael J. Smith • Currituck County Regional	• Henderson-Oxford

With these two sets of projects completed, 78% of airports will meet runway/taxiway separation standards in the near term.

Interrelationship with ADP Category Objectives

In considering runway/taxiway separation standards, it is important to consider the standards as it relates to future aircraft activity, including the most demanding airplanes' design group and visibility minimums. This is especially important for those airports that do not currently have parallel taxiways and who will build them in the future as a recommendation from the NCASP, it should be ensured that all future construction or reconstruction of runways/taxiways have 300 feet of separation, regardless of classification, to allow for a reduction in airport visibility minimums to lower than ¾ mile for a Localizer Performance with Vertical Guidance (LPV) approach.

This separation would meet the standards for an ARC of C-II with no lower than ¾ mile visibility, or an ARC of B-II with lower than ¾ mile visibility.[17]

The current separation standards mean that airports that are currently in compliance with their minimum standards will remain in compliance unless new runway or taxiway construction or reconstruction occurs. These construction or reconstruction projects should be planned and designed to have 300 feet of separation. Similarly, airports that will be building taxiways in order to comply with the ADP taxiway requirements should plan to have 300 feet of separation between the runway and taxiway.

The following airports are currently in compliance with less than 300 feet of separation but would be expected to increase this separation to at least 300 feet if they undergo taxiway construction or reconstruction:

RED	BLUE	GREEN
• Macon County	• Mount Airy Surry	• Clinton Sampson
• Cape Fear Regional	• Henderson-Oxford	• Odell Williamson

Future Target Performance

The target for performance with this measure is 94%. This target reflects the existence of four airports that will be unable to meet runway separation requirements in the future due to physical constraints that prevent runway/taxiway relocation or, in the case of Jackson County, prevent the addition of a parallel taxiway. Further, in the case of Gastonia Municipal, the airport's land envelope is so constrained that it limits the ability of the airport to make any necessary improvements and enhancements. Study of a replacement airport has been suggested for Gastonia to provide an airport capable of serving the demand in the area for general aviation activity.

In summary, the airports that will not meet runway/taxiway separation standards include:

RED	BLUE	GREEN
• Macon County	• Gastonia Municipal	• Clinton-Sampson County
		• Jackson County

[17] Chapter 5, *Current System Performance,* contains a section describing the interrelationship of several ADP categories and performance measures. This interrelationship includes the impact of changes to various standards based on changes to visibility minimums as well as changes to RDCs.

Percent of airports meeting all mandatory items in ADP

Existing Statewide Performance	Target Statewide Performance
Varies by item	Informational

In the past, the GAADP established a list of mandatory items that all publicly owned and operated airports had to have in place in order to be eligible for funding. The DOA established these mandatory items due to the paramount importance of safe and effective operations, and making them mandatory gave all airports incentive to comply.

As compliance with the mandatory items has improved drastically since their implementation, they will no longer be designated as mandatory items going forward. As mentioned previously within the Airport Emergency Plan measure, these mandatory items have been disbanded as a collective group, and instead items will be incorporated or developed into different performance measures, since they are still important considerations for airport performance monitoring. Table 6.3 describes the recommended locations for each of the previous mandatory items.

Table 6.3: New Locations of Former GAADP Mandatory Items

Former Mandatory Item	New Location (Performance Measures & Updated ADP)
An approved current Airport Layout Plan (ALP). For the purpose of the NCASP, "current" is considered to be completed and approved by FAA in the last 10 years.	New item in the ADP.
An Airport Height Ordinance to meet Federal Aviation Regulation (FAR) Part 77, established by local ordinance. The ordinance must include the ultimate runway length as depicted on the latest Airport Layout Plan (ALP). *It is also highly recommended that each Airport Sponsor establish Land-Use Zoning for their airport.*	Compliance with Part 77 zoning will become a new performance measure.
Published current Minimum Operating Standards and Rules and Regulations (accessible to the public) which have been adopted by local ordinance.	Compliance with Minimum Operating Standards and Rules and Regulations will become a new performance measure.
Runway Approach Surfaces must be clear for the primary runway. This includes Visual and the best (lowest minimums) Published Approach Surfaces as defined in FAA AC 150/5300-13A, Change 1, Chapter 3, Runway Design, Section 303. Runway end siting requirement (Table 3.2). It is also recommended that any other runways have, at a minimum, a clear Visual Approach surface 20:1 as defined in FAA AC 150/5300-13A, Change 1, same section as referenced above. The Division of Aviation will participate with Approach Obstruction Projects for runway approach surfaces as outlined above for the first three thousand (3,000) feet from the runway end. (See Airport Development Category Item Number 100. Runway Approach on page 6) *Note: For airports with a Standard Instrument Approach Procedure (SIAP), FAA Order 8260.3, "Terminal Instrument Procedures," (TERPS) current revision approach surfaces should be maintained clear for the lowest published minimum approach.*	Already incorporated into the performance measure for instrument approaches.
At least one fully charged fire extinguisher available and easily accessible 24 hours a day for use around the terminal area.	Now a required part of the Airport Emergency Plan (AEP).

Source: NCDOT DOA, North Carolina Airport Development Plan 2014

The two new performance measures, compliance with Part 77 zoning and compliance with Minimum Operating Standards and Rules and Regulations will be discussed in later in Chapter 7.

Airport Layout Plan (future ADP objective)

Existing Statewide Performance
81%

Target Statewide Performance
100%

Possession of a current and approved Airport Layout Plan (ALP) will become a new item in the ADP. ALPs are important planning tools as they show both the existing and anticipated future development for the airport. Currently, an approved ALP is required in order for airports to receive federal grant funding. Guidance on ALPs is available in AC 150/5070-6B, *Airport Master Plans, Change 1*. In the existing conditions analysis, it was found that 79% of airports had a current and approved ALP; there were 4 Red, 9 Blue, and 2 Green airports that did not have an ALP. The target for this future ADP objective is that 100% of system airports have an approved ALP that is considered current (approved within the last 10 years).

Percent of Airports Meeting System Objectives in the ADP

As previously stated, recent changes to the ADP included updated system objectives as opposed to use of minimum and recommended criteria. Chapter 5 analyzed each development category and ADP objective, examining the system's performance in meeting the objectives. The performance was reported by category and by airport grouping, as well as for the system. A summary of the system's performance for each of the ADP development categories is provided in Table 6.4.

Table 6.4: Compliance with ADP System Objectives

Development Category		System Objectives				Current System Performance
		Commercial Service	*General Aviation*	*General Aviation*	*General Aviation*	
		Yellow	Red	Blue	Green	
100	Runway Approach	Clear Threshold Siting Surface on all Runway Ends	Clear Threshold Siting Surface on Primary Runway	Clear Threshold Siting Surface on Primary Runway	Clear Threshold Siting Surface on Primary Runway	
Current Compliance:		N/A	N/A	N/A	N/A	N/A
200	Runway Safety Area (RSA)	Meet Runway Design Code (RDC)	Meet Runway Design Code (RDC)	Meet Runway Design Code (RDC)	Meet Runway Design Code (RDC)	
Current Compliance:		90%	75%	77%	85%	Total: 81%
300	Runway Protection Zone (RPZ)	Fee Simple	Fee Simple	Fee Simple	Fee Simple	
Current Compliance:		30%	31%	42%	50%	Total: 40%
400	Pavement Condition	PCI>75	PCI>75	PCI>75	PCI>75	
Current Compliance: 1. Primary runway 2. Taxiway 3. Apron		 67% 56% 56%	 88% 69% 63%	 73% 69% 58%	 80% 75% 65%	Total: 77% 69% 61%
500	Runway Length	6500'	6000'	5000'	4200'	
Current Compliance:		90%	44%	85%	55%	Total: 68%
	Runway Width	150'	100'	100'	75'	
Current Compliance:		90%	100%	65%	75%	Total: 79%
600	Pavement Strength	Per PCN Analysis	> 60,000lbs SW or DW or Per PCN Analysis if a Part 139	> 30,000lbs SW or DW and < 60,000lbs SW or DW or Per PCN Analysis if Part 139	< 30,000lb SW or DW and > 12,500lb SW or DW	
Current Compliance:		100%	63%	73%	90%	Total: 79%

Development Category		System Objectives				Current System Performance
		Commercial Service	*General Aviation*	*General Aviation*	*General Aviation*	
		Yellow	Red	Blue	Green	
700	Visual Navigational Aids	Rotating Beacon, Lighted Wind Sock, PAPI-4	Rotating Beacon, Lighted Wind Sock, PAPI-4	Rotating Beacon, Lighted Wind Sock, PAPI-4	Rotating Beacon, Lighted Wind Sock, PAPI-2	
Current Compliance:		90%	31%	19%	65%	Total: 44%
800	Runway Edge Lighting	HIRL	MIRL	MIRL	MIRL	
Current Compliance:		100%	100%	100%	80%	Total: 94%
900	Weather Reporting Capability	AWOS-IIIP	AWOS-III	AWOS-III	AWOS-III	
Current Compliance:		100%	100%	96%	50%	Total: 85%
1000	Standard Instrument Approach	PA <250' and <3/4m	APV 250' - 3/4m	APV 250' - 3/4m	APV 400' - 1m	
Current Compliance:		90%	69%	46%	45%	Total: 57%
1100	Taxiway	Full Parallel	Full Parallel	Full Parallel	Full Parallel	
Current Compliance:		100%	88%	69%	25%	Total: 65%
1200	Aircraft Apron	20% Based Aircraft + 20% Busy Day Transient (GA)	25% Based Aircraft + 20% Busy Day Transient	25% Based Aircraft + 20% Busy Day Transient	50% Based Aircraft + 20% Busy Day Transient	
Current Compliance:		100%	94%	88%	75%	Total: 88%

Development Category		System Objectives				Current System Performance
		Commercial Service	*General Aviation*	*General Aviation*	*General Aviation*	
		Yellow	Red	Blue	Green	
1300	General Aviation Terminal Building	Commercial Passenger Terminal-Not Eligible. General Aviation Terminal Bldg/Parking per Master Plan	5,500 SF Terminal/Admin Bldg w/ FBO-Flight Planning Area-Public Meeting Area-Restrooms and 1 auto space per based aircraft + 50% for visitors/ employees	4,500 SF Terminal/Admin Bldg w/ FBO-Flight Planning Area-Public Meeting Area-Restrooms and 1 auto space per based aircraft + 50% for visitors/ employees	3,200 SF Terminal/Admin Bldg w/ FBO-Flight Planning Area-Public Meeting Area-Restrooms and 1 auto space per based aircraft + 20% for visitors/ employees	
Current Compliance:		100%	25%	23%	20%	Total: 33%
1400	Taxiway & Apron Edge Lighting	MITL	MITL	MITL	Reflective Markers	
Current Compliance:		100%	100%	81%	65%	Total: 83%
1500	Airfield Signage	Runway Hold Position, Location, Guidance, and Distance Remaining	Runway Hold Position, Location, Guidance, and Distance Remaining	Runway Hold Position, Location, and Guidance	Runway Hold Position, Location, and Guidance	
Current Compliance:		100%	63%	50%	15%	Total: 50%
1600	Ground Communication	UNICOM, RCO or GCO	UNICOM, RCO or GCO	UNICOM, RCO or GCO	UNICOM, RCO or GCO	
Current Compliance:		100%	63%	69%	20%	Total: 58%
1700	Approach Lighting	MALSR, SSALR, or ALSF	MALSR, SSALR, or ALSF	ODALS, MALS, SSALS, or SALS	ODALS, MALS, SSALS, or SALS	
Current Compliance:		90%	44%	27%	0%	Total: 32%
1800	ARFF Equipment	As req Part 139	Case by Case	Case by Case	Case by Case	
Current Compliance:		100%	56%	19%	0%	Total: 33%

Development Category		System Objectives				Current System Performance
		Commercial Service	*General Aviation*	*General Aviation*	*General Aviation*	
		Yellow	Red	Blue	Green	
1900	Hangars	Not eligible	75% Based Aircraft + 25% Transient Overnight	75% Based Aircraft + 25% Transient Overnight	50% Based Aircraft	
Current Compliance:		N/A	44%	62%	60%	Total: 56%
2000	Airfield Maint. Equip/Storage Bldg	Not eligible	Approved Tractor/ Building	Approved Tractor/ Building	Approved Tractor/ Building	
Current Compliance:		N/A	69%	46%	35%	Total: 48%
2100	Perimeter Fencing	Not eligible	8' Perimeter	8' Perimeter	8' Perimeter	
Current Compliance:		N/A	38%	27%	0%	Total: 21%
2200	Fuel Facilities	Not eligible	Based on Demand	Based on Demand	Based on Demand	
Current Compliance:		66 airports have AvGas 63 airports have jet fuel 35 airports have self-serve fuel				

Source: NCASP analysis

To evaluate future system performance, each of the ADP development categories was examined and the existing compliance reviewed to determine where there were plans in place to improve facilities, where capabilities existed to make modifications, and where airports were unlikely to be able to meet the development category objective. The following sections describe and summarize target performance by development category.

100: Airport Approach

The ADP system objective for runway approaches are:

- Yellow airports should have clear threshold siting surfaces on all runway ends
- Red, Blue, and Green airports should have clear surfaces on both ends of the primary runway

As described above in Section 6.1.8: Percent of system airports meeting FAA threshold siting surface requirements, current compliance for approaches could not be calculated due to the absence of data at the time of this study; however, as FAA guidance is clarified and 18b surveys are completed at all airports to identify obstruction, it is expected that 100% of airports meet their relevant objective for runway approaches. Clear approaches will be achieved by removing obstructions or mitigating them by lighting or lowering them. Otherwise, an airport's approach visibility minimum will be increased to compensate for remaining obstructions that were not mitigated or removed.

200: Runway Safety Area (RSA)

Existing Statewide Performance
81%

Target Statewide Performance
100%

The RSA analysis conducted in Chapter 5 looked at on the existing RSAs at the airports based on the current RDC for each runway and identified whether airport representatives indicated compliance with RSA standards during the inventory effort. According to the inventory survey results, it found that 81% of airports reported meeting current RSA objectives. The inventory effort was focused on existing conditions and did not address the ability of airports to meet higher RSA requirements should the airport's RDC change in the future.

Interrelationship with ADP Category Objectives

As airports achieve longer runways or improved approach capabilities, the associated RDC for the airport may also change, which affects the objective for the airport. The airports that were anticipated to undergo such a change in the future, whether based on existing airport plans or recommended projects in the NCASP, were identified. New RSAs would be required if the airports changed their RDC to meet the new ADP development categories for runway length and approach visibility minimums. For these airports, the locations of the extended RSAs were identified and evaluated for future compliance with their RSA objective. Table 6.5 identifies whether or not each

airport currently meets the RSA objective, which airports that will require a change in their RSA in the future, and the reason for the RSA change. Changes in runway length, the airport's RDC (and thus its minimum ARC), and/or the visibility minimums oftentimes result in an altered RSA. There were some cases where a change in an airport's RDC occurs but does not alter the RSA. In these cases, the column was not checked and/or the airport was not included in Table 6.5.

Table 6.5: Changes to Future RSAs Based on NCASP Analysis

		Reason for Future RSA Change		
Airport that will need new RSA	**Not Currently Meeting RSA Objective**	**Runway Extension**	**Increase in minimum ARC**	**Reduction in visibility minimums**
Yellow				
Coastal Carolina		X	X	X
Wilmington International				X
Pitt Grenville			X	X
Piedmont Triad International	X			
Red				
Currituck County		X	X	
Rowan County		X	X	
Davidson County	X	X		
Macon County		X	X	
Burlington Alamance Regional	X	X	X	
Charlotte Monroe Executive	X	X	X	
Hickory Regional			X	
Johnson County		X		
Dare County Regional		X	X	
Michael J Smith		X	X	
Moore County		X		
Cape Fear Regional		X	X	
Rocky Mount- Wilson Regional	X			
Blue				
Siler City Municipal				
Gastonia Municipal		X	X	
Duplin County	X		X	
Shelby-Cleveland County Regional			X	
Curtis L Brown Jr Field			X	
Rutherford County Marchman Field			X	
Henderson Oxford				
Harnett Regional			X	
Blue (continued)				
Elizabeth City CG Air Station/ Regional	X			
Lincolnton Lincoln County Regional			X	
Henderson Field		X	X	
Ashe County		X	X	
Asheboro Regional			X	

		Reason for Future RSA Change		
Airport that will need new RSA	**Not Currently Meeting RSA Objective**	**Runway Extension**	**Increase in minimum ARC**	**Reduction in visibility minimums**
Wilkes County	X			
Person County	X			
Foothills Regional			X	
Stanly County	X			
Mount Airy/ Surry County		X	X	
Warren Field				
Western Carolina Regional			X	
Rockingham County NC Shiloh			X	
Triangle North Executive	X			
Green				
Jackson County		X	X	
Montgomery County		X	X	
Odell Williamson Municipal			X	
Avery County Morrison Field		X	X	
Hyde County				
Tri-County			X	
Tarboro Edgecombe		X	X	
First Flight		X	X	
Billy Mitchell		X	X	
Ocracoke Island		X	X	
Elkin Municipal		X		
Richmond County	X			

Source: NCASP analysis

In the same process used in the analysis of RPZs (Section 6.1.1), current and future RSAs for each runway end at every system airport was examined using aerial photography overlaid by the existing and future RSA boundaries. Airports that had changes to their future RSA boundaries were determined by Table 6.7. The aerial of each runway end and associated RSA was examined to determine if there was an obstruction located within the proposed new or altered RSA that would preclude the airport from meeting the FAA guidelines/NCASP objectives. This analysis focused primarily on the existence of obstructions such as buildings, roads or other geographic features that could be identified from the aerial photography; it did not consider grading or other construction standards that could not be identified in the aerials but which could exist, causing a barrier to RSA compliance.

Future Target Performance

The target performance for RSAs is 100%. This relates directly to FAA's guidance that modifications to standards no longer apply to RSAs and cannot be approved. As previously noted, 81% of the current RSAs at North Carolina's airports are in compliance according to airport representatives. Achieving 100% compliance for these existing RSAs is a priority for both DOA and FAA. In examining future projects, full RSA compliance will be a requirement prior to proceeding with any projects that would affect the size or ability of the airport to fully meet RSA standards. The only alternatives available for RSA compliance include use of declared distances and engineered materials arresting systems (EMAS). Modifications to standards are no longer applicable to RSAs according to FAA guidance.

300: Runway Protection Zones (RPZ)

Existing Statewide Performance
40%

Target Statewide Performance
100% of capable airports

As discussed in Section 6.1.1, the target performance for this objective is that all airports have controlling interest over their RPZs by means of control mechanisms such as fee simple (ownership), avigation easements, etc. It is well-acknowledged that this target performance will take significant time and money to achieve, and in some cases, may not be possible for all airports. Thus, it was determined that the focus for this measure is to have 100% of airports have controlling interest over the central portion of their RPZs (see Figure 6.1 in the previous section).

As previously described in Section 6.1.1 and in the above discussion about RSAs, anticipated future compliance with this objective was examined by using aerial imagery overlaid with the future RPZ boundaries for the runway ends at every airport. Future RPZ boundaries took into account future changes to approaches or runways that might change the size of the RPZ. The aerial imagery was used to examine any potential conflicts that exist within the current and future RPZs of each airport. An emphasis was taken on the conflicts that might exist within the central portion of the future RPZ, as the FAA is currently focusing on compliance within the central portion.

In areas where potential conflicts are identified, there will be further discussions of control mechanisms that can be used by each airport to secure controlling interest over each of the RPZs. Such measures might include fee simple ownership, the establishment of avigation easements, or the purchasing of property as it becomes available.

Future Target Performance

The target performance for RPZs is 100% of capable airports.

400: Pavement Condition

Existing Statewide Performance-Primary Runway PCI Exceeding 75	Target Statewide Performance-Primary Runway PCI of 75 or higher
77%	100%

Existing Statewide Performance-Taxiways PCI Exceeding 75	Target Statewide Performance-Taxiways PCI of 75 or higher
69%	100%

Existing Statewide Performance-Aprons PCI Exceeding 75	Target Statewide Performance-Aprons PCI of 75 or higher
61%	100%

An airport's pavement is critical to its success as it provides the access needed by an aircraft to safely operate at the facility. The condition of North Carolina's airport pavements or pavement condition index (PCI) was analyzed in association with the NCASP through a separate statewide Airport Pavement Management System (APMS) study completed in 2013 for all general aviation airports and 15 Part 139 airports. This program provided data on each airport's current PCI by "branch" or type of pavement (runway, taxiway, and apron).

To forecast each airport's future pavement conditions over the long-term planning period, the methods that will be used to maintain and repair the pavements must be considered. It is widely recognized and noted by the FAA in AC 150/5380-7A, Airport Pavement Management Program, that "by projecting the rate of deterioration, a life-cycle cost analysis can be made for various alternatives. This analysis will help determine the optimal time for applying the best alternative. Such a decision is necessary to avoid higher maintenance and repair costs in the future." Ongoing pavement maintenance is critical because repairs are much more costly once the condition deteriorates below a certain level. Generally speaking, a PCI above 85 will

benefit from routine maintenance actions, such as periodic crack sealing or patching. Pavements with a PCI of 56 to 85 may require pavement preservation, such as a surface treatment, thin overlay, or joint resealing. Often, when the PCI is 55 or less, major rehabilitation, such as a thick overlay or reconstruction, are the only viable alternatives due to the substantial damage to the pavement structure.

Future Target Performance

The ADP system objective for pavement condition is for all airports to maintain a PCI of 75 or greater for all three branches of pavement. The target for performance of this ADP objective is 100% for North Carolina's airports. Airports that are currently not meeting the objective have several options moving forward in order to ensure that they reach compliance. These options are as follows:

- Programming Pavement Projects: One option is to program and prioritize specific pavement projects to address any existing and future pavement issues for the runways, taxiways, and aprons at the airport. Projects for the primary runway should be addressed first followed by those for the secondary runway (if applicable), the taxiways, and the aprons. These projects should be included in the airport's future capital improvement plans. The option could be to program all projects that are below the ADP objective PCI of 75 at one time, but this is not considered a feasible option and is better addressed over time

- Preventative Maintenance: Another option, and recommendation for all airports, is to conduct preventative maintenance throughout the life cycle of the pavement. A program is typically established that makes periodic improvements to pavement throughout the airport before any of it begins to fall below standards. This method is a proactive approach towards pavement condition compliance rather than a reactive approach and it can maintain a higher PCI longer at the airports without experiencing rapid deterioration. Continuous pavement management is also required by the FAA for all airports included in the National Plan of Integrated Airport Systems (NPIAS) based on Public Law 103-305 which requires sponsor assurances that they are addressing preventative maintenance for project applications involving airfield pavements, including implementation of an effective pavement maintenance management program

500: Runway Length and Width

Existing Statewide Performance-Runway Length
68%

Target Statewide Performance-Runway Length
85%

Existing Statewide Performance-Runway Width
79%

Target Statewide Performance-Runway Width
100%

Adequate runway facilities are important to aviation systems as the foundation of the airfield. System objectives for runway length and width area were developed based on trends that are occurring within the industry, including increased production of new and more sophisticated aircraft that require longer runways and higher usage of these aircraft by businesses throughout the U.S.

Planned Projects that Will Improve Performance

Several airports are currently undergoing projects or have planned projects that will put them in compliance with the length and/or width objectives. The airports that were identified as having current or planned projects to provide additional runway length and therefore meet the objectives include the following:

RED
• Macon County (RW 7) • Burlington-Alamance Regional (RW 24) • Charlotte-Monroe Executive (RW 5) • Michael J Smith (RW 26)

In addition, Macon County is in the process of widening its runway and will meet the runway width objective in the near term.

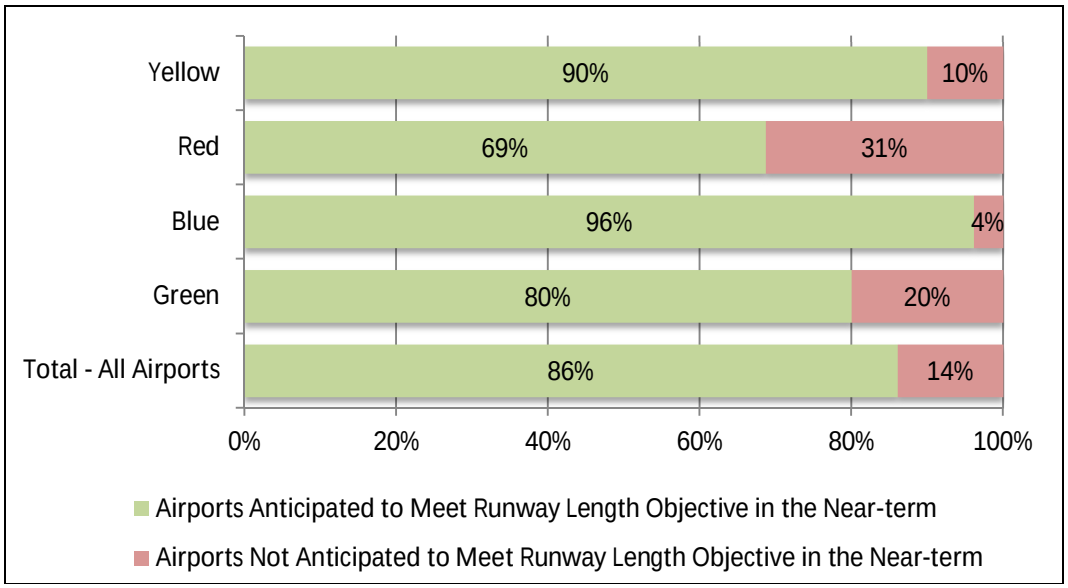
Future Target Performance

In working with DOA, it was also noted that there are also some airports within the system that will be unable to comply with the runway length requirements due to unavoidable obstacles such as the presence of a body of water for those airports situated next to the coast. The following airports are not able to meet the runway length objective due to unavoidable obstacles:

RED	BLUE	GREEN
• Currituck County Regional • Macon County • Davidson County • Dare County Regional • Cape Fear Regional Jetport	• Gastonia Municipal	• Billy Mitchell • First Flight • Avery County/Morrison Field • Jackson County

If the identified runway extension projects at the four Red airports are implemented, 86% of system airports will meet the runway length objective as depicted in Figure 6.4. This surpasses the future target for the ADP length objective.

Figure 6.4: 500: Anticipated Future Runway Length Compliance



Source: DOA and NCASP Team Analysis, 2014

For runway width, it is assumed that all airports have the ability to comply with the objective since there are no known barriers to widening runways within the North Carolina system. Thus, the target for compliance with the runway width ADP objective is 100%.

600: Pavement Strength

Existing Statewide Performance	Target Statewide Performance
79%	100%

The strength of runway pavement determines the weight of aircraft that may regularly operate on a specific runway. This is important when considering the classification of aircraft that an airport can support as well as the durability and maintenance of a runway. In 2011, the FAA issued AC 150/5335-5B, *Standardized*

Method of Reporting Airport Pavement Strength – PCN which provided guidance on standardizing the assessment of pavement strength based on Pavement Classification Numbers (PCN). In order to standardize the process to determine strength of airfield pavements, every aircraft will be given an Aircraft Classification Number (ACN).

DOA is currently conducting surveys and working towards developing PCNs for all Part 139 airports which include all Yellow airports and some of the Red airports. The FAA expects all commercial service airports serving air carrier aircraft to be compliant with the PCN standards put forth in the AC by 2016. A calculation of the PCN ratings at each of these airports in North Carolina will be completed as part of the NCASP. These surveys will meet the FAA's requirements for these airports. For purposes of the NCASP analysis, if a Yellow airport does not currently have a PCN rating for their primary runway, it is considered to meet the system objective if they can support greater than 60,000 pounds single wheel landing gear (SW) or double wheel landing gear (DW).

Future Target Performance

The target for this ADP objective is that 100% of airports comply with pavement strength standards based on the above standards and in all cases where PCN analysis is required by the FAA. In order to strengthen pavement, airports can create a multi-year plan that will allow them to strengthen existing pavements in phases; this will help to distribute the costs over time so they can capitalize on "easy-win" projects and create a plan to fund and execute more difficult projects. One thing that must be considered when undergoing pavement-strengthening projects is that there may be associated environmental consequences. All required environmental analyses that need to be conducted should be included as part of the work plan for pavement strengthening.

700: Visual Navigational Aids (NAVAIDs)

Existing Statewide Performance
44%

Target Statewide Performance
94%

The goal for this ADP objective is for all appropriate airports to be in compliance with their respective airport role objective. In relation to this objective, it is also expected that all airports have an approach lighting system (ALS), which is discussed below in ADP 1700: Approach Lighting System. In order to comply, airports can choose to purchase/replace the necessary equipment all at once, which would require a large, up-front investment but allow the airport to immediately meet this ADP objective. The likely option is to replace and/or upgrade the existing equipment as each reaches its end of its useful life, with the understanding that certain equipment should be upgraded while others can be replaced. For example, at the end of their useful life, existing PAPI-2 equipment should be replaced with PAPI-4 equipment.

In the existing conditions analysis in Chapter 5, it was noted that 44% of system airports currently meet their visual NAVAIDs objectives. The exception to this ADP,

and to the goal of all airports meeting the objectives, involves airports that do not currently support nighttime operations and do not have runway lighting. Four airports fall into this category: Avery County/Morrison Field, Ocracoke Island, Billy Mitchell, and First Flight. Only PAPIs and a rotating beacon are recommended at these airports to provide additional safety during daytime reduced visibility. Therefore, the resulting target for this ADP objective is 94%, which assumes these four airports are not recommended to fully meet the visual NAVAID objectives.

800: Runway Edge Lighting

Existing Statewide Performance
94%

Target Statewide Performance
94%

The existing conditions analysis found that 94% of all system airports currently meet their objective, with four airports, Billy Mitchell, First Flight, Ocracoke Island, and Avery County/Morrison Field failing to meet the objective.

Future Target Performance

As discussed in the previous section on NAVAIDS, three of these four airports do not have visual aids. Ocracoke Island does have a rotating beacon but does not have runway edge lighting. As these airports are not operational at night, it is not recommended that they get runway lighting, since the airport and the DOA do not want to encourage aircraft to land at these airports at night or during very poor weather conditions. Given that, the target for future performance remains the same as existing performance at 94%.

Therefore, the only change to the future condition of the airport system for this objective is that it is recommended that all runway lighting is eventually converted to LED lighting. This should be done at the end of an existing lighting system's useful life cycle. Beyond this upgrade, there will likely be no change in the compliance for this ADP objective within the North Carolina system.

900: Weather Reporting Capability

Existing Statewide Performance
85%

Target Statewide Performance
100%

The provision of on-site weather reporting equipment is important for aircraft in inclement or changing weather as pilots as it helps ensure that pilots are given sufficient information related to weather conditions at their destination airport as well as at other potential backup airports. The current system analysis found that 85% of all system airports have on-site weather reporting capabilities and meet their objective for their associated airport grouping.

Future Target Performance

The target is to have 100% of airports possessing the appropriate AWOS equipment. There are no other alternatives available for this ADP objective. In order to meet the target, airports should ensure the continued maintenance of an existing AWOS or ASOS through its useful life cycle, which is found to be around 15 to 20 years. At the end of life of any existing equipment, the ASOS or AWOS should be replaced with the recommended and most current weather observation system available.

1000: Standard Instrument Approach Procedures (SIAP)

Existing Statewide Performance	Target Statewide Performance
57%	85%

The majority of new standard instrument approach procedures developed by the FAA are now satellite-based systems that rely on Global Positioning Systems (GPS), Localizer Performance with Vertical Guidance (LPV), or Lateral Navigation (LNAV). The existing conditions analysis in Chapter 5 found that 57% of airports currently meet their ADP approach objective.

Planned Projects that Will Improve Performance

However, there are airports that are in the process or have a project planned to upgrade their approaches and will be compliant with the objective in the near-term; this will raise near-term performance to 61%. These airports include:

BLUE	GREEN
• Lincolnton Lincoln County Regional	• Elkin Municipal • Hyde County • Montgomery County

Future Target Performance

It is important to note that while the listed approach objectives are desirable for all airports, they may not be feasible in all cases. While some airports are already in the process of updating their approach, the following airports are will likely unable to develop enhanced approach capabilities (typically lowered minimums) needed to meet system objectives in the future:

RED	BLUE	GREEN
• Macon County	• Western Carolina Regional • Gastonia Municipal • Ashe County	• Billy Mitchell • First Flight • Odell Williamson Municipal • Ocracoke Island • Avery County/ Morrison Field • Jackson County

Given the constraints at some airports, the target for this ADP objective for the North Carolina system is 85%, which would be achieved when all airports, excluding the 10 listed above, meet their approach objective.

Similar to other ADP objectives, there are limited alternatives available to airports in terms of improving their approaches. Depending on the obstacle that is controlling the minimums, the obstacle may be able to be lowered or removed, thereby lowering the approach minimum to meet the objective or at least lowering it below its current level. With new technology, including the FAA's Airports GIS-Surface Analysis and Visualization Tool (SAV), airport sponsors can now access information on the penetrations to the visual area surface of instrument approaches and determine which obstacles are impacting the airport. The tool currently only addresses the 20:1 Visual Area Surface and the 30:1 Glide Path Qualification Surface (GQS), but is expected to be expanded to look at other approach surfaces. This tool could be helpful to airport sponsors and DOA in determining the appropriate and available remedies to improve airport approaches in the future.

1100: Parallel Taxiway

Existing Statewide Performance	Target Statewide Performance
65%	98%

Interrelationship with ADP Category Objectives

As previously noted in the evaluation of the system's performance related to airports meeting 2013 FAA taxiway geometry standards, the ADP objective is for all airports to have a full parallel taxiway. Further, the existence of a parallel taxiway has direct effects on the instrument approach that was discussed in the previous section (1000: Standard Instrument Approach Procedures) and is a recommendation for airports with visibility minimums at or above ¾ mile. Chapter 5 analysis found that 65% of all airports currently have a full parallel taxiway for their primary runway.

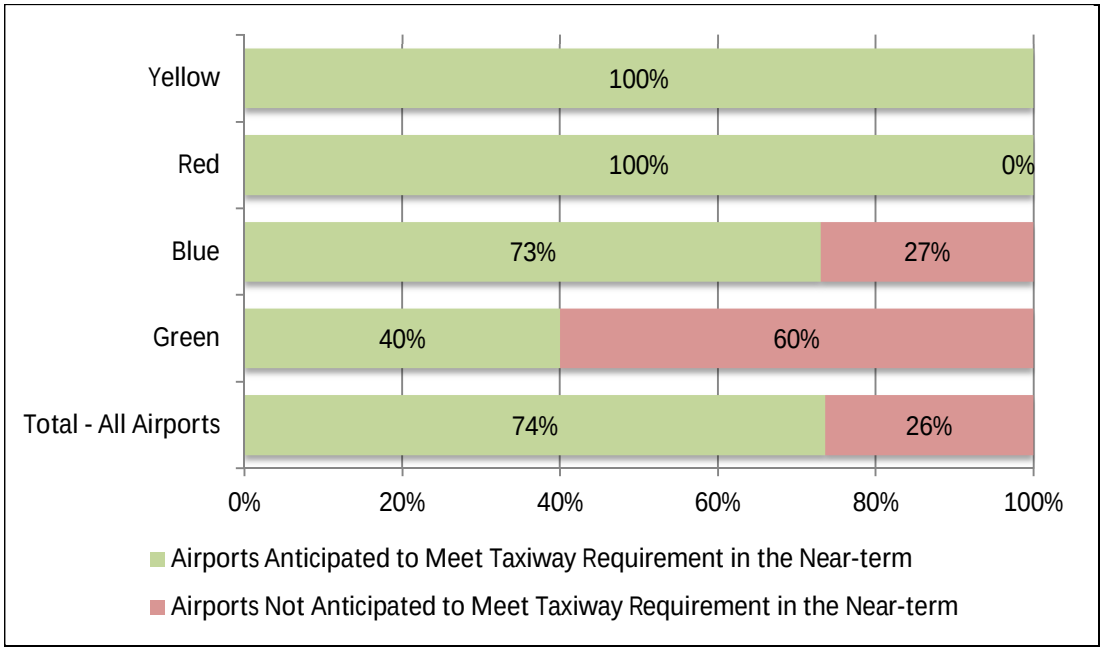
Planned Projects that Will Improve Performance

There are six airports that are currently constructing parallel taxiways and will be in compliance with this ADP objective in the near term. These airports are listed below.

RED	BLUE	GREEN
• Michael J. Smith Field • Currituck County Regional	• Henderson Field	• Hyde County • Montgomery County • Columbus County Municipal

Figure 6.5 shows the updated current/near-term compliance percentages based on information on taxiway projects that are currently underway.

Figure 6.5: 1100: Near-Term Taxiway Compliance



Source: DOA and NCASP Team Analysis, 2014

Future Target Performance

Through the system analysis it was identified that every airport within the system, with the exception of one (Jackson County), should be able to construct a parallel taxiway for their primary runway. Constructing a parallel taxiway at Jackson County is not feasible given the topography of the airport. The target for this ADP objective is to have 98% of airports (71 of 72) meet the taxiway objective.

While Jackson County is the only airport identified as not being able to meet the taxiway ADP objective, it is important to note that there are other airports at which the parallel taxiway development will be challenging and/or costly. For example, some airports will have to acquire the property on which to construct the taxiway, and other airports will require large amounts of fill in order to have proper grading

and separation for the taxiway. While these difficulties are acknowledged, the DOA feels a parallel taxiway is important for the performance of each airport and the entire the system.

In general, it is recommended that airports update their future plans to include the parallel taxiway to their primary runway and begin to acquire and set aside funding in order to construct the project. It will also be important to consider the taxiway connectors and ensure that the issue of indirect access from the apron and terminal areas is addressed. The alternatives for this ADP objective relate to how the parallel taxiways are designed and implemented. If it is deemed that the development of a full parallel taxiway is too challenging or costly, it may be acceptable to construct something less than a full parallel taxiway system; these decisions should be made on a case-by-case basis.

1200: Aircraft Apron

Existing Statewide Performance
88%

Target Statewide Performance
100% to meet demand

The analysis in Chapter 5 was conducted based on demand for 2011 as obtained during the inventory effort. The analysis revealed that 88% of airports currently meet their 2011 apron objective. For purposes of future analyses, the forecasts for 2031 for based aircraft and itinerant activity were used to compare the existing facilities to the demand for future apron area. The following assumptions were used to determine busy day transient aircraft apron space objectives for the year 2031 for each airport:

- 2031 transient (itinerant) operations were derived from the activity forecasts prepared as part of the NCASP (*Chapter 3: Forecasts of Aviation Demand*). It was assumed that the percent of total operations that were itinerant in 2011 would stay the same for the year 2031, and that number was multiplied by the 2031 operations forecasts to arrive at number of itinerant operations in 2031
- Annual transient operations for each system airport were divided by 10 to derive busy month operations. Busy month operations were then divided by 30 to derive average day operations. To estimate busy day operations, it was assumed that the busy day is 15% more active than an average day

Future Target Performance

The target for this objective is to have 100% of airports providing enough apron space to meet their demand (i.e. number of tie-downs is at least as large as the apron index calculated from the above objectives). However, it is anticipated that only 79% of Red, Blue, and Green airports will meet this objective in the year 2031 if no additional apron space is provided in the future.

Apron space at Yellow airports was not analyzed due to the vast apron that exists at these commercial airports to serve both general aviation and commercial activities.

From the analysis, it was found that three Red, five Blue, and five Green airports would not meet their aircraft apron objective for the year 2031. The following airports are expected to be beyond capacity in 2031 based on the objective and the projected number of based and itinerant aircraft:

RED	BLUE	GREEN
• Hickory Regional • Statesville Regional • Smith Reynolds	• Foothills Regional • Mount Airy/Surry County • Henderson-Oxford • Rockingham County NC Shiloh • Person County	• Northeastern Regional • Elkin Municipal • Mount Olive Municipal • Avery County/Morrison Field • Columbus County Municipal

Additionally, the following airports are expected to be at 100% capacity (although not project to be beyond capacity) based on the objective and the project number of based and itinerant aircraft.

RED	BLUE
• Currituck Regional • Davidson County • Johnston County	*At 100% of capacity* • Western Carolina Regional • Triangle North Executive • Henderson Field

If the number of based aircraft or itinerant operations by 2031 is larger than forecasted, then the above airports will not have enough apron space to meet demand and will not comply with this objective.

It is important to note that, although a deficiency may be identified at an airport in this NCASP analysis, the airport may not feel that additional parking is needed. Typically an airport adds additional apron space when they perceive there is sufficient demand to justify it. Given that this analysis is based on forecasted demand for nearly 20 years into the future, the airports that are anticipated not to meet the objective in 2031 will probably not increase apron space in the near term. Apron space is likely to be added as determined to be needed based on realized demand.

1300: General Aviation Terminal Building

Existing Statewide Performance	Target Statewide Performance
33%	100%

The analysis in Chapter 5 focused only on the size of the general aviation terminal building and did not include discussion of terminals at Yellow airports. Typically with terminal projects, the planning and design of the facility takes into account automobile parking needs, although the size of the auto parking facilities varies by

airport. The ability of the North Carolina airports to meet the automobile parking objectives was not examined, and was only identified as an objective. When considering only the general aviation terminal building's square footage, 23% of the airports with a GA terminal building objective meet their objective.

Future Target Performance

Since the analysis focuses only on the size of the building, there is not a direct relationship to the anticipated growth in activity that would generate the need for a larger general aviation terminal buildings. The building sizes that were selected for this ADP category are based on current buildings underway or recently completed throughout North Carolina and other nearby states. A target of 100% has been established for this ADP category, meaning that all airports will meet their objective on terminal size based on their role category. Potential programs and other ways to provide higher performance for this ADP objective will be identified as part of the recommendations discussion in Chapter 7.

1400: Taxiway and Apron Edge Lighting

Existing Statewide Performance
83%

Target Statewide Performance
94%

The current system analysis in Chapter 5 noted that 83% of all system airports currently meet their taxiway edge lighting objective while data on apron edge lighting was not available.

Planned Projects that Will Improve Performance

Currently, Anson County is undergoing a taxiway lighting project that will put them into compliance with this objective in the near-term, increasing the system's performance to nearly 85%.

Future Target Performance

It is intended that all but four airports will meet this ADP objective in the future. These airports are Billy Mitchell, First Flight, Ocracoke Island, and Avery County/Morrison Field. These are the same airports that were mentioned in previous ADP objectives that pertain to lighting or visual aids at night (ADP 700: NAVAIDS and ADP 800: Runway Edge Lighting). These airports are not operational at night and do not want aircraft to be landing at that time, thus it is not recommended that the airports install taxiway and edge lighting that could encourage pilots to land at night. The resulting target for performance with this ADP objective is that 94% of airports meet their taxiway and apron lighting standards, which would mean that all airports besides the four mentioned above are meeting this objective.

1500: Airfield Signage

Existing Statewide Performance	Target Statewide Performance
50%	100%

In the existing conditions analysis from Chapter 5, it was identified that 50% of all system airports currently meet their airfield signage objective, although data for performance with objectives for distance remaining signs was not available.

Future Target Performance

In the future, there are no foreseen insurmountable barriers that would prevent any airport from complying with their respective objective, thus the goal for this ADP objective is that 100% performance. Further, all airports should look to maintain signage information (types and locations) to ensure proper location and maintenance is maintained.

1600: Ground Communication

Existing Statewide Performance	Target Statewide Performance
58%	100%

In the Chapter 5 existing conditions analysis, 58% of airports were identified as meeting their ground communications objective. The target for future performance with this ADP objective is 100%. There are no other alternatives available for this ADP objective since it is only necessary to provide either an RCO or GCO. It was determined that RCOs are more than sufficient for most North Carolina airports, and are a more feasible requirement for both economic and maintenance purposes, then requiring GCOs at airport; thus, the main goal for this objective is for 100% of airports to have at least an RCO. It should also be noted that some airports that have RTRs are and will continue to be considered in compliance with this measure.

1700: Approach Lighting

Existing Statewide Performance	Target Statewide Performance
32%	85%

The existing analysis found that 32% of system airports currently have an approach lighting system (ALS).

Interrelationship with ADP Category Objectives

The performance of the objective for approach lighting is related to compliance with the objective for an instrument approach (1000: Standard Instrument Approach

Procedures). There are alternative ALS systems available for installation at the airports depending upon the visibility minimums and type of approach. The ALS objectives are as follows:

- For airports with visibility minimums less than ¾ mile, appropriate systems include a MALSR, SSALR or ALSF
- For airports with visibility minimums greater than or equal to ¾ mile, appropriate systems include ODALS, MALS, SSALS, and SALS

Future Target Performance

With the constraints identified under ADP 1000 and the linkages between these two objectives, the target performance for ADP 1700: Approach Lighting is 85%. The following airports will likely be unable to meet the ALS objective as they are not anticipated to meet the objective for an instrument approach:

RED	BLUE	GREEN
• Macon County	• Western Carolina Regional • Gastonia Municipal • Ashe County	• Billy Mitchell • First Flight • Odell Williamson Municipal • Ocracoke Island • Avery County/ Morrison Field • Jackson County

1800: Aircraft Rescue & Fire Fighting (ARFF) Equipment

Existing Statewide Performance-ARFF Equipment	Target Statewide Performance-ARFF Equipment
33% Statewide; 100% Part 139 airports	Statewide as appropriate; 100% Part 139 airports;

Existing Statewide Performance-Formal Mutual Aid Agreement	Target Statewide Performance-Formal Mutual Aid Agreement
N/A	100%

The FAA has established specific requirements for Aircraft Rescue and Fire Fighting (ARFF) equipment that depend on the size and operational frequency of the airport. These relate to the Part 139 airports only.

Future Target Performance

The ADP system objectives for ARFF equipment are for 100% of Part 139 airports to meet the requirements of their certification.

In addition to AARF equipment for Part 139 airports, an objective for this ADP objective is that all airports within the airport system have a formal mutual aid agreement in place with emergency responders, with the target being 100% for the airport system. This mutual aid agreement is directly associated with the objective as part of performance measure on Airport Emergency Plans (Percent of system airports with an Airport Emergency Plan), where every airport is expected to have such an agreement with local emergency responders. This agreement will be necessary for compliance with both the performance measure and ADP objective.

1900: Hangars

Existing Statewide Performance
56%

Target Statewide Performance
100% based on demand

It is good business for a general aviation airport to provide hangar space for its customers, especially those with based aircraft at the airport. The goal for the hangar objective is to have 100% of airports (excluding Yellow who are not eligible for funding for hangars and do not have an objective) be able to have an appropriate number of hangars to satisfy demand. In the existing conditions analysis, it was found that only 56% of airports with a hangar storage objective currently meet it, meaning that they are reporting less than 100% hangar occupancy and have sufficient hangar storage for the reported 2011 based aircraft. Of those airports not meeting the objective, 34 have a waiting list for hangar parking and 32 were at 100% capacity, such that they are unable to accommodate another customer request for hangar parking. Only 11 airports noted that they have a designated transient hangar on site.

Future Target Performance

In the future, based on projected growth in based aircraft for 2031, only 31% of airports will be in compliance with their hangar objective, assuming no additional hangars are constructed. Figure 6.6 presents the results of the analysis for future hangar objective compliance by airport grouping. As shown, over 60% of system airports will require additional hangar storage by 2031 to meet anticipated growth in based aircraft. In addition, in order to meet the ADP objective, additional hangars for storage of itinerant aircraft will be needed as demand warrants.

There are 38 airports that are not anticipated to meet their hangar objectives in the year 2031 if no additional hangars are supplied. Additionally, there are five Green airports that will be at 100% of their anticipated hangar capacity in year 2031 (i.e. 2031 Hangar Objective equals the number of existing hangar spaces).

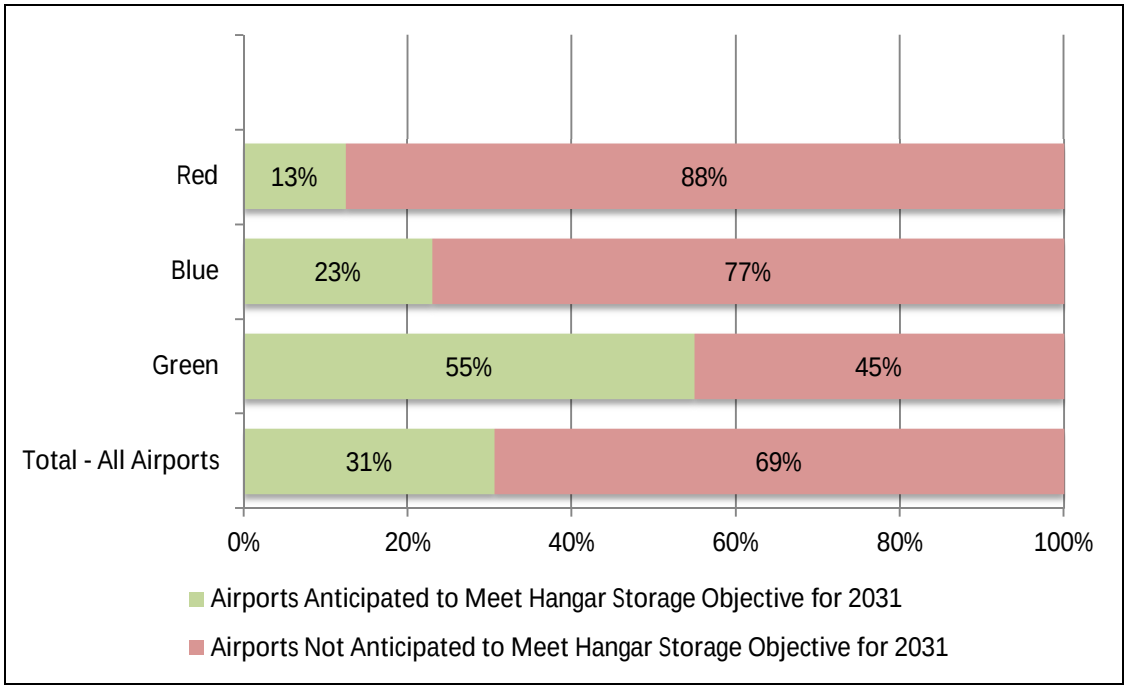
The airports that will be beyond capacity include:

RED	BLUE	GREEN
• Michael J. Smith Field • Burlington-Alamance Regional • Currituck County Regional • Macon County • Davidson County • Dare Regional • Charlotte-Monroe Executive • Cape Fear Regional Jetport • Rocky Mount-Wilson Regional • Rowan County • Raleigh Exec Jetport at Sanford-Lee County • Johnston County • Statesville Regional • Smith Reynolds	• Western Carolina Regional • Elizabeth City CG Air Station/Regional • Wayne Executive Jetport • Ashe County • Duplin County • Kinston Regional Jetport at Stallings Field • Lincolnton Lincoln County Regional • Triangle North Executive • Lumberton Regional • Laurinburg-Maxton • Foothills Regional • Mount Airy/Surry County • Wilkes County • Henderson-Oxford • Person County • Rutherford County-Marchman Field • Shelby-Cleveland County Regional • Siler City Municipal • Henderson Field	• Tri-County • Clinton-Sampson County • Odell Williamson Municipal • Columbus County Municipal *At 100% of capacity:* • Northeastern Regional • Elkin Municipal • Mount Olive Municipal • Montgomery County • Jackson County

Additionally, airports that are anticipated to be at exactly 100% capacity include:

GREEN
• Northeastern Regional • Elkin Municipal • Mount Olive Municipal • Montgomery County • Jackson County

Figure 6.6: 1900: Anticipated Hangar Objective Compliance for Year 2031



Source: DOA and NCASP Team Analysis, 2014

Typically, airports construct hangars based on demand and the ability of funding for the projects. Hangars generate revenue for the airport in the form of rentals as well as the revenue received from fuel sales and other activities by the aircraft based at the airport; however, airport managers are often reluctant to invest in hangers for anticipated future demand if current demand is being satisfied. Alternatives for hangars include providing additional apron space, shade hangars, and provision of different types of hangars such as box or conventional versus T-hangars. There is also alternative financing available to fund hangar development from private and other sources that can be sought to ensure the demand for hangars is being met at the airports.

2000: Airfield Maintenance Equipment & Storage Building

Existing Statewide Performance
48%

Target Statewide Performance
100% based on demand

This ADP objective considers the ability of each airport to provide and store equipment that is sufficient to support the airport's role grouping in the North Carolina system. The existing conditions analysis found that 48% of eligible system airports have a designated building to store equipment. It is important to note that while Yellow airports are not eligible for equipment/storage building funding through the

ADP and are not included in the calculations for statewide performance, all Yellow airports do provide storage infrastructure for their airfield maintenance equipment.

Future Target Performance

Going forward, the goal for this ADP objective is that 100% of airports have the proper maintenance equipment and a designated building in which to store it. For those airports that do not currently meet the objective due to a lack of storage facilities, the goal is for them to construct proper storage facilities for that equipment. For those airports that do not have the proper equipment, meeting this ADP objective will involve both equipment acquisition and storage building construction.

2100: Perimeter Fencing

Existing Statewide Performance
13%

Target Statewide Performance
100%

The existing system analysis found that 13% of airports meet the fencing objective; this percentage does not include compliance by Yellow airports, which is 100% for that role category. Yellow airports are required to have fencing due to the presence of commercial airline service, although they are not eligible to receive for funding for fencing within the ADP.

Future Target Performance

The objective for this measure is that all airports (100%) undergo proper procedures to ensure that the appropriate fencing is installed in and around the airport. The general recommendations is that every airport will have a fence that is at least 8-feet high, but the type and size of fencing will change on a case-by-case basis based on what the fencing must deter for that specific airport (deer, people, small animals, etc.); either way, adequate fencing should be installed at all airports. Currently there are no alternative means for providing fencing, only in the type and size of fencing that is appropriate for the airport.

2200: Fuel Facilities

Existing Statewide Performance
N/A

Target Statewide Performance
Case-by-case

While fuel facilities were added to the ADP as part of the NCASP, funding for these facilities will only be considered for Red, Blue, and Green airports when all airside safety needs have been met; Yellow airports are not eligible. The objective for the other three categories is based on the demand at the particular airport and is essentially a business decision for each individual airport. Since the system objective is based on demand, current and future target performance were not identified related to fuel facilities. An extended discussion about the availability of fuel at

airports can be found in Section 6.4.7: Percent of System Airports with 24/7 Fueling, and more information on types of fuels at airports can be found in Section 6.4.8: Percent of System Airports with Jet Fuel.

Percent of system airports that are adequately accessible in terms of signage and wayfinding

Existing Statewide Performance	Target Statewide Performance
69%	100%

Approximately 68% of airport managers reported their signage to be adequate. In addition to their importance for of customer satisfaction, adequate signage around airports is imperative, as airports can be used for emergency situations such as evacuations, medical emergencies, or as part of other local emergency response plans. If the airport is not easily found by people, then it is both bad for its business and may pose a safety risk to the community.

Future Target Performance

It is important for the performance of the system that every airport (100%) be easily identified and accessed, and thus every airport should ensure that they are meeting this objective. With the increasing usage of GPS and mobile devices that have maps and guidance applications, the need for extensive signage and wayfinding is reduced, but it is still necessary to ensure a user's ability to reach the airport on the ground transportation network. There are no alternatives available to increase the system's performance for this measure other than working with the appropriate state and local officials to improve the adequacy of the signage and wayfinding.

Goal Category: Mobility

The third goal category, Mobility, evaluates how accessible and convenient various facets of the airport system are to aviation users. For an airport system to adequately serve a state, it should provide the level of facilities necessary to accommodate demand from both current and future users. These users include the traveling public, as well as individual aircraft operators, including those that use air travel for business and pleasure.

The performance measures used to evaluate North Carolina airports' mobility include the following depicted in Table 6.6.

Table 6.6: Performance Measures in the Mobility Category

Performance Measure	Informational/Action
Percent of population within 30 minutes of a system airport by role grouping.	Action
Percent of total employment/businesses within 30 minutes of a system airport.	Action
Percent of system airports with a published instrument approach procedure.	Action
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).	Action
Percent of population within 60 minutes of a system airport with commercial airline service by at least one airline.	Action
Percent of system airports that provide intermodal options for their community, including public transportation interfaces at the airports.	Informational
Percent of system airports with 24/7 fueling.	Informational
Percent of system airports with Jet Fuel.	Informational & Action
Percent of system airports operating below 60% operational capacity levels.	Action
Percent of system airports meeting service objectives (FBO, pilot training, maintenance, charter/aircraft rental, terminal amenities).	Informational
Percent of system airports that are incorporated in local comprehensive transportation plans.	Action

The results of the future system evaluation for these performance measures related to the mobility goal category are discussed in the following sections.

Percent of population within 30 minutes of a system airport by role grouping

Existing Statewide Performance	Target Statewide Performance
94%	94%

GIS analysis was conducted and reported in Chapter 5 with regard to the percent of North Carolina's population that is within a 30-minute drive time of any North Carolina system airport. The existing conditions analysis found that over 94% of North Carolina's population is within a 30-minute drive of at least one and, in some cases, multiple system airports.

Out of State Airport Coverage to Improve Performance

It is important to recognize that, in addition to North Carolina's airports, airports that are in adjacent states (Virginia, Tennessee, Georgia, and South Carolina) but within a 30-minute drive time of North Carolina provide additional airport access for North Carolina residents. The 30-minute drive times of nearby out-of-state airports were examined to determine if they provide any additional coverage to North Carolina's population. The out-of-state airports that were considered are shown in Figure 6.7

and listed in Table 6.7. Of the airports examined, only 26 were found to provide coverage to North Carolina within a 30-minute drive time.

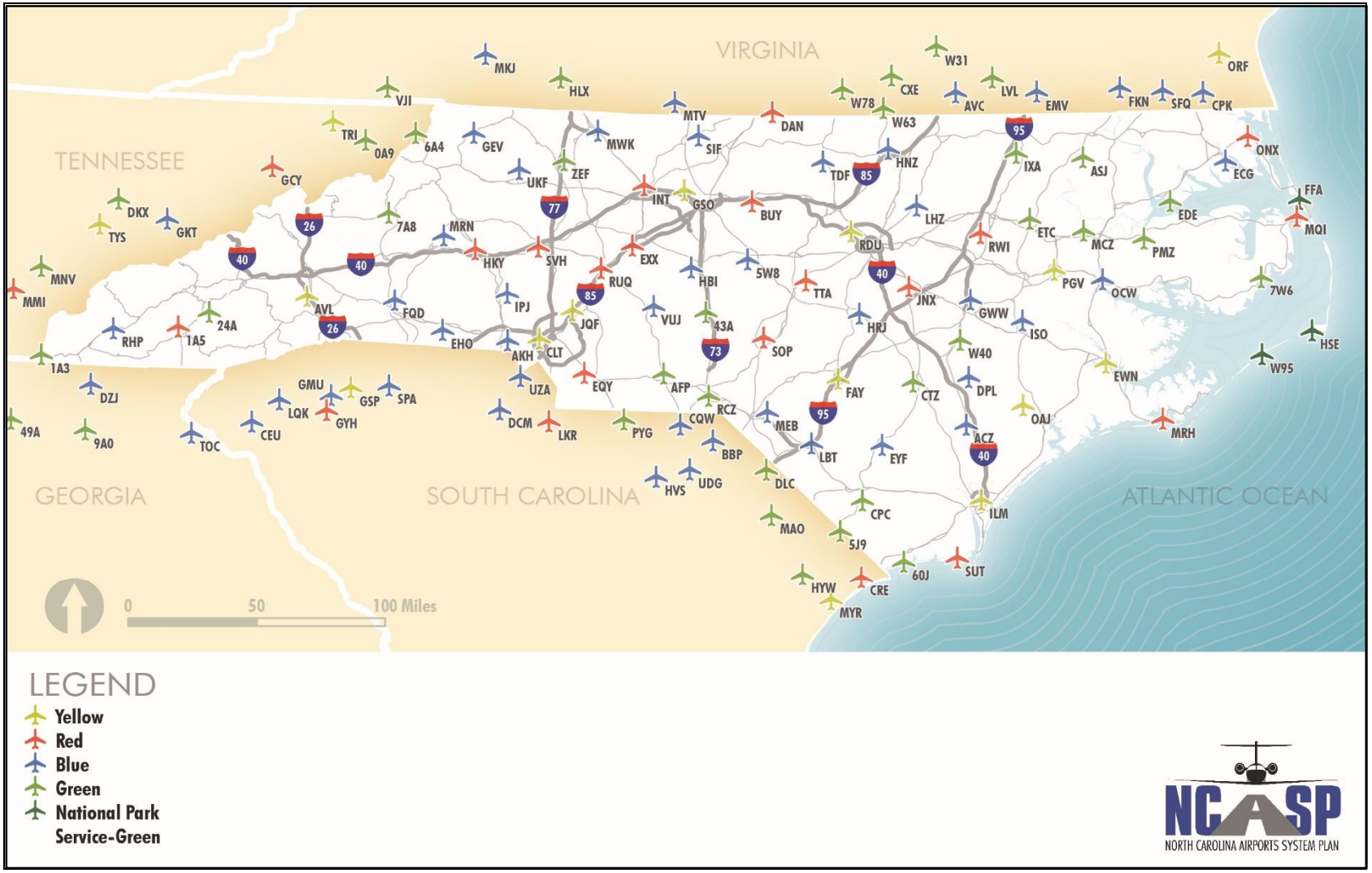
Table 6.7: Out-of-State Airports Considered for Additional Coverage in North Carolina

Associated City	Airport Name	Code	Relevant Airport Grouping
Georgia			
Blairsville	Blairsville*	DZJ	Blue
Toccoa	Toccoa Regional/ Letourneau Field	TOC	Blue
Dahlonega	Lumpkin County-Wimpys	9A0	Green
Ellijay	Gilmer County	49A	Green
South Carolina			
Greer	Greenville Spartanburg International	GSP	Yellow
Myrtle Beach	Myrtle Beach International	MYR	Yellow
Greenville	Donaldson Center	GYH	Red
Lancaster	Lancaster County- MC Whirter Field*	LKR	Red
North Myrtle Beach	Grand Strand*	CRE	Red
Bennettsville	Marlboro County Jetport – H.E. Avent Field*	BBP	Blue
Cheraw	Cheraw Municipal/Lynch Bellinger Field*	CQW	Blue
Chester	Chester Catawba Regional	DCM	Blue
Clemson	Oconee County Regional	CEU	Blue
Darlington	Darlington County Jetport	UDG	Blue
Greenville	Greenville Downtown	GMU	Blue
Hartsville	Hartsville Regional	HVS	Blue
Pickens	Pickens County	LQK	Blue
Rock Hill	Rock Hill/York Co/Bryant Field*	UZA	Blue
Spartanburg	Spartanburg Downtown Memorial*	SPA	Blue
Conway	Conway-Horry County	HYW	Green
Dillon	Dillon County*	DLC	Green
Loris	Twin City*	5J9	Green
Marion	Marion County*	MAO	Green
Pageland	Pageland*	PYG	Green
Tennessee			
Bristol/Johnson/ Kingsport	Tri-Cities Regional TN/VA	TRI	Yellow
Knoxville	McGhee Tyson	TYS	Yellow
Athens	McMinn County	MMI	Red
Greenville	Greenville-Greene County Municipal*	GCY	Red
Sevierville	Gatlinburg-Pigeon Forge	GKT	Blue
Copperhill	Martin Campbell Field	1A3	Green
Elizabethton	Elizabethton Municipal*	0A9	Green
Knoxville	Knoxville Downtown Island	DKX	Green

Madisonville	Monroe County	MNV	Green
Mountain City	Johnson County*	6A4	Green
Virginia			
Norfolk	Norfolk International	ORF	Yellow
Danville	Danville Regional*	DAN	Red
Emporia	Emporia-Greensville Regional*	EMV	Blue
Franklin	Franklin Municipal-John Beverly Rose*	FKN	Blue
Marion/ Wytheville	Mountain Empire	MKJ	Blue
Martinsville	Blue Ridge*	MTV	Blue
Norfolk	Chesapeake Regional*	CPK	Blue
South Hill	Mecklenburg-Brunswick Regional*	AVC	Blue
Suffolk	Suffolk Executive*	SFQ	Blue
Abingdon	Virginia Highlands	VJI	Green
Chase City	Chase City Municipal*	CXE	Green
Clarksville	Lake Country Regional*	W63	Green
Galax Hillsville	Twin County*	HLX	Green
Kenbridge	Lunenburg County	W31	Green
Lawrenceville	Lawrenceville/Brunswick*	LVL	Green
South Boston	William M Tuck*	W78	Green

Source: Parsons Brinckerhoff
Note: *Out-of-state airports providing 30 minute drive time coverage of North Carolina population

Figure 6.7: North Carolina and Out-of-State Airports Considered for 30-minute Drive Time Coverage



Source: Parsons Brinckerhoff GIS Analysis

The analysis of out-of-state airport coverage was considered relative to the coverage provided by North Carolina's airports, with the out-of-state airports assigned to a role grouping similar to that used for North Carolina airports (Yellow, Red, Blue, Green). Role categories were assigned based on whether or not they had commercial service and the length of their primary runway compared to the ADP objective for runway length in the NCASP. Through GIS analysis, an additional 57,500 North Carolina residents were found to be within 30-mintue drive times of out-of-state airports. However, this did not significantly change the performance percentage for this measure, as it remained at 94%.

Table 6.8 shows the percentage of North Carolina's population that is located within a 30-minute drive time of a North Carolina or nearby out-of-state airport.

Table 6.8: Percent of Statewide Population within a 30-Minute Drive Time of Airports (both in and out-of-state), by Role Grouping

Airport Group	% of North Carolina Population Coverage by Individual Grouping	% of Cumulative North Carolina Population Coverage
All System Airports	94%	
Yellow	52%	52% (Yellow Only)
Red	45%	74% (Yellow + Red)
Blue	35%	90% (Yellow + Red + Blue)
Green	12%	94% (Yellow + Red + Blue + Green)

Source: Parsons Brinckerhoff GIS Analysis

It remains that 52% of the state's population is within a 30-minute drive time of a Yellow airport and has access to commercial airline service within North Carolina. No Yellow out-of-state airports were within a 30-minute drive time of North Carolina.

When 30-minute drive times of Red airports are added to the coverage provided by Yellow airports, 74% of the state population is now covered (see Figure 6.8). Figure 6.9 presents the coverage provided by airports when the 30-minute drive times of Blue airports are added. Ninety percent (90%) of the state population is located within a 30-minute drive time of both in and out-of-state Yellow, Red, and Blue airports. When the Green airport drive times are included, 94% of the statewide population is located within a 30-minute drive time of an airport in the North Carolina system and those in adjacent states (Georgia, South Carolina, Tennessee, and Virginia). Figures 6.10 and 6.11 show the population within 30-minute drive time coverage for all airports evaluated in North Carolina and out-of-state.

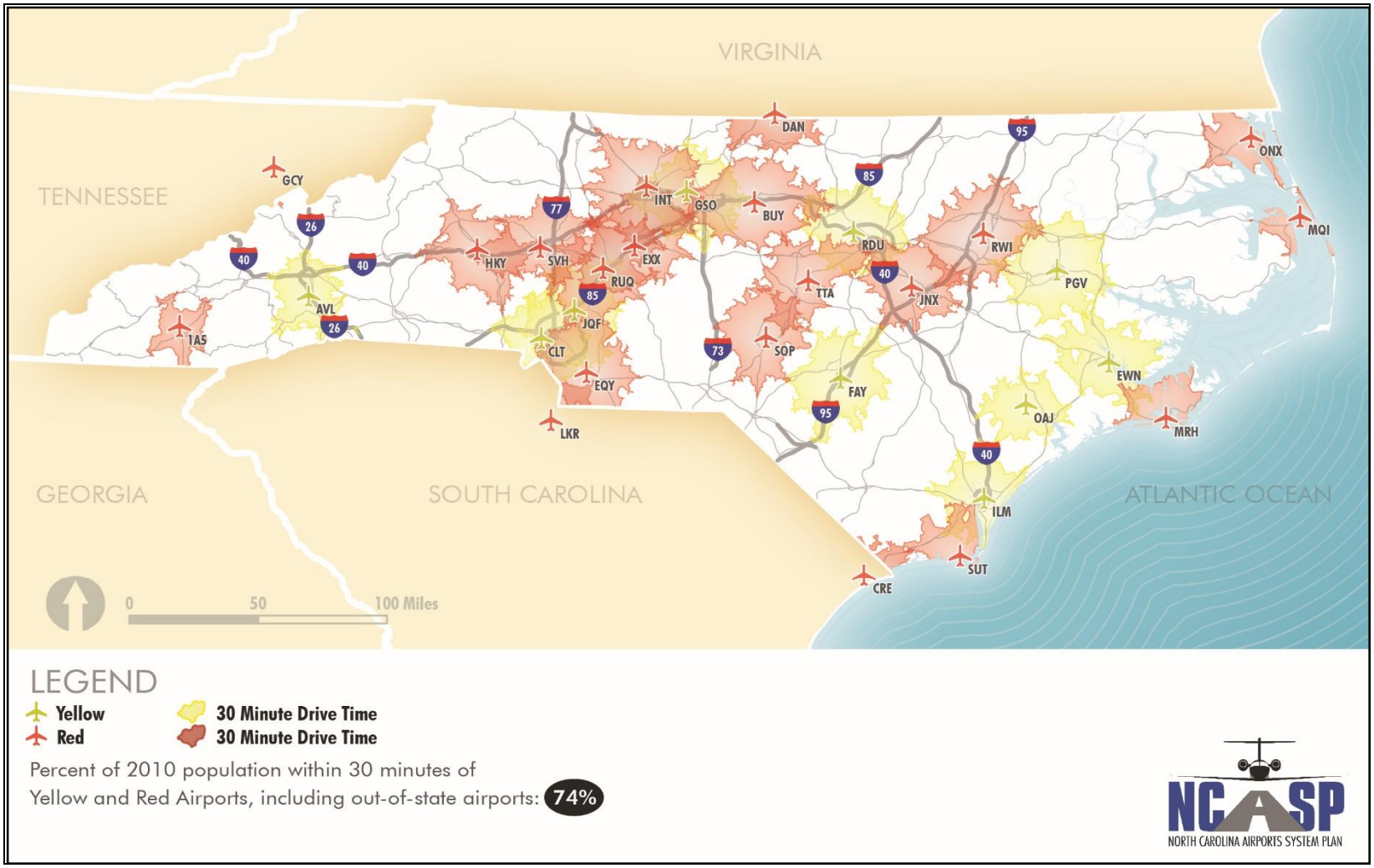
Military Restricted Airspace and Population Coverage

One important consideration that should be noted is that there are multiple areas within North Carolina where there is restricted airspace due to a military operations area (MOA) or other restrictions associated with a military establishment. An MOA is airspace designated outside of Class A airspace to separate or segregate certain nonhazardous military activities from IFR traffic and to identify where these activities

are conducted for VFR traffic.[18] The MOAs and other military-associated special use airspaces that exist in North Carolina are depicted in Figure 6.12. In these areas, there will be restrictions to both ground and airspace, and thus coverage to these areas within the state are reduced, even though there are likely lower population levels other than military installations. This is likely the case for the northeastern part of the state where there are multiple military special use areas and where Figures 6.10 and 6.11 depict lower amounts of coverage.

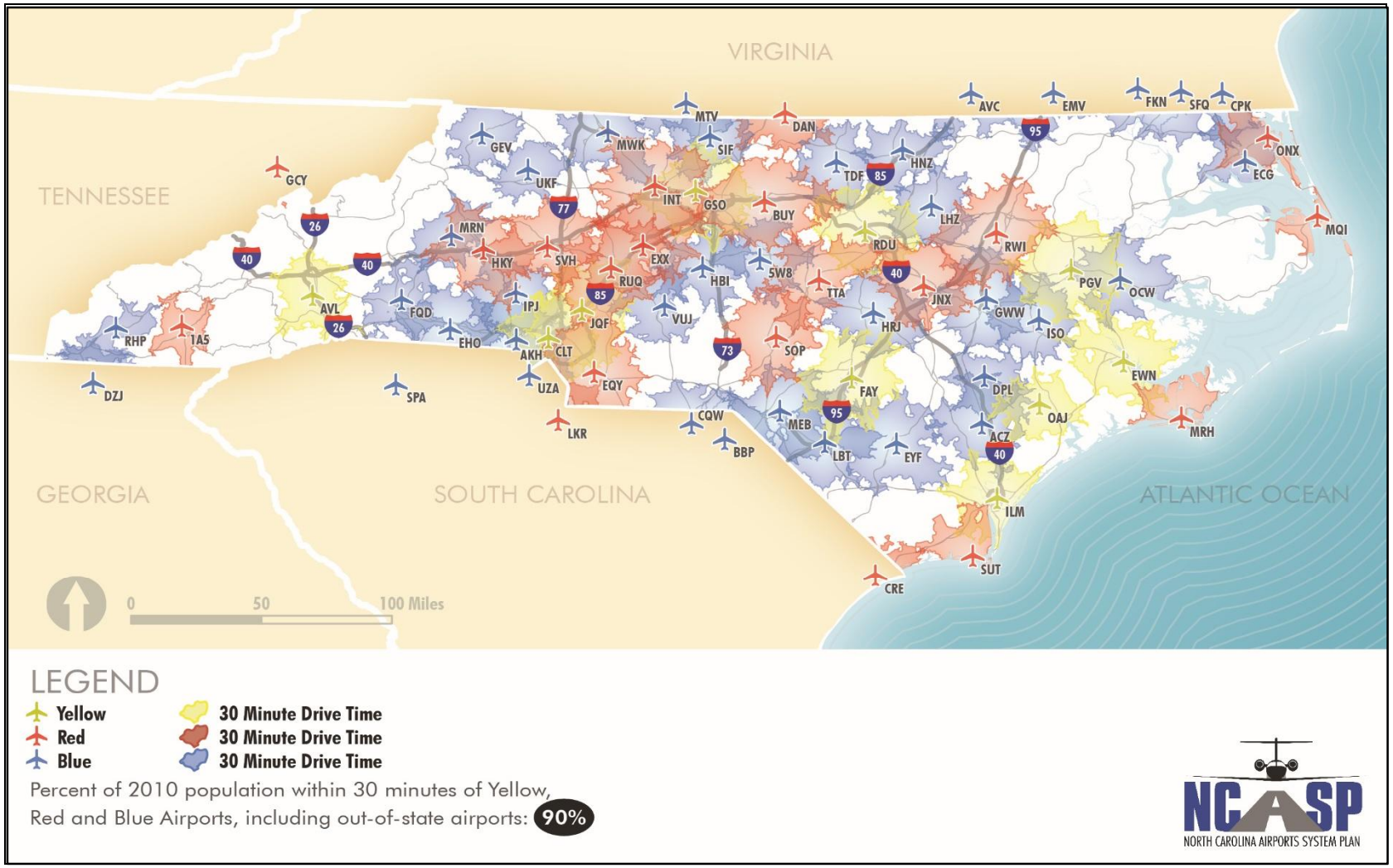
[18] US DOT. Military Operations Areas. Order JO 7400.2K. Effective April 3, 2014. Retrieved on June 5, 2014 from: http://www.faa.gov/air_traffic/publications/atpubs/AIR/air2501.html

Figure 6.8: Percent of Population within 30-Minute Drive Times of Yellow and Red Airports including Out-of-State Airports



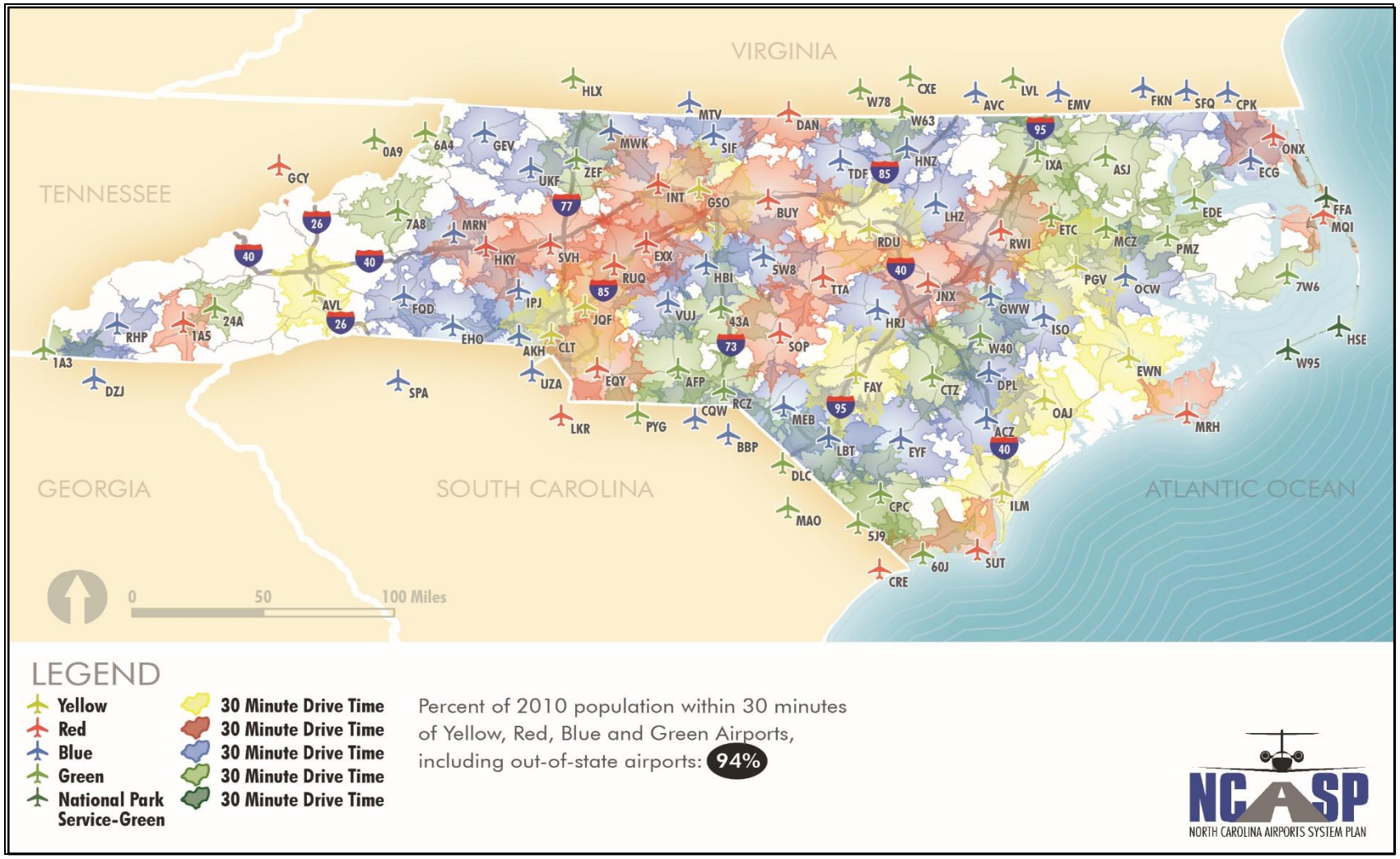
Source: Parsons Brinckerhoff GIS Analysis

Figure 6.9: Percent of Population within 30-Minute Drive Times of Yellow, Red, and Blue Airports including Out-of-State Airports



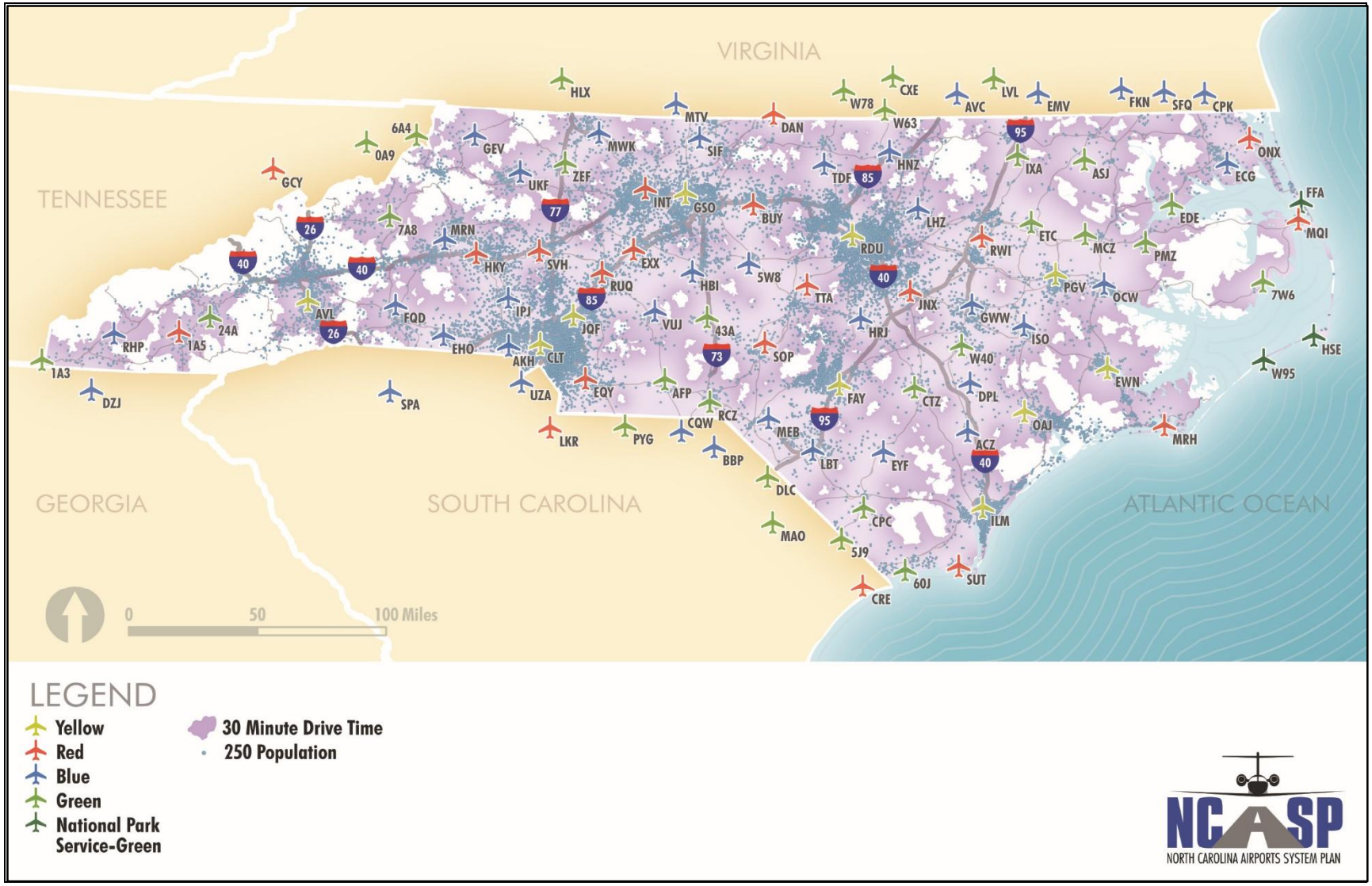
Source: Parsons Brinckerhoff GIS Analysis

Figure 6.10: Percent of Population within 30-Minute Drive Times of Yellow, Red, Blue, and Green Airports including Out-of-State Airports



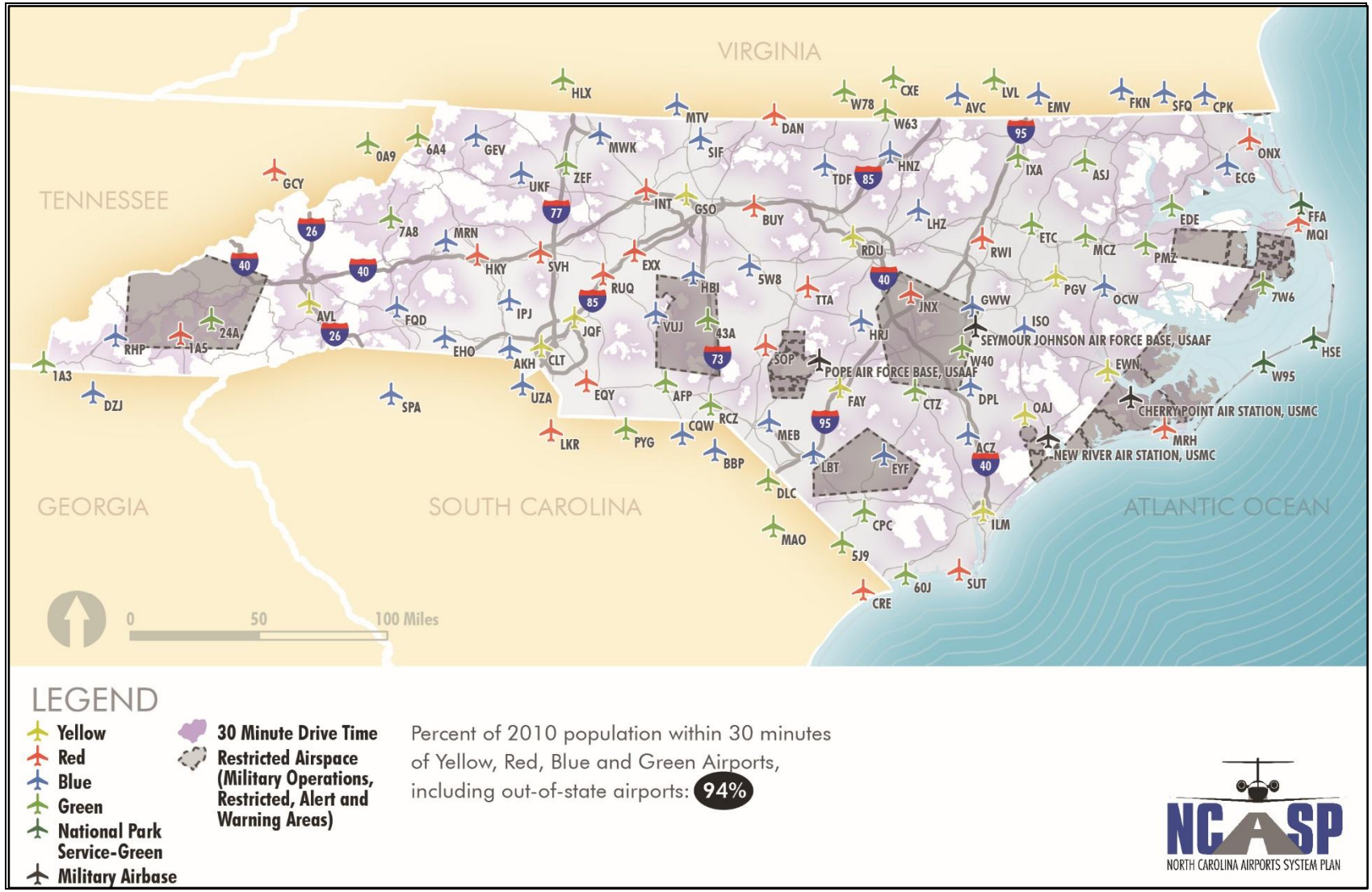
Source: Parsons Brinckerhoff GIS Analysis

Figure 6.11: State Population Density with respect to Airport Coverage



Source: Parsons Brinckerhoff GIS Analysis

Figure 6.12: Military Restricted Airspace as Compared to 30-Minute Drive Time Population Coverage



Source: Parsons Brinckerhoff GIS Analysis

Future Target Performance

The coverage and access provided by North Carolina and out-of-state airports to North Carolina's residents is considered high at 94%. In order to increase the performance, new airports would need to be added to the system. Private airports and other considerations related to new airports in North Carolina are discussed in a later chapter.

Percent of total employment/businesses within 30 minutes of a system airport

Existing Statewide Performance	Target Statewide Performance
97%	98%

Providing aviation access to employment centers and businesses is another key component of a well-rounded and accessible airport system. As discussed in Chapter 5, 97% of the state's identified employment is within a 30-minute drive time of a North Carolina system airport. Chapter 5 also examined businesses within the state with a propensity to utilize aviation in order to assess business-related demand on North Carolina's airport system. The previous analysis identified only 86 out of 3,900 businesses that were beyond a 30-minute drive time of a North Carolina airport.

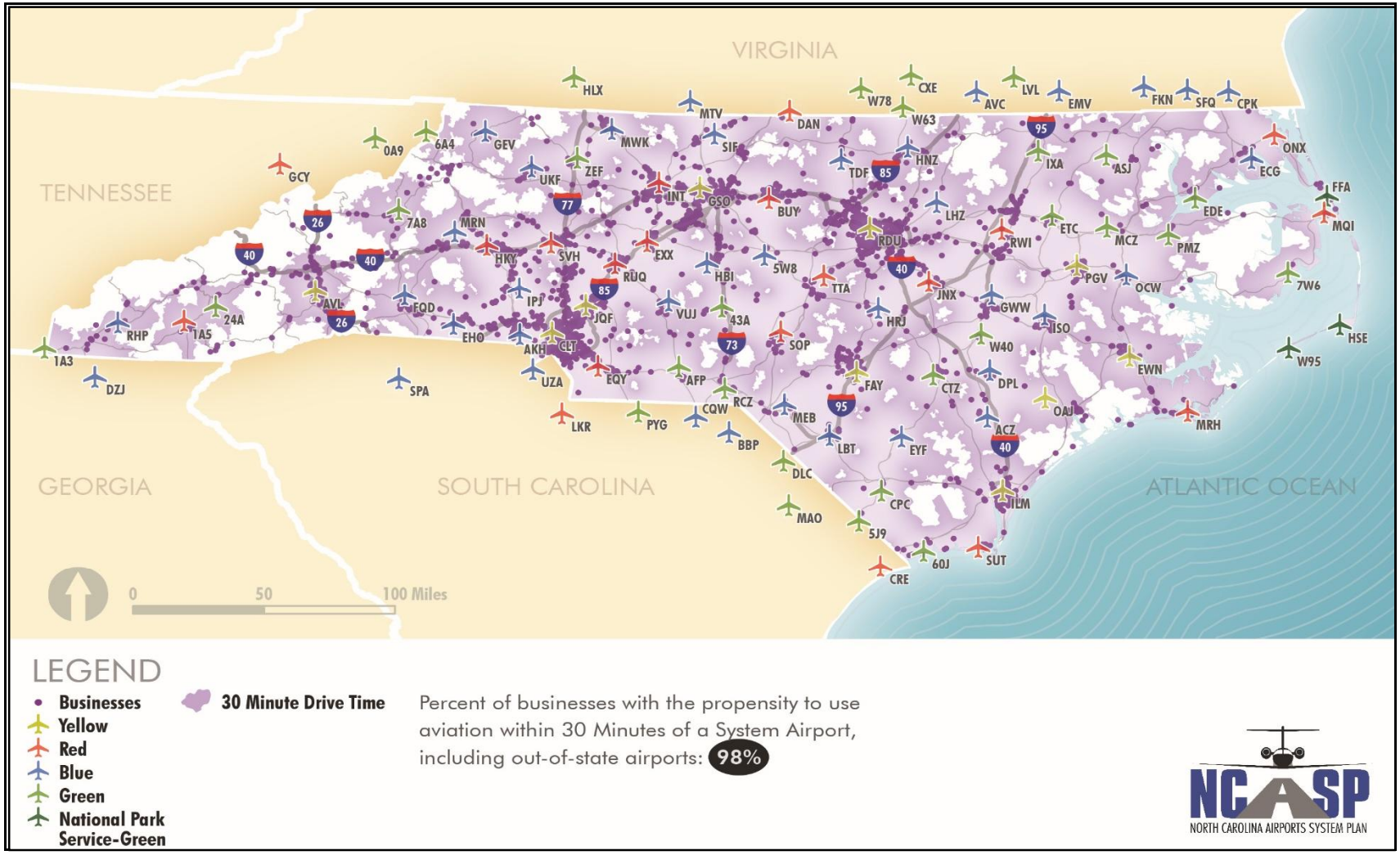
Out of State Airport Coverage to Improve Performance

As previously noted, airports beyond North Carolina's borders do provide access opportunities to some of North Carolina's residents as well as businesses. Figure 6.13 depicts the location of the 3,900 North Carolina businesses in relation to North Carolina and out-of-state airports with 30-minute drive times. Of these 3,900 businesses, only 86 were identified as being located outside of 30-minute drive time areas of North Carolina airports. The out-of-state airports provide coverage to an additional five businesses. This leaves 81 businesses that are just beyond the 30-minute drive time of any airport in or outside of North Carolina; the percent coverage is now 98%.

Future Target Performance

The coverage and access provided by North Carolina and out-of-state airports to North Carolina's employment centers and businesses is considered high at 98%. In order to increase the performance, new airports would need to be added to the system. Private airports and other considerations related to new airports in North Carolina are discussed in a later chapter.

Figure 6.13: Percent of Businesses with the Propensity to Use Aviation within a 30-Minute Drive Time of a North Carolina or Out-of-State Airport



Source: Parsons Brinckerhoff GIS Analysis

Percent of system airports with a published instrument approach procedure

Existing Statewide Performance	Target Statewide Performance
92%	93%

In Chapter 5, 92% of airports were identified as having a published instrument approach procedure.

Interrelationship with ADP Category Objectives

Even though 92% of the airports have a published instrument approach procedure, the NCASP's ADP objective is more detailed and identifies specific visibility minimums and decision height above touchdown objectives. As previously identified, only 56% of the airports currently meet their ADP approach objective for visibility minimums and decision height; in the near term, this will increase to 61% when four airports complete projects that are planned or in progress.

Future Target Performance

The future target for this performance measure for the North Carolina system is 93% compliance. A target of 93% means that all airports that can feasibly meet the performance measure so do, whether the approach meets the specific visibility minimums of the previously mentioned ADP objective or not. There are five airports for which the objective is not possible due to physical constraints, and thus they are not expected to be able to meet it. These airports include:

RED	GREEN
• Macon County	• First Flight • Odell Williamson Municipal • Avery County/ Morrison Field • Jackson County

Percent of population within 30 minutes of a system airport meeting business user needs (5,000' runway, jet fuel, approach (250' & 3/4m minimums), and ground transportation)

Existing Statewide Performance	Target Statewide Performance
77%	89%

The existing conditions analysis found that 77% of the population was served by the North Carolina airports that have existing business user characteristics.

Interrelationship with ADP Category Objectives

Based on previous analysis of ADP objectives, an additional 19 airports were identified as being able to implement improvements that will allow them to meet the features needed to support business user needs. With the addition of these 19 airports, a total of 88% of the North Carolina population will eventually be served by airports that have these characteristics.

Out of State Airport Coverage to Improve Performance

Further, a set of out-of-state airports were added to the analysis based on their location within a 30-minute drive time and their ability to meet the same characteristics for business user needs. From this analysis, the out-of-state airports provided coverage to an additional 76,500 people in North Carolina; however, the addition of these airports into the analysis only increased the performance of the measure to 89%.

Out-of-state airports that meet business user needs and were considered in the above analysis include the following:

South Carolina:

- Marlboro County Jetport- H.E. Avent Field (BBP)
- Cheraw Municipal/Lynch Bellinger Field (CQW)

Tennessee:

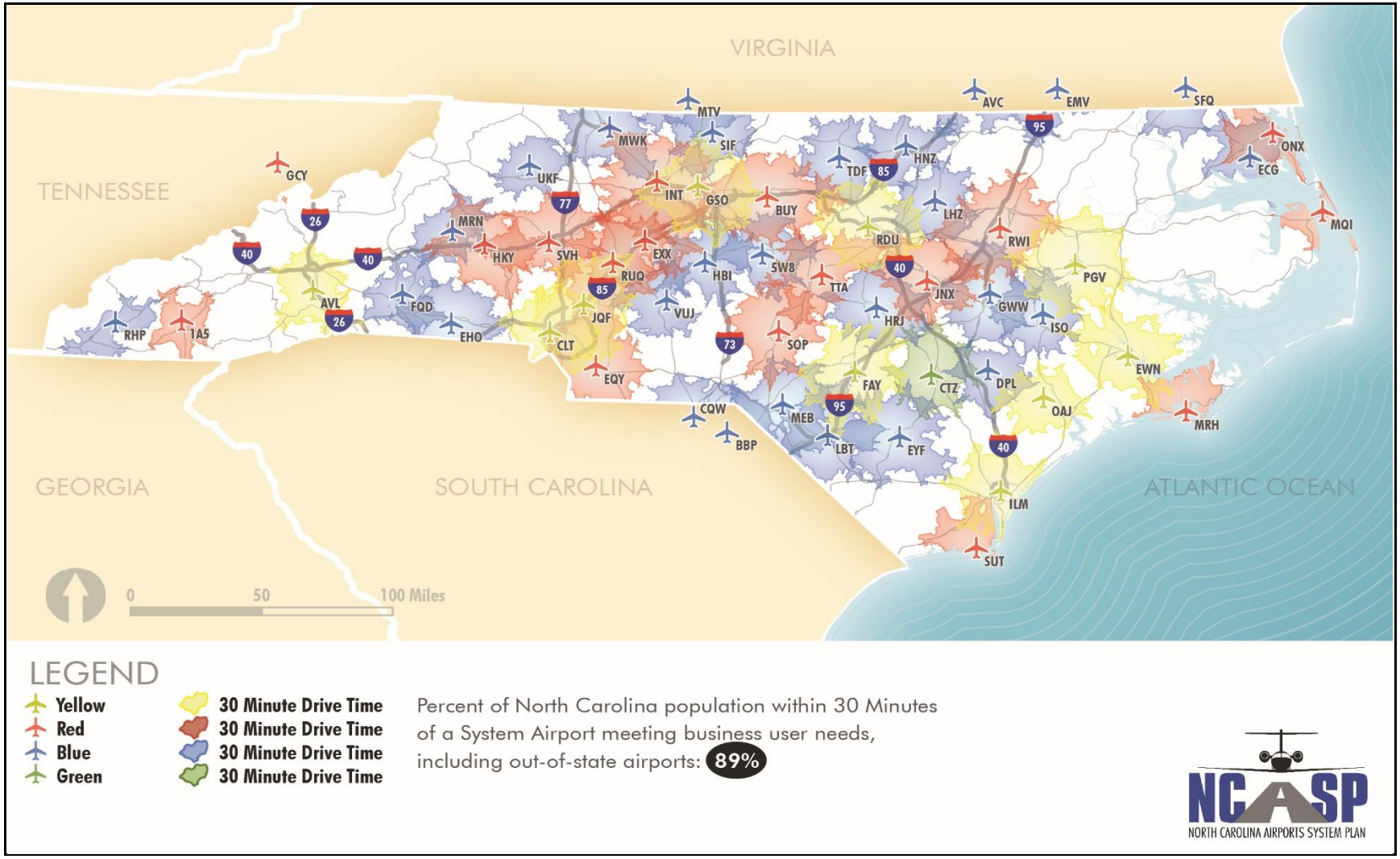
- Greeneville-Greene County Municipal (GYC)

Virginia:

- Emporia-Greensville Regional (EMV)
- Blue Ridge (MTV)
- Mecklenburg-Brunswick Regional (AVC)
- Suffolk Executive (SFQ)

Figure 6.14 presents the North Carolina and out-of-state airports that meet the specific needs of business aviation and their respective 30-minute drive times.

Figure 6.14: Percent of Population within 30 minutes of a North Carolina or Out-of-State Airport Meeting Business User Needs



Source: Parsons Brinckerhoff GIS Analysis

Future Target Performance

The coverage and access provided by North Carolina and out-of-state airports for business aviation is considered high at 89%. In order to increase the performance, new airports would need to be added to the system. Private airports and other considerations related to new airports in North Carolina are discussed in a later chapter.

Percent of population within 60 minutes of a system airport with commercial airline service by at least one airline.

Existing Statewide Performance	Target Statewide Performance
89%	89%

Access to an airport with commercial air service is essential to North Carolina residents, visitors, and businesses. There are presently 10 airports in North Carolina with scheduled commercial service as of April 2014, which make up the Yellow airport grouping. The existing conditions analysis found that 89% of the state's population was within a 60-minute drive time to a Yellow airport.

Out of State Airport Coverage to Improve Performance

Airports from Georgia, South Carolina, Tennessee and Virginia were also considered as they provide service to North Carolina's residents. The following out-of-state airports have commercial airline service and were considered for the above analysis:

South Carolina:

- Greenville Spartanburg International (GSP)
- Myrtle Beach International (MYR)

Tennessee:

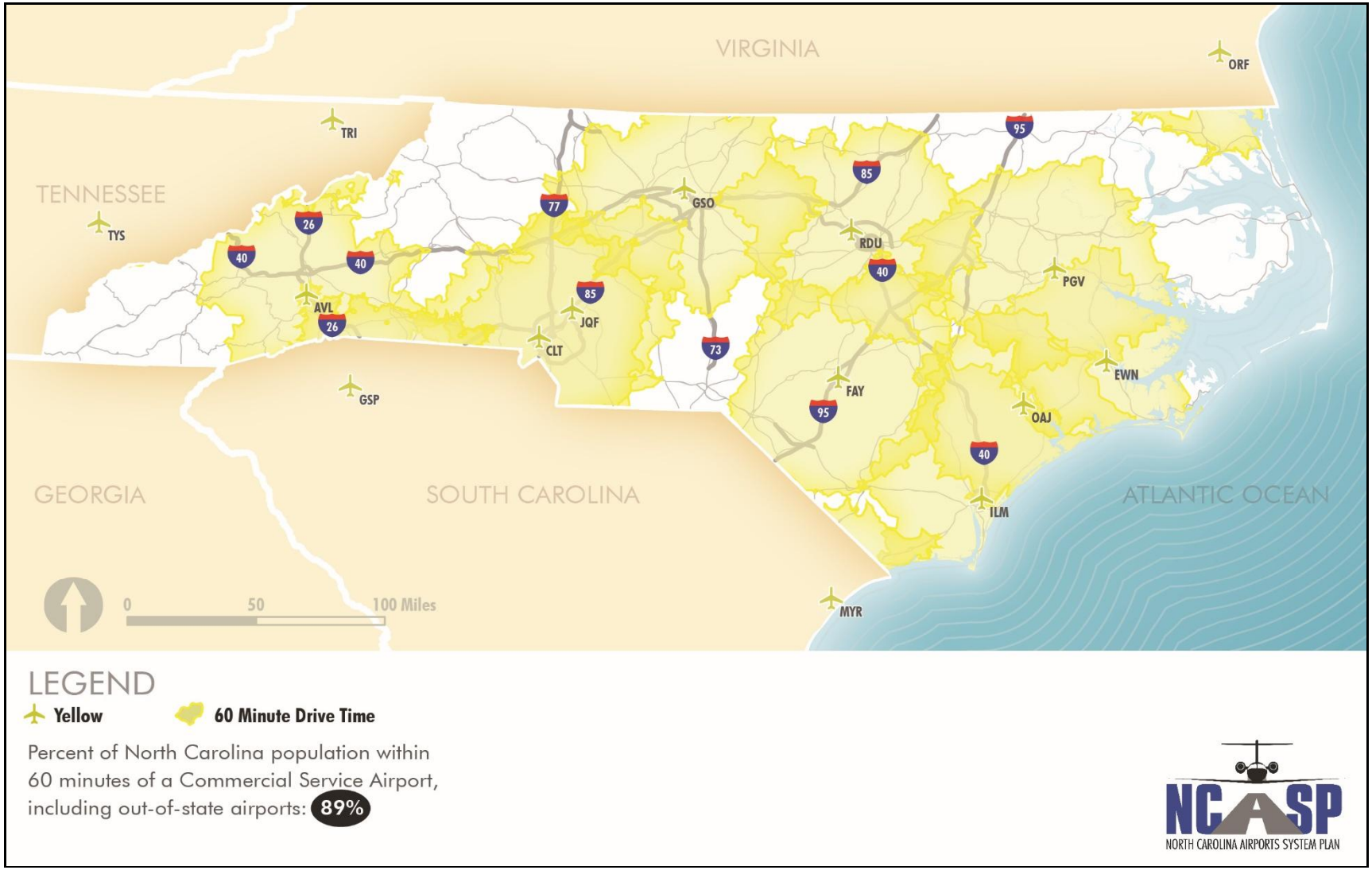
- Tri-Cities Regional TN/VA (TRI)
- McGhee Tyson (TYS)

Virginia:

- Norfolk International (ORF)

With these out-of-state airports, an additional 83,500 people in North Carolina had access to a commercial service airline within 60 minutes; however, this did not change the performance of this measure, with 89% of the population being served. Figure 6.15 shows the 60-minute drive times of Yellow airports both in North Carolina and out-of-state.

Figure 6.15: Percent of Population within a 60-Minute Drive Time of a North Carolina or Out-of-State Airport with Commercial Airline Service (Yellow Airport)



Source: Parsons Brinckerhoff GIS Analysis

Future Target Performance

The coverage and access provided by North Carolina and out-of-state airports for commercial airline service is considered high at 89%. In order to increase the performance, new airports would need to be added to the system. Private airports and other considerations related to new airports in North Carolina are discussed in a later chapter.

Percent of system airports that provide intermodal options for their community, including public transportation interfaces at the airports

Existing Statewide Performance
N/A

Target Statewide Performance
Informational

Airports in North Carolina have several intermodal options, including ferry service, to provide access for visitors and employees going to or from North Carolina's airports. It is not feasible for all airports to accommodate public transportation and intermodal options, but the analysis indicated that many airports have these options.

Future Target Performance

For the future expansion of the airport system, the presence of an integrated public transportation system that services the state airports is encouraged as it will support future growth and development of the airport system and the local communities. Providing unique forms of transportation, such as an Outer Banks ferry service, would help airports comply with this performance measure and increase both the economic and public value of the system.

Percent of system airports with 24/7 fueling

Existing Statewide Performance
91%

Target Statewide Performance
100%

In Chapter 5, 91% of airports were identified as providing 24/7 fuel, with three Blue and three Green airports failing to provide this level of service.

Future Target Performance

In the future, it is recommended that all airports have a supply of fuel that can be distributed to the public at any time. While type and distribution method was not considered previously, going forward both of these may need to be more closely considered when analyzing performance. With respect to fuel distribution, there are two options: 1) There is someone physically at the airport at all times to distribute the fuel (FBO-fueling); and 2) There are automatic pumps with card readers, similar to gas pumps, where aircraft operators can swipe a card and refuel the aircraft

themselves (self-serve). In many cases, operators of larger jets would be unwilling or unable to fuel their aircraft without proper equipment and training. In these cases, having a card-reading dispenser is insufficient, since operators would be unable to obtain the fuel, even though it is available 24/7. For airports that have a significant number of larger aircraft where this might be the case, it is recommended that a person is present at all times to assist in the refueling of these aircraft.

Similarly, airports that have a significant percentage of larger aircraft traffic should be providing jet fuel as opposed to AvGas (100LL). The presence of 24/7 fueling would be ineffective if many of the aircraft present are not provided with proper fuel. Thus, it is recommended that jet fuel be present at airports where it is appropriate. This is further discussed in the performance measure below (Percent of System Airports with Jet Fuel).

Percent of system airports with jet fuel

Existing Statewide Performance
88%

Target Statewide Performance
Informational

The existing conditions analysis found that 88% of system airports, including all Yellow, Red and Blue airports, offer jet fuel, which is an important necessity for many types of general aviation such as jet aircraft, agricultural sprayers, and rotary wing operators. Nine (9) Green airports do not provide jet fuel.

Future Target Performance

In the future, it is recommended that all airports have jet fuel available for aircraft that need it, but it is recognized that all airports may not have traffic necessary to support the availability of jet fuel. Because the objective is not applicable to all airports, there is no target performance for this measure.

Percent of system airports operating below 60% operational capacity

Existing Statewide Performance
100%

Target Statewide Performance
100%

As presented in Chapter 5, when airport operational capacities were calculated for 2031, none of the airports were projected to be operating at or above 60% of their capacity, and thus the target of 100% is met for this performance measure.

Percent of system airports meeting service objectives (FBO, pilot training, maintenance, charter, terminal amenities)

Existing Statewide Performance
N/A

Target Statewide Performance
Informational

In the existing analysis in Chapter 5, it was identified that all 72 airports within North Carolina provide public restrooms, and at least 63 of 72 (88%) provided the following services: FBO, courtesy/crew car, vending/food/beverage service, a pilot lounge, a conference room, a flight planning room, public internet access, and Wi-Fi. On the other hand, provision of services such as on-site rental car, aircraft charter, and a restaurant were provided by less than half of the airports.

Future Target Performance

In the future, it is recommended that airports provide these services to the extent that is possible and reasonable based on demand and the ability to justify the services. Therefore, no specific future target performance has been identified. Similarly, some of the services provide similar benefits, such as rental-car and courtesy car or food/beverage service and a restaurant. For smaller airports, it is not appropriate to have some of the more labor- and cost-intensive services. On the other hand, the busier airports should consider having many of these services, if it does not have them already. This would allow them to provide better service to the general aviation population as well as to the population as a whole in terms of revenue and job creation.

Percent of system airports that are incorporated in state and local comprehensive plans

Existing Statewide Performance
79%

Target Statewide Performance
100%

As part of the inventory effort, airports were asked whether or not they were included in local comprehensive plans. It was not asked whether an airport is included in local transportation plans or regional transportation plans, but inclusion in these planning documents is a key component in protecting and promoting airports. The analysis in Chapter 5 showed that 78% of system airports were aware of their inclusion in local comprehensive plans.

Future Target Performance

In the future, the target for this performance measure is to have 100% of North Carolina's airports be included in a local comprehensive plan. In addition to comprehensive plans, states and jurisdictions also develop transportation plans which

have similar goals but with a focus on transportation planning. These plans often provide long-range suggestions or recommendations for the expansion and maintenance of the transportation system and include considerations for all modes of transportation. Aviation should inherently be included in these plans on both the state and regional level and possibly on the local level. Federal, state, regional and local decision makers use these plans, and it is through them that capital projects are developed and included in the processes for funding or land acquisition for expansion. Just as it is important for airports to be included in comprehensive plans, airport managers should ensure that their Airport Layout Plan (ALP) is included in local, regional, and state-wide comprehensive transportation plans, with a target goal of 100% of North Carolina airports having ALPs included in this plans.

Summary

The North Carolina airport system's ability to meet current and target performance is summarized in Table 6.9. This chapter has identified where current improvements are planned or underway that will improve performance, as well as where improvements cannot be made for a variety of reasons. The next chapter examines the influence of aviation and non-aviation factors on the future system's ability to meet the long-term needs of North Carolina and will provide specific project and policy recommendations that will help the airports and the system achieve the target performance as identified in this analysis.

Table 6.9: Summary of Current and Target Performance

System Objective	Current Performance	Target Performance
Safety Performance Measures		
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.	N/A	100%
Infrastructure Health Performance Measures		
Percent of system airports that meet applicable FAA runway/taxiway separation design criteria on their runways for their current ARC.	88%	94%
Percent of airports meeting all mandatory items in ADP. (ALP / Part 77 Zoning / Minimum Standards Rules / Fire Extinguisher)	81% / 89% / 78% / 99%	Informational
Percent of airports meeting all system objectives in ADP.		

ADP 100: Runway Approach	N/A	100%
ADP 200: Runway Safety Area (RSA)	81%	100%
ADP 300: Runway Protection Zone (RPZ)	40%	100% of capable
ADP 400: Pavement Conditions (primary runway/ taxiway/ apron)	77% / 69% /61%	100%
ADP 500: Runway Length/Runway Width	68% / 79%	85% / 100%
ADP 600: Pavement Strength	79%	100%
ADP 700: Visual Navigational Aids	44%	94%
ADP 800: Runway Edge Lighting	94%	94%
ADP 900: Weather Reporting Capability	85%	100%
ADP 1000: Standard Instrument Approach	57%	85%
ADP 1100: Taxiway	65%	98%
ADP 1200: Aircraft Apron	88%	100% to meet demand
ADP 1300: General Aviation Terminal Building	33%	100%
ADP 1400: Taxiway and Apron Edge Lighting	83%	94%
ADP 1500: Airfield Signage	50%	100%
ADP 1600: Ground Communication	58%	100%
ADP 1700: Approach Lighting	32%	85%
ADP 1800: ARFF Equipment / Mutual-Aid Agreement	33% / N/A	100% of Part 139 airports /100%
ADP 1900: Hangars	56%	100% based on demand
ADP 2000: Airfield Maintenance Equipment/Storage Building	48%	100% based on demand
ADP 2100: Perimeter Fencing	13%	100%
ADP 2200: Fuel Facilities (AvGas/Jet fuel/Self-serve fuel)	N/A	Determined on a case-by-case basis
Percent of system airports that are adequately accessible in terms of signage and wayfinding.	69%	100%
Mobility Performance Measures		
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.	N/A	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 (FBO, pilot training, maintenance, charter/aircraft rental, terminal amenities).	N/A	Informational
Percent of system airports that are incorporated in local comprehensive transportation plans.	79%	100%

Source: NCASO analysis

Chapter 7 – Future System Recommendations and Program Implementation

Overview of Chapter

This chapter serves as the culmination of the North Carolina Airports System Plan (NCASP). With the analysis of the system's needs documented in previous chapters, both existing and future, the final step in the study is to identify recommendations, project costs and financial needs, and methods for implementation. Policy considerations and continuous planning are also elements of the recommendations.

In developing recommendations, analyses from previous chapters were considered as well as the need for changes to future airport groupings, the accessibility of the airport system, and the potential impact of influences outside the airport system.

Each performance measure, including the evaluation of the airport development plan (ADP) categories, was assessed related to potential projects or financial implications resulting from increasing the performance. These financial needs are summarized in general terms within this chapter, with full airport capital needs identified in a separate appendix.

The implementation of recommendations also has potential policy implications as it relates to the Division of Aviation's (DOA's) current priority rating system and funding programs. Other state programs were investigated and reviewed as part of the process to develop suggestions and considerations for updating North Carolina's priority rating system and existing funding programs and policies. It is important to note that the NCASP recommendations do not reflect a change in current policy or programs and do not constitute a commitment to funding either by the Federal Aviation Administration (FAA) or DOA.

In order to ensure that the NCASP continues to serve as a guiding document and part of a longer-term approach to planning for the system of airports, a continuous planning process is identified. This positions DOA to monitor the progress of the airport system and identify trigger points for updating elements of or the full NCASP.

Future Airport Grouping and System Impacts

Chapter Four summarized the process to update the airport groupings to reflect current conditions. The airport groupings process relies on a spreadsheet model that utilizes county-level economic data and a formula established by DOA in 2004 to identify an airport's role or grouping within the state system. Since this process relies on specific available county-level data including population, annual per capital income, gross retail sales, and tourism revenues, which are then evaluated in terms of their "rank" amongst the North Carolina counties, it is difficult to use this model to project the future airport groupings or roles that the airports may serve. In order to project airport groupings into the future and the potential impact to system

recommendations, non-aviation factors, existing airport coverage, and FAA classifications were considered.

Outside Influences

Non-aviation factors can influence aviation demand and influence future airport groupings. These factors include areas of projected high population growth, major transportation infrastructure improvements, new intermodal connections, and statewide policies related to investment in specific areas that may impact the future airport system's needs. Information regarding potential future impacts through 2040 has been collected and summarized. The results of this research are presented below and graphically represented in Figure 7.1.

Roadway Projects

Across the state of North Carolina the highway system supplies access to all the major urban hubs. These urban hubs have fairly direct access via interstates to major cities in neighboring states. The travel routes make it possible for passengers and freight to move in to, out of, and around North Carolina with relative ease. New sections and improvements to highways will continue to entice travel along these corridors but will also stimulate new growth, both in urban hotspots and newly connected rural areas that may have an impact on the existing airport system. Listed below are the major roadway projects likely to progress within the next 20 years:

I-73; Detroit to Myrtle Beach via Greensboro

This route offers another good option for both passenger cars and freight trucks. It will be an alternative route heading north aside from I-77 and I-95.

I-74; Indianapolis to Wilmington

This route could drastically improve road travel time from Charlotte to Wilmington. Serving purposes from freight transport to hurricane evacuation, I-74 would be a far shorter route than the indirect access currently provided by I-40.

I-26; North from Asheville into Tennessee and to I-81

At present, there are limited options for traveling northbound from Asheville. The planned I-26 project would facilitate convenient access from Asheville to Tennessee and connect to I-81.

US-64/I-495 and Norfolk VA connector

This route would decrease travel times and relieve congestion between the Triangle area and the Port of Virginia in Norfolk.

Railway Projects

As airlines/airports and roadways in North Carolina continue to experience increased congestion, rail lines are becoming viable alternative options. Both freight and passenger lines have become more popular and efficient and will continue to impact other primary forms of travel. Passenger rail's key market is distances less than 400 miles; longer distances typically favor airlines. Listed below are potential freight and

passenger rail projects which may influence travel choices in the future for North Carolina. Projected completion dates for these projects range anywhere from one to 25 years:

Higher Speed Rail
Higher speed rail is anticipated to improve passenger travel times into the Northeast Corridor (Charlotte, Raleigh, Richmond, and Washington, DC). This will make rail more competitive with air travel and will be an attractive alternative to the highways by reducing the Raleigh to Washington, DC trip to about 4.5 hours as compared to over six hours by road today.

Higher Speed Rail Extension from Charlotte to Atlanta
Though still in the concept phase, this route which is considered an extension of the Southeast High-Speed Rail Corridor, has been studied and is being considered as an alternative travel route between these two major urban centers.

Light Rail System Extension in Charlotte providing access to the Charlotte-Douglas International Airport
The expansion of the LYNX light rail system to Charlotte-Douglas International Airport would provide beneficial travel options for residents and businesses in Charlotte.

Growth of Inland Ports
Inland ports have proven to be a very efficient way to move freight from seaports to inland locations that provide better connections to the interstate highway system. Offloading containers at seaports onto trains rather than trucks reduces roadway congestion and reduces truck/trailer related space at seaports, allowing ports to expand and improve efficiency. As ports become increasingly busy with more containers to distribute, the need for inland ports will grow. North Carolina's future plans for inland ports include:

- Expansion of existing inland port at Charlotte-Douglas International Airport
- Potential expansion of inland port at Greensboro (currently at capacity with limited opportunities grow near site)

Industry Growth

Along with the transportation improvements, industry is also expanding in North Carolina. A number of large companies are planning to add employment campuses in urbanized areas within the next couple years. Charlotte and its airport with its American hub has attracted new firms previously located in Cincinnati and served by Delta's hub at Cincinnati/Northern Kentucky International Airport. Since this airport's Delta hub was significantly reduced, Chiquita has relocated to Charlotte. It is expected that more firms will do the same in the near future. A few examples of other industry growth in 2014 are listed below:

- MetLife will be bringing approximately 1,300 jobs to Charlotte.
- Consumer Financial Services could bring up to 2,000 jobs to Winston Salem.
- Convergys, a customer and information management firm, may establish an office in Charlotte bringing upward of 1,600 jobs.

- Charlotte and Raleigh are on the list to get Google fiber internet which will provide new fiber-optic network at up to 100 times faster than basic broadband for $100 per month. This could be an additional attractor for new business in North Carolina.
- In 2014, the North Carolina Legislature passed a law allowing permits to be issued in 2015 for exploring shale gas potential in Triassic Strata of the Deep River Basin, located west of Raleigh. Assuming fracking operations are established in North Carolina, the use of general aviation airports should increase as they have in Pennsylvania and North Dakota due to the oil and gas industry.

State Policies and Areas of Investment

Anticipated state policies that are being considered and the areas of investment announced to date are summarized below:

Ports Authority and Global TransPark

North Carolina is considering moving the North Carolina Ports Authority and the North Carolina Global TransPark Authority to be under NCDOT. This has been studied by the Governor's Logistics Task Force and has been advertised as a future "One stop shop" logistics capability.

Improving local export of agricultural products

Agriculture is the largest industry in North Carolina. However, the current infrastructure necessary to transport these products to ports or storage facilities is lacking. Improving the infrastructure would benefit the North Carolina agriculture business as well as the shipping industry.

NGAT UAS Flight Locations in North Carolina

The NextGen Air Transportation (NGAT) Center at the Institute for Transportation Research and Education (ITRE) at North Carolina State University is a non-profit partnership with academia, industry, and the government and is focused on developing and evaluating improvements to existing and anticipated air traffic control, airspace management, airport and airspace system capacity, surface traffic management, and flight safety for unmanned aircraft systems (UAS)/remotely piloted aircraft (RPA). Its goals are:

1. Unify the UAS/RPA community across North Carolina
2. Develop a complete UAS lifecycle support capability native to North Carolina for statewide integration
3. Position North Carolina as a NextGen early adopter for FAA evaluations, technology fielding, and user deployment
4. Serve as a regional Knowledge Center for UAS and air transportation modernization activities

NGAT has already established UAS flight locations in North Carolina and have proposed several more across the state. They estimate that over 1,100 North Carolina jobs will be related to UAS by 2025.

Summary of Outside Influences

All of these outside influences are considered in the evaluation of the future airport system's needs, including airport categorization and future development. When combined as depicted on Figure 7.1, the potential impact of these influences as a whole is even greater.

Figure 7.1: Future Non-Aviation Influences that May Affect the North Carolina Airport System

Airport System Accessibility and Coverage

Chapter Six identified that 94 percent of the population in North Carolina is within a 30-minute drive of a system airport or a nearby out-of-state airport, as depicted in Figure 7.2. The coverage provided by each airport grouping individually, as well as cumulatively, is presented in Table 7.1.

Table 7.1: Percent of Statewide Population within a 30-Minute Drive Time of Airports (both in and out-of-state), by Role Grouping

Airport Group	Percent of North Carolina Population Coverage by Individual Grouping	Percent of Cumulative North Carolina Population Coverage
All System Airports	94 percent	
Yellow	52 percent	52 percent (Yellow Only)
Red	45 percent	74 percent (Yellow + Red)
Blue	35 percent	90 percent (Yellow + Red + Blue)
Green	12 percent	94 percent (Yellow + Red + Blue + Green)

Source: NCASP analysis

Even though 94 percent of the population has good access to an airport, there are clear coverage gaps within the state, especially in the mountainous areas in western North Carolina and in areas along the eastern coastline. The population within three of the larger coverage gaps was examined in order to get an estimation of how many people are not provided adequate coverage with the current airport system. The first area examined is in the west, south of I-40 and out of the range of Asheville Regional Airport (AVL). The estimated population in this area that is outside of any 30-minute drive time is 60,000 people. Similarly, it was estimated that 102,000 people live in the area north of I-40 but out of the 30-minute drive time to AVL; thus there are over 160,000 in the western part of the state that are not adequately served by the existing airport system.

In the eastern part of the state, there is one area where there is a significant population that lies outside of a 30-minute drive time. This area is in the southeast and is located between Albert J. Ellis Airport (OAJ) and Michael J. Smith Airport (MRH). It is estimated that 75,000 people in this area are outside of the 30-minute drive time from a system airport, and thus are considered without coverage. Airport accessibility or coverage can be important for reasons of health and safety of North Carolina citizens and also in situations that require evacuation or medical emergencies, thus, it is important to examine these coverage gaps to determine if there are ways to provide access to aviation services.

The availability of public-use heliports and helipads within the state was examined to see if these areas without coverage had access through this form of aviation. In North Carolina, there are 97 public-use heliports and helipads. The location of these is depicted in Figure 7.3. As shown, there are areas where a public-use heliport can fill some of the coverage gaps in the northwest portion of the state; however, there

are still some significant gaps where no form of aviation is available. The terrain in these areas may make building a new airport infeasible, so it recommended that heliport development be considered in strategic locations in order to provide the population with access to necessary aviation services.

The locations where a heliport may be considered exist mostly in the western part of the state in the mountainous region near the Tennessee border. Figure 7.4 shows general areas within North Carolina where heliports might be considered as a good alternative for improving coverage in the area. In these areas, the mountainous terrain and denser forests make it difficult to build an airport as well as operate aircraft given the height obstructions and obstructed visibility. Helicopters would be better suited to navigate the area and a heliport/helipad may be more feasible to construct and operate in these areas.

In the eastern part of the state near the coast, establishing heliports to improve coverage is less feasible and not recommended. First of all, as seen in Figure 7.4, much of the areas that have coverage gaps do so because of restricted military airspace. This is the case for the two largest coverage gaps in the eastern part of the state. Additionally, these areas are also the sites of current and future UAS testing (see Figure 7.1 above), which further reduces the feasibility of building any additional aviation facilities, including airports or helipads.

Figure 7.2: Percent of Population within 30-Minute Drive Times of System Airports and Nearby Out-of-State Airports

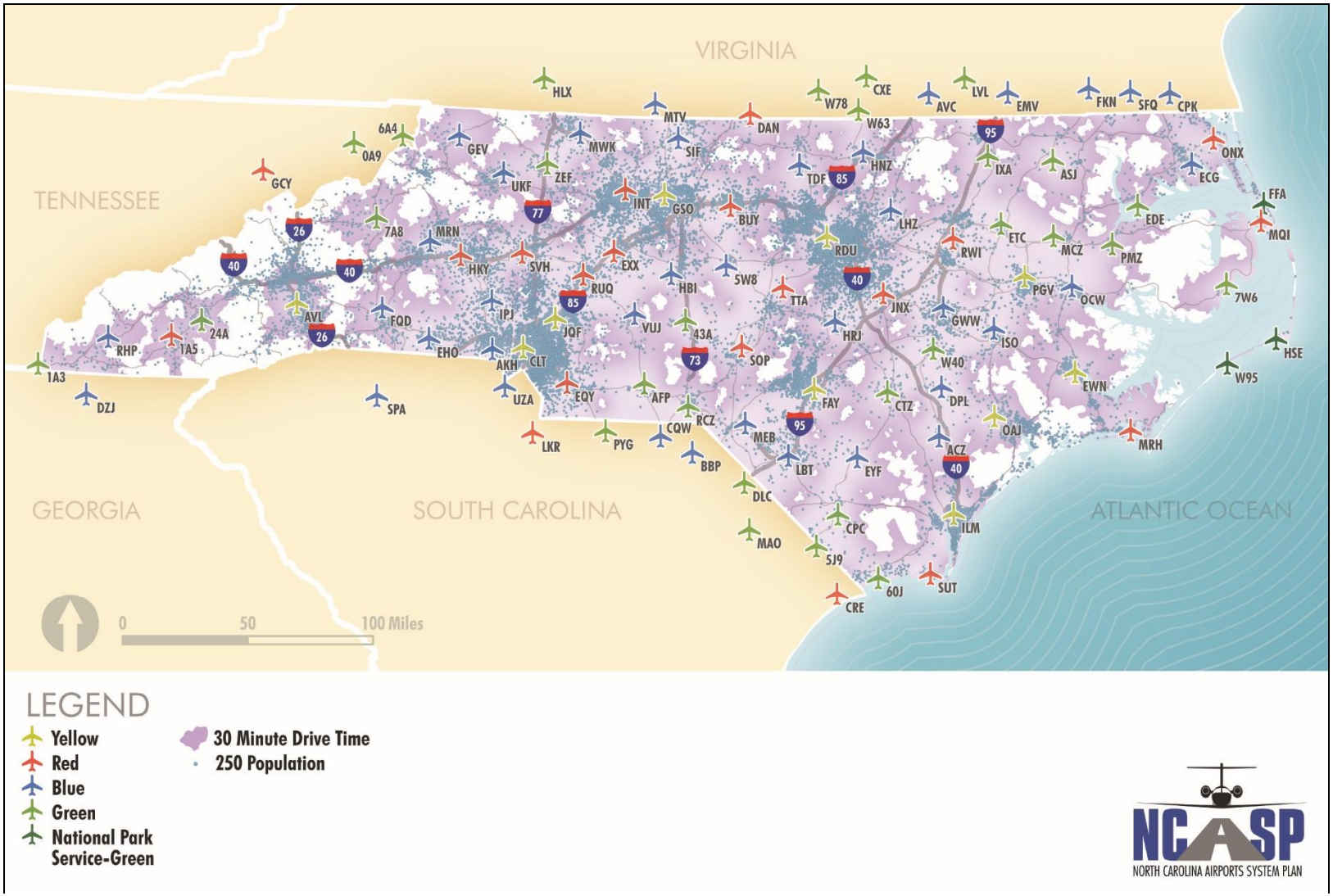


Figure 7.3: Public Use Heliports/Helipads in North Carolina with Respect to Existing 30-Minute Drive Time Coverage

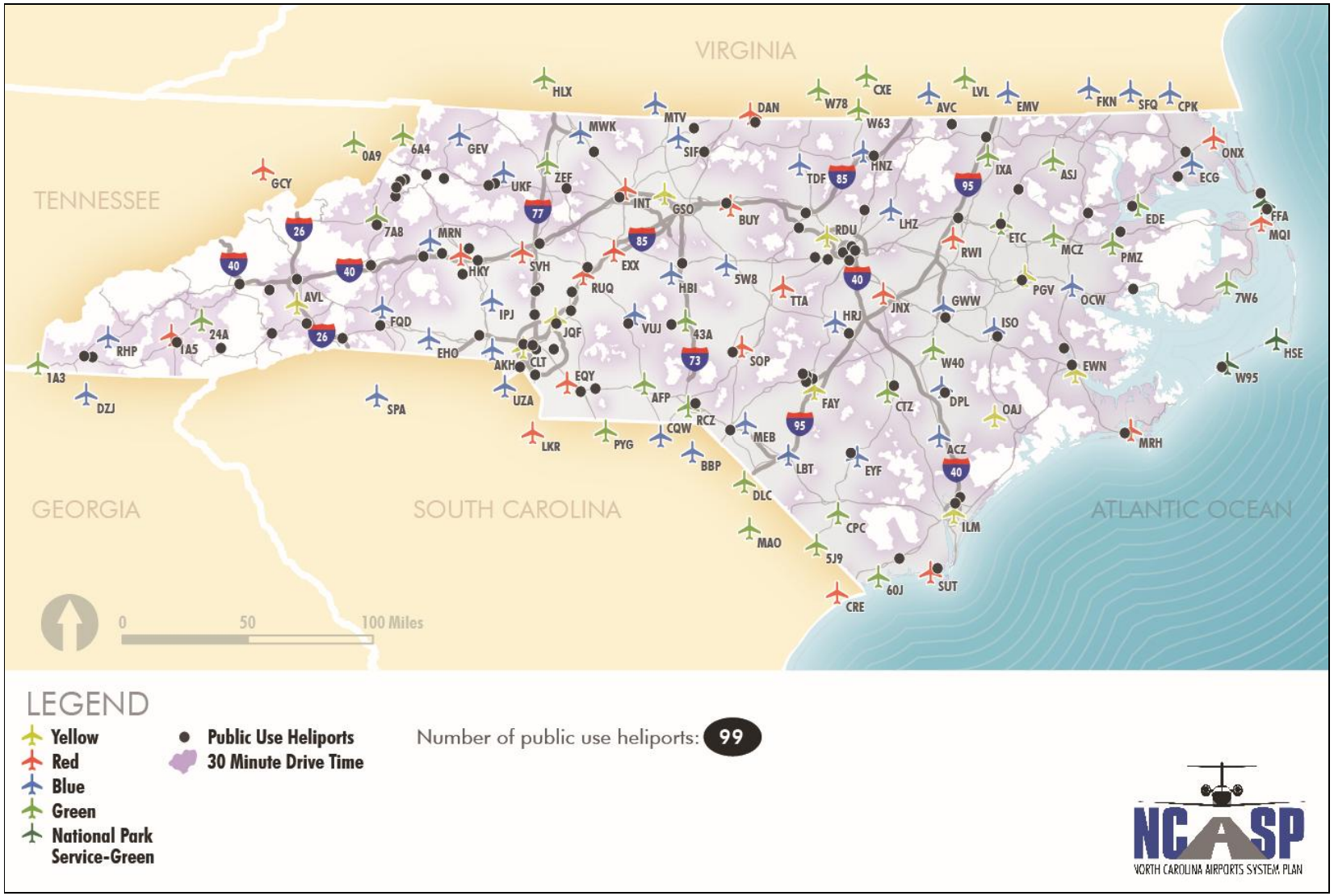
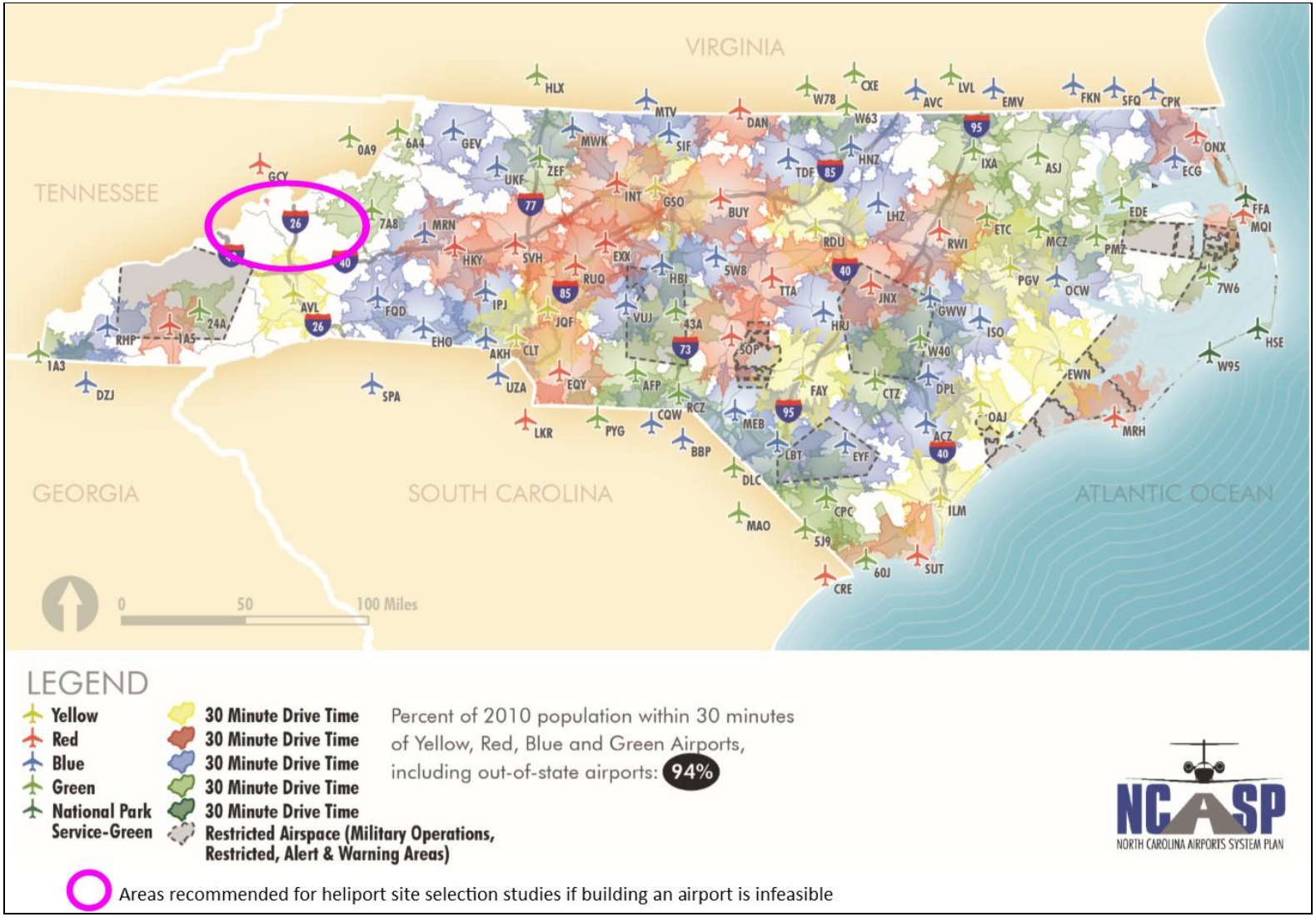


Figure 7.4: Locations where New Public Use Heliports/Helipads may Feasibly Improve Coverage



Coverage of Red Counties

In addition to areas where there are gaps in airport accessibility, there are other considerations for improving future coverage in North Carolina. Counties that have been identified and categorized as Red counties (those that have the highest socioeconomic performance) that do not currently have an airport were examined to determine if an airport should be considered or pursued in the future. The following Red counties do not currently have a public-use airport:

- Durham
- Orange
- Henderson
- Haywood

Durham County is part of the Raleigh metropolitan area and is within the general coverage area for Raleigh-Durham International Airport (RDU), an airport that serves a much larger area than the traditional 30 minutes' drive time due to the high level of both commercial and general aviation services provided. Therefore an additional airport was not considered in this county.

Similarly, Orange County, which is home to the City of Chapel Hill, is also within the Raleigh/Durham metropolitan area and largely within the general coverage area for RDU. There is an airport within Orange County, Horace Williams Airport (IGX), which has been scheduled to close by the University of North Carolina at Chapel Hill, its owner. The closure has been planned to accommodate construction of Carolina North, a major long-term expansion of the campus. As of 2015, the airport remains open but is not used on a regular basis and has limitations on the weight of the aircraft that can operate at the airport and on the type of aircraft based on its noise footprint. With the limited availability of this airport, there are no airports, public or private, that exist within Orange and Durham counties, and all aviation demand is addressed by RDU and other airports in the area such Burlington-Alamance Regional Airport (BUY), a Red airport in the Burlington metropolitan area (Alamance County) and Triangle North Executive Airport (LHZ), a Blue airport that exists 50 miles east of Chapel Hill.

There is some local support to re-establish Horace Williams as a public-use airport, and there have been multiple replacement/relocation studies completed in the region; however, there has not been a feasible alternative site found at this time due to constraints imposed by the existing land uses in the area and real estate values. With these existing barriers and accounting for the availability of RDU, which is anticipated to continue to adequately serve both general aviation and commercial aviation demand, it is not recommended that a new airport be constructed in Orange County.

Henderson County is in the southwest corner of North Carolina and borders South Carolina to the south and the mountainous National Forest to the west. It is located within the 30-minute drive time of AVL, which is a Yellow airport in adjacent

Buncombe County that provides commercial and general aviation services. Additionally, Hendersonville Airport, which is a highly active, private-use airport within the county, provides significant aviation services to the surrounding area. With these resources available, a new airport is not recommended in Henderson County.

Haywood County, which happens to be adjacent to Henderson County, has been identified as a location that will benefit from the establishment of enhanced aviation services. For one, its location along I-40 near the Tennessee border and will likely see increased growth due to the development of the future I-26 corridor in Asheville (see Figure 7.1). Similar to Henderson County, parts of Haywood County are within the 30-minute drive time of the Yellow airport AVL, yet the next closest airport is more than 50 miles away. One constraint in this area is the terrain, which makes the establishment of an airport less feasible. Given the current coverage gap in the area, the current level of population and activity (it is a Red county), and the future development that is anticipated due to the development of new infrastructure and economic opportunities, it is recommended that Haywood County be a priority area for a site selection study for a heliport (see Figure 7.4).

In addition to these four Red counties, other counties were examined that are in areas outside of current system coverage but where there is high growth potential or other reasons that an airport should be considered.

Watauga County, identified as Blue, in the northwestern part of the state is home of Appalachian State University, which is a constituent member of the University of North Carolina and currently enrolls over 17,000 students. The presence of the university spurs growth and economic development in the area for both larger institutions, such as the Appalachian Regional Medical Center and other associated institutions that may benefit from locating near a university as well as businesses and attractions that serve the population of students that reside there. While there is no airport today, it is recommended that the characteristics of Watauga County be monitored to determine if an airport is needed to serve the needs of the area.

It is recommended that the five counties mentioned above, as well as other counties that are found to have similar opportunities for growth and development, are monitored for triggers that would justify the consideration of a new airport or other facility to serve the aviation and economic needs.

Relocation and Replacements

Finally, in order to improve coverage and provide the aviation services that are most appropriate for each area within the state, there are three instances where it is recommended that a current system airport be fully replaced or significantly redeveloped. Gastonia Municipal Airport (Gaston County) is such an airport where complete replacement is recommended. The current location of the airport creates significant constraints to the operation, maintenance, and development of the airport, and the consequences of this are apparent in the airport's inability to meet many of

the NCASP ADP objectives for a Blue airport. It is recommended that alternative site selection studies should be undertaken and relocation of the airport be considered.

Another airport that is recommended for replacement is Odell-Williamson Municipal in Brunswick County, since its current location also provides too many constraints for it to provide the services that are necessary and meet the ADP for Green airports, as seen in this NCASP. A new location for this airport has not been identified yet, however, there is a strong desire to keep the airport within the town in which it is currently located.

Lastly, relocation of Avery County/Morrison Field, also a Green airport, is recommended. The airport's current alignment creates significant constraints to improving the airport's level of service, since surrounding development prohibits extending the runway and improving its approaches. This and other alternatives are being investigated for Avery County/Morrison Field. It is recommended that this effort be followed through in order to encourage the development of an airport that meets system goals and provides adequate aviation services for the surrounding communities.

In the cases of airports that are recommended for replacement, the DOA should encourage the process of site selection and potentially replacement. The analyses and results of the NCASP provide strong evidence to support the recommendations as they show that, in their current state, the airports are not, and in some cases, cannot meet the requirements of the system. The airports may not provide adequate levels of service or more importantly, may be failing to meet goals for safety, which should be of the highest importance for a public facility. In these cases, the DOA would need to consider financially supporting the status quo compared to the amount of money that would be required to bring the airport into compliance. There is a cost to maintaining the status quo and those funds could be used to fund a replacement airport which could yield a higher return-on-investment. Thus, for airports that are recommended for replacement, the DOA may decline to fund any large capital projects at the airports and may provide assistance only to maintain the airport for safety purposes, since it will take time for a replacement airports to be built, and in that time, the original airport must be operational and safe.

Consideration of Private Airports and NPIAS/ASSET Classifications

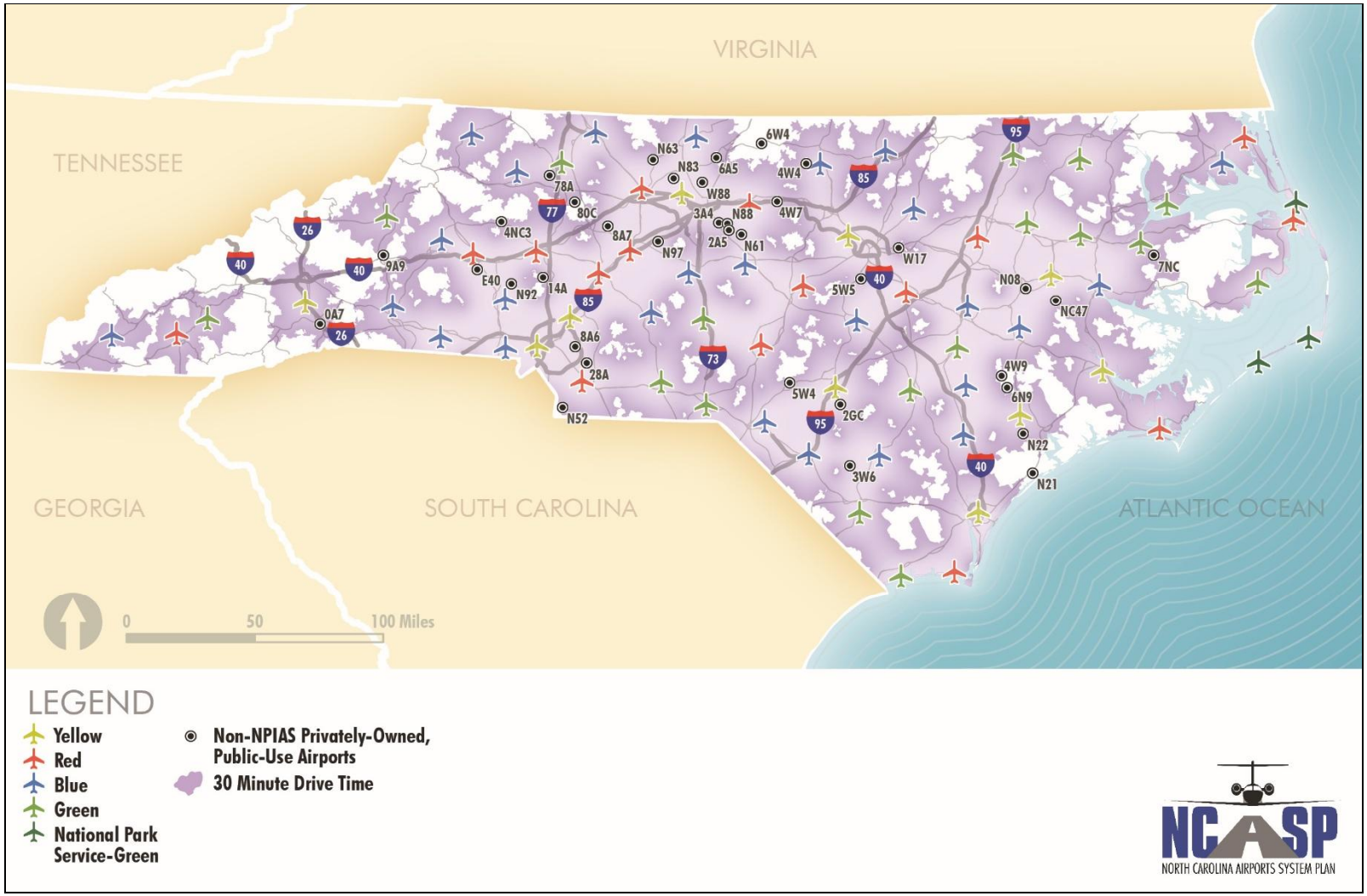
For areas of North Carolina that do not have an airport in the system, the private airports that are open for public-use were examined to determine if they could provide an option in those areas. Currently, none of North Carolina's privately-owned airports are included in the state or FAA's systems. For the most part, the FAA's National Plan of Integrated Airport Systems (NPIAS) has consisted of publicly-owned, public-use airports, although in some states there are privately-owned, public-use airports that have been deemed important to the state and national systems and have been included in the NPIAS. Airports included in the NPIAS have been determined to be of significance to the national air transportation system and are eligible to compete for federal funding from the FAA's Airport Improvement Program (AIP). In May 2012, the FAA published its General Aviation Airports: A National Asset

(ASSET) study further categorizing NPIAS general aviation airports, both publicly-owned and privately-owned, into four categories (National, Regional, Local, and Basic).[19] ASSET does not change the airport entry criteria into the NPIAS, but provides another description of general aviation airport roles and functions within the national system.

North Carolina has historically focused its funding and planning efforts on the publicly-owned, public-use airports. As part of the NCASP, the privately-owned, public-use airports were identified and their facilities summarized for purposes of viewing the state airport system holistically. Figure 7.5 depicts the location of North Carolina's existing 72 NPIAS public-use airports by North Carolina's role groupings and the 30-minute drive time coverage for each. It also shows the locations of the 36 privately-owned, public-use airports in the state. These airports were examined to determine if they meet the current FAA NPIAS criteria for inclusion and further consideration to fill gaps in coverage. The results of this examination are discussed later in this section.

[19] ASSET also contains an "unclassified" category wherein the FAA did not have sufficient data to determine the appropriate classification. Four North Carolina airports were originally unclassified. In a subsequent analysis of the unclassified airports in 2013, North Carolina only has one remaining unclassified airport, Tarboro-Edgecombe.

Figure 7.5: NPIAS and Non-NPIAS Privately-Owned Public Use Airport Locations



NPIAS and ASSET Eligibility Criteria

The FAA's criteria for an airport's inclusion in the NPIAS and ASSET are based on a variety of factors such as demand, geographic location, as well as other criteria. The following sections discuss the NPIAS and ASSET entry criteria. The FAA is considering combining these two sets separate criteria into one, but as of the time of this evaluation, no formal guidance has been published and the NPIAS criteria remain in place.

NPIAS Criteria

- *Airports formerly in the NPIAS* – Airports that were at one time included in the NPIAS, but have been eliminated from the program, are eligible for inclusion. These airports must meet other NPIAS criteria, however, such as a minimum level of based aircraft. An exception to this criterion includes airports not included in a State Airport System Plan or airports where it is clear that there no longer a continuing national interest in the airport.
- *Airport's location in relation to the nearest NPIAS airport* – An airport that is included in a State Airport System Plan may be included in the NPIAS if it has 10 or more based aircraft and serves a community located at least 20 miles or a 30-minute drive from the nearest existing or proposed NPIAS airport.
- *Reliever Airport* – An existing or proposed airport may be included in the NPIAS if it relieves airport congestion in a metropolitan area by providing general aviation users with an alternative landing location. The purpose of the reliever airport is to provide substantial capacity or instrument training relief.
- *Airports receiving U.S. Mail Service* – Any public airport where a scheduled air carrier transports mail to an airport or where an independent carrier, freight forwarder, FBO, etc. is under contract with the U.S. Postal Service (USPS) to carry mail may be included in the NPIAS. The airport must be adequate to satisfy the needs of the USPS.
- *Airports with a National Defense Role* – Any public-use airport where a unit of the Air National Guard or of a reserve component of the Armed Forces of the United States is permanently based or is adjacent to and who operates permanently assigned aircraft directly related to its mission is included in the NPIAS.

An existing or proposed airport that does not meet the criteria above may be included in the NPIAS if it meets all of the following:

- It is included in the State Airport System Plan,
- It serves a community more than 30 minutes from the nearest NPIAS airport,
- It is forecast to have 10 or more based aircraft within the short-term planning period (five years), and
- There is an eligible public sponsor willing to undertake the ownership and development of the airport.

Airports that do not meet any of the previously discussed entry criteria may be considered for inclusion in the NPIAS on the basis of a special justification. This justification must show that there is a significant national interest in the airport.

FAA ASSET Criteria

An existing or proposed public-use airport may be classified within ASSET's categories if it meets the following minimum criteria:

- 10+ based aircraft; OR
- 4+ based helicopters; OR
- Is located 30+ miles from the nearest NPIAS airport.
- Is used by US Forest, or US Marshalls, or US Customs and Border Protection, or US Postal Service, or has Essential Air Service; OR
- Is a new or replacement airport activated after 1/1/01; and
- Is a public or private "reliever" with a minimum of 90 based aircraft.

Evaluation Results

The 36 privately-owned public use airports in North Carolina were evaluated for potential inclusion into the NPIAS and ASSET and whether or not it could contribute to the system's coverage. It is important to note that all of these airports play a role in the national, state, and local economies, even though they are not included in either the North Carolina or FAA airport systems. They provide vital services and enhance the quality of life of their communities.

Utilizing data from a variety of sources including but not limited to the FAA, US Department of Agriculture-Forest Service, US Customs and Border Protection, US Marshalls Service, and US Postal Service, airports were analyzed to determine if they met the NPIAS and ASSET entry criteria discussed above. Table 7.2 shows the results of NPIAS entry criteria and Table 7.3 shows the results of the ASSET entry criteria.

None of the 36 privately-owned public use airports have been included in a previous NCASP and it is unknown if these airports have an eligible public sponsor at this time. When these two criteria are removed from the NPIAS criteria evaluation, two airports, Triple W and Raleigh East, both in the Raleigh metro area, meet the NPIAS entry criteria for based aircraft and distance (mileage and time). However, both airports are located very close to Raleigh International, Raleigh Exec-Jetport, Johnston County, Rocky Mount-Wilson Regional, Harnett Regional Jetport, and Triangle North Executive and fill very marginal gaps within the existing system. At this time, it is not recommended that these airports be considered for inclusion into the NPIAS.

Holly Ridge-Topsail Island Airport is the only airport that meets the entry criteria for both NPIAS (based aircraft and distance) and ASSET. The airport has a 3,600-foot long turf runway and is located between Jacksonville and Wilmington along US Hwy 17. Even though the airport meets the criteria and would help to fill a gap in coverage, it is not recommended that the airport be considered for inclusion in the NPIAS due to its close proximity to Camp Lejeune Marine Corp Base and location within the Hatteras Foxtrot Military Operating Area (MOA).

Finally, Tarboro-Edgecombe airport, although included in the NPIAS, is currently identified by ASSET as unclassified due to a reduction in based aircraft that left the

airport below the threshold. Since the airport was previously included in the system, it is recommended that it be examined annually to see if the airport statistics fulfill ASSET criteria and the airport can request for re-classification in ASSET.

Table 7.2: Privately-Owned Public Use Airports Meeting NPIAS Entry Criteria

Associated City	Airport Name	ID	Based Aircraft	Formerly incl. in NPIAS	Distance to Nearest NPIAS (mileage)	Distance to Nearest NPIAS (minutes)	Reliever	Incl. in SASP	Receive US Mail	National Defense Role
HENDERSONVIL	HENDERSONVILLE	0A7	45	NO	13	19	NO	NO	NO	NO
MOORESVILLE	LAKE NORMAN AIRPARK	14A	70	NO	19	29	NO	NO	NO	NO
INDIAN TRAIL	GOOSE CREEK	28A	25	NO	8	16	NO	NO	NO	NO
LIBERTY	CAUSEY	2A5	25	NO	14	19	NO	NO	NO	NO
FAYETTEVILLE	GRAYS CREEK	2GC	25	NO	10	13	NO	NO	NO	NO
GREENSBORO	SOUTHEAST GREENSBORO	3A4	40	NO	19	24	NO	NO	NO	NO
RALEIGH	TRIPLE W	5W5	18	NO	20	33	NO	NO	NO	NO
CHARLOTTE	WILGROVE AIR PARK	8A6	42	NO	16	21	NO	NO	NO	NO
MOCKSVILLE	TWIN LAKES	8A7	84	NO	19	25	NO	NO	NO	NO
WAXHAW	JAARS-TOWNSEND	N52	9	NO	17	26	NO	NO	NO	NO
WALNUT COVE	MEADOW BROOK FIELD	N63	10	NO	16	26	NO	NO	NO	NO
KNIGHTDALE	RALEIGH EAST	W17	31	NO	20	31	NO	NO	NO	NO
GREENSBORO	AIR HARBOR	W88	40	NO	10	19	NO	NO	NO	NO
BLADENBORO	BLADENBORO	3W6	56	NO	14	19	NO	NO	NO	NO
FARMVILLE	FLANAGAN FIELD	N08	9	NO	13	22	NO	NO	NO	NO
HICKORY	WILSON'S	E40	10	NO	10	17	NO	NO	NO	NO
HOLLY RIDGE	HOLLY RIDGE-TOPSAIL	N21	40	NO	31	38	NO	NO	NO	NO
HURDLEMILLS	WHITEFIELD FARMS	4W4	2	NO	5	11	NO	NO	NO	NO
JACKSONVILLE	SKY MANOR	N22	6	NO	15	21	NO	NO	NO	NO
JONESVILLE	SWAN CREEK	78A	3	NO	10	15	NO	NO	NO	NO
JULIAN	KECKS	N88	31	NO	13	16	NO	NO	NO	NO
LIBERTY	HINSHAW (GREENACRES)	N61	11	NO	20	25	NO	NO	NO	NO
MAIDEN	LANEYS	N92	1	NO	14	26	NO	NO	NO	NO
MARION	SHIFLET FIELD	9A9	1	NO	28	42	NO	NO	NO	NO
MEBANE	HURDLE FIELD	4W7	0	NO	13	17	NO	NO	NO	NO
OAK RIDGE	DS BUTLER FARM AND	N83	9	NO	10	17	NO	NO	NO	NO
PINK HILL	PINK HILL	4W9	4	NO	20	28	NO	NO	NO	NO
PLYMOUTH	DONALD'S AIRPARK	7NC	6	NO	14	20	NO	NO	NO	NO
POTTERS HILL	EAGLES NEST	6N9	5	NO	6	13	NO	NO	NO	NO
RAEFORD	PK AIRPARK	5W4	6	NO	22	37	NO	NO	NO	NO
REIDSVILLE	WARF	6A5	0	NO	15	23	NO	NO	NO	NO
TAYLORSVILLE	TAYLORSVILLE	NC2	5	NO	22	35	NO	NO	NO	NO
THOMASVILLE	HIATT	N97	4	NO	15	20	NO	NO	NO	NO
WINTERVILLE	SOUTH OAKS AERODOME	05N	16	NO	12	25	NO	NO	NO	NO
YADKINVILLE	LONE HICKORY	80C	22	NO	23	26	NO	NO	NO	NO
YANCEYVILLE	CASWELL	6W4	8	NO	17	20	NO	NO	NO	NO

Source: Marr Arnold Planning

Table 7.3: Privately-Owned Public Use Airports Meeting ASSET Entry Criteria

Associated City	Airport Name	ID	10+ Based Aircraft	4+ Based Helicopters	30+ Miles from Nearest NPIAS	Used by US Forest Service, US Marshalls, US Customs, US Postal Service, or has EAS	New or Replacement Airport since 01/01/01	Reliever with 90 based aircraft
HENDERSONVILLE	HENDERSONVILLE	0A7	YES	NO	NO	NO	NO	NO
MOORESVILLE	LAKE NORMAN AIRPARK	14A	YES	NO	NO	NO	NO	NO
INDIAN TRAIL	GOOSE CREEK	28A	YES	NO	NO	NO	NO	NO
LIBERTY	CAUSEY	2A5	YES	NO	NO	NO	NO	NO
FAYETTEVILLE	GRAYS CREEK	2GC	YES	NO	NO	NO	NO	NO
GREENSBORO	SOUTHEAST GREENSBORO	3A4	YES	NO	NO	NO	NO	NO
RALEIGH	TRIPLE W	5W5	YES	NO	NO	NO	NO	NO
CHARLOTTE	WILGROVE AIR PARK	8A6	YES	NO	NO	NO	NO	NO
MOCKSVILLE	TWIN LAKES	8A7	YES	NO	NO	NO	NO	NO
WAXHAW	JAARS-TOWNSEND	N52	NO	NO	NO	NO	NO	NO
WALNUT COVE	MEADOW BROOK FIELD	N63	YES	NO	NO	NO	NO	NO
KNIGHTDALE	RALEIGH EAST	W17	YES	NO	NO	NO	NO	NO
GREENSBORO	AIR HARBOR	W88	YES	NO	NO	NO	NO	NO
BLADENBORO	BLADENBORO	3W6	YES	NO	NO	NO	NO	NO
FARMVILLE	FLANAGAN FIELD	N08	NO	NO	NO	NO	NO	NO
HICKORY	WILSON'S	E40	YES	NO	NO	NO	NO	NO
HOLLY RIDGE	HOLLY RIDGE-TOPSAIL	N21	YES	NO	YES	NO	NO	NO
HURDLEMILLS	WHITEFIELD FARMS	4W4	NO	NO	NO	NO	NO	NO
JACKSONVILLE	SKY MANOR	N22	NO	NO	NO	NO	NO	NO
JONESVILLE	SWAN CREEK	78A	NO	NO	NO	NO	NO	NO
JULIAN	KECKS	N88	YES	NO	NO	NO	NO	NO
LIBERTY	HINSHAW (GREENACRES)	N61	YES	NO	NO	NO	NO	NO
MAIDEN	LANEYS	N92	NO	NO	NO	NO	NO	NO
MARION	SHIFLET FIELD	9A9	NO	NO	YES	NO	NO	NO
MEBANE	HURDLE FIELD	4W7	NO	NO	NO	NO	NO	NO
OAK RIDGE	DS BUTLER FARM AND	N83	NO	NO	NO	NO	NO	NO
PINK HILL	PINK HILL	4W9	NO	NO	NO	NO	NO	NO
PLYMOUTH	DONALD'S AIRPARK	7NC	NO	NO	NO	NO	NO	NO
POTTERS HILL	EAGLES NEST	6N9	NO	NO	NO	NO	NO	NO
RAEFORD	PK AIRPARK	5W4	NO	NO	YES	NO	NO	NO
REIDSVILLE	WARF	6A5	NO	NO	NO	NO	NO	NO
TAYLORSVILLE	TAYLORSVILLE	NC2	NO	NO	YES	NO	NO	NO
THOMASVILLE	HIATT	N97	NO	NO	NO	NO	NO	NO
WINTERVILLE	SOUTH OAKS AERODOME	05N	YES	NO	NO	NO	NO	NO
YADKINVILLE	LONE HICKORY	80C	YES	NO	NO	NO	NO	NO
YANCEYVILLE	CASWELL	6W4	NO	NO	NO	NO	NO	NO

Source: Marr Arnold Planning

Future Airport Grouping Consideration

As previously discussed, the analysis of airport groupings in Chapter Four utilized a quantitative process to evaluate the groupings. The data available at the time of the analysis was for 2010 and was county-level data. However, when considering the future airport groupings, quantitative information is not available (since it is considering future characteristics) and thus alternative types of information must be used to inform future roles, including the information presented in this section such as future outside influences, the current and anticipated coverage, and the status of private airports in the state. The following section identifies airports or locations within the state where it is recommended that a change in the airport role be considered in the future.

To improve coverage in the south-central portion of the state and in anticipation of growth that is likely to occur due to access to shale deposits and intersection of highways (see Figure 7.1), it recommended that at least one Green airport transition to Blue in that area. Based on location and existing services, Richmond County Airport (RCZ) or Anson County-Jeff Cloud Field (AFP) were identified as the best candidates for this increase in role or grouping. Richmond County has location constraints, such as an adjacent railroad, that would make it difficult for the airport to expand and provide the necessary facilities for a Blue airport. Thus, it is recommended that Anson County-Jeff Cloud Field undergo transition to be classified as a Blue airport. Anson County is a good candidate for role transition since it already has much of the necessary facilities and infrastructure to serve as a Blue airport. Further, Anson County had been categorized as a Blue airport in previous role groups and was only switched to Green for the NCASP because of the economic climate of the surrounding area; thus, the airport has been held to the standards of Blue airports before and will not require significant improvements.

The northeastern corner of the state currently has a gap in coverage when it comes to availability of Red or Blue airports. Currently, this is the case based on the current, mild economic climate of the surrounding region; however, the population in this part of the state currently has no options for aviation services greater than those provided by Green airports. Thus, it is recommended that Halifax-Northampton Regional Airport (IXA) be monitored for triggers to support it transitioning to a Blue airport. Halifax-Northampton already has many of the necessary facilities to support the transition, such as the airport's ILS and MALSR, both of which are not often found at Green airports. Going forward, if the region's economy changes and significant growth becomes evident or there is greater demand for enhanced aviation services, Halifax-Northampton should be supported to undergo role transition.

Finally, Pender County, which is situated near I-40 and the North Carolina coast line, has seen a lot of growth in tourism recently due to its coastal location near popular beaches. Currently, Henderson Field, which is a Blue airport, is located there, but there is concern as to the airport's ability to accommodate the future demand of the area based on the recent and projected growth in the county. In order to prepare for this potential growth in demand, it is recommended that the area development and

the associated airport demand be monitored as to identify opportunities that support the future transition of Henderson Field from Blue to Red in the future.

In addition to the specific recommendations listed above, it is also recommended that there be constant monitoring of the system airports and the state's growth and development to ensure that the airport system is providing adequate levels of service. Based on the information presented in this section, areas with high growth potential or high anticipated future demand should be monitored for triggers which would support actions such as airport role changes, airport expansion, or airport redevelopment. As was done for the NCASP, airport role groupings should be revisited every 10 year to ensure they adequately reflect the current status of each airport and county.

System Recommendations by Goal Category

Similar to previous chapters, recommendations related to each goal category and performance measure were examined. In some cases the recommendation is to identify projects and costs of those projects to improve the performance to the target established in Chapter Six. Projects are not the only recommendation and in some cases, it is not possible to accurately estimate the cost of improving the performance due to other issues. It is important to note that the NCASP recommendations do not reflect a change in current policy or programs and do not constitute a commitment to funding either by the Federal Aviation Administration (FAA) or DOA.

Goal Category: Safety

Percent of airports with controlling interest over the FAA design standard Runway Protection Zones (RPZs) for each runway end

Currently, 40 percent of system airports have identified that they have controlling interest over the land included in their runway RPZs. Since RPZs were established to protect people on the ground and in the air relative to airport operational activity, it is important that this performance be maintained at a minimum, and improved as possible, with a target of 100 percent of capable airports having control of their RPZs.

During the NCASP, information was obtained from the airports about control of the RPZ but no distinction was made regarding the central portion versus the controlled activity area of the RPZ (see Chapter Six for description and depiction of the RPZ). Also during the study, the RPZs for each runway end were overlaid on aerial photography to examine the general features within the existing RPZs, as well as potential future RPZs should projects identified in the NCASP such as runway extensions be sought. While helpful from a review standpoint, this information still does not provide information on the control by the airport, with no firm data on airport boundaries or control measures obtained for this study.

It is important to acknowledge that securing total controlling interest over RPZs, which could include more than 50 acres of land at a minimum, is difficult, expensive and sometimes not feasible. Many airports encounter both natural and man-made

barriers within their RPZ that limit their ability to own or control the property including adjacent private development, public roads, and bodies of water. Since some of these obstacles are unavoidable, going forward the DOA's primary focus when it comes to RPZs will be that the airport has controlling interest over the central portion of the RPZ, with an ultimate goal of controlling the entire RPZ. Methods such as acquiring land, removing non-compatible features, obtaining easements, and appropriate land use zoning will be sought to obtain control of existing RPZs.

In September 2012 the FAA issued its Interim Guidance on Land Uses within a Runway Protection Zone. The interim guidance provides clarification regarding compatible land uses and notes that the FAA understands that airports may not be able "to fully control land within the RPZ", but expects airports to "take all possible measures to protect against and remove or mitigate incompatible land uses." The FAA is in the process of developing new guidance documentation as well as updating its Land Use Compatibility Advisory Circular to include addressing RPZ control and land use compatibility. The most recent guidance documentation identifies a comprehensive RPZ review process, especially related to proposed land uses within an RPZ that would result either through a change to the airport's RPZ due to airport development (such as a runway extension or change in the approach procedure and minimums) or development by others within an RPZ that is not controlled by the airport. It is expected that all future projects will comply with this objective where the airport has controlling interest over all parts of their RPZs.

For purposes of the NCASP, it is recommended that DOA closely monitor the RPZs as it works closely with airports on future development. DOA project managers have direct relationships with airports and have an opportunity to encourage acquisition or other measures such as easements or land use zoning, to achieve control of the RPZ, ensuring that the performance does not decline and that RPZ control becomes a focus of the airports in the future.

Given the uncertainty of current information on airport control of RPZs and the wide variations in costs and ability of airports to acquire land or easements, airport-specific costs were not calculated for this performance measure; an estimate cost for the system based on generalized costs was calculated. It is important to note that projects to control RPZs should be supported by the DOA as they are submitted by airports, especially for the central portion. In the Financial Needs section of this chapter, three scenarios are provided to describe projects that might be needed to address RPZ issues, and costs for each of the scenarios were developed. The types of scenarios included low/minor which would involve only land acquisition, 'medium' which would involve land acquisition and road relocation, and 'high/major' which involve major reconstruction or relocation of infrastructure. An estimated cost for the system was established based on the number of airports that fit into each scenario.

Percent of system airports addressing wildlife issues

In previous chapters, it was identified that 100 percent of system airports have had a least one Wildlife Hazard Site Visit conducted in order to assess the vulnerability of the airport to wildlife hazards. These site visits help to identify any wildlife concerns

that exist which could pose safety risks to both airport passengers as well as the wildlife itself, and in some cases, the result of the site visit determines if there is a recommendation to conduct a Wildlife Hazard Assessment and prepare a Wildlife Management Plan.

In order to continue to adequately address wildlife concerns and put in place appropriate plans to ensure safety to the aviation system users, the wildlife, and the surrounding public, several recommendations are proposed. These recommendations are considered preliminary, awaiting the issuance of the FAA's updated wildlife advisory circulars which are thought to have similar recommendations regarding the timing of site visits and other measures.

It is recommended that every system airport undergo a Wildlife Hazard Site Visit at least every five years, since the natural environment is dynamic and can change fairly quickly. Consideration of conducting the site visits at different times is also recommended. These recommendations will help airports be proactive when dealing with wildlife hazards. In addition to the site visits, which for general aviation airports are only a day and a half, all Part 139 airports should conduct a Wildlife Hazard Assessment at least every 10 years, possibly more frequently depending on the issues that are identified as part of site visits or actions identified in assessments. These assessments reflect a full year of study.

In order to ensure there is follow-through on the recommendations and action items, it is recommended that the DOA establish a statewide program to periodically monitor wildlife hazards and management at airports. This will allow the DOA to be aware of the preparation of Wildlife Hazard Assessments that are conducted and monitor the implementation of any recommendations that result. The DOA could monitor the performance by including questions about wildlife hazards or management projects at least two times per year during airport outreach for items such as annual capital improvement plan (CIP) requests or 5010 update survey. The collection of this information can help monitor which airports need to take action to prevent wildlife hazard issues.

Percent of system airports with an Airport Emergency Plan

Every airport in the system should have an AEP that they are able to identify and provide a copy when necessary. In association with the AEP, each airport should have a fully-charged fire extinguisher available and easily accessible on the premise, preferably near the fuel farm; the presence and location of the extinguisher should be documented within the AEP.

From the existing conditions analysis, it was found that 57 percent of airport managers reported having or being aware of an AEP for their airport. In order to increase performance of this measure to the target of 100 percent, it is recommended that the DOA provide additional guidance and assistance to all airports on the guidelines for emergency planning as available from the Airport Cooperative Research Program (ACRP) and by the FAA. The DOA could provide information on the available guidelines and recommended practices through handouts and references available

through their website to ensure that all airports have access to the information and can seek assistance from the DOA if needed. Additionally, the DOA should encourage all airports to coordinate with the local emergency responders in the surrounding areas so that there is a mutual understanding of emergency planning and so that the entities can provide resources and put forth a coordinated effort in the event of an emergency in the region. There are no project costs associated with this performance measure.

Percent of system airports with a General Aviation Security Plan

A General Aviation Security Plan is an important document that general aviation airports should have in order to ensure the safety of the airport personnel and patrons, as well as the general public. This measure does not apply to those airports with commercial airline service (Yellow airports) since they must adhere to more stringent Transportation Security Administration (TSA) guidelines for security. Of eligible airports, only 26 percent reported that they had a security plan of which they were aware. The target is 100 percent for this measure, and thus it is recommended that the DOA encourage the general aviation airports to provide a General Aviation Security Plan.

There are several resources for both guidance and funding with respect to general aviation security. There are security enhancements that are federally endorsed, which are outlined in the TSA's document titled *Recommended Security Guidelines for General Aviation Airports and Users*. Additionally, the ACRP provides guidance on general aviation security in their document titled *General Aviation Safety and Security Practices - A Synthesis of Airport Practice*.

Similarly to the recommended actions for AEP, the DOA could create a program that would provide assistance to airports and provide them with the necessary guidance through handouts and website references to TSA and ACRP guidance. There are no project costs associated with this performance measure; however, implementation of a Security Plan may result in the identification of projects that could improve security at the airports.

Percent of system airports that support search and rescue operations

With proximity to the coast and with the presence of various mountainous regions, North Carolina's aviation system plays a pivotal role in search and rescue operations throughout the state. An airport's ability to support search and rescue operations and other operations that contribute to the quality of life of the residents of and visitors to North Carolina should be encouraged. It is equally important that there is up to date information regarding which airports can provide search and rescue support, and this information should be accessible and available to relevant parties.

To serve as the resource, it is recommended that DOA collect this information as part of annual surveys by adding questions about the provision of this service by operators at the airport. This information should also be shared with emergency management agencies within the state on an ongoing basis to ensure its availability during times

of crisis or disaster. Coordination and communication with state emergency management and others involved in responding to these situations is critical to the ability to adequately respond when airports may be the best transportation option for people, goods, or emergency services. There are no project costs associated with this performance measure.

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

Airports and aviation services play an important role in the medical world as ways to provide expedited transportation services to and between medical facilities. For example, in a medical emergency, it may be necessary to quickly transport a patient from a smaller, rural hospital to a larger hospital, and by far the most efficient way to do so would be by aircraft or helicopter. There are also specialty doctors that fly from larger cities and hospitals out to more rural locations to conduct clinics or provide services at smaller hospitals and many of these doctors use aviation to get to these locations. It has been determined that, in order to sufficiently serve medical needs, and especially the locations of the hospitals in North Carolina, airports need to have IMC capability, on-site weather reporting, and jet fuel. It was found that, currently, 89 percent of the hospitals in North Carolina are within a 30-minute drive of an airport with these necessary capabilities.

For weather reporting or availability of weather information, it was noted in Chapter Six that there were four airports that, due to the absence of weather-reporting, could not provide assistance to hospitals in the area; however, it was also found that it was entirely feasible for these airports to obtain AWOSs and thus provide the necessary services and improve the hospital coverage. These four airports included one Blue airport (Henderson Field), and three Green airports (Elkin Municipal, Mount Olive Municipal, and Plymouth Municipal). Thus, the recommendation stands that these four airports should get AWOSs in order to improve performance of this measure. Further discussion on airports that are recommended to obtain or replace AWOSs can be found in subsequently in ADP 900: Weather Reporting Capability.

In the case of jet fuel, whether or not it is provided at an airport is based on the type of aircraft that operate at the facility. It does not make sense to require each airport to have jet fuel, since they may not have sufficient demand to make it financially feasible. As a result, recommending that an airport have jet fuel available should be a case-by-case evaluation. This is also discussed subsequently as part of the performance measure 'Percent of system airports with Jet Fuel'.

In addition to capabilities that help serve the local hospitals, there are also ADP objectives related to the availability to support activity during IMC, on-site weather reporting, and jet fuel, which are discussed later in this section. Therefore, there are no specific project costs associated with this performance measure in and of itself, although there are project costs associated with providing some of these capabilities at airports as part of meeting their ADP objectives.

While not directly related to these capabilities, the location of airports outside the state that meet the criteria as well as the locations of helipads or heliports that could provide access to hospitals was also examined in Chapter Six. By adding these facilities and their associated "coverage", it was determined that 94 percent of hospitals would have air access, either by fixed wing or helicopter, within 30 minutes of their facilities.

Percent of system airports meeting 2013 FAA taxiway geometry standards

With the establishment of new and significantly different FAA guidance in 2013 regarding taxiway geometry standards, the current compliance of system airports is very low. The new guidance focuses on three primary concepts for taxiway geometry: three-node, direct access, and wide expanses of pavement. The most common issue identified in the North Carolina airport system is direct access, which describes cases where there is direct access from a taxiway or aircraft parking area to a runway without having the aircraft make any turns. Additional information on these three taxiway concepts can be found in previous chapters and the associated FAA Advisory Circular.

The NCASP recommends that all system airports have a parallel taxiway for purposes of both safety and efficiency (see subsequent section on ADP 1100: Parallel Taxiway). There is one system airport, Jackson County, for which it is completely infeasible for a parallel taxiway to be constructed due to its location within a mountainous area. All other airports that are currently without a parallel taxiway are recommended to plan for and construct one in the future. It is a reality that this project will be more difficult and expensive to construct for some airports than it is for others, but for the purposes of system safety and performance, the investment is considered worthwhile and is strongly recommended. It is anticipated that all new taxiways that are constructed will meet the FAA standards that are available at the time of design and construction.

For those airports that already have taxiways, it will be important for each airport to create plans to address any deficiencies that exist based on the most recent FAA guidance. This could include relocating taxiway connectors or re-designing the airport's taxiway system to ensure no cases of three-node or wide expanses of pavement. The FAA's policy on conforming with these standards is that "every effort should be made to bring an airport up to current standards", but if this is infeasible, the airport can consult with the FAA regional office to "identify any applicable FAA funding criteria and/or adjustments to operational procedures necessary to accommodate operations to the maximum extent while maintaining an acceptable level of safety". The FAA is encouraging airports to address taxiway design as part of current planning efforts and in cases where taxiway design is underway, designs be updated to meet the FAA standard prior to construction of taxiways and not use older design standards.

Given the existing low performance of this objective and the need for individual planning of the necessary taxiway changes at each airport, individual project costs were not identified as part of the NCASP but generally conservative estimates are included as part of the ADP performance measure.

Percent of airports meeting FAA threshold siting surface requirements

The threshold siting surface (TSS) is composed of multiple Terminal Instrument Procedures (TERPS) surfaces, including a Visual Area Surface or 20:1 surface. Threshold siting standards, including the shape, dimensions, and slope of the surface, are determined based on the approach category of the aircraft operating at the airport, visibility minimums, and the types of instrumentation to the runway. In 2013, the FAA specifically began reviewing the 20:1 surface within the overall TSS more routinely with the implementation of advanced approaches which took advantage of new technology. This review revealed that there were obstructions in many of these 20:1 surfaces and the FAA's immediate response was to raise visibility minimums and/or disallow nighttime operations. Since this focus on the 20:1 surfaces in 2013, more analysis has indicated that for many of the airports, the published approach procedures included aircraft in approach categories C and D even though the airport had not planned nor was designed to accommodate these aircraft types on a regular basis. The TSS width standard for the approach end of runways expected to accommodate instrument night operations serving approach category A and B aircraft is 400 feet, while the same width standard to serve aircraft greater than approach category B (which would be C and D) increases to 800 feet.

The TSS's 20:1 surface has received significant attention during the NCASP as a result of the FAA's emphasis on providing clear surfaces. For purposes of evaluating the general TSS needs of North Carolina's airports, it was suggested that Yellow and Red airports should have approaches designed to accommodate C and D aircraft, Blue airports should be evaluated on a case-by-case basis, and Green airports would not require approach clearance for C/D aircraft as a general rule. The NCASP has identified that all airports should meet the FAA's TSS requirements, with a target for this measure to have 100 percent of the runway ends meet the requirements.

There are many airports which will have to clear their current approaches in order to achieve this target and meet the FAA's guidance. The first step is reviewing the latest addition to FAA's Airports Surveying Geographic Information System (Airports GIS) website https://airports-gis.faa.gov/airportsgis/ which allows airport and their designated consultants to view the 20:1 approach surface for their airport and the "obstructions" FAA has in its database. If an obstruction has been removed by an airport, they are to inform FAA so it can be removed from its database.

The second step to meet the FAA's standards focuses on obtaining current and accurate data. It is recommended that all airports have an updated aeronautical survey that meets the FAA's standards as identified in its Advisory Circular 150/5300-18C, *General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards.* Referred to as "18C surveys", this guidance outlines the specifications for conducting

and submitting aeronautical surveys for use in the FAA's Airports GIS, which is being developed to meet the needs of the Next Generation National Airspace System or NextGen. The 18C surveys are completed at airports to help collect data on obstructions within an airport's approach and standardize the ways that the data is processed and analyzed in order for airports to properly address any issues. With accurate and up-to-date information, airports can ensure the safety of the approaches to the runways. The FAA Memphis ADO has determined that all Airport Layout Plans will include 18C surveys for "Safety Critical" features, such as runways and NAVAIDS.

With accurate data and evaluation of obstructions, the next step is to mitigate the obstructions. For some airports, obstruction clearing will be straightforward and require actions such as tree clearing in order to comply. In other cases, obstruction clearing will be much more involved and may include actions such as realigning or relocating existing public roads that encroach on the airport's surfaces. Other types of potential projects might include purchasing land or relocating other facilities that exist within the approach such as buildings or housing developments. It is recommended that each airport identify and address any obstructions within their TSS and to focus in the near term on the 20:1 surface. Given the lack of specific data from the FAA and the need for individual identification of obstructions at each airport, individual project costs for clear TSS surfaces were not identified as part of the NCASP.

Percent of system airports that have adopted a FAR Part 77 Airport Height Ordinance

As part of the former ADP mandatory items list, it was mandated that every airport have an Airport Height Ordinance that meets Federal Aviation Regulation (FAR) Part 77 and is established as a local ordinance. It was found that 89 percent of airports had adopted a Part 77 ordinance in the current system analysis. As this measure was formerly a mandatory item which was required for airports in order to be eligible for funding, the goal of this measure is that 100 percent of airports adopt an appropriate ordinance. Further, this ordinance is extremely important in order to ensure compatibility with airport development, including preventing potential obstructions in the approaches to the runway system. The presence of obstructions not only creates safety hazards for approaching and departing aircraft, but it could also jeopardize an airport's ability to maintain its established approach visibility minimums and meet its FAA grant assurances. Thus, it is recommended that all airports work with their local jurisdictions to ensure that proper zoning is in place to restrict obstructions around the airport.

Additionally, while it is not directly part of this measure, airports should work with their local sponsor and nearby cities and counties to establish additional compatible land use zoning for the airport to restrict the amount of non-compatible development that can occur around the airport and help to avoid conflicts within airport safety areas such as RPZs, as well as within the approach areas of the airport.

There are no project costs associated with this performance measure. It is recommended that the individual airport Part 77 drawings that were prepared in GIS for the NCASP and provided to the airports during the on-site visits for the study are kept up to date in order to provide the DOA the most accurate information about heights around each airport and to be referenced when needed for each system airport's future development.

Infrastructure

Percent of system airports that meet applicable FAA runway/taxiway separation design criteria on their runways for their current ARC

The goal for compliance with this measure is 94 percent of system airports since it was found in the Future Conditions analysis (Chapter Six) that there are four airports that will be unable to meet runway/taxiway separation standards as it is considered not feasible due to constraints from the airport's location and topography. These airports include one Red airport (Macon County), one Blue airport (Gastonia Municipal), and two Green airports (Clinton-Sampson County and Jackson County). Of these four, two of the airports have previously been discussed; Gastonia Municipal is recommended for complete airport replacement, and it is thus assumed that all new construction will be built according to standards not only for runway/taxiway separation, but for all relevant standards. Additionally, it was discussed that Jackson County Airport will be unable to construct a parallel taxiway, making this measure not applicable.

For airports that currently do not meet the design criteria but for which it has been determined that compliance with the separation standard is possible, projects have been identified and general costs for these projects are provided in the NCASP. There are some cases where the separation project can be addressed with only minimal effort and may not require significant costs beyond actual construction. However, there are other cases where airports may have to undergo larger projects such as buying additional property or moving a building in order to reach proper separation. The level of involvement for each airport to meet separation requirements will need to be determined on an airport-by-airport basis and should be discussed with the airport's DOA program manager to decide what is appropriate to meet this performance measure.

Percent of airports that have adopted Minimum Operating Standards and Rules and Regulations

As a former mandatory item, all airports were required to have published Minimum Operating Standards and Rules and Regulations that are adopted by local ordinance and accessible to the public. Currently, 78 percent of airports reported complying with this measure. It is recommended that all airports work with their local jurisdictions in order to adopt these standards as part of local ordinances. They should also ensure that the ordinance is updated as necessary to reflect the most current standards in the local ordinances. There are no project costs identified for this

performance measure, although some airports do use consulting services to assist with development of Minimum Operating Standards and Rules and Regulations.

Percent of airports meeting system objectives in the ADP

100: Airport Approach

It is important for airports to keep their approaches clear in order to facilitate safe takeoffs and landings. As mentioned above, the Threshold Siting Surface, and specifically the 20:1 surfaces, must be completely clear of obstructions. However, it is also important to ensure that there are as few as possible obstructions to the rest of the approach beyond the 20:1 surface.

Obstructions in any part of an airport's approach can create safety hazards for approaching and departing aircraft. Any vertical obstructions that are identified at a system airport with an approach should be addressed which could include removing, lowering, or lighting the obstructions at night so that they can be avoided by aircraft.

As previously discussed in the performance measure on "airports meeting FAA threshold siting surface requirements", aeronautical surveys are recommended to identify obstructions that need to be mitigated at the airports; these costs are found as part of the ADP objective for ALPs, and involves a one-time 18C survey for each airport. Additionally, the costs for obstruction clearing have been estimated as part of the NCASP. The cost reflects a one-time obstruction clearing process funded by the DOA, which would include all aspects of clearing including items like grubbing and grading. After this initial effort, it is each airport's responsibility to keep approaches clear.

200: Runway Safety Area (RSA)

For safety reasons, it is important that the RSAs of every runway meet FAA standards. Currently, 83 percent of system airports reported that their RSAs meet FAA design standards based on the airport's current runway design code (RDC). With a target of 100 percent compliance with RSA design standards, airports will need to undergo projects to address their RSAs and ensure that they are up to standard. The only alternatives available for RSA compliance include use of displaced thresholds and declared distances and engineered materials arresting systems (EMAS). Modifications to standards are no longer applicable to RSAs according to FAA guidance. All projects to improve RSAs should be included in an airport's CIP, with a focus to achieve 100 percent compliance in the near term.

Further, there are a variety of potential future airport improvement projects that would require a modification to the existing RSAs, and would require the compliance of the RSAs to be revisited. For example, a change in runway length, an airport's RDC and design aircraft, or a change in visibility minimums may result in an altered RSA. Any airport that is undergoing a project that would modify the RSA is expected to concurrently ensure that the RSA adheres to current FAA standards. Airports will need to provide evidence that RSAs will be fully compliant prior proceeding with any projects that would affect the size or ability of the airport to fully meet RSA standards.

Data on RSAs was requested from airports and an evaluation was conducted using aerial photography, although some additional, more detailed information on specific projects needed for RSA compliance is still necessary. Given this, a system cost was developed based on generalized estimates for clearing RSAs at system airports that were out of compliance. RSA costs do not reflect the additional costs of buying property or relocating facilities for RSAs in the cases of runway extensions or widening; the costs only reflects an general estimate for clearing obstructions from the RSA.

300: Runway Protection Zone (RPZ)

As previously discussed, this measure's goal is for 100 percent of airports to have controlling interest over their RPZs either through ownership or easement. Existing barriers to having full compliance at system airports include things like public roads, private developments or natural barriers such as navigable bodies of water. Because of these challenges, it has been deemed most important to have controlling interest of the central portion of the RPZ, even if it is not feasible to have controlling interest over the entire RPZ. Projects that would need to be undertaken by airports in order to comply with this objective could include purchasing property, securing easements or using other zoning controls to regulate development, or, in the most drastic cases, working with local jurisdictions to plan for a relocation of infrastructure that is within the RPZ. A range of costs for some general projects regarding RPZ compliance can be found in the NCASP. The costs for three general scenarios are provided which include low/minor impact projects, such as land acquisition, medium impact projects such as land acquisition and road relocation, and high/major impact projects, which will require significant work and funding.

Similar to RSAs, data on the airport's controlling interest over RPZs was also requested from airports, and an evaluation was conducted using aerial photography; however, detailed information on the projects needed for RPZ compliance is not available. Given this and the need for individual planning of the appropriate methods to obtain a controlling interest at each airport, individual project costs for each airport were not identified as part of the NCASP. General cost estimates for the system were developed and reflect what might be needed in order to clear incompatible land uses from RPZs based on available information; land acquisition for extended RPZs are not included. Additionally, more firm guidance from the FAA on what is mandated for RPZs is also needed in order to identify specific airport projects and costs for RPZ compliance.

400: Pavement Condition

An airport's pavement condition is an extremely important factor when considering the safety, efficiency, and capacity of airports. While complete pavement rehabilitation may be necessary every 20 or so years depending on the conditions, the pavement should be consistently monitored. Preservation should be ongoing through pavement maintenance projects in order to get the most life out of existing pavement at the airport. The most critical pavement on the airport is runways which should be maintained in good condition followed by that of the taxiways and then aprons. The goal for pavement condition is that the Pavement Condition Index (PCI)

should be maintained at a score of 75 or greater for all pavement areas. At scores lower than this, airports will have to perform more frequent and more involved pavement preservation projects and will likely be required to undergo major rehabilitation more quickly. By keeping a pavement's PCI at the target level, the pavement will stay in good condition longer with only routine maintenance. As part of the NCASP, a statewide Pavement Management System study was completed in 2013 which evaluated the pavement for all general aviation airports and 15 Part 139 airports in North Carolina. For system airports, it was found that 76 percent of primary runways, 69 percent of taxiways, and 61 percent of aprons surpassed the PCI target.

Further as part of the NCASP and the Pavement Management System study, a 5-year Maintenance and Rehabilitation Program was developed that included maintenance policies and costs. Using the results of the recently completed statewide Pavement Management System study, estimates of maintenance and rehabilitation projects were developed on an individual airport basis and are included in the NCASP, as appropriate, to reflect the financial needs of maintaining this critical airport infrastructure. These studies and assessments also serve as a way to comparatively prioritize and budget costs for future pavement reconstruction needs beyond the 5-year CIP.

500: Runway Length and Width

The length and width of an airport's runway dictates the type of aircraft and level of service that the airport can provide. Without adequate runway dimensions, airports cannot accommodate the larger and more sophisticated aircraft that may be demanded by the users of the area. The target dimensions for each category of airport are as follows:

- Yellow: 6,500' x 150'
- Red: 6,000' x 100'
- Blue: 5,000' x 100'
- Green: 4,200' x 75'

The goal for this measure is that 86 percent of system airports meet the runway length objective and that 100 percent meet the width objective. The 86 percent target for runway length was determined by the fact that there are five Red airports, one Blue airport, and four Green airports which will not be able to undergo runway extensions due to significant constraints. The Blue airport, Gastonia Municipal, has been recommended for full replacement after which it will be expected to meet both the length and width objectives.

It should be noted that any project that involves extension of a runway must also consider the need to adjust the RSA and RPZ, both of which have been previously discussed. Project costs for runway expansions should factor in any associated costs to keep RSAs clear and to maintain controlling interest over the RPZ's central portion. These three objectives are all interrelated, and project costs should be comprehensive to include them all, since one should not be considered without the others. For airports that currently do not meet the runway length and width objectives

but for which it has been determined that compliance with the objectives is possible, projects and estimated costs have been identified. These costs reflect a general estimate of the construction as well as the costs of acquiring the necessary land for RSA and RPZs in order to meet all necessary standards for the project.

600: Pavement Strength

Pavement strength plays a role in determining the type and size of aircraft that can be accommodated at an airport. In the U.S., two methods are most commonly used to express a runway's pavement strength: Pavement Classification Number (PCN) and weight limits expressed in pounds per wheel or limits of gross weight. For airports that accommodate primarily small aircraft of less than 12,500 pounds and those that are not Part 139, the weight limits are typically used, while PCN and an Aircraft Classification Number (ACN) are used at Part 139 airports.

As part of the NCASP, the DOA conducted PCN surveys for 12 of the Part 139 airports, which includes Yellow airports minus Charlotte Douglas International Airport (CLT), Raleigh-Durham International Airport (RDU), and Piedmont Triad International Airport (GSO) and some Red airports. Additionally, the following standards for pavement strength have been established in the NCASP:

- Yellow: Per PCN Analysis
- Red: > 60,000lbs SW or DW or Per PCN Analysis if Part 139
- Blue: > 30,000lbs SW or DW and < 60,000lbs SW or DW or Per PCN Analysis if Part 139
- Green: < 30,000lbs SW or DW and > 12,500lbs SW or DW

The goal is for 100 percent compliance with the pavement strength, which should correlate directly to the type of aircraft anticipated to use the airport. It should be noted that for many airports, detailed analysis of the pavement strength in the form of non-destructive testing is not available. The pavement strengths identified in the NCASP for the smaller, non-Part 139 airports are reported and estimated but may not accurately reflect the actual strength.

In order to ensure 100 percent compliance with this measure, additional analysis of the pavement strengths and the ability to increase the strengths is needed. This analysis is appropriate when airports are planning for future pavement projects such as an overlay or rehabilitation to determine the appropriate strength given the ADP and projected activity at the airport. For purposes of the NCASP, a general cost estimate has been prepared for those airports that were identified as needing to increase their pavement strength to meet the objectives.

700: Visual Navigational Aids (NAVAIDs)

NAVAIDs provide assistance to arriving and departing aircraft and are necessary for various weather conditions. For example, rotating beacons are needed for nighttime operations or in conditions where it is dark or cloudy outside. Another important system is Precision Approach Path Indicators (PAPIs) which help pilots locate the runway and approaching at the correct glideslope using visual cues. The objective for this ADP measure is for the majority of airports to have PAPIs. There are four airports

that do not support nighttime operations and do not have runway edge lighting, and thus are not included in the compliance for this measure. These airports include Avery County/Morrison Field, Odell-Williamson Municipal, Billy Mitchell, and First Flight. PAPIs could be installed at these airports, however, PAPIs were not recommended as an objective for these airports.

The existing system analysis found that only 44 percent of airports were meeting their NAVAIDs objective. With the exception of these four airports, all system airports should eventually have PAPI-4 equipment. As existing PAPIs reach the end of their useful lives, which is around 20 years, PAPIs will need to be upgraded or replaced at all airports. Costs for the acquisition of specific NAVAIDS can be found later in the chapter within the discussion of Financial Needs. Each airport should assess the need to replace or update their PAPIs as part of future projects.

800: Runway Edge Lighting

Chapter Six determined that the only change to the future condition of the airport system for this objective is the recommendation that all runway edge lighting is eventually converted to LED lighting, which should be done at the end of the existing system's useful life cycle (around 20 years). Current FAA policy only allows use of LED runway edge lighting for low intensity and medium intensity, while high intensity runway lighting is currently not eligible for AIP funding. It was found that 94 percent of airports have appropriate lighting, and the 6 percent that are not meeting the objective are the four airports that do not support nighttime operations, thus they do not need edge lighting (Avery County/Morrison Field, Odell-Williamson Municipal, Billy Mitchell, and First Flight).

With respect to the conversion to LEDs, the conversion should be done along with regular maintenance and repairs of the electrical system at each airport. In the NCASP, costs for runway edge lighting replacement at each airport have been developed, assuming that every airport (besides the four without lighting) will need to replace their system at least once in the next 20 years. Additionally, it is recommended that the system-wide conversion become integrated into a larger project that is proposed for all North Carolina airports. This larger project involves a complete electrical system evaluation, of which one component would be lighting. More details on the proposed statewide electrical evaluation can be found subsequently in this chapter in the discussion of special studies.

900: Weather Reporting Capability

The established target for this objective is that 100 percent of airports have appropriate AWOS equipment for on-site weather reporting. Currently, 85 percent of airports were reported to be meeting this objective. In addition to ensuring that the airports without AWOSs acquire them, there will also be a need to maintain and repair existing AWOSs and ASOSs until the equipment is at the end of its useful life. Studies have been done to establish the useful life cycle of a weather reporting system, and it has been established that equipment should be replaced between 10 and 13 years after its initial installation. At times when replacement is necessary, it should be ensured that airports have the most up-to-date weather components and equipment.

In 2014, a Program Guidance Letter was published by the FAA that provided guidance on eligibility requirements to obtain federal funding to obtain or replace an AWOS. Per the guidance, the determining factor for determining eligibility is the result of a Benefits-Costs Analysis that must be performed for all airports other than those designated as National or Regional in the FAA's ASSET classification system. Thus, the FAA is the governing body who determines which airports will receive federal funding for new or replacement AWOSs.

The NCASP costs developed for this objective includes the cost to replace weather reporting equipment (mainly AWOSs) at each airport during the timeframe of the plan. Given the age of the existing system and the need to keep these systems functioning until replacement is possible, a new statewide program for repair and maintenance should be established for existing weather reporting systems. Historically, the National Weather Service (NWS) played a role in ensuring the functioning and accuracy of AWOS/ASOSs, but, based on conversations to date, the NWS is not maintaining this role and the AWOS system will likely be handled by the DOA. Given that, a statewide maintenance program should include funds to help with the routine maintenance and repair of existing equipment and a way to replace and upgrade equipment at the end of its existing life. Costs for an airport to acquire an AWOS are identified in the NCASP. This is essential in order to facilitate compliance with this ADP objective and to ensure that pilots have sufficient information to make safe and efficient landings and departures, especially during inclement weather.

1000: Standard Instrument Approach Procedures (SIAP)

With the continued implementation of the FAA's NextGen technology, the air traffic control system is transforming to a satellite-based system instead of a ground-based system. By using satellite-based technology to gather and communicate information, aircraft will be able to fly closer together, take more direct routes and avoid delays due to congestion in the air and on the ground.

North Carolina airports have seen the application of LPV and other satellite-based approaches, which are a result of NextGen implementation. The NCASP objectives for approaches based on airport category are as follows:

- Yellow: Precision Approach (PA) <250' and <¾ mile
- Red, Blue: Instrument Approach with Vertical Guidance (AVP) 250' and ¾ mile
- Green: AVP 400' and 1 mile

The existing conditions analysis found that 57 percent of airports were complying with their objectives, while the goal for compliance is 85 percent given that there are 10 airports that are unlikely to develop enhanced approach capabilities. These airports include one Red airport (Macon County), three Blue airports (Western Carolina, Gastonia, Ashe County), and six Green airports (Billy Mitchell, First Flight, Odell-Williamson Municipal, Ocracoke, Avery County/Morrison Field, and Jackson County).

Given the standards associated with satellite-based systems, the recommendations for this objective involve obstruction clearing for improved approaches and obtaining electronic NAVAIDs for all airports. It is assumed that there will be no ground equipment needed, such as replacement of localizers due to NextGen. Further, with the FAA's target of 2022 for completing implementation of NextGen, the DOA may no longer assist with the maintenance for ground-based NAVAIDs beyond 2022. No specific project costs have been identified as part of this ADP category.

As previously discussed in ADP 100, it is recommended that the DOA establish a program to facilitate the clearing of obstructions within an airport approach that may hinder the lowering of visibility minimums. Ways to address obstacles include lowering or removing obstacles where possible. The FAA's Airports GIS-Surface Analysis and Visualization Tool (SAV) can help airport sponsors access information on the penetrations to the visual area surface of instrument approaches and determine which obstacles are impacting the airport. This tool could be helpful to airport sponsors and DOA in determining the appropriate and available remedies to improve airport approaches in the future. Similar to the FAA's position on obstruction clearing, it is recommended that the DOA provide funds to allow for initial obstruction removal, but that the airports are responsible for maintaining the clear approach paths in the future.

1100: Parallel Taxiway

This ADP objective is for all airports to have a full parallel taxiway. Beyond the safety and efficiency improvements that it brings on the ground, the existence of a parallel taxiway has direct effects on the instrument approach that was discussed in the previous section (ADP 1000: Standard Instrument Approach Procedures) and is a recommendation for airports with visibility minimums at or above ¾ mile.

The Chapter Five analysis found that 65 percent of all airports currently have a full parallel taxiway for their primary runway and that only one airport, Jackson County, will be unable to construct one in the future. There are airports where it will be challenging and costly to construct a parallel taxiway, as it may involve acquisition of property, large amounts of fill or grading, and some may have to move existing facilities, but it is expected that all of the other system airports create plans and eventually construct a parallel taxiway.

For airports currently without taxiways, projects have been included in the NCASP and should be documented in future airport-specific plans so that airports can begin to take measures to eventually fund and construct the project. Project planning should include the project components and costs in their entirety, including costs associated with buying land as well as the actual construction costs. In the NCASP, estimated costs are presented for constructing new parallel taxiways at those airports that currently lack one.

1200: Aircraft Apron

The target for this objective is to have 100 percent of airports providing sufficient apron space to meet their future demand (i.e. number of tie-downs is at least as

large as the apron index calculated). However, it is anticipated that only 79 percent of Red, Blue, and Green airports will meet this objective in the year 2031 if no additional apron space is provided in the future.

There are six Red airports, eight Blue airports, and five Green airports that are anticipated to have an apron demand that is at or over their existing capacity, and will likely need to consider expanding their aprons. Each airport should consider this expansion in their future plans as demand dictates, providing sufficient time for the planning, design and construction of the apron to accommodate demand. There may be cases where there are constraints to expansion, and these constraints should be considered now so there can be plans in place when the expansion is necessary in the future. This could include plans to buy land as it becomes available or relocate facilities that may impact apron expansion.

For airports that are anticipated to need additional aircraft apron in the future, projects have been identified and included in the NCASP.

1300: General Aviation Terminal Building

The existing conditions analysis focused on the size of terminals in order to calculate compliance with this objective. Each terminal's size objective was based on the airport category: Red airports should have a 5,500 square foot (SF) terminal, Blue should have 4,500 SF, and Green should have 3,200 SF. Yellow airports have different standards due the presence of commercial airline service. As such, 33 percent of airports with a general aviation terminal building met their size objective; the target for the measure is to have 100 percent of airports meeting the size objective for their role category.

There are additional objectives for terminals including the types of rooms and services that are provided (public meeting rooms, office space for FBOs) and the amount of parking that should be provided.

When working towards greater compliance with this ADP objective, other factors such as the age of the building should be considered. Any buildings that are less than 20 years old will not be eligible for funding to replace the facility. Any airports with terminal buildings that are not in compliance with size but are less than 20 years old should be identified, and at the 20-year mark, these airports will then be eligible for funding of a replacement terminal.

There are cases where terminal renovations will be needed which would not require a full replacement. Renovations may be eligible for DOA funding for buildings under 20 years old if there is a justification that is substantiated and if there is funding available. For example, a good case can be made for renovations that would fix liability issues that exist in terminals. In other cases, a renovation that would support economic development or that is needed in order to adequately service the economic and business needs of the area may also have success in securing funds.

Costs for terminal building replacements or new facilities based on an airport's role category have been identified as part of the NCASP.

1400: Taxiway and Apron Edge Lighting

It is recommended that taxiway and apron edge lighting is incorporated with the recommendations for runway edge lighting, which is discussed above in ADP 800: Runway Edge Lighting. All lighting objectives should be considered during a future statewide electrical evaluation, which will result in a statewide plan to upgrade, replace, or maintain/repair the electrical systems of airports. Included in this evaluation and program establishment will be airport lighting, including its maintenance and repair schedule as well as necessary upgrades to ensure compliance with all lighting objectives. Project costs have also been identified for this ADP category and include costs for the addition of LED lighting at airports that currently don't have proper lighting, as well as one complete replacement per airport, which will include conversion to LEDs if not previously done.

1500: Airfield Signage

Airfield signage is important for assisting pilots to navigate an airport safely. Signage can include runway hold position signs, location signs and guidance signs, amongst others.

Approximately 50 percent of airports were reported to be out of compliance with their signage objective. It is recommended that all airports be in compliance and should thus plan to undergo projects to obtain the proper signage in the appropriate locations. Costs for these projects have been identified in the NCASP.

DOA is considering undertaking a statewide electrical evaluation which could examine compliance issues having to do with signage lighting and lighting objectives within this plan. See ADP 800: Runway Edge Lighting or the subsequent section on Special Studies for more information.

1600: Ground Communication

Compliance with this objective requires 100 percent airports to have either a RCO or a GCO. Currently, 58 percent of system airports were reported to be in compliance with this objective.

In a recent study done for North Carolina airports, it was found that it is not cost effective to install RCOs at airports and that GCOs are completely sufficient for all system airports. RCOs are owned, operated and maintained by the FAA and can cost upwards of $1 million. Because they are owned by the FAA, an airport would have to have specific eligibility to have one, and this is unlikely for the general aviation airports in North Carolina. Given this information, it is recommended that all airports ensure that they have a GCO that is both up-to-date and maintained regularly for proper functioning.

Similar to the recommendations for weather reporting capabilities (ADP 900), it is recommended that a statewide program is established to deal with the repair and

maintenance cycles of ground communication equipment. The costs of GCO repair or replacement can range from $15,000 to $40,000, and every situation is unique based on the airport and its facilities. For example, close coordination is needed with the operators at each airport, in addition to normal cycles of maintenance and replacement of GCOs or RCOs, to ensure that the ground communication objectives are being met. GCO installation costs are included as projects in the NCASP, however, maintenance costs have not been identified or included.

1700: Approach Lighting

Approach lighting is strongly related to compliance with objectives for approaches and visibility minimums (ADP 1000: Standard Instrument Approach Procedures). An approach lighting system such as a MALSR, SSALR or ALSF are appropriate for airports with visibility minimums under ¾ mile, while there are other systems such as ODALS, that are appropriate for minimums that are equal to or greater than ¾ mile. As reported in ADP 1000: Standard Instrument Approach Procedure, there are 10 existing system airports that are not anticipated to get instrument approach procedures; thus the target for this objective is 85 percent compliance. The current compliance reported in Chapter Five was 32 percent.

In order to increase the performance to the target of 85 percent, approach lighting projects have been identified and cost estimates included in the NCASP that assume that replacement is necessary for the physical equipment after 20 years and that the more permanent ground equipment would have a lifespan of at least 40 years, and would thus not need to be replaced at most airports.

1800: Aircraft Rescue & Fire Fighting (ARFF) Equipment

All Part 139 airports are required to have ARFF equipment, and the specific equipment objectives are related to the type of aircraft that are served by the airport. While it is required for Part 139 airports, it is also useful for all airports to understand ARFF requirements and ensure that other resources are available to assist with aircraft rescue and firefighting at the airport, possibly participating in ARFF training, as appropriate. It is recommended that all Part 139 airports obtain the appropriate equipment for their respective ARFF index.

Another aspect of emergency management that is considered in this ADP objective is the need to have mutual-aid agreements with local emergency responders. This recommendation is also incorporated as part of the AEP objective. In the case of an emergency at an airport, the airport manager must be ready and prepared to act. It is good practice for airports to involve local emergency responders during airport emergencies, whether it is informing them during emergencies or asking for assistance. There should also be agreements with local responders about how to respond to emergencies that involve a larger area and which may require a coordinated response between airport and local responders. In all, airports cannot act in isolation and should have open lines of communication with local jurisdictions to ensure that all emergency management is well planned and can be well executed.

No project costs have been identified for this ADP category.

1900: Hangars

The number or volume of hangars that an airport provides is usually based on the number of based aircraft at an airport. By providing hangars, airports can both make money and satisfy the demands of customers.

The target for this objective is that all airports have a sufficient amount of hangar space to satisfy existing and future demand. It was found that 56 percent of airports currently have sufficient facilities to meet existing demand and that many airports are either currently at 100 percent capacity or have a waiting list for hangars. It was also calculated that over 60 percent of system airports will require additional hangar storage by 2031 in order to accommodate the anticipated growth in based aircraft. However, hangars are often not constructed in anticipation of demand; the demand must be present for hangar expansions to occur, as well as the financial capability to construct and support the hangar expansion.

For the larger airports, such as Red and Yellow airports, it is further recommended that there be a sufficient number of additional hangars available for itinerant aircraft that may land at an airport and require storage. Having hangar space for itinerant aircraft is a big selling point for an airport and can help increase both the airport revenue and the overall demand at the airport. Since Yellow airports are not currently eligible to receive state funding for hangar construction, this recommendation may be more challenging. That being said, it is also recommended that the DOA consider funding the construction of additional hangars at all airports. In discussions during the development of these recommendations, it was noted that hangar projects are included in the new STI program, which will be the main source of funding for transportation capital projects, including aviation. Further, there are other states that do fund hangar construction and expansion, so it is recommended that the DOA consider funding hangar expansion at all system airports. Costs to construct additional hangars are identified in the discussion of Financial Needs later in this chapter.

2000: Airfield Maintenance Equipment & Storage Building

The goal for this objective is that 100 percent of airports have the appropriate maintenance equipment that is necessary for them to maintain the airfield given their classification and level of service. Part of the objective also includes the existence of a maintenance storage building to store the equipment. It was found that 46 percent of airports had proper storage facilities, and thus it is recommended that the airports without storage plan to construct storage facilities. With the exception of Yellow airports, all system airports are eligible to receive funding for construction of storage facilities. Additionally, it was found that some airports don't have proper maintenance equipment, let alone a storage facility. In these cases, it is recommended that the airports acquire maintenance equipment as well as construct a storage facility for the equipment.

General costs for airfield maintenance equipment and storage buildings are identified as part of the NCASP later in this chapter.

2100: Perimeter Fencing

The system objectives for perimeter fencing to enhance safety and deter wildlife are to have all Red, Blue, and Green airports have full perimeter fencing. Yellow airports are not eligible for funding for fencing within the ADP, but are required by TSA to have fencing due to their presence of commercial airline service. Currently, 21 percent of all airports meet the fencing objective; this includes compliance by 100 percent of Yellow airports.

Further, it has been determined that 8-foot fencing is the minimum needed in order to deter wildlife from entering the airfield, although many Wildlife Hazard Assessments or Site Visits have been recommending a higher fencing size. Fences also help deter other potential safety hazards, such as unauthorized people from entering the airfield. Regardless of the intended deterrent, airports should have at least 8-foot perimeter fencing around the facility or meet the recommendation from their Wildlife Hazard Assessment or Site Visit. For the 21 percent of airports that have existing fencing but may not meet the objective, the recommendation is that at the end of the useful life of the existing fencing, 8-foot fencing around the entire perimeter should be installed, thus allowing the airport to be in compliance with the objective. For purposes of NCASP, costs have only been identified for those airports that do not meet the objective (no fencing, gaps in fencing, or fences less than 8-feet high) as opposed to those who may need to upgrade their perimeter fencing.

2200: Fuel Facilities

It is recommended that all airports provide some access to fuel at the airport, while the type of fuel available should be dictated by the type of aircraft that the airport serves. The availability of jet fuel (Jet A) is necessary in order for airports to serve hospitals (for more information, see above measure 'Percent of Hospitals within 30 Minutes of a System Airport with IMC Capability, On-site Weather Reporting, and Jet Fuel'). Jet fuel is also necessary for airports to serve business user needs, which is discussed in more detail below. However, airports that do not or cannot provide support for hospitals or larger business users may not support the type of aircraft that would require jet fuel, and thus should not be expected to supply it.

NEW ADP: Percent of airports with an up-to-date Airport Layout Plan (ALP)

Previously the requirement for every airport to have an ALP used to be part of the Mandatory Items that were required to be eligible for state funding. Due to great progress in compliance with these items, there is no longer a set list of 'mandatory items' but instead the items are interspersed throughout the NCASP as components of other performance measures or as new performance measures themselves. In this case, it was recommended that having an up-to-date ALP is very important to ensure airport and system performance, and thus the DOA is interested in tracking the performance separately.

ALPs should be living documents that are routinely updated based on changing conditions, new facilities and future plans for airport development. However, it is recommended that every airport should review their ALP at least once every 10 years to decide if an update is needed. For Yellow Airports, ALPs should be reviewed at least every 5 years. In addition to the review, development of electronic ALPs should also be considered with the continued focus of the FAA on its Airports GIS program.

Additionally, conducting the FAA-required 18C surveys for safety critical features and identifying obstructions within airport approaches, which was mentioned in pervious performance measures and ADP objective, should be completed during the development and updating of ALPs. These surveys should be conducted once and then regularly updated as necessary by means of updating safety critical data in the overall database.

Estimated costs for the one-time overall 18C survey and for updating a general aviation airport's ALP every 10 years are included in the NCASP. However, the costs do not reflect the recommendation for Yellow airports to conduct and update 18C surveys every 5 years since those airports with commercial airline service obtain funding directly from FAA.

Percent of system airports that are adequately accessible in terms of signage and wayfinding

It is important that system airports are easy to locate by ground and that driving directions are well documented to facilitate navigation to and from the location. In this age of technology, a rise in GPS technology often helps people navigate to and from destinations. Airports should ensure that they document accurate information on their address and relative location so that GPSs will navigate to the correct location and allow people to easily find any system airport. However, technology cannot replace physical signage and on-the-ground wayfinding at times when GPS is not used or available. For example, there may be airports where cellular or satellite service is weak or unavailable, which would make people rely on signage. Further, there are times when, during major emergencies, cellular or satellite service may go down and be unavailable for extended periods of time. In a case like this, the existence of proper wayfinding may affect the safety of the local population and could be imperative in order to carry out emergency response plans.

In the current system analysis 68 percent of airports reported having adequate signage, and the target is 100 percent compliance. For airports that are not in compliance or for airports that need to update their signage, it is recommended that the airports work directly with their local jurisdiction or county to discuss signage on local or county roads. Airport managers should also coordinate with their district's representative from the North Carolina Department of Transportation to ensure that signage is adequate on freeways, which are NCDOT-operated roads. Costs for this performance measure are not included in the NCASP.

Mobility

Percent of population within 30 minutes of a system airport by role grouping

This measure is directly related to future coverage, which is covered in detail in Section 2 of this chapter. A summary of recommendations to improve coverage is as follows:

- Public use helipads or heliports are recommended to address coverage gaps in the western portion of the state and especially in areas where building an airport is not possible or not feasible such as Haywood County (see Figure 7.4 in Section 2)
- The following airports are recommended for replacement: Odell-Williamson Municipal, Gastonia Municipal and Avery County/Morrison Field
- Anson County-Jeff Cloud Field should transition from Green to Blue to better serve demand in the south-central portion of the state
- Halifax-Northampton Regional Airport should transition from Green to Blue to better serve demand in the northeastern corner of the state
- Henderson Field could transition from Blue to Red in the future

There are no specific project costs associated with this performance measure.

Percent of total employment/businesses within 30 minutes of a system airport

The previous outside influences discussion found in Section 2 considers factors that will likely lead to future population and employment increases within areas of North Carolina. These outside influences, though not aviation-related, will directly affect the aviation demand and the employment/business coverage. In order to ensure that future demand is addressed, the recommendations put forth in the 'Coverage' discussion in Section 2 should be considered.

There are no specific project costs associated with this performance measure.

Percent of system airports with a published instrument approach procedure

The more airports that have instrument approach procedures, the more choices that aircraft have when deciding where to land in times of low visibility. This is important for both the coverage of the airport system as well as the safety of aircraft that are flying. Today, 92 percent of North Carolina airports were identified as having a published instrument approach procedure, and the target compliance for this measure is 93 percent since there are 5 airports that will be unable to get instrument approach procedures due to physical and local constraints.

The recommendations that were put forth that address this measure are:

- Recommendations involving obstruction clearing for improved approaches
- The recommendation that the DOA should establish a program to facilitate the clearing of obstructions (lowering or removing) within an airport approach that may be hindering the lowering of visibility minimums
- Continuing to provide DOA funds for initial obstruction removal but that airports be responsible for maintaining the clear approach paths in the future
- Recommendations for obtaining electronic NAVAIDs for all airports

See ADP 1000: Standard Instrument Approach for more information and recommendations. There are no other specific project costs associated with this performance measure.

Percent of population within 30 minutes of a system airport meeting business user needs (5,000' runway, jet fuel, approach (250' & 3/4m minimums), and ground transportation)

The system airports were categorized into airport groupings (Yellow, Red, Blue and Green) and these groupings were largely based on demand as determined through analysis of county-level socioeconomic analysis. All airports that meet the objectives for Red and Blue airports will meet business user needs, other than the requirement for jet fuel which is based on demand and not an objective for all airports.

In the earlier discussion about coverage (Section 2), there is a recommendation that Red counties, those that have the highest socioeconomic performance, be prioritized for new or upgraded airports since those airports will likely see increases in demand for aviation services. Additionally, in the discussion about future airport grouping considerations (Section 2), there are recommendations for specific airports that should transition to a higher role category given the anticipated increase in population and economic growth in the area of those airports.

All of these discussions and recommendations are directly related to ensuring that airports are providing the level of service that is needed for an area, and that includes the business user needs that are likely to be demanded throughout the state.

There are no project costs associated with this performance measure.

Percent of population within 60 minutes of a system airport with commercial airline service by at least one airline

The 10 Yellow airports that are presented in this plan are those that have scheduled commercial airline service as of April 2014. As seen in Figure 7.6, 89 percent of the population within North Carolina is currently within a 60-minute drive time of one of these airports or to a commercial service airport in an adjacent state. Because it is each airline's decision as to where they locate, it is not appropriate to recommend new commercial airline service; additionally, there are no specific costs identified for this performance measure.

Currently, the two largest airports in North Carolina are CLT and RDU. As seen in Figure 7.7, 85 percent of the state's population is within a two-hour drive time of

one of these major airports where people have access to a huge number and variety of flights and airlines to meet all of their aviation needs. As these airports grow in the level and variety of services that they can provide, more and more people choose to use them for commercial flights. The result of this is that the demand for commercial service flights at some of the other, smaller Yellow airports is relatively stagnant or declining, since these airports have a smaller number of airlines and provide more limited service in terms of flight times and destinations. It has been found that there are more airports in the system losing service than there are gaining with the exception of Concord's recent service introduction by Allegiant Airlines.

With this trend evident, the DOA should be willing to provide support to airports that are looking to provide commercial service. While this support will mostly be non-financially-based, they can provide documentation or letters of support that may be necessary to help attract commercial airlines to system airports in the state.

There are no project costs associated with this performance measure.

Figure 7.6: Percent of Population within a 60-Minute Drive Time of a North Carolina or Out-of-State Airport with Commercial Airline Service (Yellow Airport)

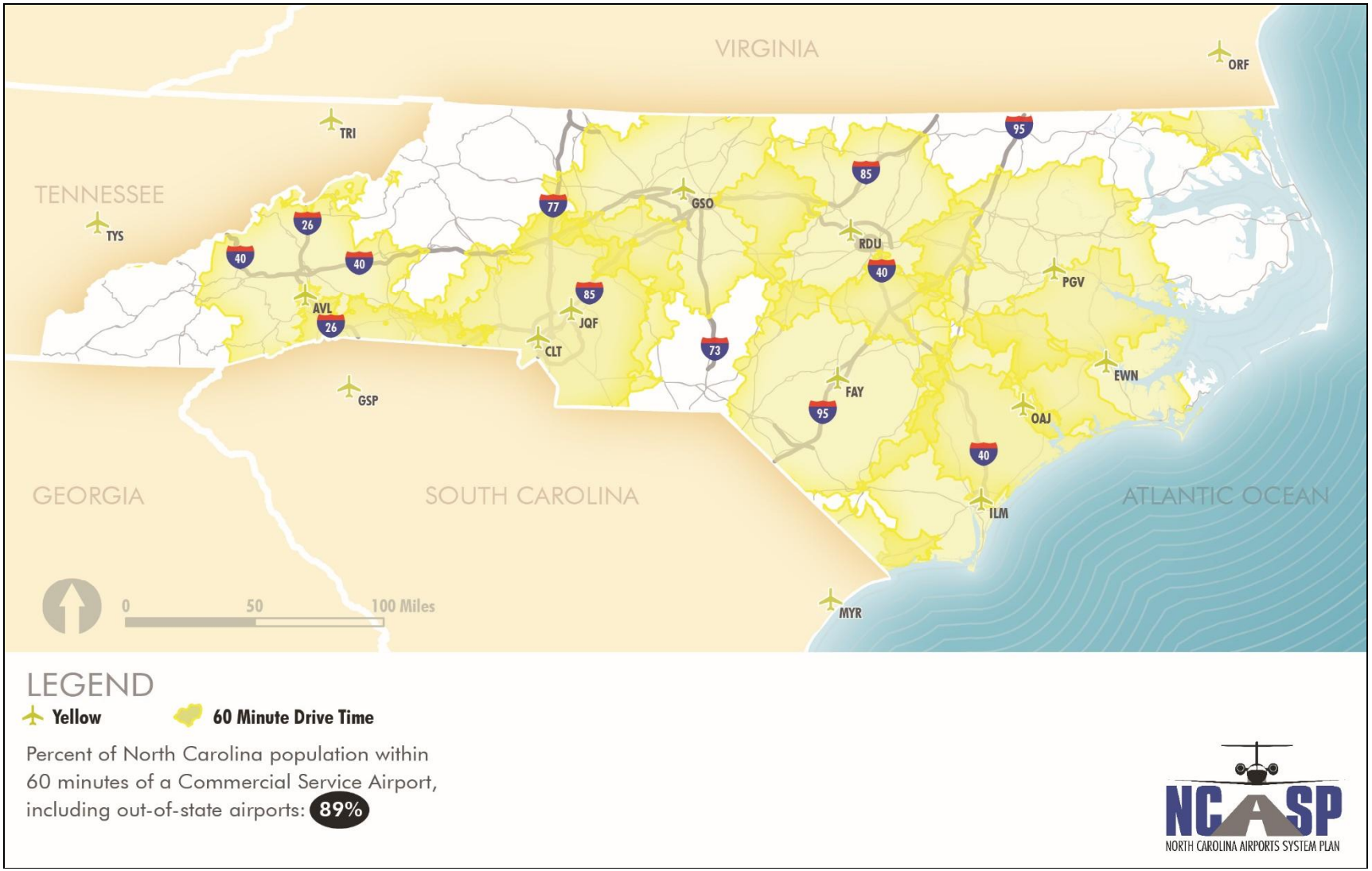
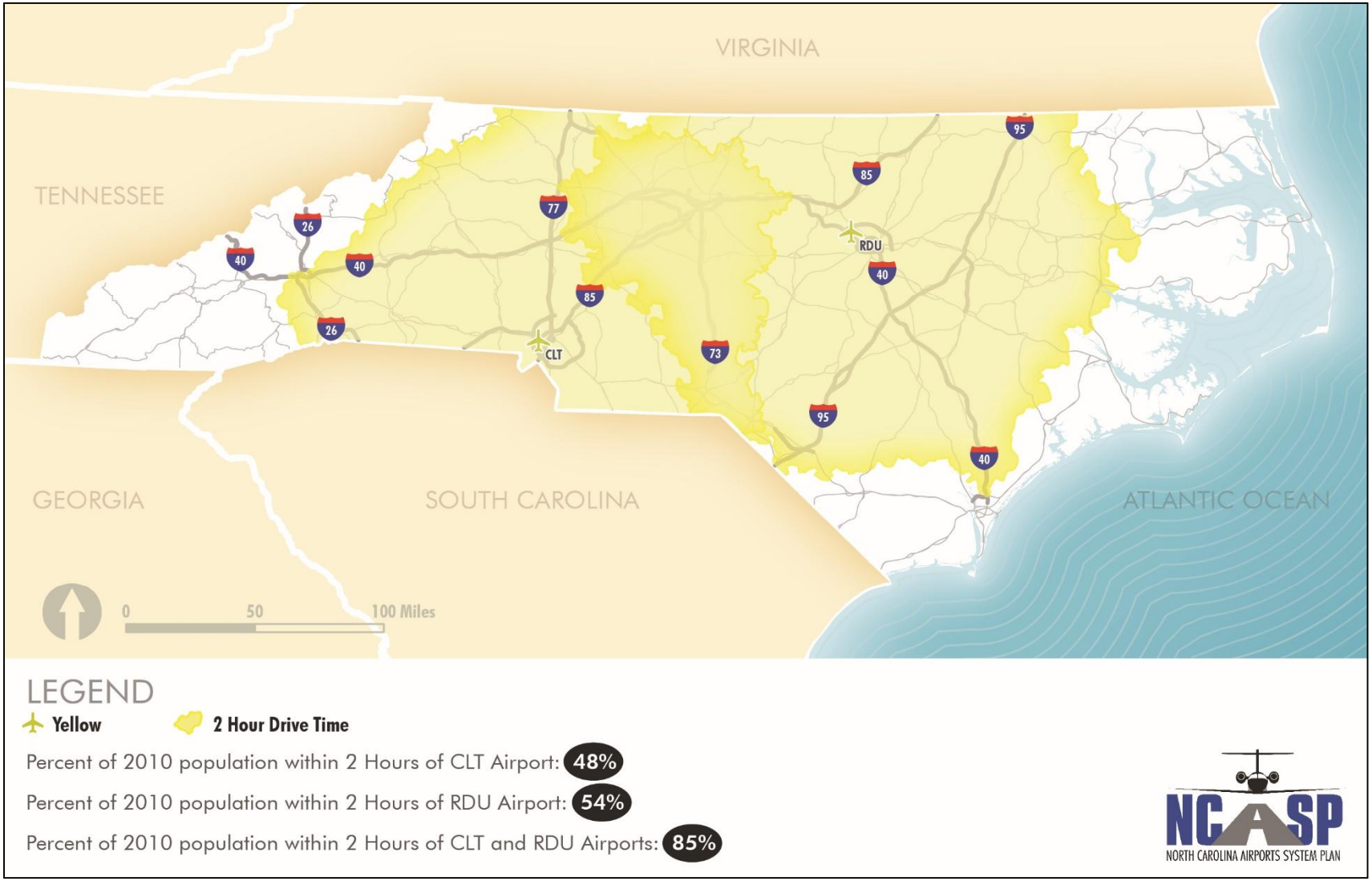


Figure 7.7: Percent of Population within a 2-Hour Drive Time of the Major Airports (CTL and RDU) in North Carolina



Percent of system airports that provide intermodal options for their community, including public transportation interfaces at the airports

The primary form of intermodal activity at an airport is the use of automobiles for passengers and employees that travel to and from the airport. Some airports are also accessible by rail (light rail or freight rail), and some are accessible by bus transit, as well as a few by ferry in North Carolina.

Airports should be accessible to all people, including those who do not or cannot own a personal automobile. Options for intermodal or public transportation interfaces may include public buses or vans, trams or trains, or unique forms such as ferries. In a report produced by the FAA titled Airport Ground Access Planning Guide (available at http://ntl.bts.gov/DOCS/AGAPP.html), it is noted that "high quality public transit service…can attract significant ridership and help alleviate vehicular congestion in the terminal area." Airports should work with their local municipalities and counties to ensure that there are intermodal options available to passengers and employees, and they should understand the specific need for options such as freight rail access.

There are no project costs associated with this performance measure.

Percent of system airports with 24/7 fueling

Providing 24/7 fuel access can benefit an airport and the surrounding community. First, access to fuel may be helpful or necessary during emergency situations at the airport or in the surrounding region. Also, the availability of fuel can raise the competitive advantage of an airport when it comes to attracting based aircraft or regular customers.

Currently, 91 percent of airports were identified to provide fuel service 24 hours a day every day. There are two options for airports to provide 24/7 fuel: 1) Have someone physically at the airport at all times to distribute the fuel (FBO-fueling); and 2) Provide automatic pumps with card readers, similar to gas pumps, where aircraft operators can swipe a card and refuel the aircraft themselves (self-serve). For airports that have a significant number of larger aircraft that require jet fuel, it is recommended that they provide FBO fueling since, in many cases, operators of larger jets will be unwilling or unable to fuel their aircraft without proper equipment and training. For smaller airports that currently do not have a 24/7 fuel system, it is recommended that they install card readers to provide self-serve fuel to their customers.

The following airports do not currently provide 24/7 fueling, but are recommended to do so based on operations and demand: Gastonia Municipal, Triangle North Executive, Mount Airy/Surry County, Tri-County, Montgomery County, and Martin County. Specific project costs have not been identified for this performance measure.

Percent of system airports with jet fuel

In association with the discussion above, it was found that all Yellow, Red and Blue airports and a total of 88 percent of system airports provided jet fuel. Availability of jet fuel is important for airports to serve hospitals and business user needs; thus it is recommended that all airports with adequate demand should have jet fuel available. This should be determined on a case-by-case basis. See ADP 2200: Fuel Facilities for more information and recommendations. There are no project costs associated with this performance measure.

Percent of system General Aviation airports operating below 60 percent operational capacity

Anticipated capacity for general aviation airports within the system in the year 2031 was calculated and it was found that 100 percent of airports will be under 60 percent of their operational capacity; this means that the target compliance is likely to be met. Even though the anticipated compliance is 100 percent, it is still recommended that each airport's demand and capacity be monitored over time. If any airport's demand approaches 60 percent of its capacity, then the airport should begin to consider developing plans to enhance capacity. If an airport's demand approaches 80 percent of its available capacity, then the airport should implement these projects.

The capacity at Yellow airports, especially the largest commercial service airports, is measured differently than at most general aviation airports. The Yellow or commercial service airports typically use hourly capacity as their measurement and conduct detailed analysis to evaluate the capacity condition. This level of analysis was not prepared as part of the NCASP. During the site visits and other discussions during the NCASP, a potential capacity issue has been identified at CLT that is being studied to determine the appropriate actions. An additional runway at CLT has been requested over the years, and the aforementioned studies will be necessary to determine the level of urgency at which this is necessary. A cost to address this capacity concern is not included in the NCASP at this time.

Percent of system airports meeting service objectives (FBO, pilot training, maintenance, charter, terminal amenities).

It is recommended that airports provide certain services and amenities that are beneficial to airport patrons and can help provide a better experience. These include the following:

Services	*Terminal Amenities*
FBO	Restaurant
On-site rental car	Public Restrooms
Courtesy/crew car	Vending/Food/Beverage
Flight instruction	Pilot Lounge
Aircraft maintenance	Conference room
On-site aircraft charter	Flight planning room
	Public internet access
	Wi-Fi

These services and amenities should be offered to the extent that is possible and reasonable based on demand and the ability to justify the services. Similarly, some of the services provide similar benefits such as rental car and courtesy car or food/beverage service and a restaurant; for smaller airports, it is not appropriate to provide the more labor- and cost-intensive services. On the other hand, the busier airports should consider having many of these services if it does not have them already. Project costs have not been identified for this performance measure.

Percent of system airports that are incorporated in state and local comprehensive plans

The target for this performance measure is to have 100 percent of North Carolina's airports be included in their respective local comprehensive plan and into any local or regional transportation plans that are developed. Currently, it is recommended that, at a minimum, each airport's ALP is acknowledged and included in their respective areas local plans as inputs into long-term planning and programming for an area. Aviation services are inherently important to an areas comprehensive and long-term plan but have not always been considered prior to the implementation of STI.

Including airport planning documents into local plans may help to get funding for airport projects, since Federal, state, regional and local decision makers use these plans when deciding what capital projects are developed and included in the processes for funding or land acquisition. Thus, it is recommended that airports coordinate with the local, county, regional, and state planners to ensure that the needs of the airports are considered during the planning process and are included into those of the jurisdictions. Airport representatives should also make an effort to attend local planning meetings and be in conversation with local planners in order to ensure that there are open lines of communication and that each party is aware of the plans and goals of the other.

Related to this measure, the DOA can help facilitate land use compatibility at airports by providing airports with relevant resources. There is a lot of existing guidance put forth by the ACRP and FAA on land use compatibility issues such as object height, noise impacts, and airspace obstructions, which should be made readily available for use by all North Carolina Airports. It is anticipated that better access and awareness of this guidance can help airports to formalize land use policies and/or ordinances that could be presented to municipalities for adoption.

Financial Needs

This section presents system-level costs to improve the state system and meet the established performance measure targets relative to the airports. These costs have been prepared for the DOA for planning purposes only to help determine the overall, long-term aviation needs of the system. These costs are not intended to replace those previously developed in airport master planning or capital improvement programming development nor do these costs provide a commitment of funding for projects by either the DOA or the FAA.

Methodology

Cost estimates were developed for each airport in the system by comparing existing conditions with applicable performance measure objectives established in the NCASP. Costs were not developed for each performance measure since several of the performance measures have costs tied to measures in other categories and others simply have no costs associated with them. Table 7.4 identifies which performance measures have associated costs.

Table 7.4: Identification of Costs by Performance Measure

Performance Measure	Recommendation	Costs Provided
Goal Category: Safety		
• Percent of airports with controlling interest over the FAA design standard Runway Protection Zones (RPZs) for each runway end	Projects	Yes Costs included in ADP 300
• Percent of system airports addressing wildlife issues	Program	No
• Percent of system airports with an Airport Emergency Plan	DOA Guidance	No
• Percent of system airports with a General Aviation Security Plan	Program	No
• Percent of system airports that support search and rescue operations	Informational; DOA to Collect	No
• 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	Projects	Yes Costs included in multiple ADP categories
• Percent of system airports meeting 2013 FAA taxiway geometry standards	Projects	No Insufficient Information
• Percent of system airports meeting FAA threshold siting surface requirements	Projects	No Insufficient Information
• Percent of system airports that have adopted a FAR Part 77 Airport Height Ordinance	Continuous Planning	No
Goal Category: Infrastructure Health		

Performance Measure	Recommendation	Costs Provided
• Percent of system airports that meet applicable FAA runway/taxiway separation design criteria on their runways for their current ARC	Projects	Yes
• Percent of airports that have adopted Minimum Operating Standards and Rules and Regulations	Airport Action	No
• Percent of system airports that are adequately accessible in terms of signage and wayfinding	Airport Action	No
• Percent of airports meeting all system objectives in ADP.		
• 050: Airport Layout Plan (ALP)	Program/Projects	Yes
• 100: Runway Approach	Program	Yes
• 200: Runway Safety Area	Program	Yes
• 300: Runway Protection Zone	Program	Yes
• 400: Pavement Conditions	Projects	Yes
• 500: Runway Length/Runway Width	Projects	Yes
• 600: Pavement Strength	Projects	Yes
• 700: Visual Navigational Aids	Projects	Yes
• 800: Runway Edge Lighting	Program/Projects	Yes
• 900: Weather Reporting Capability	Program/Projects	Yes
• 1000: Standard Instrument Approach	Program/Projects	Yes
• 1100: Parallel Taxiway	Projects	Yes
• 1200: Aircraft Apron	Projects	Yes
• 1300: General Aviation Terminal Building	Projects	Yes
• 1400: Taxiway and Apron Edge Lighting	Program	Yes
• 1500: Airfield Signage	Program/Projects	Yes
• 1600: Ground Communication	Program/Projects	Yes
• 1700: Approach Lighting	Projects	Yes
• 1800: ARFF Equipment	No Action	No
• 1900: Hangars	Program/Projects	Yes

Performance Measure	Recommendation	Costs Provided
• 2000: Airfield Maintenance Equipment/Storage Building	Projects	Yes
• 2100: Perimeter Fencing	Projects	Yes
• 2200: Fuel Facilities	Projects	No Case-by-case
Goal Category: Mobility		
• Percent of population within 30 minutes of a system airport by role grouping	No Action	No
• Percent of total employment/businesses within 30 minutes of a system airport	No Action	No
• Percent of system airports with a published instrument approach procedure	Projects	Yes Costs included in ADP 1000
• 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)	No Action	No
• Percent of population within 60 minutes of a system airport with commercial airline service by at least one airline	No Action	No
• Percent of system airports that provide intermodal options for their community, including public transportation interfaces at the airports	No Action	No
• Percent of system airports with 24/7 fueling	No Action	No
• Percent of system airports with Jet Fuel	No Action	No
• Percent of system airports operating below 60 percent operational capacity levels	No Action	No
• Percent of system airports meeting service objectives (FBO, pilot training, maintenance, charter/aircraft rental, terminal amenities)	No Action	No
• Percent of system airports that are incorporated in local comprehensive transportation plans	No Action	No

Source: NCASP analysis

Assumptions used in developing the anticipated costs to meet the system objectives are outlined in the following section. While costs were developed from the bottom up, generally by airport, the estimated costs for the system plan are presented in summary format later in this chapter.

Assumptions

The following sections present the assumptions used in developing costs associated with each performance measure and ADP category.

Runway/Taxiway Separation Design Criteria

Costs for this measure were based on a $170 per square yard unit cost, which was taken from other similar projects in North Carolina (provided by the DOA) plus a 20 percent contingency factor. Pavement area estimates for applicable airports to place taxiways at a proper separation were based on the runway's current ARC.

050: Airport Layout Plan

ALP costs were estimated at $250,000 for Red airports, $200,000 for Blue airports, and $150,000 for Green airports. ALP updates were assumed to be needed every 10 years for each Red, Blue, and Green airport. The cost also includes the cost of one AC 150/5300-18C compliant survey for each Red, Blue, and Green airport at a cost of $50,000 per airport. This category does not apply to Yellow airports.

100: Runway Approach

Costs for this objective were based on an estimate of $75,000 per runway end at each airport in order to clear the runway approaches. This cost was expected to be incurred by the DOA once during the planning period for each airport.

200: Runway Safety Area

There are a variety of reasons that an airport can fail to meet its RSA objective; these include, but are not limited to, existing grading of the RSA, objects within the RSA, or insufficient length or width of the RSA. An estimated cost of $6,000,000 per non-compliant runway end was used to determine the total cost for this objective. These costs were associated with improvements to existing RSAs, and do not include RSAs associated with future runway extensions or other changes associated with meeting future RSA standards.

300: Runway Protection Zone

RPZs for existing runways were reviewed from aerial photography and categorical estimates were made for each airport to meet the objective of complete fee simple ownership or easement control/acquisition. Estimates of acreage, price per acre, and airport property limits were not available to estimate costs for RPZ acquisition. The categories and associated, assumed costs were as follows:

- No Impact (all RPZ area within airport property): $0
- Only Easements needed (non-central portion of RPZ): $500,000
- Low/Minor Impact to acquire: $1,000,000
- Medium Impact to acquire: $2,500,000
- High/Major Impact to acquire: $5,000,000

Similar to RSAs, these costs were associated with improvements to existing RPZs, and do not include RPZs associated with future runway extensions or other changes associated with meeting future RPZ standards.

400: Pavement Conditions

Individual cost estimates for each airport were developed based on the current and target pavement conditions. The estimates included costs of major projects that will be necessary to achieve the desired PCI over the first five years of the planning period. They also included Micropaver-supplied costs associated with necessary preventative maintenance that would occur over a 20-year planning period.

500: Runway Length/Runway Width

Multiple items were associated with total cost estimates for meeting runway length and width objectives. Costs were estimated for extending runway pavement, construction of an associated parallel taxiway, RSA grading, and RPZ land acquisition. Pavement costs were based on unit costs provided by the DOA for similar projects in North Carolina. RSA and RPZ estimated costs relative to runway extensions or improvements were derived using the assumptions outlined above for ADP 200 and ADP 300, respectively.

600: Pavement Strength

Individual cost estimates by airport were developed based on the existing and target pavement strengths.

700: Visual Navigational Aids

The cost estimates for meeting this objective included installation of airport beacons and PAPIs only. The cost to add an airport beacon was estimated at $50,000. Installation of a PAPI at each needed runway end was estimated at $50,000.

800: Runway Edge Lighting

Costs for this category assumed a cost of $150 per linear foot of runway length in order to install new or replace/upgrade existing systems for MIRLs and HIRLs for the existing runway. Existing runway edge lighting systems were assumed to be upgraded to LED systems at some point during the planning period. Any new lighting needed relative to a runway extension was included in the cost estimate for ADP 500.

900: Weather Reporting Capability

Installation of a new or replacement ASOS or AWOS system was assumed to cost $70,000. All existing AWOS/ASOS systems are assumed to be replaced at some point during the planning period.

1000: Standard Instrument Approach

There were multiple costs associated with this category. A GPS-based procedure with a lump sum cost of $50,000 was assumed to be needed for non-compliant airports to meet their approach objective.

All existing (as of 2014) state-owned ILS installations were assumed to need replacement during the planning period at a cost of $350,000 for each localizer and $350,000 for each glideslope/DME.

1100: Parallel Taxiway

Costs were estimated for extending or installing taxiway pavement as necessary to provide full parallel taxiways for the length of the existing primary runway. Pavement costs were based on a $142 per square yard unit cost, which was estimated based on costs from similar projects in North Carolina provided by the DOA.

1200: Aircraft Apron

Costs for additional apron area to accommodate based aircraft were estimated using an $82 per square yard unit cost, according to data obtained from the DOA, and an average apron area of 500 square yards per aircraft. Based on discussions with DOA, estimates assumed that an apron expansion project would result in a minimum of 12 additional apron spaces.

1300: General Aviation Terminal Building

Costs for new/replacement GA terminal buildings were developed based on a unit cost estimate of $250 per square foot combined with the size requirements of this ADP category for the terminal area. The resulting terminal costs by airport type are as follows:

- Red Airports: $1,375,000
- Blue Airports: $1,125,000
- Green Airports: $800,000

1400: Taxiway and Apron Edge Lighting

Costs for this category assumed a cost of $170 per linear foot of taxiway in order to construct new or replace/upgrade existing systems. Existing taxiway edge lighting systems were assumed to be upgraded to LED systems at some point during the planning period.

1500: Airfield Signage

Costs for this category assumed a cost of $10,000 per required sign with 20 signs assumed per runway.

1600: Ground Communication

Estimated costs assumed a cost of $40,000 for each airport requiring a communication line.

1700: Approach Lighting

The estimated cost associated with a new or replacement MALSR system was $1,500,000, and a cost of $270,000 was assumed for a new or replacement ODALS. Half of the existing MALSR and ODALS systems currently in place as of 2014 were assumed to be replaced within the planning period.

1800: ARFF Equipment

No costs were included for this category. All Part 139 airports in the system currently meet system requirements for this category.

1900: Hangars

A cost of $100,000 per hangar unit was estimated for this category.

2000: Airfield Maintenance Equipment/Storage Building

Costs for new airfield maintenance equipment/storage buildings were developed based on an assumed cost estimate by category as follows:

- Red Airports: $250,000
- Blue Airports: $150,000
- Green Airports: $50,000
-

2100: Perimeter Fencing

Costs for perimeter fencing were estimated at $23 per linear foot for an 8-foot, buried and concertina wire fence.

2200: Fuel Facilities

No cost estimates associated with fuel facilities were included for this objective. Fuel facility provisions are made on a case-by-case basis and are based on unique business cases at each facility.

System Plan Cost Summary

Total estimated costs are presented in this section. Estimated costs are expressed in 2014 dollars, with no adjustments for inflation. These estimates should be used for planning purposes only. Actual project costs should be determined through formal planning, engineering, and design at the time of project implementation.

The total estimated cost to meet applicable 20-year system plan objectives is approximately $1.2 billion. Table 7.5 and Figure 7.8 presents a summary of the system plan costs by airport classification.

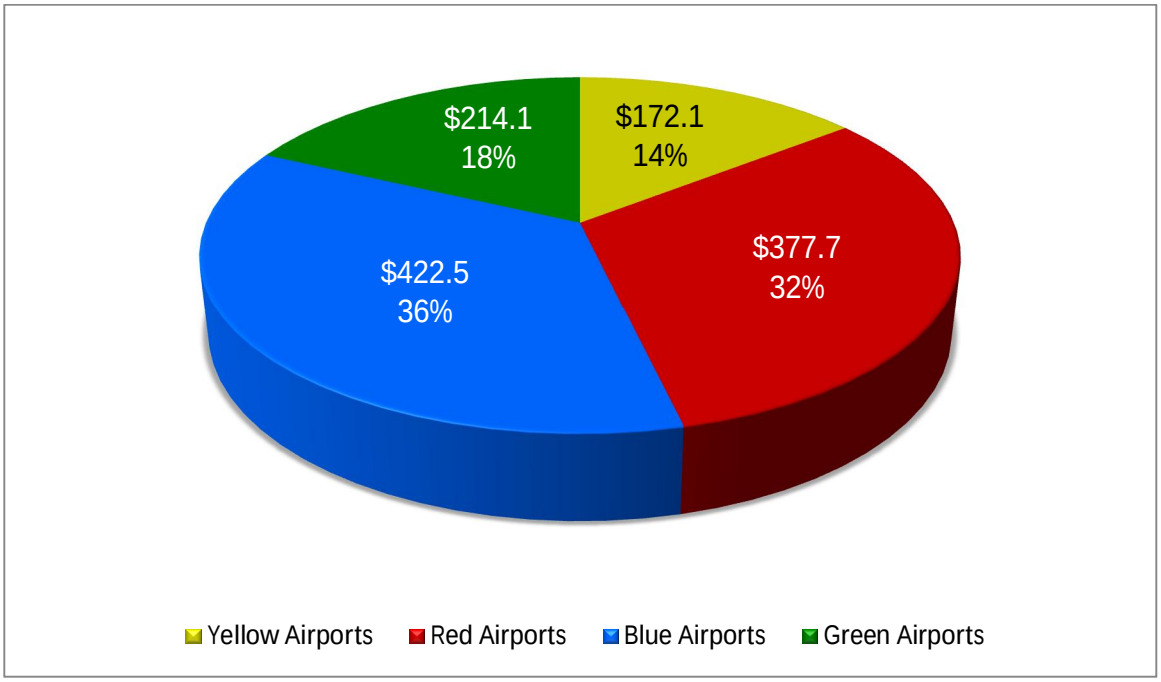
Table 7.5: Summary of System Plan Costs by Performance Measure

Performance Measure/ ADP Category	Yellow Airports	Red Airports	Blue Airports	Green Airports	Total
Infrastructure Health #1: Airports Runway-Taxiway Separation	$0	$15,750,000	$13,017,000	$0	$28,767,000
Infrastructure Health #3: ADP System Objectives					
ADP 050: Airport Layout Plan Compliance	$0	$8,800,000	$11,700,000	$7,100,000	$27,600,000
ADP 100: Runway Approach Compliance	$3,300,000	$3,150,000	$4,650,000	$3,150,000	$14,250,000
ADP 200: RSA Compliance	$6,000,000	$36,000,000	$42,000,000	$24,000,000	$108,000,000
ADP 300: RPZ Compliance	$7,500,000	$54,500,000	$49,500,000	$16,000,000	$127,500,000
ADP 400: Pavement Condition Compliance	$77,560,000	$53,820,000	$63,770,000	$14,400,000	$209,550,000
ADP 500: Runway Length and Width Compliance	$20,229,000	$54,148,000	$66,305,000	$37,984,000	$178,666,000
ADP 600: Pavement Strength Compliance	$0	$50,800,000	$24,800,000	$4,400,000	$80,000,000
ADP 700: Visual Navigation Aids Compliance	$50,000	$1,050,000	$2,050,000	$1,000,000	$4,150,000
ADP 800: Runway Edge Lighting Compliance	$22,414,000	$17,535,000	$24,098,000	$11,770,000	$75,817,000
ADP 900: Weather Reporting Capability Compliance	$700,000	$1,120,000	$1,820,000	$1,400,000	$5,040,000
ADP 1000: Standard Instrument Approach Compliance	$1,450,000	$3,700,000	$6,450,000	$500,000	$12,100,000
ADP 1100: Taxiway Requirement Compliance	$0	$0	$36,654,000	$47,008,000	$83,662,000

Performance Measure/ ADP Category	Yellow Airports	Red Airports	Blue Airports	Green Airports	Total
ADP 1200: Aircraft Apron Requirements Compliance	$0	$943,000	$1,476,000	$2,460,000	$4,879,000
ADP 1300: General Aviation Terminal Building Compliance	$0	$15,125,000	$18,000,000	$13,125,000	$46,250,000
ADP 1400: Taxiway & Apron Edge Lighting Compliance	$25,401,000	$19,872,000	$27,312,000	$13,339,000	$85,924,000
ADP 1500: Airfield Signage Compliance	$0	$1,200,000	$3,400,000	$3,400,000	$8,000,000
ADP 1600: Ground Communications Compliance	$0	$240,000	$320,000	$640,000	$1,200,000
ADP 1700: Approach Lighting Compliance	$7,500,000	$18,000,000	$9,360,000	$3,780,000	$38,640,000
ADP 1800: ARFF Compliance	$0	$0	$0	$0	$0
ADP 1900: Hangars Compliance	$0	$19,200,000	$10,200,000	$2,300,000	$31,700,000
ADP 2000: Airfield Maintenance Equipment/ Storage Building Compliance	$0	$1,250,000	$2,100,000	$650,000	$4,000,000
ADP 2100: Perimeter Fencing Compliance	$0	$1,500,000	$3,498,000	$5,735,000	$10,733,000
ADP 2200: Fuel Facilities Compliance	$0	$0	$0	$0	$0
Totals	$172,104,000	$377,703,000	$422,480,000	$214,141,000	$1,186,428,000

Source: NCASP analysis

Figure 7.8: System Plan Cost Summary by Airport Category (in millions)



Source: NCASP analysis

Projects identified in the NCASP represent those needed to meet the system objectives. Airport-specific capital improvement programs and other project costs are considered above and beyond the $1.2 billion total system plan costs.

Table 7.6 presents the total system costs and additional program costs identified above into near-term (2015-2019), mid-term (2020-2024), and long-term (2025-2034) periods. For all cost categories except three, the preliminary assumption made for distributing costs across the planning periods was 25 percent in the near-term, 25 percent in the mid-term, and 50 percent in the long-term period. The three exceptions were ADP 200, ADP 400, and ADP 500. For ADP 200, it is assumed that due to the FAA's focus on RSA compliance, 95 percent was assigned to the near-term period, with 5 percent in the mid-term. The ADP 400 phasing placed the major project costs for PCI adherence identified in Section 7.6.2 entirely in the near-term period, with the remaining costs of the category split 40 percent in the mid-term and 60 percent in the long-term. ADP 500 costs were distributed 15 percent in the near-term, 30 percent in the mid-term, and 55 percent in the long-term period to account for the longer lead times related to planning, environmental clearance, and design typical for runway extension projects.

Table 7.6: Total Airport System Plan Costs 2015-2034 (in millions)

Cost Category	Near-Term 2015-2019	Mid-Term 2020-2024	Long-Term 2025-2034	Total
NCASP Project Costs	$430.49	$263.96	$491.98	$1,186.43
Additional System Costs	$0.5	$0.5	$1.0	$2.0
Total Costs	$430.99	$264.46	$492.98	$1,188.43

Funding Sources

Publicly-owned airports in North Carolina have several funding sources available to aid in the improvement and maintenance of their airports. Airports can use a combination of federal, state, and local funds to fund projects.

To receive federal and state funding, airports must participate in the DOA's Transportation Improvement Program (TIP), which identifies and prioritizes projects for all airports in the system.

DOA is part of the federal State Block Grant Program and is responsible for administering federal funds in addition to state funds. Both federal and state funding sources have separate requirements regarding types of projects that are eligible for funding and different processes required to secure funding.

For additional and up-to-date information regarding funding of airport projects in North Carolina, refer to the *North Carolina Airport Development Programs and Policies Guide* (NCADPP Guide).

Federal Funding

The FAA's Airport Improvement Program (AIP) is available to airports that are included in the NPIAS. The AIP provides funds for projects to improve infrastructure including runways, taxiways, aprons, noise control, land purchases, navigational aids, safety, and security. The AIP is funded entirely by aviation-related fees and taxes such as airline ticket taxes, segment and international travel fees, cargo fees, and aircraft fuel taxes that are deposited into the Airport and Airway Trust Fund. AIP money is distributed by the FAA through formulas set by law for apportionment (including entitlements) and discretionary grants. Two-thirds of AIP funding is allocated to apportionments and the other third is allocated to discretionary funding.

State Block Grant Program

As one of 10 states that participate in the FAA's State Block Grant Program, DOA assumes the responsibility for administering AIP funds to airports classified as non-primary. For these airports, DOA acts as the conduit by which airport sponsors apply to the FAA for funding of airport development projects, and through which airport sponsors receive federal funds for reimbursement. Federal funding for primary airports in North Carolina is allocated and administered by the FAA.

State Apportionment & Non-Primary Entitlement Funding

The FAA's non-primary airport apportionment fund accounts for 20 percent of the total federal AIP funding. There is a two-step process to allocate the FAA general aviation apportionment funds: 1. Allocate $150,000 to each non-primary airport (non-primary entitlement or NPE) and 2. Allocate the remaining apportionment balance among the states based on area and population (also known as State Apportionment). In 2014, the FAA determined that airports that are unclassified in ASSET are not eligible for NPE funding, although they still remain eligible for AIP.

Discretionary Funding

After distributing apportionments, the balance of the FAA AIP funding is dedicated to discretionary funding. Discretionary funding is subject to the set-aside requirements for noise, former military airfield, and reliever airport projects. Once the set-asides are allocated, the remainder of the discretionary funds is considered "pure" discretionary. About 75 percent of these funds are designated as Capacity/ Safety/Security/Noise and are available only to primary and reliever airports. The remaining 25 percent is available to all other airports. Each year, the FAA identifies a candidate pool of the highest priority projects by region and distributes these funds to the regions.

In North Carolina, the FAA awards and administers discretionary funding to the primary airports. The FAA works closely with DOA to award discretionary funds to the non-primary airports. However, as a Block Grant State, DOA oversees and administers the discretionary funds to the general aviation NPIAS airports in the State.

State Funding

State funding sources for North Carolina airports is used to fund three categories of projects: capital improvements, regulatory projects, and statewide programs.

Capital Improvement and Regulatory Project Funding

The new state funding process and source for NCDOT is referred to as Strategic Transportation Investments (STI) and was signed into law in June 2013. STI funds capital expenditures for all transportation modes including highway, rail, airports, public transportation, bike/pedestrian, and ferry. Non-highway modes receive a minimum combined 4 percent of the annual Highway Trust Fund. The Highway Trust Fund is used to fund capital improvement projects while the Highway Fund is used to fund regulatory projects.

Airport projects eligible for STI funds include any project that is beyond the NCASP system objectives by airport grouping, including but not limited to land acquisitions beyond FAA critical areas, such as RPZs and RSAs and runway expansions beyond the ADP objective.

Airport projects that are submitted for STI funding must undergo a detailed scoring process to compete for funds with all other modes.

Safety, Regulatory, and Operational Project Funding

Airport safety, regulatory, and operational (SRO) projects are those airport projects recommended in the NCASP to meet the system objectives by airport grouping. Regulatory projects are funded through the NCDOT Highway Fund as opposed to the NC Highway Trust Fund. Capital expenditures are those projects above and beyond system objectives, such as a runway extension to 7,000 feet.

Statewide Programs Funding

Several statewide programs provide funding for specific types of airport projects. Similar to SRO funding, the funding for these programs is provided through the NCDOT Highway Fund. The state provides 100 percent of the funding for most of these projects and there is no local match needed for participation in the programs. DOA has the authority to create additional programs if there is a system need and a statewide issue that needs to be addressed.

The following state-funded special programs are available for North Carolina airport participation:

- Airport Safety Preservation Program: DOA uses state staff and contractors to carry out minor airport maintenance and safety correction projects such as pavement marking, crack sealing, shoulder grading, ditch cleaning, and tree removal.
- Wildlife Hazard Management Program: DOA partners with the USDA APHIS Wildlife Services to provide wildlife hazard site visits at general aviation airports, Wildlife Hazard Assessments at 14 CFR Part 139 certified airports, wildlife hazard training to personnel at both publicly-owned and privately owned airports, and responds to various requests for direct hazard management or technical assistance.
- AWOS Program: DOA partners with North Carolina airports to share the costs of supporting the AWOS systems. While DOA provides the original equipment, provides routine maintenance (every 3 years), and affords the cost of the NADIN data uplink, the airport sponsor is responsible for insuring the equipment against weather and acts of God and pays for upgrades to the older equipment. AWOS upgrades can be funded from FAA NPE monies, on a 90 percent federal/10 percent local match.
- Unmanned Aerial Systems (UAS) Program: North Carolina Session Law 2014-100 required implementation of testing and permitting for UAS operations in the State. This program funds this implementation.

Local Funding

Local communities and counties also play a large role in the funding of their local airport projects. In North Carolina, the local match for both state and federally funded projects is 10 percent of the total project cost. While some airports can use excess

revenue from airport operations and leases to fulfill their match, other airports must rely on additional public funds, especially when funding large projects.

Other Funding Sources

After exhausting the traditional aviation funding sources for airport and aviation related projects, airports in North Carolina have several additional options for funding their projects. Brief descriptions of these sources of funding are presented in the following sections.

State Infrastructure Bank (SIB)

The State Infrastructure Bank (SIB) Program gives states the capacity to increase the efficiency of their transportation investment and significantly leverage federal resources by attracting non-federal public and private investment. The federal program allows states to enter into agreements with the USDOT Secretary of Transportation to establish infrastructure revolving funds eligible to be capitalized with federal transportation funds.

The North Carolina SIB, established in 1997, was capitalized with federal funds under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). The SIB created revolving credit assistance funds using apportioned federal and state funds. Its purpose is to assist projects that have a source of revenue but need either short-term financial assistance or long-term financing.

Between 1997 and 2012, eight (8) SIB agreements have been signed, worth $3.2 million.

Golden LEAF Foundation

The Golden LEAF Foundation is devoted to advancing the economic well-being of North Carolina and to transforming its economy. Founded in 1999, the foundation was created to receive half of the funds coming to North Carolina as a result of the master settlement agreement with cigarette manufacturers. Golden LEAF works in partnership with local governments, educational institutions, economic development organizations, etc. to achieve their goals of transforming the economy of North Carolina. Since 1999, Golden LEAF has funded more than 1,200 projects, totaling more than $561 million.

Examples of awarded projects at airports include infrastructure needs (water and sewer) necessary for businesses to locate in airport industrial and/or business parks; runway and taxiway extensions that are cited necessary to retaining and expanding existing industry in the community as well as the recruitment of new businesses; development of airport industrial/business parks; and the purchase of necessary ARFF vehicles to support safety at the airports and support jobs for an extended time period.

Private Funds

Projects such as maintenance and storage hangars, fuel systems, and pay parking lots, which are not typically eligible for federal or state grant funding at public airports

can be paid for by FBOs or other local businesses who typically benefit from their development as these facilities generate revenue.

Historical Funding

Historically, the DOA has obtained on average about $20 million annually in AIP funds from the FAA for the Block Grant Program. North Carolina funds airports at nearly $12 million annually, through the NC Highway Fund. This amounts to $32 million in funding in a typical year with the vast majority going towards the 62 general aviation airports. Funding for the commercial service airports is above and beyond this amount, with many of these airports being eligible for other federal funding and the ability to generate much higher revenue from passengers, concessions, parking, and other fees.

System Costs by Funding Sources

Table 7.7 presents the total system costs broken down by federal/state and local funding sources. The NCASP's long term needs amount to $1.2 billion over the 20-year planning period, which breaks down to an average annual need of approximately $50 million. Thus there is a current shortfall of about $18 million annually or a 20-year deficit of about $360 million.

Table 7.7: Total Airport System Plan Costs by Funding Source (in millions)

Category	State Funding (Incl. Block Grant and State Aid to Airports)	Local/Other	Total
Airport Projects			
Commercial Service Airports	$ 76,000,000	$ 96,104,000	$ 172,104,000
GA Airports	$ 881,905,600	$ 132,418,400	$ 1,014,324,000
Subtotal - Airport Projects	*$ 957,905,600*	*$ 228,522,400*	*$ 1,186,428,000*
Other Programs			
Wildlife Assessments	$ 2,000,000		$ 2,000,000
Subtotal - Other Programs	*$ 2,000,000*	*$ -*	*$ 2,000,000*
Total	*$ 959,905,600*	*$ 228,522,400*	*$ 1,188,428,000*
Percentage Share	*81%*	*19%*	*100%*

Implementation Responsibilities

The following section identifies the duties and roles that different entities play in maintaining and developing North Carolina's airport system. Each of these entities will impact the future of the airport system and will have a role in ensuring that recommendations from this system planning effort are followed through.

NCDOT DOA

DOA is a branch of NCDOT that advocates for and delivers services that promote and enhance a healthy and safe air transportation system. To achieve this goal, the DOA's responsibilities include the following:

- Administers funding programs including the Federal Aviation Administration's (FAA) Block Grant Program and the State Aid to Airports Program
- Administers applicable provisions of the North Carolina General Statutes
- Inspects all general aviation public use airports
- Supports the statewide aviation weather reporting (AWOS) program
- Supports airport wildlife hazard management
- Plans for the development of the State aviation system
- Provides runway markings and windsocks for all public use airports
- Promotes aviation through communications, outreach, and educational activities
- Develops special studies and initiatives

In order to support airports and their development, DOA has divided the airports into one of four geographic regions - North East, North West, South East, and South West. DOA has assigned an Airport Project Manager to each region to provide technical assistance and expertise with airport planning, engineering, design, and construction. Airport Project Managers are also responsible for the administration and management of the State's and FAA's grant programs for airports within their respective geographic region.

Individual Airport Sponsors

All airport sponsors in North Carolina have obligations and responsibilities to ensure the safe operation of their airports. All sponsors are responsible for the daily maintenance of their airports and supervision of operational activities as well as budgeting and financial dealings. Airports that are included in the FAA's National Plan of Integrated Airport Systems (NPIAS) are eligible for federal funding and must adhere to additional FAA and state standards and obligations. All 72 publicly-owned and operated airports in North Carolina are included in the NPIAS. There are an additional 300 privately-owned airports in the State that are not included in the NPIAS.

NPIAS Airports

According to DOA, the responsibilities of the 72 publicly-owned and operated airports in North Carolina included in the NPIAS include (but are not limited to) the following:

- Compliance with North Carolina General Statutes (NC GS) Chapter 63. Article 1 of NC GS 63 authorizes cities, towns, and counties to establish public airports while Article 6 defines the powers of municipalities in operating the airport.
- Compliance with State and Federal Grant Assurances. Both federal and state aid programs carry with them certain obligations on the part of the local

government receiving funds. Airport sponsors are obligated to both FAA and NCDOT for past grants.

- Up-to-date Airport Layout Plan (ALP). Sponsors are responsible for the long term development planning of the airport. DOA requires airports to update their ALPs at least every 10 years, every 5 years for Yellow Airports, or as needed. NPIAS airports must closely follow FAA design standards in planning the development of their airport. These are included in FAA Advisory Circular (AC) 150/5300-13A, *Airport Design*.
- Participation in the Five-Year Airport Transportation Improvement Program (TIP). The Airport TIP identifies and prioritizes projects for all airports in the system. Submission of airport projects to the TIP is needed to secure federal, state, and local project funding. These are usually submitted to DOA prior to the beginning of each fiscal year. Additional information on the funding programs is provided later in the NCADPP guide.
- Obstruction Clearance. Sponsors are responsible for keeping their runway approaches clear of obstructions to the appropriate FAA standards found in Section 3.3.2.c of FAA Order 8260.3B, *United States Standard for Terminal Instrument Procedures (TERPS)*.
- Federal Aviation Regulations (FAR) Part 77 Height Restrictions and Land Use Zoning. Airport sponsors must work with local (city, county, and regional) planning offices to establish and enforce local ordinances regarding height restrictions around the airport and ensure land use plans and airport overlay zones support compatible land use around airports. Article 4 of NC GS 63 - Model Airport Zoning Act - provides height and land use zoning guidance to airports
- Airport Minimum Operating Standards and Rules and Regulations. In order to promote safe airport and aircraft operations and sound business practices, DOA requires all airports to publish current Minimum Operating Standards and Rules and Regulations that have been adopted by local ordinance.
- Adherence to the DOA's Airport Development Plan (ADP). DOA has established airport system objectives regarding airport development. Sponsors should understand their role in the state airport system, the DOA's project prioritization system, and which airport development projects are eligible and ineligible for funding.
- Selection of Consultants. Airport sponsors are required to select consultants that will result in high quality services at a reasonable expense and in accordance with applicable FAA advisory circulars including 150/5100-14E, *Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects*.

Public Use/Non-NPIAS Airports

Non-NPIAS airports do not receive federal or state funding and, therefore, they are not required to adhere to many of the items listed previously. However, all privately-owned airports should maintain the safest operating environment possible for the pilots and aircraft utilizing their facilities. Non-NPIAS airports can participate in several NCDOT programs including DOA's Turf Runway Marking Program, Windsock

Program, Safety and Education Program, and Wildlife Hazard Training. Privately owned pubic-use airports also receive airport safety inspections and can utilize the height zoning model found in NC GS 63.

Metropolitan and Rural Planning Organizations (MPOs and RPOs)
There are 19 Metropolitan Planning Organizations (MPOs) and 19 Rural Planning Organizations (RPOs) in North Carolina. These organizations were developed, in part, to support the statewide coordination and planning of transportation projects. STI, which was signed into law in 2013, is the new funding model for state transportation capital projects that requires all transportation modes to compete for capital expenditures funded from the Highway Trust Fund. STI requires local input from MPOs and RPOs in scoring transportation projects, including aviation projects. MPOs/RPOs should recognize the ALP or Airport Master Plan and have a clear understanding of the aviation development needs of the airports within their planning region. This includes ongoing education and conversations between airport sponsors and the MPO/RPO representatives so they have better knowledge of the importance of the continued development and maintenance of the airports in their region.

Continuous Planning

Continuous system planning is an essential part of an effective system planning process and serves as a way to constantly measure the success of the system, especially with respect to the goals put forth by this system plan. Continuous planning is comprised of five elements; these include Surveillance, Reappraisal, Service and Coordination; Special Studies, and Updates. Each of these elements, if considered, will give longevity to the plan and allow it to be relevant for years after its development. It will also ensure that the plan is revisited, goals are monitored, and that the recommendations that are presented are not lost over time. Each of the five elements of continuous planning as they relate to the NCASP is described in more detail below.

Surveillance

As part of the continuous planning process, surveillance of airports with respect to demand components and facilities/services should be undergone for all system airports. For example, demand indicators include those considered in this plan such as numbers of based aircraft or annual operations at each airport. As part of a successful, continuous airport system planning effort, the following actions are recommended:

Activity Indicators

- An informational database should be assembled that documents and tracks annual data on number of based aircraft and operations at each airport. Data on these indicators are presented in this plan and can be used as baseline data. Updated information on these indicators should be collected annually during annual airport inspections or other times of annual information reporting, and the database should be updated based accordingly.

- Beyond general operation numbers, each airport should be encouraged to keep a log of the type and frequency of specific types of aircraft that arrive and depart at the airport throughout the year. The objectives and recommended projects put forth in this plan were largely based on the most demanding ('critical') aircraft that operates at an airport. Logs of the types of aircraft operating at each airport and the frequency of their operations are necessary in order to justify critical expansion projects, such as runways. Additionally, it would be valuable to reach out to emergency medical responders and air ambulance operators to determine which airports are most frequently used for emergency medical transport.

Facilities/Services

- For the time between NCASP updates, system airports are expected to keep their ALPs up to date to reflect any changes to the airport's facilities; it is recommended that these changes also be reported to the DOA on an annual basis. Facilities that should be included in this reporting process include runways (new, extended, and rehabilitated), taxiways (upgraded, shifted, lengthened, and new), airfield lighting, approach aids, instrument approaches, weather reporting facilities, and aircraft hangars.

- Similar to an update of facilities, a report on updates to airport services should be reported. Services that are particularly important include fueling availability (types of fuels, self-service fueling), new/change in FBO, aircraft maintenance and repair capabilities or flight training services and UAS operations. This information should annually be reported to the DOA (during an annual inspection or reporting period) and updated in a database.

Reappraisal

The DOA should follow up with system airports at least once per year to look at the identified goals and objectives and see if there are any notable changes to the airport that significantly affect an airport's ability to meet the identified goals and projects that were put forth by the NCASP.

Service and Coordination

Although specific implementation responsibilities were established in Section 5, there should be communication and coordination between the relevant stakeholders such as the DOA, the system airports, the MPOs/RPOs, DOT Division Engineers and the FAA. Relevant continuous planning efforts could be the following:

- *Implementation Priorities* - The NCASP's focus was centered on performance measures and objectives for the system that involves compliance by individual system airports. As these airports undergo planning and development, strong consideration should be given to projects that will help them achieve the objectives set forth in the plan. Recommendations as well as some specific projects to help airports achieve the objectives are detailed in the above sections of Chapter 7, however, there are a variety of projects that an airport

can do to achieve compliance. When these projects are planned and programmed, it is recommended that those that will make the most significant impact on the airport's overall compliance should be considered and prioritized where possible.

- *Security Issues* - The DOA should encourage and assist airports in taking appropriate security measures to ensure the safety of the airport employees, flight crews/passengers, and aircraft. Airports are recommended to follow and comply with all relevant TSA guidelines and requirements. Airports with commercial airline service are mandated to comply with specific requirements that differ vastly from those of a general aviation airport. Efforts to ensure that all North Carolina system airports are in compliance with state and federal security regulations is recommended.

- *Compatible Land Use* - It is recommended that the DOA continue to encourage airports to utilize land use planning tools to help protect airports from encroachment and incompatible land uses. One such tool that is recommended in this plan includes adopting local zoning ordinances for the height of buildings around airports (FAR Part 77). Airport managers should work closely with local and county municipalities to put in place zoning laws to prevent future vertical obstructions within airport approach surfaces. Additionally, airports should push for the adoption of zoning to prevent current and future commercial and residential development in and around the operating space of system airports. Encroachment can have negative effects on both the ability of the airport to operate effectively as well as on the businesses and residents in question.

Special Studies

- *Statewide Electrical System Evaluation* - During the development of the NCASP, there was interest in developing a statewide program to conduct electrical evaluations at all system airports. This evaluation would include assessing the following electrical components at each system airport: power distribution, pavement lighting (runways, taxiways, etc.), airfield signage, landing visual aids and NAVAIDS, and weather related equipment such as AWOSs.

  This statewide assessment is intended to provide a holistic evaluation of the electrical system of the North Carolina airport system. The results of this evaluation can help the DOA and the individual airports track compliance with performance measures and ADP objectives put forth in the NCASP. Further, the evaluation can help to create an estimated timeline for programming necessary electrical upgrades (lighting, weather reporting, NAVAIDs, etc.) based on the evaluation results. This can help the DOA and the individual airports plan for upgrades that require large investments so that the proper planning and funding is in place when the upgrade becomes necessary. DOA could also consider a statewide program to upgrade the facilities, helping achieve cost efficiencies.

- *Data Maintenance* - A large amount of data was collected and evaluated during the course of the development of this system plan. Much of this data was collected in order to evaluate compliance to the system performance measures and ADP objectives and to provide feasible recommendations for target compliance; data was also collected when determining role categories for each airport. All of this data will be given to the DOA and all of this data should be periodically updated and managed in a statewide system.

  The data and any data management system that is developed should subsequently be used to facilitate the process of awarding and managing grants from the DOA. The data can help track statewide capital aviation needs and can help to manage the annual grant process, including the awarding and monitoring of grants. Thus, maintaining the relevance of the data sets complied for this plan will not only help keep the DOA informed about changes to system airports, but it will also facilitate the process of monitoring performance measure and objective compliance, prioritize for capital improvements, and facilitate the process of updating the NCASP when necessary.

  In order to best approach this, it is recommended that a performance dashboard be developed to help track, maintain, and organize the data and create a user-friendly interface to interact with it. This dashboard should be associated with the current Partner Connect system that is used by the DOA to track grant and projects requests. By creating a direct link between an airport's current performance and project and funding requests, the DOA can more easily justify their decisions for funding and ensure that funds are going towards airports and projects that are most beneficial to the system performance.

- *Runway Approach Study* - As recommended as part of the Threshold Siting Surface performance measure (7.3.8 Percent of airports meeting FAA threshold siting surface requirements), all airports within the system should have a current 18C survey completed to identify obstructions that exist within an airport's approach surface. 18C surveys function as a way to standardize the procedure of conducting the survey so that relevant data is collected and reported to the FAA. The survey procedure also standardizes the procedures for submitting the survey results to the FAA so that they can be included in the FAA Airports GIS.

  It is recommended that a statewide program be created for conducting these surveys and reporting the results to the FAA. It may also be beneficial for the DOA to house the results of the survey and keep record of them in the case that an airport changes ownership or management and the data gets lost. After the initial survey, airports with commercial airline service should update their 18C every five years; for other airports, after the initial survey is completed, they need to be held responsible for periodically updating their safety critical data at any point when this data may change, such as when projects are undertaken that affect critical areas. Similar to the recommendation for wildlife

hazards, the DOA can help monitor the updating of this data by adding questions about it as part of annual surveys or check-ins with the airports.

Updates

As part of the continuous planning process, two types of updates are appropriate. Necessary updates include: individual updates to airport master plans and ALPs; and an update to the NCASP.

- *ALPs and Master Plans* - The NCASP recommends that all airports have up-to-date ALPs as an ADP objective. Prior to this plan, the existence of a current (within 10-years) ALP was considered a Mandatory Item and was required in order for an airport to be eligible for state funding. ALPs are important tools to communicate to the DOA, the FAA and other state, county, and local governments about the current facilities provided at the airport and the planned projects that are likely to occur in the future. This can help with securing funding from the FAA or DOA and will also be important when coordinating with state, regional, and local municipalities on long-range land use and transportation plans. It is recommended that airports should review and update their ALPs every 5 years for Yellow Airports (commercial service) and 10 years for general aviation airports.

- *State Airport System Plan* - The NCASP provides information on the state system using the most currently available information and guidance. As both the North Carolina system and the aviation industry in general change and evolve, the NCASP will need to be updated. In both its existing AC (150/5050-3B Planning the State Aviation System) as well as the update to the AC (150/5070-7 Change 1), the FAA indicates that airport system plans are adequate for up to five years "depending on the changes that occur in the state or metropolitan aviation system". It also indicates that if there are large-scale changes "in the national or local aviation environment, interim updates of the airport system plan may be necessary every two to five years."

APPENDIX A

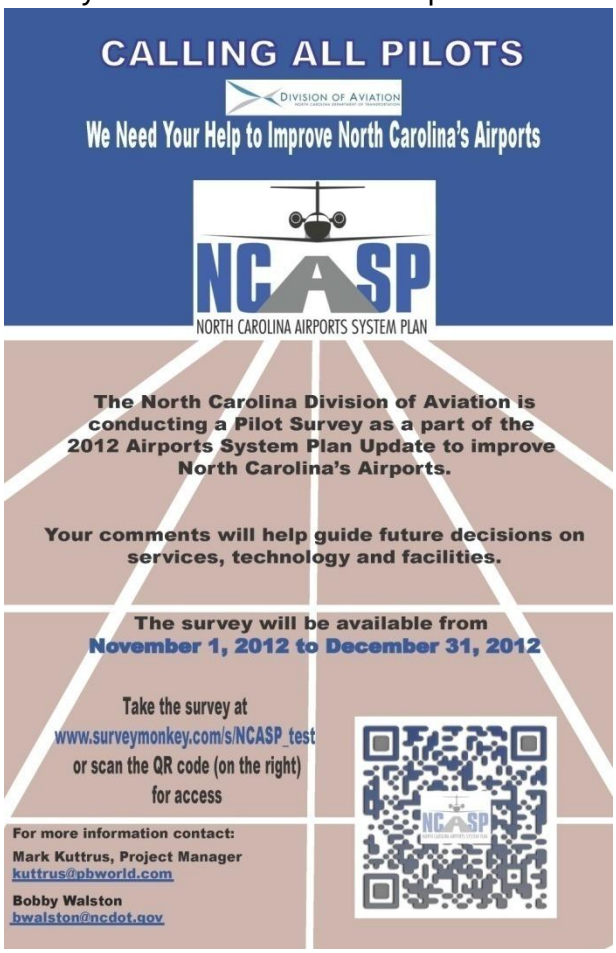
Pilot User Survey Results

FLYING
AIRPORT
hangar
fuel
MOGAS
SERVICE
ETHANOL
aircraft
COUNTY
NC
FBO
GAS
FREE
Cox
Hill
COSTS
MAINTAINED
runway
FIELD
WILSON
MAINTENANCE
HORACE
PUBLIC
GILLIAM
RALEIGH
SILER
Premium
RECREATIONAL
RESTAURANT
improvements
NEEDS
PILOTS
CLUBS
ENCLOSED
SPORT
great
serve
McConnell
related
ILS
use
light
CLOSING
BUILDING
CIVIL
AIRFIELD
EXPENSIVE
CURRENT
area
friendly
WILLIAMS
AVAILABLE
auto
approach
self
private
based
prices
facility
ADDITION
TRANSPORTATION
CHAPEL
GROUND
FLIGHT
NICE
MEETING
CONFERENCE
BETTER
CONTROL
PATROL
INDIVIDUAL
RWI
ROCKY
SEAPLANE
HOME
IGX
SOUTH
people
Unleaded
COMMUNITY
AFFORDABLE
HIGH
INCREASE
BUSINESS
Dependable
PLANES
instruction
Aerodrome
GRASS
Avionics
IMPORTANT
reliable
limiting
glide
INCLUDING
EXTREMELY
DIFFERENT
satisfied
lower
State
autogas
REASONS
BUY
FAR
APEX
KHBI
SHOP
RCO
Carthage
Atlantic
Air
GPS
Operational
OBSERVATION
AWARE
ACTIVITIES
Instructor
STRUCTURE
Jetport
Moore
NORTH
CHANGE
SCHOOL
EAA
KHNZ
KERY
FLOWN
UNKNOWN
OCRACOKE
HALIFAX
MARKED
SURVEY
Angier
Craven
leaves
HANGER
BOSTON
BELIEVE
RICHMOND
CHALLENGE
overpriced
INDICATORS
appreciated
Authority
JOHNSTON
FREQUENCY
bonus
old
ANIMALS
ratings
SINGLE
STANLY
ENCOURAGING
CERTIFY
ELKIN
Holly
Fuquay
working
mechanic
performer
pump
existing
largest
FIXING
BOONE
AVL
ORANGE
PLANS
LOCATE
CLOSER
STORED
PARKING
SHELTERS
FINANCIAL
Wallace
WILLIAMS
ADVENTURE
Smith
Aero
LITTLE
secure
FAYETTEVILLE
WILLING
WILKES
KZEF
ENGINE
Pine
LEASE
Industrial
HILLSBOROUGH
COMPETITION
FEEL
run
EMOS
FABRIC
open
man
Test
OK
source
LANDING
AWAY
DESIRED
CTAF
Cafe
bad
DEMEANT
entire
ramp
DIFFERENT
Personal
OPTIONS
LEAD OCCUPATION
local
CORP
Martin
Check
slope
replaced
aviation
visual
Photography
EQUIPMENT
Attending
overnight
Oaks
ILM
WISSON
SUPPORT
OWNERS
REPAIR
PIC
CLASS
SHARED
CONCORD
ATTITUDE
Confusing
ANNUAL
MUNICIPAL
companies
MOUNT
KJNX
UNIVERSITY
HOURS
Pink
utility
HAVING
TRANSIENT
grow
ABOLISHED
Angelflights
charitable
COMPLETE
COMPARED
REYNOLDS
USERS
Chairman
Kimrey
SIMPLY
REMOTE
RIDGE
SMALL
NIGHT
traffic
Connell
ENJOY
Cafe
Ethynol
Carolina
medical
AKI
KFOD
JNX
KGSO
UNDERSTAND
HENDERSON
ASHEBORO
CRITICAL
TERMINAL
CHEAPER
CHAPTER
ROOM WAITING
PROGRAMS
reliever
STATION
MAKE
colleges
LONG
TIME
INVOLVED
NAVAIDs
Comraderie
TYPICALLY
ISD
PROCESS
CESSNA
KRDU
EXECUTIVE
competent
Funding
SPRUCE
place
SURVIVE
growth
wind
RENTAL
DURHAM
CITY
tower
space
PAY
AIRFIELD
Test
ENGINE
FED
Operational
ramp
entire
DESIRED
CTAF
Cafe
bad
DEMEANT
AWAY
STRIPS
EMOS
FABRIC
run
FEEL
COMPETITION
WILLING
FAYETTEVILLE
WILKES
KZEF
ENGINE
Pine
LEASE
Industrial
HILLSBOROUGH
CONFERENCE
BETTER
CONTROL
PATROL
INDIVIDUAL
RWI
ROCKY
SEAPLANE
HOME
IGX
SOUTH
people
Unleaded
COMMUNITY
AFFORDABLE
HIGH
INCREASE
BUSINESS
Dependable
PLANES
instruction
Aerodrome
GRASS
Avionics
IMPORTANT
reliable
limiting
glide
INCLUDING
EXTREMELY
DIFFERENT
satisfied
lower
State
autogas
REASONS
BUY
FAR
APEX
KHBI
SHOP
RCO
Carthage
Atlantic
Air
GPS
Operational
OBSERVATION
AWARE
ACTIVITIES
Instructor
STRUCTURE
Jetport
Moore
NORTH
CHANGE
SCHOOL
EAA
KHNZ
KERY
FLOWN
UNKNOWN
OCRACOKE
HALIFAX
MARKED
SURVEY
Angier
Craven
leaves
HANGER
BOSTON
BELIEVE
RICHMOND
CHALLENGE
overpriced
INDICATORS
appreciated
Authority
JOHNSTON
FREQUENCY
bonus
old
ANIMALS
ratings
SINGLE
STANLY
ENCOURAGING
CERTIFY
ELKIN
Holly
Fuquay
working
mechanic
performer
pump
existing
largest
FIXING
BOONE
AVL
ORANGE
PLANS
LOCATE
CLOSER
STORED
PARKING
SHELTERS
FINANCIAL
Wallace
WILLIAMS
ADVENTURE
Smith
Aero
LITTLE
secure
FAYETTEVILLE
WILLING

User Surveys are a systematic outreach approach used to raise awareness and solicit input on decision-making and project development or prioritization processes. The survey is designed specifically for pilots to help identify growing trends, existing issues and potential improvements that are pertinent to the growth and vitality of the North Carolina Airport System Plan (NCASP). An online user survey was prepared and implemented for this project to solicit feedback from general aviation pilots using publicly owned and operated airports within the NCASP. General aviation activities included, but were not limited to, commercial, personal/non-business, instructional, business/corporate, air taxi, agricultural, air medical, air cargo, experimental, military, recreational, and search and rescue.

Notification

Pilots were notified of the survey availability via notification flyers at FBO locations at airports around the state, electronic mail, Facebook, Twitter and E-Newsletters. Various professional and civic aviation organizations were asked to help spread the word and encourage participation.



A notification flyer was distributed to the airports and to professional and civic aviation organizations. The purpose of the notification flyer was to provide a brief overview of the project's purpose and need, introduce and provide instructions on how to access the survey online, and to provide contact information if additional assistance was required. A Quick Response Code (QR Code) was placed in a highly visible location on the flyer. Using a smart phone, "on-the-go pilots" were able to open the survey by scanning the QR code with the telephone camera and any current reader program.

Those pilots receiving notification electronically had an option to either scan the QR Code or click on the hyperlink provided. For convenience, organizations distributing information on behalf of the study were provided sample text to ensure common messaging about the study as well as strategic placement ideas to serve as a guide on how to post information at airports, on social media outlets and websites, and in emails and newsletters.

Survey Design

The 26-question survey was designed to solicit feedback on a variety of topics including: current aviation activity, aircraft ownership, aircraft home base location and operations. Only 21 of the 26 questions were presented to all respondents. Using "Skip Logic technology", only those pilots who indicated they own a general aviation aircraft were asked an additional five questions that were designed for specific information regarding fleet technology and facility and service needs. Skip Logic directed respondents through different paths depending on the pilot's response.

Respondents were also asked to discuss factors that are not, but should be, included as a part of the airport system. Responses from the survey presented an understanding of the preferences potential users would have and the changing trends, demands and needs of future services and facilities.

Comment Period

The online survey was available from November 1, 2012 through January 7, 2013. During the comment period, a total of 266 online surveys were attempted. Since the final question, 26, was optional Question 25 was used to determine the survey's completion rate. A total of 203 pilots completed Question 25 equating to an overall 89% completion rate.

Pilot Survey Results

One of the primary goals of this study is to measure the types of activities that may occur at a particular airport or within a region. To get a better understanding, it is important to understand the users and what services and facilities they may desire. The following sections represent the analysis of the results of the survey to determine (A) Pilot Demographics, (B) Fleet Type and Storage, (C) Owned or Leased Fleet Description, (D) General Airport Description, and (E) Additional Comments.

A. PILOT DEMOGRAPHICS

<u>Question 1 - What is the zip code of your residence?</u>

Pilots were asked to provide the zip code were they reside. This question required a response before respondents were able to proceed with the survey. A full 265 pilots provided zip code information of which three zip codes were incomplete or invalid and were not included in the analysis. Using the United States Postal Service Zip Code locator, the corresponding City and State was identified for the remaining 262 respondents. It was determined that nine pilots resided in the states of Iowa, Georgia, Maryland, South Carolina and Virginia and 253 registered pilots resided within the State of North Carolina (NC).

Figure 1, "Pilot Place of Residence", illustrates where the North Carolina pilots reside according to the North Carolina Department of Transportation Planning Group Division (NCDOT Planning Division). The NCDOT Planning Group division consists of six regional planning groups, i.e. Northeast, Southeast, Mountains, Metrolina, Triad and the Triangle. Each Planning Group is responsible for coordinating transportation planning activities within its region (see Figure 2, "Number of Pilots by NCDOT Planning Group") for cities within each Planning Group and the number of responding pilots by division. As shown in Figure 1, 38% of respondents reside in the Triangle Planning area, 17% in Metrolina, and 15% in the Mountains Planning area.

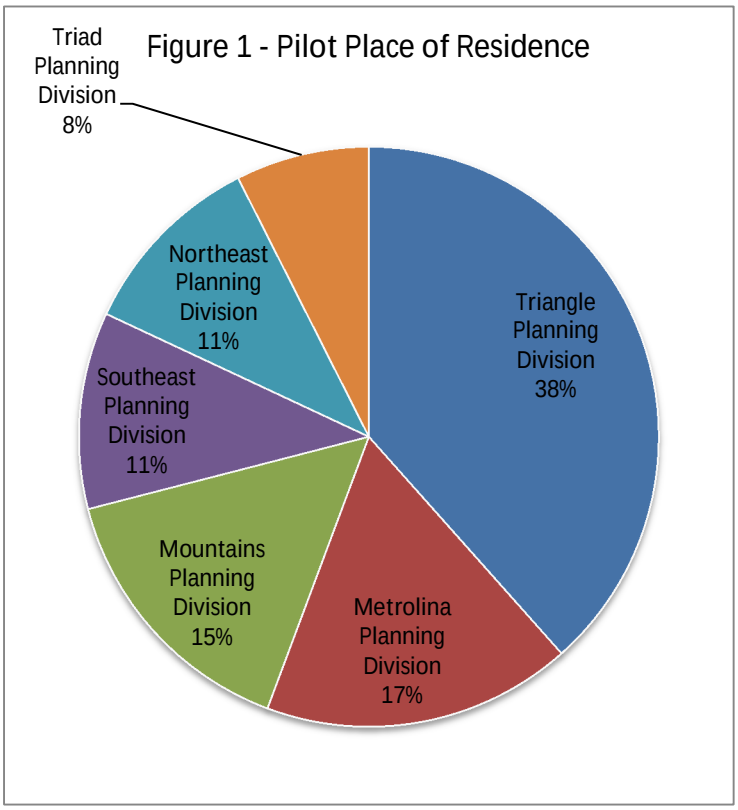
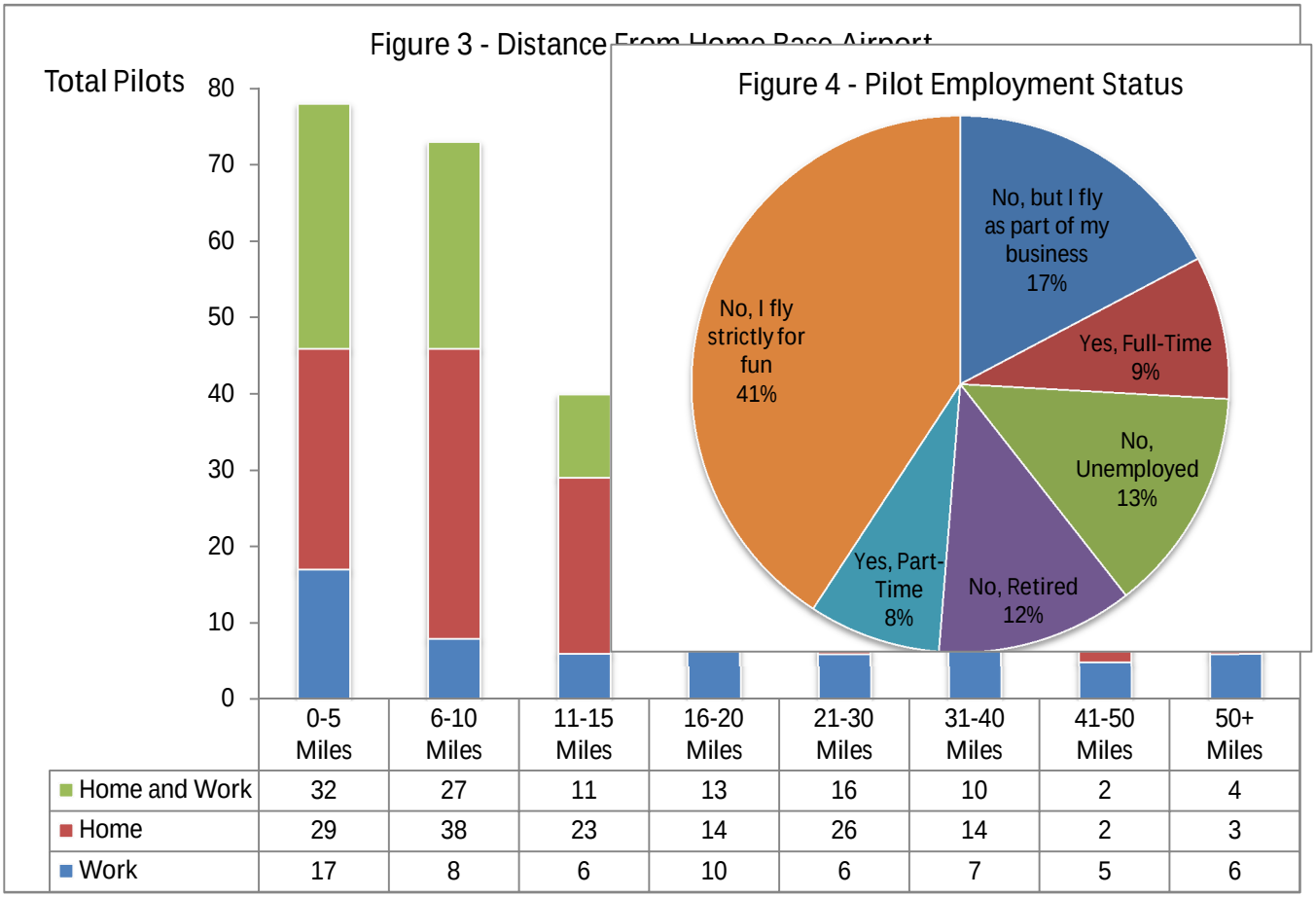


Figure 2 – Number of Pilots by the NCDOT Planning Group Division

NCDOT Planning Group	City	# of Pilots
Triangle	Apex, Carthage, Cary, Durham, Chapel Hill, Franklinton, Fuquay Varina, Hillsborough, Hurdle Mills, Lakeview, Louisburg, Macon, Morrisville, Pinehurst, Pittsboro, Raleigh, Rougemont, Roxboro, Sanford, Siler City, Southern Pines, Timberlake, West End	98
Metrolina	Albemarle, Belmont, Charlotte, China Grove, Concord, Cornelius, Davidson, Gold Hill, Harrisburg, Huntersville, Indian Trail, Kannapolis, Kings Mountain, Matthews, Mooresville, Shelby, Statesville, Waxhaw	44
Mountains	Asheville, Banner Elk, Boone, Burnsville, Canton, Columbus, Connelly Springs, Fleetwood, Fletcher, Franklin, Granite Falls, Hickory, Lenoir, Linville, Marion, Mills Rivers, Mills Spring, Morganton, North Wilkesboro, Penrose, Rutherfordton, Spruce Pine, West Jefferson	37
Southeast	Carolina Beach, Dunn, Elizabethtown, Fayetteville, Goldsboro, Havelock, Lillington, New Bern, Oak Island, Southport, Wilmington, Wrightsville Beach	28
Northeast	Ahoskie, Aurora, Camden, Clayton, Four Oaks, Greenville, Grifton, Kinston, Kitty Hawk, Littleton, Manteo, Maple, Nags Head, Nashville, Rocky Mount, Smithfield, Washington, Wilson, Winterville	27
Triad	Advanced, Burlington, Denton, Graham, Greensboro, Kernersville, Lexington, Mebane, Mocksville, Mount Airy, Pilot Mountain, Winston Salem	19
	Total Pilots	253

<u>Question 5 – How far is the airport where you base your primary aircraft from your home and your work?</u>

Pilots were asked the distance they travel to their home base airport from both home and work. A full 264 pilots completed this question, however, only 180 pilots provided information for both home and work locations and only 180 pilots provided information for either home or work. The averages depicted in Figure 3, "Distance From Home Base Airport", are based on the total number of pilots who completed the question regardless if they provided answers for home, work or both. Since pilots were asked to provide two answers, the total number of responses is greater than total number of pilots. Over 23% of pilots reside and 19% work within zero to five miles of their home base airport. Approximately 37% of pilots reside and live within 30 miles of their airport.



	0-5 Miles	6-10 Miles	11-15 Miles	16-20 Miles	21-30 Miles	31-40 Miles	41-50 Miles	50+ Miles
Home and Work	32	27	11	13	16	10	2	4
Home	29	38	23	14	26	14	2	3
Work	17	8	6	10	6	7	5	6

Question 4 - Are you employed as a Pilot?

Respondents were asked to provide information about their employment status, and general purpose for flying. Figure 4, "Pilot Employment Status", depicts approximately 69% of respondents indicated they are not employed pilots, and either fly for recreation (48%) or business (20%) purposes. Approximately 20% of respondents are currently employed pilots, 6% were unemployed and 5% are retired.

Question 2 - How many hours did you fly in the past 12 months?

Pilots were asked the number of hours they flew in the last 12 months. Respondents indicated, as shown in Figure 5, "Total Hours Flown in the Past 12 Months", they had flown between 1 and 800 hours during this period. Approximately 179 (68%) of respondents flew between 0 and 100 hours and 19% flew between 101 and 200 hours. Only 7% of the respondents indicated they flew more than 300 hours during the 12-month period.

Figure 5 – Total Hours Flown in the Past 12 Months

Total Hours Flown	% of Pilots	Total Pilots
0 to 100 hours	68%	179
101 to 200 hours	19%	49

201 to 300 hours	6%	16
301 to 400 hours	1%	2
401 to 500 hours	3%	9
501 to 600 hours	1%	2
601 to 700 hours	1%	3
701 to 800 hours	1%	2
Total Pilots	100%	263

Question 3 – How frequently did you fly an aircraft as a Pilot in the last 12 months?

Pilots were asked how frequently they operated an aircraft as a pilot in the last 12 months. As Figure 6, "Frequency of Flight", indicates, the majority of respondents, 147 (56%), flew between 10 and 50 flights, and 98 (37%) pilots indicted they flew more than 50 flights during the 12-month time period. Only three (1%) pilots indicated they did not operate an aircraft during the 12-month period.

Figure 6 – Frequency of Flight

Total Flights	% of Pilots	Total Pilots
Less than 10 flights	5.7%	15
10-50 flights	55.9%	147
More than 50 flights	37.3%	98
Did not fly an aircraft in the last 12 months	1.1%	3
Total Pilots	100%	263

Question 7 – Select your primary purpose for flying during the past 12 months?

Respondents were asked to provide information about the primary purpose for flying during the past 12 months. Pilots were asked to choose only one of the 18 options, as listed in Figure 7, "Primary Purpose for Flying During the Past 12 Months". The majority of pilots indicated their primary purpose for flying was for personal/non-business reasons. Instructional (student and instructor) was the second most frequently listed purpose for flying (14.7%), followed by personal business related activities (12.5%). Military, Agricultural and Air Taxi/Charter purposes were not represented in the data. Three respondents provided information for purposes not listed, including, flying for non-profit organizations (1), government (1), and aircraft mechanic (1).

Figure 7 – Primary Purpose for Flying During the Past 12 Months

Purpose to Flight	% of Pilots	Total Pilots
Personal (Non-business)*	50.9%	118
Instructional (student or instructor)	14.7%	34
Personal (Business)*	12.5%	29
Corporate Pilot	6.0%	14
Private Pilot	5.2%	12

Recreational	1.7%	4
Commercial (FAR Part 121)	1.7%	4
Other (please specify)	1.3%	3
Photography Pilot	1.3%	3
Non-Profit	1.3%	3
Sport Pilot	0.9%	2
Medical Transport*	0.9%	2
Sales/Demonstration Pilot*	0.9%	2
Search and Rescue	0.4%	1
Test/Experimental Pilot	0.4%	1
Air Taxi/Charter (FAR Part 135)	0.0%	0
Crop-Duster/Agriculture Pilot	0.0%	0
Military	0.0%	0
Total Pilots	100%	232

* Answers were reclassified from the "Other, please specify" section if the answer corresponded with a scripted answer option. Those that were unable to be classified with existing answer options are accounted for in the "Other, please specify" category.

Question 12 – What are your current FAA certificates and ratings?

A total of 233 pilots indicated the level and type of Federal Aviation Administration (FAA) certificates and ratings they have attained by selecting any one of the certificates and ratings listed in the survey. Additionally, pilots had the option to report additional certificates and/or ratings. The purpose of this survey question was to extract information in three separate categories to help identify the type of activities and uses predominant in the statewide airport system, as well as regional and local airports. The categories included FAA regulated Certificates and Ratings. Additional comments are reported in the subsequent section "Other FAA Certificates and Ratings". Respondents could choose more than one answer therefore total number of responses does not equal the total number of pilots

Figure 8.1, "Current FAA Certificate", depicts 52% of pilots indicted they have a Private Pilot's certificate, and nearly 31% indicated they were classified as commercial pilots. Approximately 62% of pilots possess one certificate and 6% acquired three certificates.

Figure 8.1 – Current FAA Certificate

Certificates	% of Certificates per Pilot	Total Certificates per Pilot
Private Pilot	52.8%	123
Commercial Pilot	30.9%	72
CFI	13.7%	32
Air Transport Pilot	13.3%	31
Student Pilot	2.1%	7
Recreational Pilot	0.4%	1
	Total Certificate	266

Figure 8.2, "Current FAA Rating", shows that over 50% of pilots have both single-engine and instrument rating. Another 15% indicated they have CFII Instructor rating and approximately 7% indicated they have Glider rating. Pilots surveyed possess between one and six ratings. A full 67 pilots did not list a certificate but indicated they attained current ratings.

Figure 8.2– Current FAA Rating

Ratings	% of Ratings per Pilot	Total Ratings per Pilot
Single-Engine	54.9%	128
Instrument (Rating)	53.2%	124
Multi-Engine	26.6%	62
CFII (Instruction)	15.0%	35
MEI	13.7%	32
Glider	6.9%	16
Rotorcraft	6.0%	14
	Total Rating	411

Respondents were given the opportunity to provide information about any additional certificates and/or ratings not listed in the survey. Pilots included certificates, ratings as well as endorsement information in the "Other" field. Additional listings, as listed in Figure 8.3, "Other Current FAA Certificate and Rating", include aircraft-specific certificates such as Aerobatic Pilot, and Advanced Ground Instructor as well as ratings, including Seaplane and Helicopter. Several pilots included endorsement information for complex, high performance and tailwheel aviation aircrafts.

Figure 8.3 – Other Current FAA Certificate and Rating

	# of Pilots
Certificates	
A&P Mechanic	6
Advanced Ground Instructor (AGI, IGI)	6
Sport Pilot	3
Flight Engineer	2
Inspection Authorization	2
Aerobatic Pilot	1
E/A-B Repairman	1
LTA	1
Total Other Certificate	22
Rating	
Seaplane	5
Instrument Helicopter	1
DA10	1
LR-JET	1
LR45	1
Total Other Rating	9
Endorsement	
Complex	1
High Performance	1
Tailwheel	1
Total Other Endorsements	3

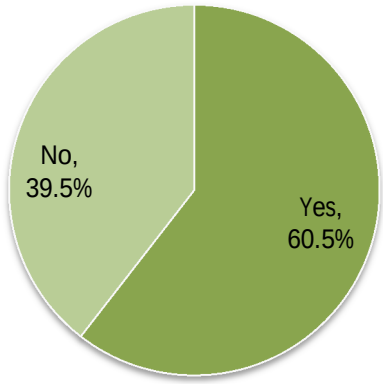
* Answers were reclassified from the "Other, please list any additional FAA Certificate or Rating not listed" section if the answer corresponded with a scripted answer option. Those answers that were unable to be classified with existing answer options are accounted for in the "Other, please list any additional FAA Certificate or Rating not listed" category.

B. FLEET TYPE AND STORAGE FACILITIES

Question 13 – Do you or does your company own or lease a general aviation aircraft?

Of the 268 respondents to the survey, 233 indicated if they "own" or "lease" a general aviation aircraft. Figure 9, "Aircraft Ownership", summarizes that 141 pilots either own or lease a general aviation aircraft. If the pilots indicated they either owned or leased a general aircraft, they were asked additional questions about their fleet, including fleet technology and the aircraft's base airport, which will be discussed in subsequent Section D, "Owned or Leased Fleet Description".

Figure 9 - Aircraft Ownership



Question 14 – What model(s) of general aviation aircraft are in your fleet?

Pilots provided information regarding the type of general aviation aircraft in their fleet. Figure 10, "Top Three General Aviation Models", depicts the top three choices for the primary and secondary aircrafts (Aircraft 1 through 5). Zero pilots reported information for Aircraft #5 and thus this survey option is not represented in the figure. Over 300 models were listed for the primary and secondary aircrafts.

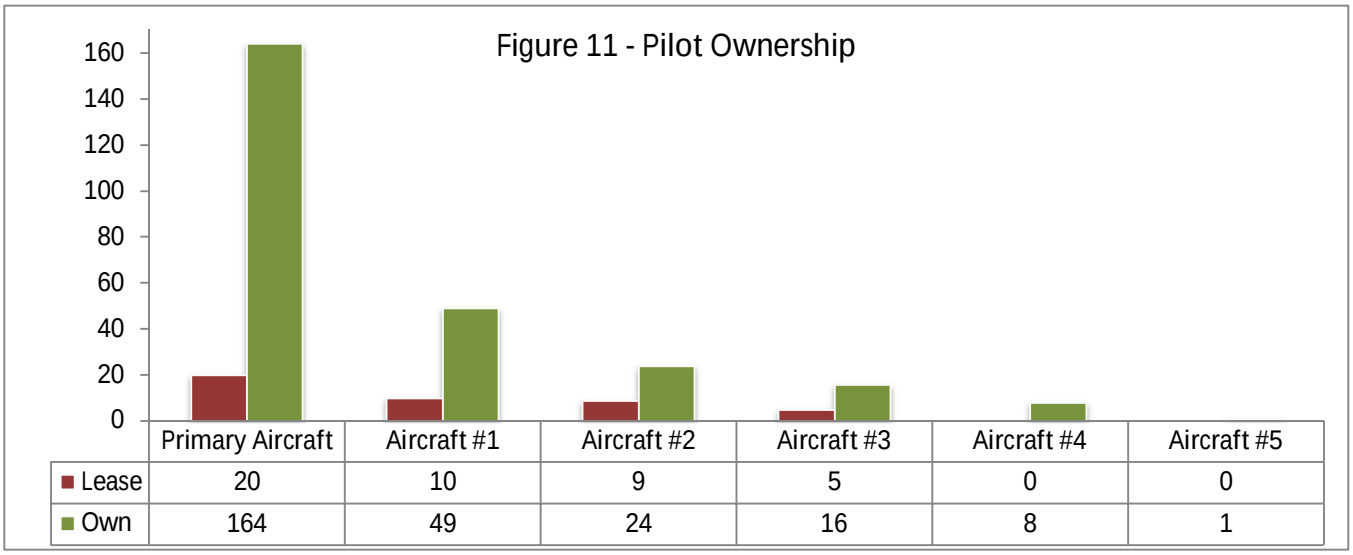
Cessna aircrafts are the most widely used general aviation aircraft among respondents. A full 194 pilots provided information, of which 138 indicated they either owned or leased a general aviation aircraft and 92 pilots indicated they did not own or lease a general aircraft. An additional 33 (15%) pilots indicated three or more aircrafts in their fleet while 132 (68%) owned or leased only one aircraft.

Figure 10 – Top Three General Aviation Models

Primary Aircraft		Aircraft #1		Aircraft #2		Aircraft #3		Aircraft #4	
Cessna 172	38	Cessna 172	15	Piper PA28	5	Piper PA28	3	Citabria	2
Piper PA28	22	Cessna 182	8	Cessna 172	5	Mooney M20J	2	Cessna 152	1
Cessna 182	13	Cessna 150	5	Piper Warrior	2	Cessna 172	2	Piper, Sikorsky	1

Question 15 – Do you or your company own or lease the aircraft identified in Question 14?

Pilots were asked to provide additional information relating to the aircrafts listed in the previous question. Figure 11, "Pilot Ownership", depicts majority of pilots own the primary general aviation aircraft in their fleet. Only one pilot indicated ownership of Aircraft #5. Approximately 81% of pilots indicated ownership at least two general aviation aircrafts, while 70% stated they have a current lease agreement of at least two.



	Primary Aircraft	Aircraft #1	Aircraft #2	Aircraft #3	Aircraft #4	Aircraft #5
Lease	20	10	9	5	0	0
Own	164	49	24	16	8	1

Question 16 – At What Airports are they Based?

Figures 12.1 through 12.4, presents data reflecting aircraft storage needs within the state. Pilots were asked to name the airport where general aviation aircrafts under their control are stored. Nearly 29% of pilots reported at least two separate airports and two pilots reported their residence as the primary home base.

Sanford-Lee County Regional Airport was listed as the most widely used airport for storing primary aircrafts, followed by the Raleigh-Durham International Airport.

Figure 12.1 – Top Five Aircraft Primary Aircraft Locations

FAA ID	Airport Name	# of Pilots
KTTA	Sanford-Lee County Regional Airport (Raleigh Executive Jetport)	15
KRDU	Raleigh-Durham International Airport	14
KSUT	Brunswick County Airport	8
(4-way tie)	Concord Regional Airport (KJQF), Pitt Greenville Airport (KPGV), Person County Airport (KTDF), Wilmington International Airport (KILM)	7
KEQY	Charlotte-Monroe Executive Airport	6

Raleigh-Durham International Airport was identified for storing the most Aircraft #2.

Figure 12.2 – Top Five Aircraft #2 Locations

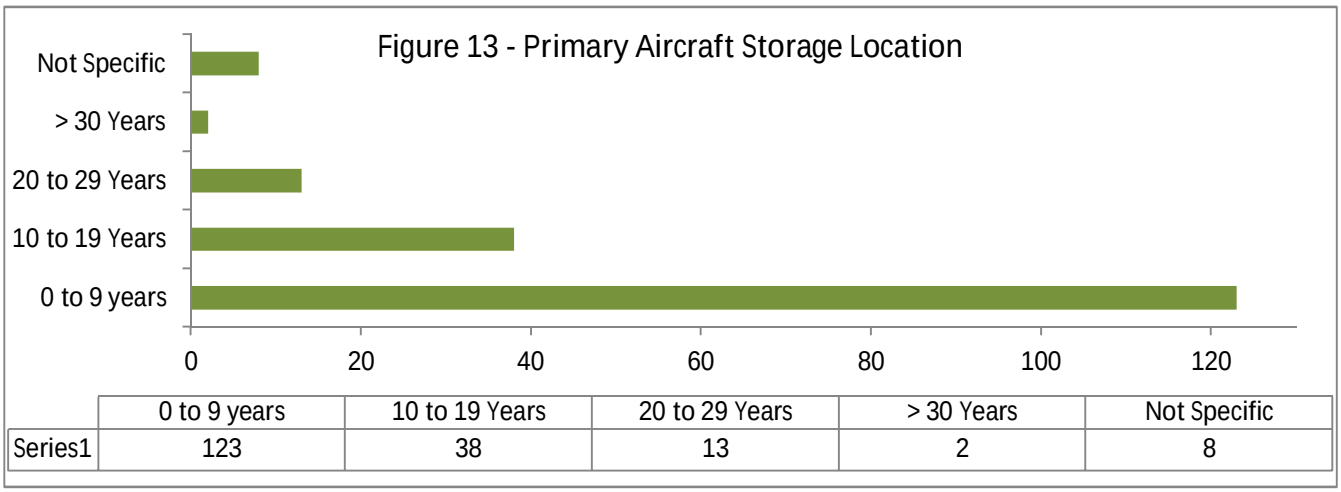
FAA ID	Airport Name	# of Pilots
KRDU	Raleigh-Durham International Airport	6
KEQY	Charlotte-Monroe Executive Airport (was Monroe Regional Airport)	3
KSUT	Brunswick County Airport	3
KTTA	Sanford-Lee County Regional Airport (Raleigh Executive Jetport)	3
5W8	Siler City Municipal Airport	2

Sanford-Lee County Durham International Airport was identified for storing Aircraft #3.

Figure 12.3 – Top Five Aircraft #3 Locations

FAA ID	Airport Name	# 0f Pilots
KTTA	Sanford-Lee County Regional Airport (Raleigh Executive Jetport)	2
N52	Townsend Airport	2
KEQY	Charlotte-Monroe Executive Airport (was Monroe Regional Airport)	1
KSUT	Brunswick County Airport	1
9NC8	Eagles Landing Airport	1

<u>Question 17 – How long has the primary owned/leased aircraft been based at the airport?</u>
Pilots were asked to provide general storage information for the primary aircraft within the fleet. Respondents indicated in Figure 13, "Primary Aircraft Storage Location", the average number of years the primary aircraft is stored at the current home base facility was approximately seven years. More than 60% of aircrafts were stored at the same airport between zero and nine years. Eight pilots provided comments but did not specify total years.



Question 18 – How is the primary aircraft stored?

Figure 14, "Primary Aircraft Storage", indicates approximately 69% of primary aircrafts were stored in hangars, 20% used tie-downs, and 11% were stored in shade hangars.

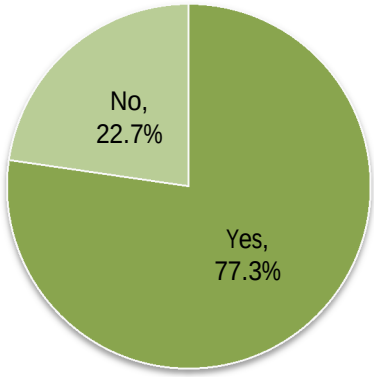
Figure 14 – Primary Aircraft Storage Type

Years	Storage Type - Hangar		Storage Type - Tie Down		Storage Type - Shade Hangar	
	#	%	#	%	#	%
0 to 9 Years	91	66%	20	50%	12	52%
10 to 19 Years	27	20%	8	20%	3	13%
20 to 29 Years	8	6%	0	0%	4	17%
> 30 Years	1	1%	0	0%	1	4%
Not Specific	11	8%	12	30%	3	13%
Total	138	100%	40	100%	23	100%

Question 19 – If your primary aircraft is not stored in a Hangar and one becomes available at your airport at current market rates, would you use one?

Pilots were asked if their primary aircraft were not stored in a hangar, would they consider relocating to their home base airport if a hangar becomes available at current market rates. Of the 97 pilots who responded to this survey question, four pilots did not provide aircraft storage information but indicated a willingness to relocate if the opportunity arises. As illustrated in Figure 15, "Willing to Relocate", 73% of pilots indicated they would relocate closer to home based if additional hangars become available.

Figure 15 - Willing to Relocate



Pilots were given the opportunity to provide additional information. Pilots expressed a concern about the scarcity of affordable hangars and indicated there is a current waiting list at home base locations to own/lease a hangar. Seven pilots expanded their response to note if airports were to increase hangar availability they would be able to: get an airport closer to home, expand their fleet, or own a private hangar. Approximately 23% stated they would not be willing to relocate, no additional information was provided.

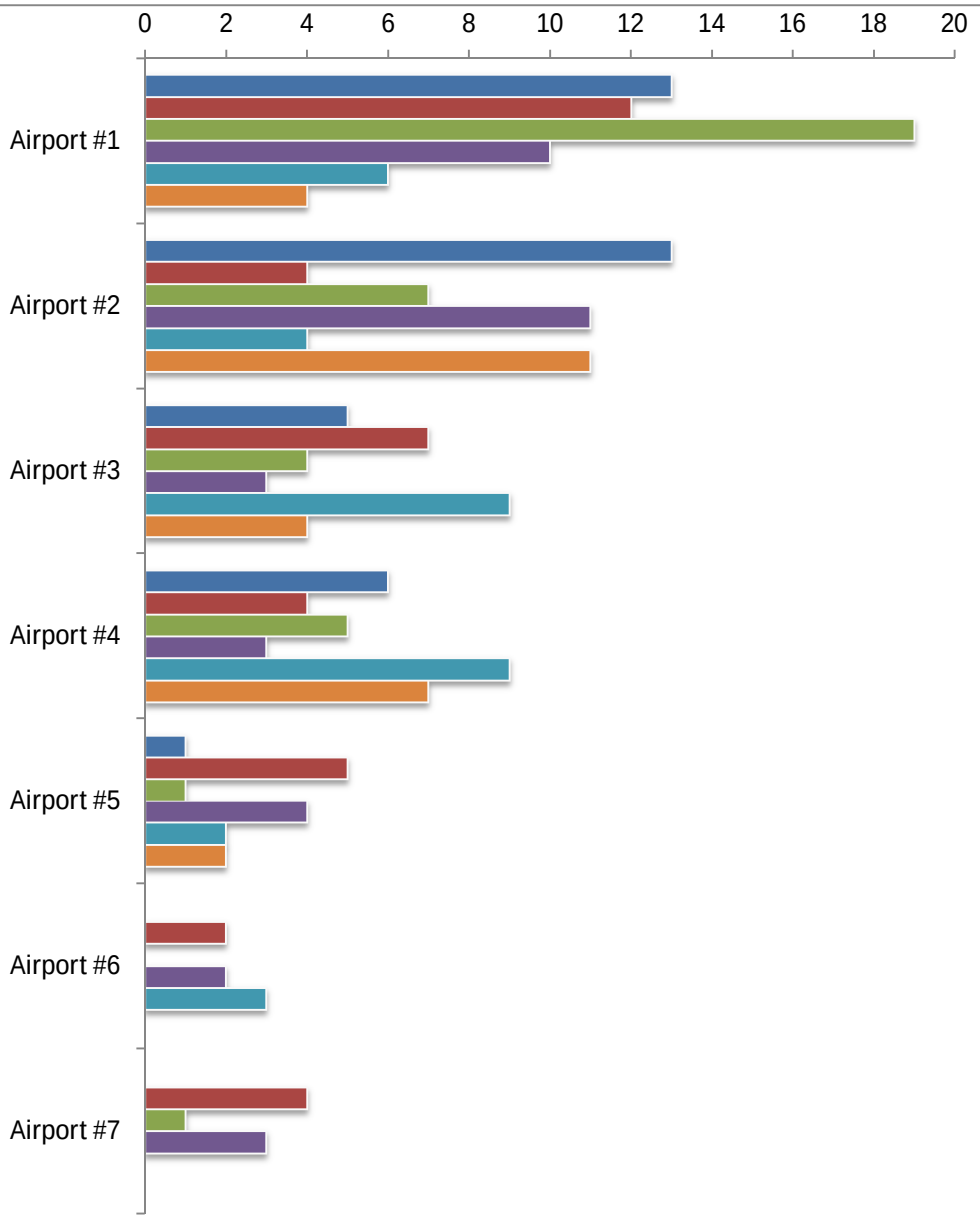
Question 8 – How often as a pilot did you use North Carolina's public-use, public owned airports in the last 12 months? Please list the airports and estimate your usage.

Pilots were asked to provide information for up to seven of the public-use, public-owned airports in North Carolina they most frequently used, as well as, annual take-offs for each airport in the last 12 months. For convenience, a list of NC's airports was provided as well as a range to express annual take-offs ("1 to 10"; "11 to 100"; "101 to 249"; "250 to 500"; "501 to 1,000: and "greater than 1,000").

A full 227 pilots provided information for this question as illustrated in Figures 16.1 through 16.3. Due to the low count for ranges: "101 to 500"; "501 to 1,000" and "greater than 1,000" those figures are not reported as a part of this report.

Overall, 38 pilots stated the Raleigh-Durham International Airport and Hickory Regional Airport were the most widely used during the 12-month reporting period.

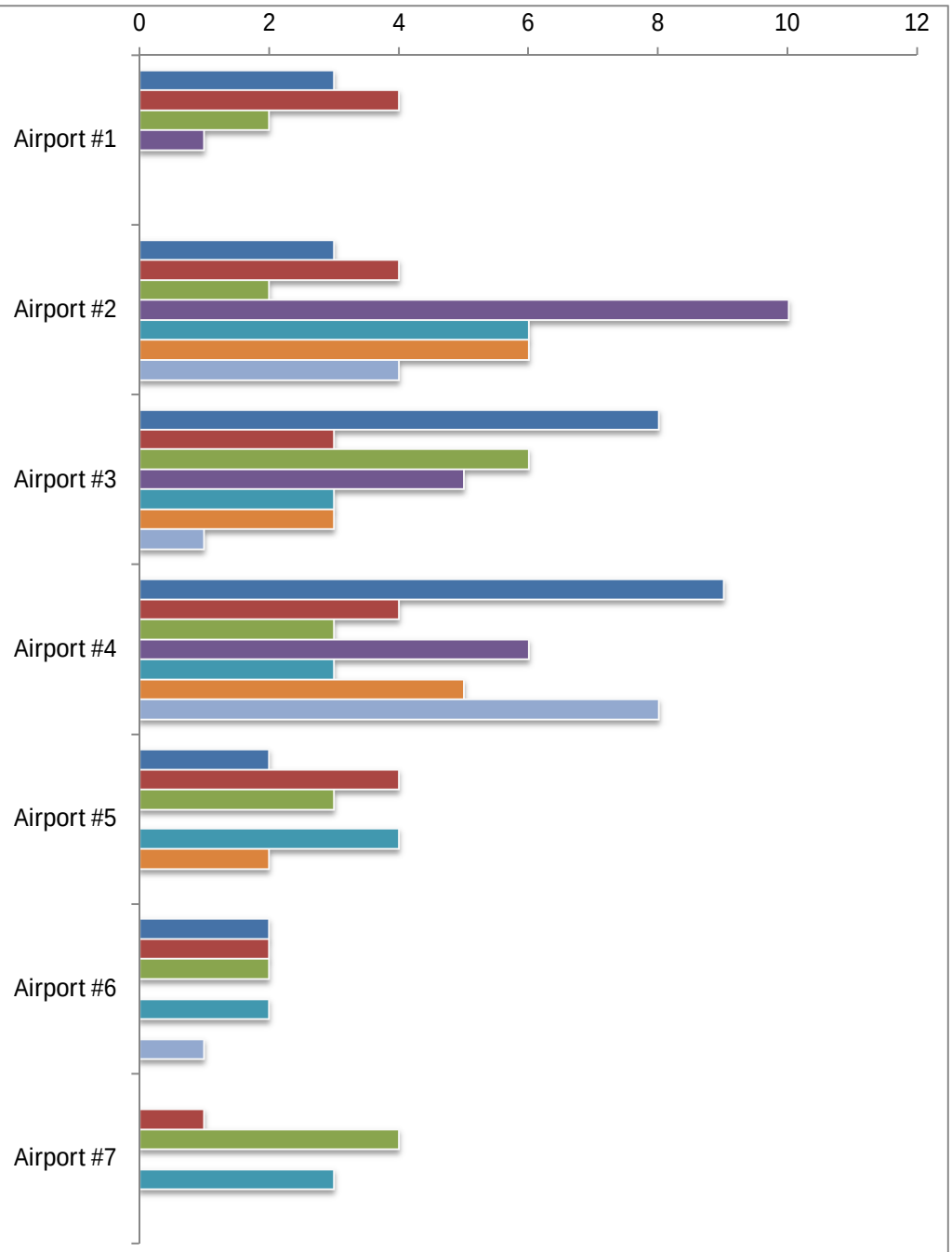
Figure 16.1 - Average Annual Take-Offs (General)



	Airport #7	Airport #6	Airport #5	Airport #4	Airport #3	Airport #2	Airport #1
Raleigh Durham Internationl Airport	0	0	1	6	5	13	13
Hickory Regional Airport	4	2	5	4	7	4	12
Sanford-Lee County Regional Airport	1	0	1	5	4	7	19
Concord Regional Airport	3	2	4	3	3	11	10
Asheville Regional Airport	0	3	2	9	9	4	6
Burlington Alamance Regional Airport	0	0	2	7	4	11	4

Asheville Regional Airport was identified as the most frequently used in the 1 to 10 Annual Take-Off category.

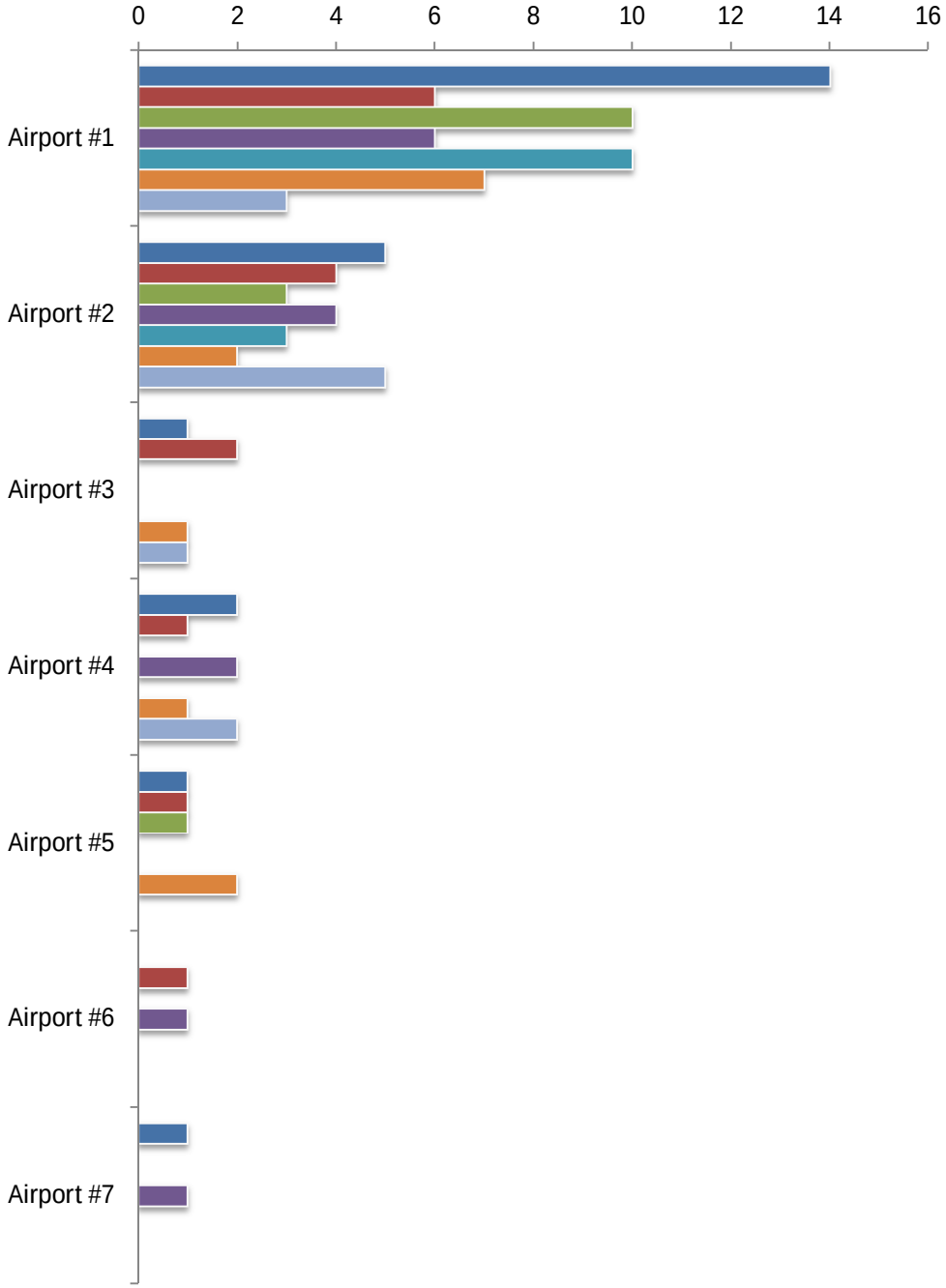
Figure 16.2 - Average Annual Take-Offs (1 to 10)



	Airport #7	Airport #6	Airport #5	Airport #4	Airport #3	Airport #2	Airport #1
Asheville Regional Airport		2	2	9	8	3	3
Asheboro Regional Airport	1	2	4	4	3	4	4
Hickory Regional Airport	4	2	3	3	6	2	2
Raleigh-Durham International Airport				6	5	10	1
Concord Regional Airport	3	2	4	3	3	6	
Burlington Alamance Regional Airport			2	5	3	6	
Foothills Regional Airport		1		8	1	4	

Sanford-Lee County Regional Airport was identified as the most frequently used airport in the 11 to 100 Annual Take-Off category.

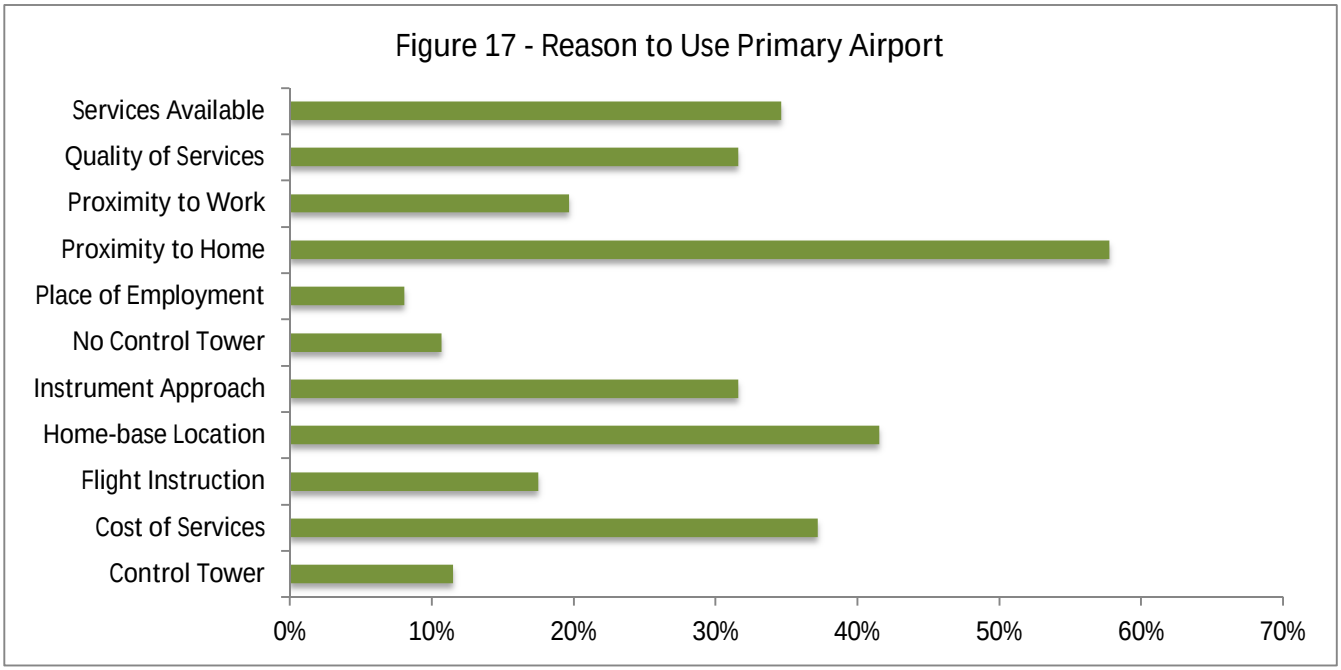
Figure 16.3 - Average Annual Take-Offs (11 to 100)



	Airport #7	Airport #6	Airport #5	Airport #4	Airport #3	Airport #2	Airport #1
Sanford-Lee County Regional Airport	1		1	2	1	5	14
Siler City Municipal Airport		1	1	1	2	4	6
Raleigh Durham International Airport			1			3	10
Person County Airport	1	1		2		4	6
Concord Regional Airport						3	10
Hickory Regional Airport			2	1	1	2	7
Burlington Alamance Regional Airport				2	1	5	3

Question 9 - Based on your response to Question 8, what are the THREE (3) top reasons that you use for selecting a primary airport?

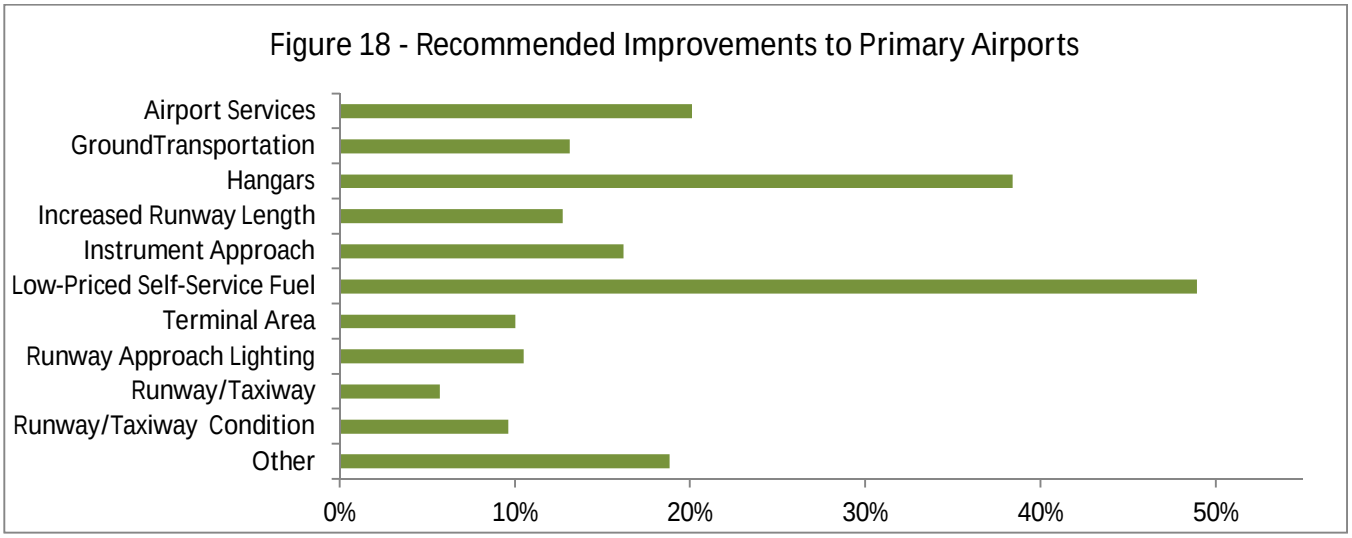
Pilots were asked to identify the top three reasons they fly in and out of their primary airport. Approximately 58% of pilots, as depicted in Figure 17, "Reason to Use Primary Airport", stated proximity to home was the top reason. Home base locations were second with 42% and cost of service was third with 37%. It should be noted that available services, instrument approach and quality of services were close (35%, 32%, and 32% respectively).



Question 10 – Which of the following improvements do you believe would best increase your primary airport's utility to you and your community?

Pilots were asked to suggest what improvements would help to increase their main airport's utility. Access to low-price/self-service fuel was ranked the highest with 50%. Approximately 38% indicated hangars would help to improve conditions, and 20% stated airport services needed to be improved. Instrument approach was listed fourth with 16% and 13% indicated improvements to ground transportation services were needed. Figure 18, "Recommended Improvements to Primary Airports", provides more detailed information.

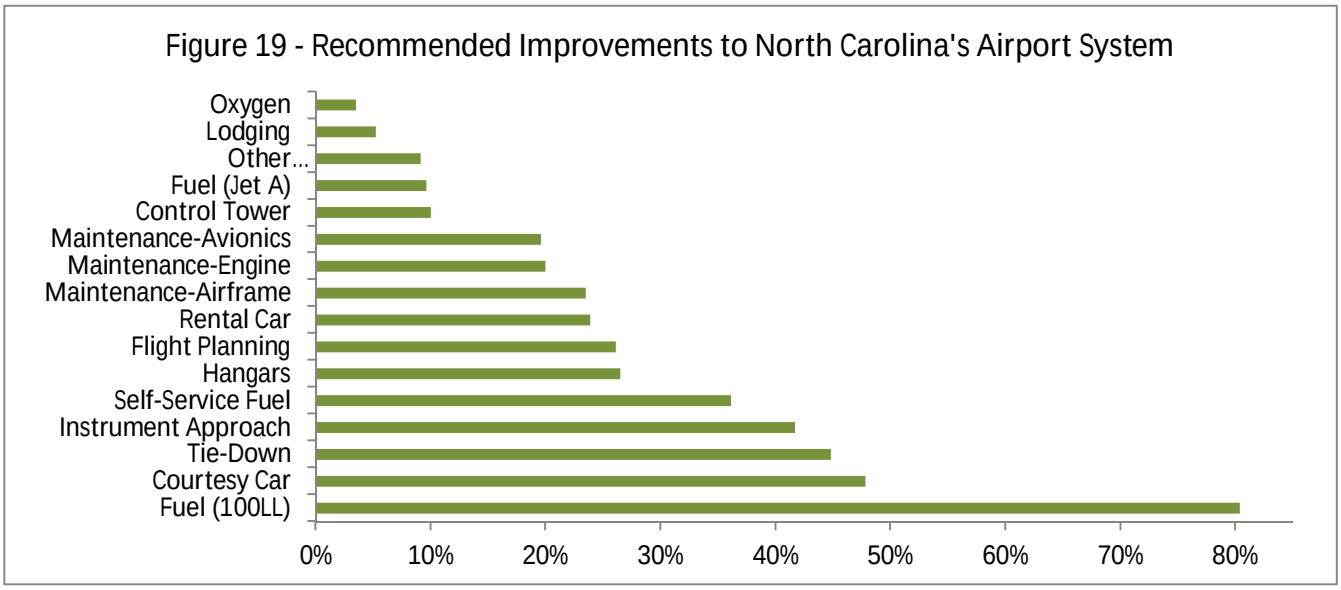
Pilots provided additional comments. Pilots recommended improvements to providing longer FBO hours, cheaper fuel, increased access to alternative fuels such as Mogas and ethanol free gas, self-service gas, flying clubs and flight instruction and providing conference, meeting rooms and restaurants. Comments were also made concerning the operation and maintenance of the existing infrastructure and facilities including highlighting the need for additional hangars, runway type and repairs, a more-friendly airport authority, control towers and maintenance-avionics. Site-specific recommendations discussed dissatisfaction with the closing of the Chapel Hill area airport, more FBOs at Asheville Regional Airport and a restaurant and the Moore County Airport.



Question 11 – What aviation services do you require at the North Carolina airports you use? (Check all that apply).

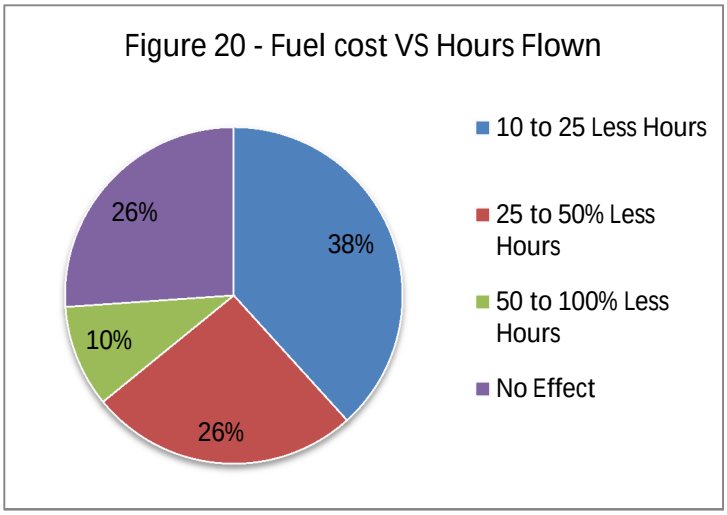
Pilots were asked to provide suggestions on what statewide improvements should be implemented. Easier access to Fuel - 100LL was the top choice with 84% and approximately 48% of pilots indicated courtesy cars at airports was needed. As depicted in Figure 19, "Recommended Improvements to North Carolina's Airport System", 45% of pilots identified increasing the amount of tie-downs and hangars as beneficial improvements to the statewide airport system. Approximately 36% of pilots noted access to self-service fuel was needed.

This question also provided an opportunity to list additional improvements that were not identified as a part of this survey. A full 21 pilots provided additional information which included stating the following potential improvements to the statewide airport system: reliable and consistent access to non-ethanol gas, Mogas, full service FBO, extended hours or 24 hour service FBO, restaurants, and secure overnight transient parking.



Question 6 - What affect have fuel prices had on the number of hour you flew over the last year?

Pilots consistently expressed throughout the survey that in order to remain active, access to cheaper and alternative fuels is needed. Figure 20, "Fuel Cost VS Hours Flown", indicates, 38% stated the price of fuel reduced the number of hours they flew by 10 to 15% and 20% of pilots indicated they flew 25 to 50% less. Another 10% of pilots reduced their hours by 50 to 100%. Conversely, 10% of pilots' indicated recent increases in fuel prices had no effect to the number of hours they flew over the last year.



C. OWNED OR LEASED FLEET DESCRIPTION

Question 13 asked pilots if they either owned or leased a general aviation aircraft. As mentioned in a previous "Section A, Survey Design", Skip Logic was used to direct those pilots who indicated they own or lease a general aviation aircraft to the following five questions.

Approximately 60% of pilots indicated they either own or lease a general aviation aircraft responded as depicted in Figures 21 through 26.

Question 21 – Is your primary aircraft equipped with GPS?

Approximately 93% of pilots indicated their aircraft was equipped with a Global Positioning System (GPS) unit while 7% responded the primary aircraft was not equipped with GPS. If the aircraft was equipped with a GPS unit the pilots were asked for additional information relating to IFR approaches, WAAS capability, and satisfaction with their primary airport.

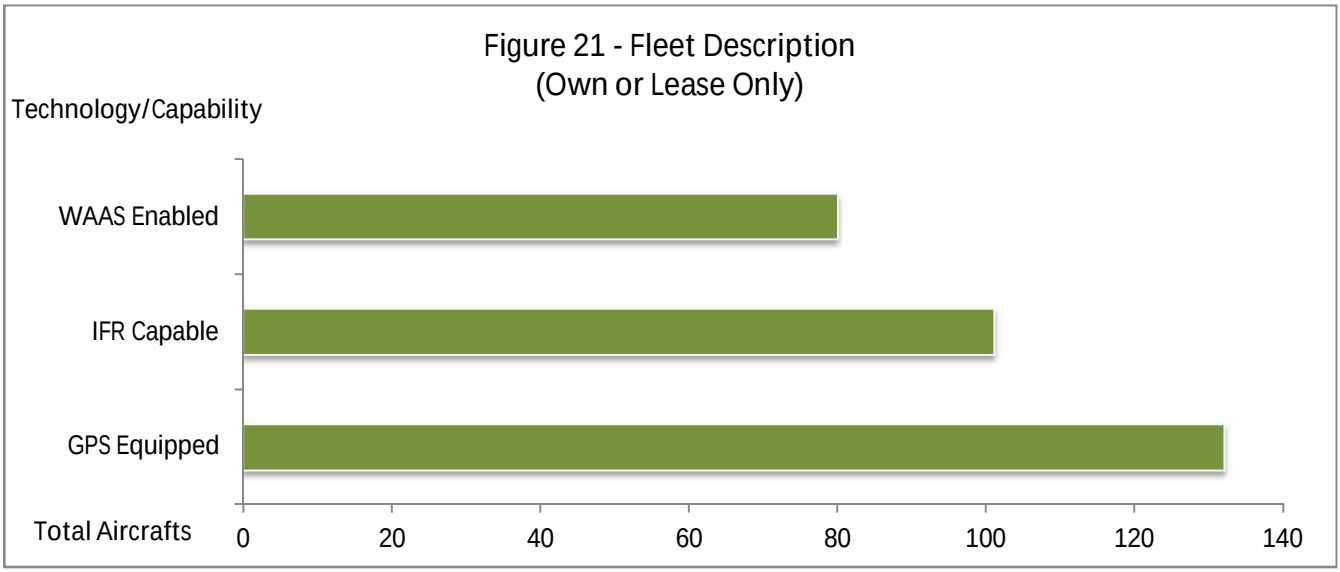


Figure 22 – GPS Equipped Aircraft (Owned or Lease only)

Global Position System Equipped (GPS)	% of Fleet (Own/Lease)	# of Pilots
Yes	93.0%	132
No	7.0%	10
Total	100%	142

Question 21 – If yes, is the GPS equipment capable of being utilized for IFR approaches?

Approximately 73% of pilots indicated they were able to utilize GPS for IFR approaches, while 27 of pilots said no.

Figure 23 – GPS Assisted IFR Approach (Own or Lease Only)

GPS assisted IFR approach	% of GPS equipped Aircrafts with IFR	# of Pilots
Yes	72.7%	101
No	27.3%	38
Total	100%	139

Question 22 – If your primary aircraft is equipped with GPS, is it WAAS enabled?

Pilots indicated that 57% of the primary aircrafts equipped with a GPS unit were enabled with a Wide Area Augmentation System (WAAS), while 42% of pilots said no.

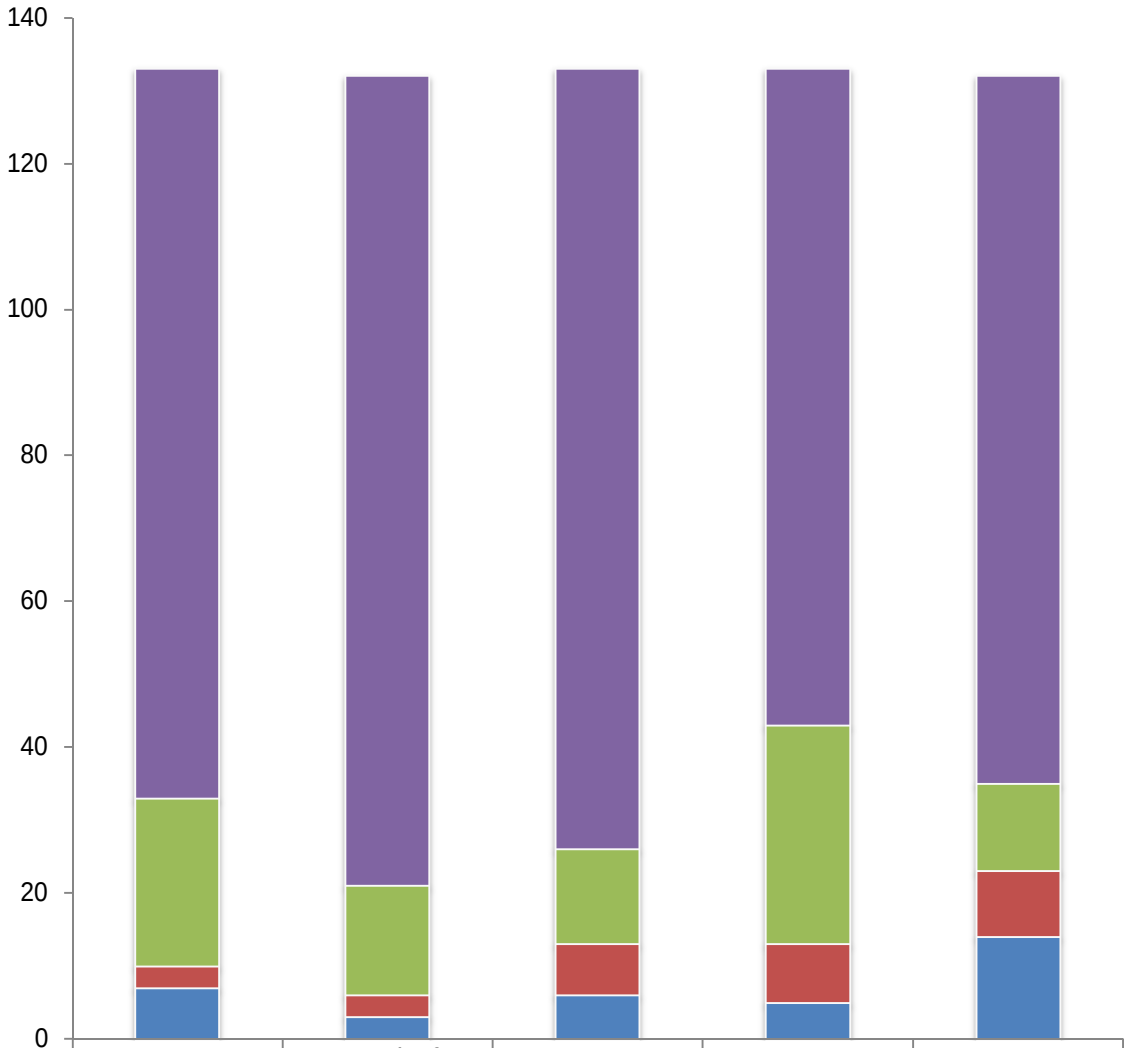
Figure 24 – WAAS Enabled (Own or Lease Only)

WAAS Enabled	% of Aircrafts WAAS Enabled	# of Pilots
Yes	57.6%	80
No	42.4%	59
Total	100%	139

Question 23 – Based on where your primary aircraft is stored, please rate the following facilities?

Using a ranking score consisting of “Good”, “Fair”, “Poor” and “Not Applicable”, pilots were asked to rate the facilities located at their primary airport. Overall, Figure 25, “Facilities Satisfaction”, indicates 133 pilots considered the primary facilities to be in good condition. Airport services ranked the highest, followed by length of runways and pavement condition. Taxiways ranked the lowest.

Figure 25 - Facilities Satisfaction
(Own or Lease)

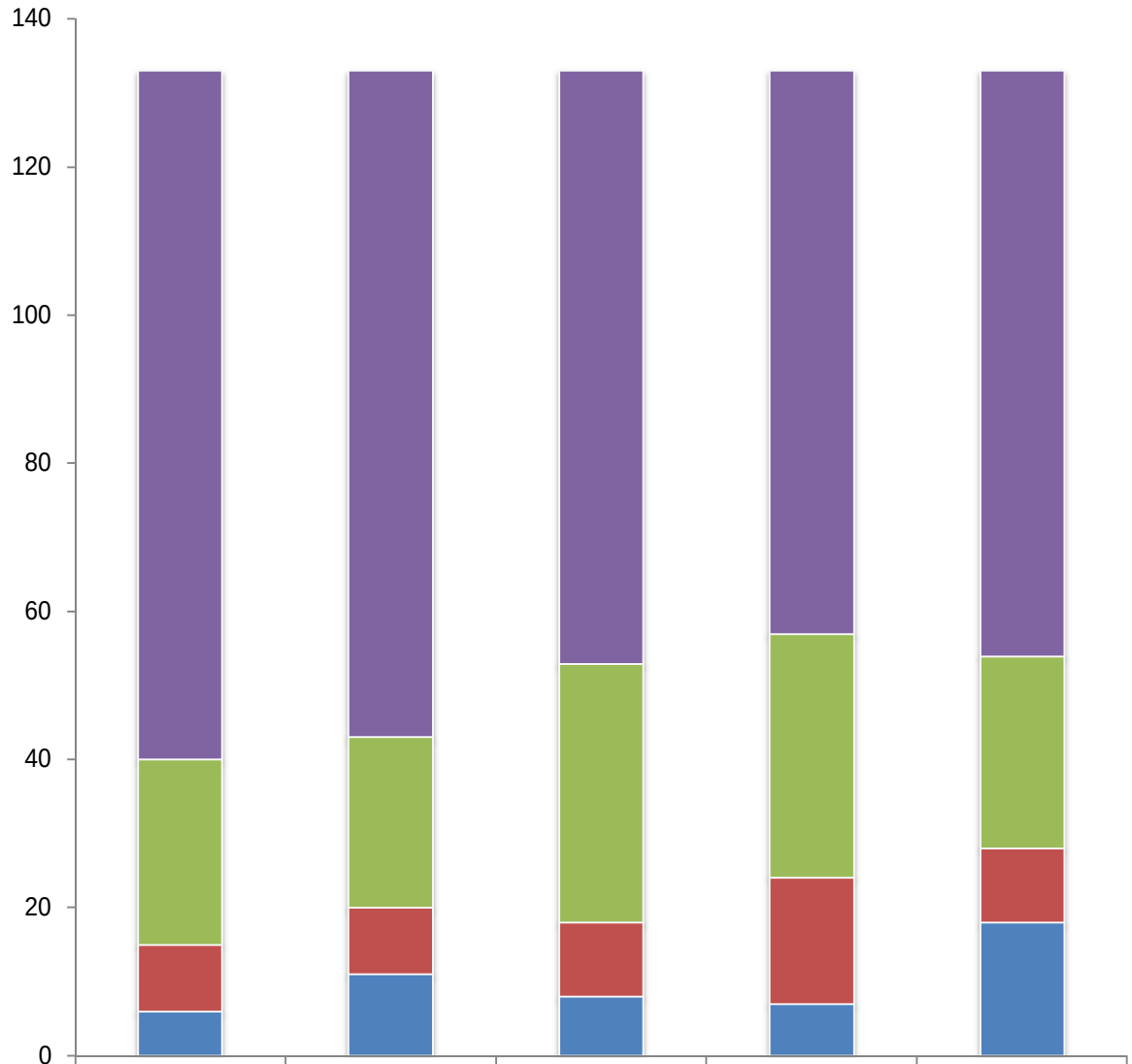


	Airport Services	Length of Runway(s)	Pavement Condition	Ramp Area	Taxiways
Good	100	111	107	90	97
Fair	23	15	13	30	12
Poor	3	3	7	8	9
Not Applicable	7	3	6	5	14

Question 24 – Based on where your primary aircraft is stored, please rate the following services?

Pilots were asked to rate the services provided by their primary airport. Using a ranking score of "Good", "Fair", "Poor" and "Not Applicable", 133 pilots indicated services were generally good. Airport communications was ranked the highest, and NAVAIDs received the lowest score. Even though many pilots indicated a desire for extended services and longer hours at FBOs, FBO services came in second followed by fuel services.

Figure 26 - Services Satisfaction
(Own or Lease Only)

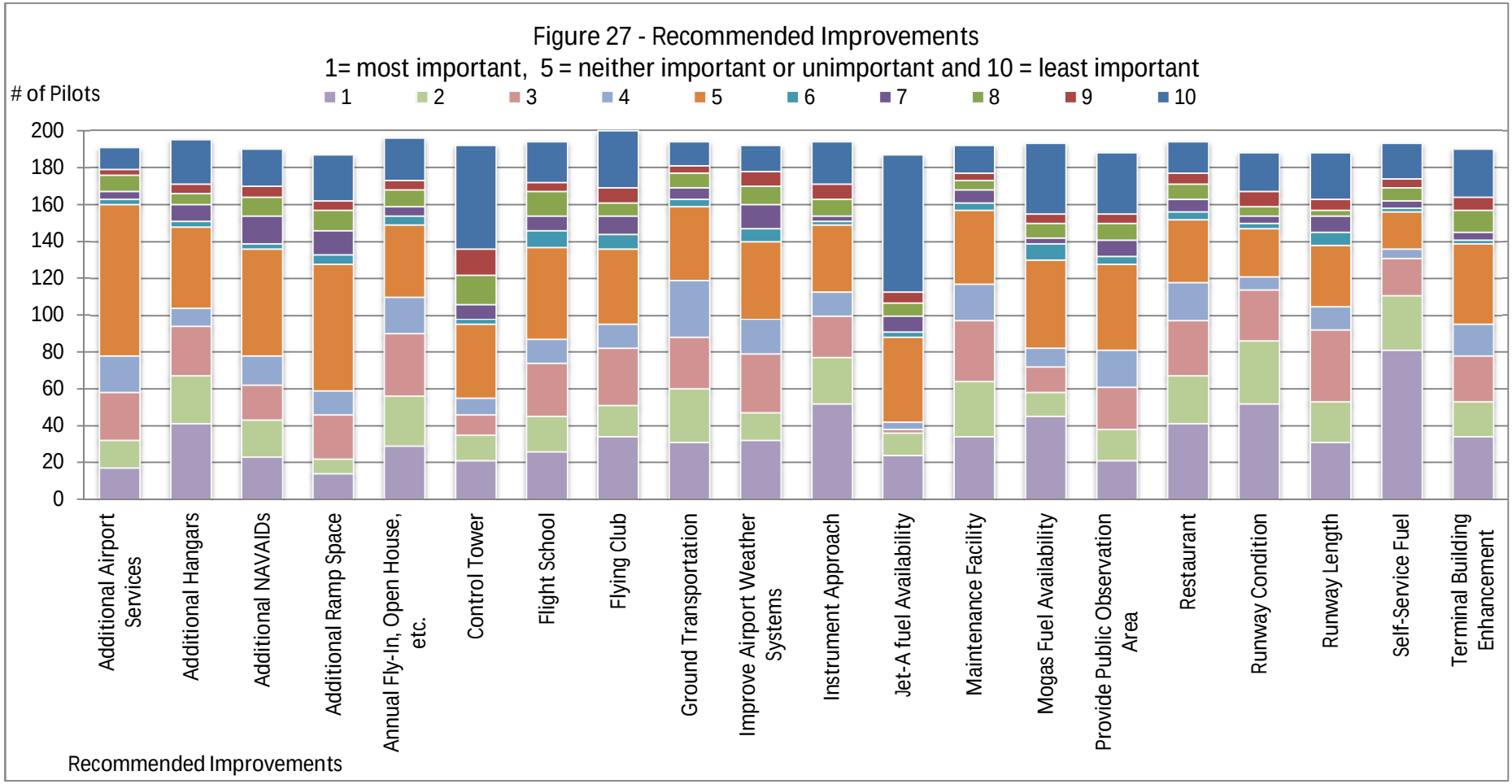


	Airport Communications	FBO Services	Fuel Services	Hangars	NAVAIDs
Good	93	90	80	76	79
Fair	25	23	35	33	26
Poor	9	9	10	17	10
Not Applicable	6	11	8	7	18

D. GENERAL AIRPORT DESCRIPTION

Question 25 – Please rank the following potential airport improvements based on importance/ desirability to you and your business.

Pilots were asked to provide information on what improvements to existing and future airports would prove beneficial to their needs. As depicted in Figure 27, "Recommended Improvements", 206 pilots indicated increased access to self-service fuel is the most important improvement followed by instrument approach, runway condition, access to Mogas and additional hangars. Improved access to Jet-A fuel was identified as the least important improvement.



E. ADDITIONAL COMMENTS

26 – Please feel free to make any additional comments, and again, thank you for your assistance.

Pilots were given the opportunity to provide additional comments or to express concern or issues relating to any public-owned, public-use airport in North Carolina. A full 42 pilots provided feedback, which included comments relating to access to cheaper gas, recommendations for marketing/public awareness programs and additional insight to facility and service needs for the North Carolina Statewide Airport System and local airports. Figure 28,"Additional Comments", provides a general overview of the comments received.

Figure 28 – Additional Comments

Comments
• Access to public transportation.
• Additional Terminals.
• After hours entry (electronic keypad).
• Airport Specific - Asheboro HBI closed the Avionics Shop which was relied on to provide supplies. Excellent services. Would like an ILS. Adequate GPS/WAAS.
• Airport Specific - Concord Regional Airport is not GA friendly. Low Hangar inventory. Restrictive regulations.
• Airport Specific - Hyde County Airport needs GPS approach capabilities.
• Airport Specific - Keep Chapel Hill open (IGX).
• Airport Specific - Moore County Airport needs cheaper fuel.
• Airport Specific - Moorehead City Airport should not charge a fee to use their facilities.
• Airport Specific - More Hangars at Warren Field (OCW).
• Airport Specific - Pitt-Greenville Airport needs self-serve fuel.
• Airport Specific - Satisfied with Siler City Municipal Airport new Aviation Weather System (AWOS).
• Airport Specific Pitt-Greenville Airport needs Control Tower to improve safety and flight approaches during inclement weather.
• Cheaper fuel. (5)
• Difficult to purchase supplies while traveling.
• Dissatisfied with the current Rutherford County Airport-Marchman Field (KFQD) Airport Authority.
• Easier access to sectional chart (has to travel to SC).
• Eliminate landing fees it is too cost prohibitive.
• Implement and maintain a Public Outreach/Education program "Benefits of Local Airports".
• Implement marketing program i.e. Sponsor a statewide flying circus from Murphy to First Flight w/ overnight camping and CTAF services.
• Implement marketing programs, "Operation Fly-NC".
• Implement public outreach/marketing programs.
• Increase access to Mogas. (2)

• Model facility is Shelby-Cleveland County Regional Airport.
• Most pilots in North Carolina are recreational pilots.
• NC Airport Guide is difficult to use.
• Need grass runways.
• New Airport Location (Chapel Hill).
• Privatize public airports - better to have fewer, stronger airports that pay their own way than a large number that require massive taxpayer support.
• Reduce spending on unnecessary cosmetic improvements, make changes that help pilots.

APPENDIX B

Aircraft Counting Programs

B STATE METHODS FOR RECORDING AIRCRAFT OPERATIONS AT NON-TOWERED AIRPORTS

Similar to many other states, North Carolina does not currently have a program to estimate aircraft operations at non-towered airports. The Division of Aviation is interested in learning more about programs in place in other state aviation organizations to record aircraft operations data. In 2007 the Airport Cooperative Research Program (ACRP) completed Synthesis 4, "Counting Aircraft Operations at Non-Towered Airports". This report summarized and evaluated methods of aircraft counting or estimating utilized by states, airports, and metropolitan planning organizations. This ACRP report was referenced for purposes of providing North Carolina's Division of Aviation with current information that could be considered as the organization evaluates potential establishment of a system for its non-towered airports.

In an effort to better understand current recording methods for aircraft operating at non-towered airports, seven states were contacted to provide information for this analysis: Maryland, Idaho, California, Nevada, Indiana, Wyoming, and Utah.[20] As the ACRP report demonstrated, some states do not have a very reliable method for counting operations and use airport management estimates for data. In the ACRP report, California, Nevada and Wyoming rely on this method the most heavily. For states that reported use of equipment to record operations, the most common type of counter is an acoustical one that detects Doppler shifts and records operations that can be stored on a hard drive. Maryland, Idaho, Indiana, and Utah use acoustical counters as part of their method for recording aircraft operations. Wyoming uses motion-activated video cameras to record some operations, and California is currently researching that option as well. It should be noted that most states use multiple or multi-layer methods to record aircraft operations, and management estimates are used in conjunction with other counting methods.

The following summarizes the efforts currently in use in the seven states that participated in the survey conducted as part of the NCASP.

B.1 Maryland

The Maryland Aviation Administration (MAA) utilizes microphone recordings and extrapolation of data in a two-part methodology for counting aircraft operations. Each non-towered airport is analyzed every three years with three rotating microphone counters that are used for two-week periods quarterly. The annual operations are extrapolated from the two-week samplings and through statistical formulas that analyze the input and provide a range of annual aircraft operations with an error factor. This data is then compared to airport estimates and analyzed along with airport opinions to extract a more accurate operations number. The resulting

[20] Ten states were contacted but only seven participated in the survey and provided information.

figures are used to make decisions on funding airport projects, to prioritize airports based upon demand at the airport, and in airport 5010s.

The state has been counting airport operations since the early 1980s, and has acoustical counter data that dates back to 1989. Prior to using the acoustical counters, the state visually sampled operations and experimented with early acoustical devices that required staff to listen to the audio and record aircraft passing over the counter. The newer acoustical counters detect Doppler shifts to record aircraft movement and sound, and they can also identify different types of aircraft. They have been a great improvement from earlier systems because they do not require as much maintenance time and do not require hiring more staff members to fully support the task. The units cost $5,000 plus maintenance and provide an affordable option for Maryland to count aircraft operations. However, the acoustical counters are not completely accurate; the system does not register helicopter or glider operations and these results sometimes conflict with airport management estimates.

Maryland staff indicated familiarity with the ACRP report on counting aircraft at non-towered airports. The state is satisfied with its current system and does not currently have plans to change it. Even though the Washington FAA Airports District Office doesn't consider the program to be FAA approved, Maryland and other states have defended this system as the most reliable and cost effective measure of reporting aircraft operations.

B.2 Idaho

The Idaho Transportation Department (ITD) only records activity at state-owned, non-towered airports with acoustical counters, while the other non-state owned, non-towered airports provide airport management estimates using informal counting. Approximately five to six airports employ acoustical counters on a rotating basis during periods of high activity throughout the year. The operations results are used to determine needed projects and funding for airports with higher demand, for system plans, and in 5010s at state-owned airports.

Idaho has been using informal management counts to estimate operations at non-state airports for 20 years. The system is not ideal, as it requires more staff time and is not a very accurate way to gather the data. However, Idaho does not currently have plans to change these methods for non-state airports.

Idaho has also been using acoustical counting devices at state airports for 20 years, beginning with a labor-intensive RENS counter. The results were determined and recorded by staff listening to the audio on the other end of the device, and this required unnecessary time and effort. Approximately 10 years ago, Idaho replaced these with more advanced acoustical counters that automatically record figures. These counters have several advantages: they are locally produced in Idaho and distributed nationally, have higher accuracy rates than older model acoustical

counters, and do not require as much maintenance. They are also a fiscally appealing choice at less than $1000 per unit to manufacture.

B.3 California

California does not currently employ a method to count aircraft operations. The state previously used an older Larson Davis acoustical counter for 15 years, but found the method unreliable due to software issues. The program was discontinued and now the state relies on airport management estimates for operations data, which was also the method used prior to the acoustical counters. The estimates are used as justification for airport development projects, justification for airport control towers, in aviation forecasts and for other purposes. FAA safety inspectors are involved when airports report their estimates on the 5010 forms.

The California Department of Transportation (Caltrans) assisted with the ACRP report for counting non-towered airport operations, and is aware that there are better methods for data collection. The state currently has no future plans to implement an operations counting program, as it is concerned about other priorities. However, California is researching the possibility of advanced state-use cameras.

B.4 Nevada

The Nevada Department of Transportation (NDOT) does not currently record non-towered airport operations and relies on airport management estimates for data. The state has been estimating operations for the past 15 years, and briefly experimented with an acoustical counting program for a month. The program was discontinued because the counters were either damaged or stolen, and Nevada has returned to using airport estimates for justifications for airport development projects and 5010s.

Last year, the state began researching a video camera system that could record operations, track runway usage and distinguish between different types of aircraft. The cameras could also stream to the airport's website and allow pilots to view the airfield online and check the traffic at the airport. This system would require less labor and would also provide more accurate results for the 5010s. However, it would be a more costly option, especially since the cameras are mounted on poles that would need to be installed. Nevada has not proceeded with this plan due to funding issues, and will not be able to look into the camera system again until its aviation trust fund has been replenished.

B.5 Indiana

Similarly to Maryland, Indiana records operations with acoustical counters and extrapolates for estimates of annual operational data. The Indiana Department of Transportation (INDOT) rotates 10 ADS 3000 Wilderness Tech acoustical devices around the state every four years and each airport deploys the device for five to seven weeks during the rotation. The acoustical counters only record takeoffs, so

the figure must be doubled to include landings. The collected data inputs to a seasonal model that can calculate monthly and yearly operations for each airport, adjusting for peak and non-peak related times during the year. INDOT uses these results to help justify program funding for airports, 5010 counts, and to assist with based aircraft counts at airports.

Indiana has been using acoustical counters since 2005, and prior to the ADS 3000s used older tape recorder acoustical models that required staff members to determine operations from the audio recordings. This was not a good option because the old acoustical counters were not that accurate and it was difficult for staff members to decipher different types of aircraft from the audio, and the counters were not reliable or cost effective. Before the acoustical counters, Indiana used tracking strips to record operations, but this was also not effective because the strips could not distinguish between aircraft and vehicles. The current acoustical counters are a much better solution because they provide higher accuracy rates, use lower amounts of power, and do not require much maintenance or staff time. At $5,000 per unit, the ADS 3000 counters are also an extremely cost effective option. The unit is powered by solar panels. INDOT's only concern is purchasing thicker and more durable solar panels that will last longer than the five to six years their current solar panels last.

INDOT is very satisfied with its current system, and works with FAA Chicago Airports District Office which also approves of their counting model; INDOT also has positive FAA support. Currently the state does not plan to make any major changes to its recording method, however is looking into more durable replacement solar panels.

B.6 Wyoming

Like California, the Wyoming Department of Transportation (WYDOT) does not currently own a system that tracks operations at non-towered airports, but the state has been allocating grants to airports so they can purchase and install systems on an individual basis. The operations data is used in justifications for airport development projects, environmental assessment documentation, aviation forecasts, economic impact statements, and in 5010s. Two or three Wyoming airports use motion-activated game cameras to detect operations, and airports that do not use a camera or counter are expected to report manager operation estimates to the state, which typically receives figures from the 5010s. Airports that do not own operations counting equipment have been estimating their operations numbers for the past 20 years and report them to the state.

The cameras are triggered by motion or light-to-dark transition on the screen and record the movement to a hard drive. The video can be audited by airport staff to identify tail numbers and count traffic, and can be labor-intensive if airport staff have to review the images to determine operations. However, they are a cost-effective option at less than $10,000 per camera including electrical wiring and installation; they also have 80% to 100% accuracy. To continue research on camera options, Wyoming is testing a new system at Cheyenne Airport that involves more reliable

cameras and new technology for installation at airports. The new system would cost up to $50,000 per two-runway airports and less for smaller airports.

When Wyoming completed its system plan and a forecast versus actual analysis, it found that airport management estimates were most accurate (with some outliers). However, the estimates are still not a comprehensive way to measure the data, and the state is currently researching other operations counting options. Wyoming has considered buying 10 systems and rotating them through the state on a yearly basis. However, the state does not want to take ownership of the equipment and maintain the system, and would prefer to allocate more grant money for airports to purchase their own systems.

B.7 Utah

For the past 15 years, the Utah Department of Transportation (UDOT) has recorded non-towered airport aircraft operations with computerized acoustical counters. These air traffic results are not used to justify funding, but they are used in reports to the transportation commission, to classify airports, to rank airports by utilization, and are included by airports in 5010s. Utah follows ACRP's recommendations on estimating air traffic, and has a two-part system for collecting operation data from the acoustical counters.

Utah's equipment is deployed near the end of the runway to monitor and record acoustic signals that match an aircraft takeoff. A staff member from the state flies to 2-3 airports a day to collect the equipment and then download the data to a computer for analysis. The state records with multiple counters quarterly to account for each season, which is a more accurate method than deploying counters once a year at the airport. This system is also superior to the airport estimates the state was using prior, which resulted in inflated numbers.

The acoustical counters provide many advantages for the state: the current acoustical counters have extremely low power requirements and can be recharged with a battery and solar power unit. These rugged counters can be left in the field for approximately a month at a time, performing at an 80% to 90% accuracy rate during all weather conditions.[21] Unlike many other counters, the computerized acoustical ones can detect touch-and-go operations and require less reviewing time. They are also an economical choice at less than $5000 per unit to purchase and maintain.

Though the acoustic counters provide a fairly accurate data collection method, they are not perfectly ideal: the counters cannot distinguish between aircraft types[22] and require 80 hours of staff deployment time a year. Deployment can be a time-consuming process, and the operations analysis uses system planning grant funds. Despite these disadvantages, Utah is generally satisfied with its current

[21] Airport Cooperative Research Program. *Counting Aircraft Operations at Non-Towered Airports*. (P. 8) Rep. Washington D.C.: Transportation Research Board, 2007.
[22] ACRP Report, p. 8

method. The state will eventually upgrade to a newer system but has not made near term plans due to high upfront and maintenance costs.

Appendix C
Case Studies

Cape Fear Regional Jetport
Case Study

Overview

Cape Fear Regional Jetport serves the Southern Cape Fear Coast and Brunswick County, the southeastern most county in North Carolina. With a 5,500-foot long runway completed in 2010 and a full parallel taxiway underway, the jetport plays an integral role in the regional economy. The economic impact associated with the jetport in 2012 was estimated to be 600 jobs and an economic contribution of $61.7 million. Cape Fear Regional Jetport supports a wide range of clientele ranging from tourists to second homeowners to local and non-local businesses. Community leaders recognize that the jetport is and will continue to be an essential element in the future growth of the region.

Located within the Wilmington Metropolitan Statistical Area (MSA), Brunswick County is the second fastest growing county in North Carolina. The population of Brunswick County has more than doubled since 1990, reaching 110,000 in 2011. Growth is projected to continue, with county population reaching nearly 123,000 by 2016. In addition to population growth, Brunswick County Economic Development Commission (EDC) tracked over 1,600 new jobs added in Brunswick County over the last 10 years.

One of the many beaches in beautiful Brunswick County (photo courtesy of North Carolina's Southeast)

The Southern Cape Fear Coast, which is comprised of eight communities along the coast including Bald Head Island, Oak Island, and Southport, has a climate that is influenced by the marine location and is mild year round. The region is comprised of miles and miles beaches and direct access to the Intracoastal Waterway and the Atlantic Ocean. The small towns of the region offer cultural and historical attractions. While the region draws tourists and visitors from all over the U.S., it also provides its residents with an unmatched quality of life and is an ideal place to live. The quality of life afforded by the region appeals to second homeowners, highly-skilled retirees, and families. The livability of the region and the variety of resources and amenities helps businesses recruit and retain top-notch management, skilled-workers, and other professionals.

In 2012, NEAH Transportation Holdings, a manufacturer of solar-powered refrigeration units, announced it would locate in Brunswick County, adding 75 jobs. COO Steve Kehrer noted that Brunswick County's location between Myrtle Beach and Wilmington was ideal because there are many skilled workers here and that "this area is underutilized."

Community leaders are keenly aware of the appeal of the community and aggressively promote it to potential businesses, residents, and visitors. According to Jim Bradshaw, Executive Director of the Brunswick County EDC, the region as a whole has a team-oriented approach for bringing new jobs and investment to Brunswick County. Cape Fear Regional Jetport is a key team member in the economic development efforts of the county. Howie Franklin, the Jetport Director, is a vital community advocate and works closely with other leaders in the region to support the community's vision of long-term economic prosperity.

A Regional Economy in Transition

The strong regional economic base has been a key driver of the success of the Cape Fear Regional Jetport. In Brunswick County, agribusiness, seafood products, tourism, recreational activities, and retirees have historically been the top economic drivers. However, in the last decade, manufacturing, biotech, and healthcare industries have come to the forefront, providing the region with a diverse economic base. The largest employers in Brunswick County are presented in Table 1.

Table 1: Brunswick County's Largest Employers

Employer	Industry	No. of Employees
Brunswick County Board of Ed.	Education & Health Services	1000+
County Of Brunswick	Public Administration	1000+
Wal-Mart	Trade, Transportation & Utilities	500 - 999
Progress Energy Carolinas	Trade, Transportation & Utilities	500 - 999
Brunswick Community College	Education & Health Services	250 - 499
Brunswick Community Hospital LLC	Education & Health Services	250 - 499
Food Lion	Trade Transportation & Utilities	250 - 499
DAK Americas	Trade, Transportation & Utilities	250 - 499
J. Arthur Dosher Hospital	Education & Health Services	250 - 499
Marine Terminals Corp. East	Trade Transportation & Utilities	250 - 499
Bald Head Island	Financial Activities	250 - 499
Department of Defense	Public Administration	250 - 499
Lowes Home Centers	Trade Transportation & Utilities	100 - 249
Lowes Food Stores Inc	Trade, Transportation & Utilities	100 - 249
Troon Golf LLC	Leisure & Hospitality	100 - 249
Securitas Security Services USA Inc	Professional & Business Services	100 - 249
Victaulic Co Leland Facility	Manufacturing	100 - 249
B & K Coastal LLC	Construction	100 - 249
Atlantic Telephone Membership	Information	100 - 249

Source: Brunswick County Economic Development Commission.

Brunswick County experienced an economic boom in the early 2000's. Between 2004 and 2007, 30 existing and new companies invested more than $247 million in constructing

new facilities and expanding existing facilities in the county. Brunswick Marine, Strategic Behavioral Health, Del Labs, DAK Americas, and Victaulic each added substantial jobs and investment during the four-year period, with an overall investment of nearly $62 million per year in the county.

Still, Brunswick County and the Southern Cape Fear Coast were not immune to the recession that began in 2008. The construction and real estate industries were hit hard by the downturn and new home sales and real estate prices in the region dropped dramatically. It appears that this trend has turned in 2012, with nearly 1,000 new housing permits issued in Brunswick County. The residential developments at St. James Plantation and Brunswick Forest, as well as others throughout the county, witnessed an increase in sales in 2012. The tourism industry in the region was hit as well, but indicators have shown strong improvements since 2011, with occupancy tax collections up 8% overall from 2007. Business expansion in Brunswick County continued despite the recession, albeit at a much lower rate than the early 2000s. Sixteen businesses announced new investment in the county between 2007 and 2012. The county and jetport are now poised and ready for more moderate economic growth in the future.

Table 2 summarizes large industry announcements in the county since 2004. Efforts to support regional economic expansion continue to remain strong. The Brunswick County EDC reported a dramatic rise in interest in industrial development in early 2013.

Table 2: New and Expanding Employers in Brunswick County

Year	Company	Industry	Jobs	Investment ($)
2012	NEAH Transportation/Torus Energy	Vehicle Manufacturing	75	unknown
2011	CMS Food Solutions	Food Preservation	52	3,500,000
2011	TRC Generators	Generator Manufacturing	6	500,000
2011	OLAM America's Inc	Wood Products Distribution	6	1,000,000
2011	ASM	Wood Product	6	250,000
2010	Coca-Cola	Distribution	60	4,500,000
2010	North State Woodcraft, LLC	Millworks	10	2,000,000
2009	Atlantic Global Yacht Group	Boat Production	20	2,000,000
2009	Caraustar	Paper Products Distribution	10	2,000,000
2009	Crestwood	Food Distribution	5	1,000,000
2009	Glycotech	Biotech	32	3,000,000
2009	Hydro Gas	Alternate Fuel	2	300,000
2009	Island Style Custom Yachts	Boat Production	20	500,000
2009	SofTee Manufacturing	Golf Products	3	500,000
2008	Twin Precision Manufacturing	Precision Manufacturing	15	2,000,000
2007	Brunswick Marine	Boat Production	300	60,000,000
2007	Cape Fear Marina	Boating	25	5,000,000
2007	A W Chesterton	Building Materials	10	500,000
2007	Berringer	Flex Space	20	1,500,000
2007	Strategic Behavioral Health	Youth Health	200	8,000,000
2006	Dean Hardwoods	Flooring Wood Products	30	5,000,000

2006	FleeCo	Boat Lift Parts	30	5,000,000
2006	McLamb Fencing	Vinyl Fencing	5	500,000
2006	Del Labs	Cosmetics	200	10,000,000
2006	Lighting Center	Commercial Lighting	10	3,000,000
2006	Custom Stainless Expansion	Boat Products	10	500,000
2006	Flow Science Expansion	Labs	10	500,000
2005	American Vinyl	Vinyl Siding	15	3,000,000
2005	Big Box Storage	Material Storage	5	1,000,000
2005	Fleet Imports	Warehouse Distribution	10	1,000,000
2005	New Millennium	Foam Insulators	15	500,000
2005	MarKraft Cabinets	Cabinets	30	5,000,000
2005	Sure-Jen	Generators	20	3,000,000
2005	DAK Americas Expansion	Resins	75	100,000,000
2005	Victaulic Expansion	Pump Parts Manufacturing	50	5,000,000
2004	Benton Trucking	Trucking	25	5,000,000
2004	Sansha USA	Dance Apparel	20	2,000,000
2004	Leather Italia	Leather Furniture	25	5,000,000
2004	West Docks	Alum Fabrication	20	1,000,000
2004	Flow Science	Labs	40	1,000,000
2004	Marine Welding	Alum Fabrication	10	500,000
2004	Feller	Cord and Couplings	25	6,000,000
2004	Timbercraft	Cabinets	5	2,000,000
2004	Custom Closets	Shelving	10	2,000,000
2004	Victaulic Expansion	Water and Gas Piping	40	5,000,000

Source: Brunswick County EDC. Data prior to 2004 not available.

New and Improved Airport to Meet Demand

In 1963, the Brunswick County Airport opened with an unpaved 3,200-foot long by 250-foot wide turf landing strip (Runway 5/23). The development of the airport was strongly encouraged by local real estate developers and built in conjunction with the residential development occurring on Oak Island. The airport was created by an act of the North Carolina General Assembly. Its construction required the relocation of S.R. 1102 (now Airport Road). The airport was used primarily for recreational purposes over the next 20 years. While the community pushed for paving the runway and additional amenities, the local political power was limited and it was difficult to get the funding to make it happen. Local companies Carolina Power & Light, Archer Daniels Midland and Pfizer Corp. wanted to utilize the airport in the early 1980s, but the runway and facilities were not adequate to support their corporate aircraft.

By 1984, a 2,000-square foot terminal building was constructed, and in 1987, Runway 5/23 was finally paved to 4,000 feet long by 75 feet wide. Turnarounds, an apron, medium intensity runway lighting, and 100LL and jet fuel were also added at that time. With new facilities in place, higher-end clientele soon began accessing the airport with private and

chartered aircraft to reach second homes located in the region, and a significant increase in corporate travel.

Approach to Runway 5 at Cape Fear Regional Jetport

Throughout the late 1980s and into 1990s, Brunswick County and the Southern Cape Fear Coast began to experience high levels of socioeconomic growth. Brunswick County and several local municipalities recognized the need for an improved airport to further support the regional socioeconomic growth. It quickly became evident that a longer runway was needed to accommodate demand. Community leaders recognized that a longer runway would allow more sophisticated aircraft to operate at the airport, including small corporate jets.

In 1994, Howie Franklin, former Air Force One Air Steward for five U.S. presidents, was hired as the airport director. Mr. Franklin is helping turn the community vision for a first-class airport to support high-end corporate users into a reality. A few of his first actions included new fuel facilities allowing for 24-hour self-service fueling and the construction of additional corporate and T-hangars.

In 1999, planning was initiated to extend the runway at the Brunswick County Airport. After nearly 10 years of planning, environmental analyses, design, and land acquisition, in 2008, the airport broke ground for the runway extension and corresponding road relocation of Airport Road. In July 2010, the 1,205-foot long extension was completed and the runway re-opened. In conjunction with the opening of the extended runway, the airport was successfully rebranded as Cape Fear Regional Jetport in order to both bring more people to the area and to clear up confusion about its location. In 2012, the construction of the $3.65 million full parallel taxiway project began and is scheduled for completion in 2013. These two projects will provide an even greater level of safety for pilots operating at the jetport.

Following the runway and taxiway projects, the jetport is also working towards developing a new apron area, additional hangars, and a new terminal on the west side of the runway. With 100 aircraft on the jetport's hangar waiting list in the fall of 2012, the demand for additional hangar development is clear. In addition, the jetport and the community leaders recognize that a larger, more modern terminal facility with state of the art amenities would appeal to the clientele they serve. The community's vision is to provide a first-class terminal with curb appeal. There are also plans to develop an industrial park adjacent to the jetport. With the recent extension of water and sewer to

the west side of the jetport, this will stimulate industrial development and job creation in the vicinity of the jetport.

The jetport prides itself on the high level of customer service it affords to those that utilize the facility. Hertz, the on-site rental car facility, assists jetport management and staff with providing a convenient and seamless travel experience for all users.

2012 Jetport Tenants (year established)

Blue Sky Aviation (1997)- paint shop
Brunswick Air (2009)- flight training, plane rides, aircraft rental
Brunswick Hangar Association- aircraft storage
Cape Fear Airworks (2007) - aircraft maintenance
Dutchmans Creek Bait & Tackle (1993)
Gyrocopters of the Carolinas (2013)- sales and manufacturing
Hertz (2008)- car rental
Oak Island Aviation (1999)- aircraft maintenance
Oak Island Aircraft Housing- aircraft storage

Cape Fear Regional Jetport provides an opportunity for aviation-related industries and businesses to enter and expand on airport property. As of early 2013, there were 10 tenants at the jetport including two aircraft maintenance companies, a flight school, paint shop, gyrocopter manufacturer, and skydiving company. Like jetport management, all tenants provide high-quality work and outstanding customer service. According to the *2012 Economic Contribution of North Carolina Airports*, the number of direct jobs provided by jetport tenants/management at the jetport increased from 21 in 2006 to 68 in 2012. This growth can be attributed to the strong local economic base, recent facility improvements, and the future development plans for the jetport. Several tenants, including an avionics shop, have recently expressed interest in operating at the jetport. With the completion of the west side terminal operating area in the next five years, the jetport will be able to accommodate these additional requests.

Rich Gwin, owner of Cape Fear Airworks and Brunswick Air, noted that he began his maintenance and flight school businesses in 2007, just before the economic recession hit the country. The companies have seen steady growth in business over the last five years, despite the economic downturn, thanks, in part, to the improvements made at the jetport. Mr. Gwin also attributes this continued growth to the jetport management's foresight and enthusiasm to grow, despite the recession.

At work at Cape Fear Airworks (photo courtesy of Cape Fear Airworks)

Jetport tenants now have the ability to accommodate and serve additional aircraft types and clientele that previously could not utilize the jetport due to limited runway length.

According to FAA activity data, corporate jet aircraft including the Bombardier Global Express, Gulfstream V, Super King Air, and Hawker 900XP now frequently use the jetport. The runway dimensions now meet the insurance requirements of many corporate jet aircraft operators including fractional ownership and charter services. FAA records show that Citation Air and Executive Jet Management (NetJets) have frequently utilized the jetport since 2010. Jet fuel sales have also grown substantially since the runway was completed. Jetport records indicate that the sale of jet fuel increased 51 percent between 2009 and 2011.

• • •

Since 2010, a jetport user from Wisconsin frequently charters a Raytheon Beechjet 400 to access his vacation home on the exclusive Bald Head Island. He noted that he "was really pushing for the runway extension so charter companies like NetJets could start accessing the jetport and make his ability to get to his second home more convenient."

Location, Location, Location

With 60 miles of beaches and 40 golf courses nearby, Cape Fear Regional Jetport supports a thriving tourism-based industry. There are seven marinas and seven golf courses within miles of the jetport alone. According Howie Franklin, the jetport's success is largely due to "location, location, location."

• • •

"The Cape Fear Jetport primarily serves the needs of the county's rapidly growing retirement/second home communities where many prominent business people have located and need their private aircraft to provide quick access to their businesses in other parts of the country."

- Jim Bradshaw, Executive Director of the Brunswick County Economic Development Commission

Wilmington International Airport is just 45 minutes away and provides commercial airline service to the region. Myrtle Beach International Airport is located just over an hour south of Brunswick County and provides another commercial service option for residents and visitors. Cape Fear Regional Jetport complements the service provided at these commercial service airports by providing close and direct access to residents and visitors to reach their destinations of resort communities and the Southern Cape Fear Region utilizing general aviation.

The Southern Cape Fear Coast appeals to many that are looking for a quiet and ideal spot for a second home as well as retirees. A pilot from Washington D.C. recently noted that the jetport's facilities and location were instrumental in his decision to build a 4,600 square foot second/retirement home in the planned residential community of St. James in Brunswick County. The jetport affords this user and others convenient access to much of the U.S.

Future residential real estate development in Brunswick County, whether it is vacation rental property, second homes, or new single family homes is projected to continue to experience strong growth due to the quality of life afforded by the area. As regional population continues to grow, the jetport will be poised to support this growth.

The film industry has emerged as a big contributor to the regional economy in recent years. In 2012, 20 production crews spent an estimated $230 million in southeastern North Carolina (including the greater Wilmington area and Brunswick County). Southport and the Southern Cape Fear Coast are not new to the filming of motion pictures. "Nights in Rodanthe," "A Walk to Remember", and "I Know What You Did Last Summer" were all filmed in the region. The jetport was an integral part in the production of several movies in 2012 including "Iron Man 3" and "Safe Haven." In July 2012, skydivers and stunt crews utilized the jetport to film scenes in Iron Man 3. Additionally, production crews set up base at the jetport for a few weeks. Actors and crews utilized the jetport to conveniently access nearby filming locations. Movie equipment and supplies also arrived on aircraft via the jetport during the 2012 filming of movies. The TV series "Under the Dome" is also currently being filmed nearby. The 1,205-foot long runway extension at the jetport proved to be invaluable and allowed larger jet aircraft to access the region, which in turn ensured timely delivery and convenient access during filming.

Film crews from Iron Man 3 set up at Cape Fear Regional Jetport

Poised to Support an Improving Economy

Jetport management estimates that approximately 85 percent of the jetport's annual operations were related to tourism and second homeowners prior to the recession. Today, the usage of the jetport has shifted. While 60 percent of annual operations can still be attributed to tourism-related travel, the remaining 40 percent are now performed by corporate users. This shift is expected to continue as additional facilities are constructed at the jetport and with expansion of business and industry in the region.

Brunswick County's industrial corridor is located 30 miles away from the jetport. Most new industrial announcements and expansions in the county have been located in that corridor. Brunswick County industrial sites include the International Logistics Park and Mid-Atlantic Logistics Park. Each of these sites has more than 1,000 acres available for development. Leland Industrial Park and Shalotte Business Park have seen recent expansion as well. There is also a small industrial park (Southport Business Park) that has a number of companies including Archer Daniel Midland and Duke Energy's Nuclear Plant. Several of the firms located in the business parks use the jetport including Duke Energy, Archer Daniels Midland, Tri-Tech Forensics, and Dynamic Entry. The county has additional plans to develop an industrial park adjacent to the jetport in the next decade.

Companies utilizing Cape Fear Regional Jetport in 2012

Dynamic Entry
Duke Energy
Progress Energy
Archer Daniels Midland
Tri-Tech Forensics
Orton Plantation
Brasfield & Gorrie
CPT Engineering
Property Administrators
Randolph M. James P.C.
Worldwide Insurance Networking
Jack Henry & Associates
BB&T

Cape Fear Regional Jetport also plays a role in supporting the local healthcare industry. Brasfield & Gorrie Construction Management served as the contractor for the Brunswick Novant Medical Center (BNMC) in Bolivia which opened in July 2011. Contractors with the firm frequently flew from its headquarters in Auburn, Alabama on Cessna Citation Jets and Citation V aircraft during and following the construction of the medical facility. Several doctors and specialists from all over the U.S. also regularly utilize the jetport to access the BNMC and the Dosher Memorial Hospital in Southport.

The jetport also supports the restoration of Orton Plantation. After being purchased by billionaire Louis Moore Bacon in 2010, the Plantation house, grounds, and property are undergoing renovation and restoration. Mr. Bacon and his associates frequently fly into the jetport on Global Express aircraft to access the Plantation, located in Brunswick County.

The jetport serves the needs of the county's rapidly growing retirement/second home communities where many prominent business people have located. Many utilize private aircraft to provide quick access from their homes to their businesses in other parts of the U.S. Jetport management noted that executives from Toys R' Us, Ralph Lauren, Simon & Schuster, FoxNews, among others, frequently utilize Cape Fear Regional Jetport to access their second or vacation homes.

A Partner in the Community

The value of Cape Fear Regional Jetport to the community goes beyond its ability to support recreational and business users. The jetport supports a wide variety of other activities including education, military, law enforcement, firefighting, and wildlife activities.

The Brunswick Community College (BCC) is the catalyst in the region for increased educational and professional development. BCC offers workforce development and provides state-of-the art career and continuing education and training for a vast array of professions and industries. A business incubator is located in the BCC's Leland branch. Cape Fear Regional Jetport and BCC have forged a partnership to develop aviation-related training opportunities over the last several years. The jetport and BCC officials are exploring the development of several programs including ground school for flight training, aircraft mechanic school, and an air traffic control training program.

Cape Fear Regional Jetport also supports the North Carolina Army National Guard. Annually in April, an Airfield Operations Battalion constructs a temporary air traffic control tower and ground control approach radar at Cape Fear Regional Jetport. The two-week long training prepares unit soldiers and officers for conducting air traffic control operations on overseas missions. During the training, the military rents accommodations in Southport and Oak Island and purchases over 5,000 gallons of jet fuel from the jetport to refuel their helicopters (Eurocopter Dauphin).

The U.S. Coast Guard utilizes the jetport on a weekly basis as a launching and refueling point for air evacuations and training exercises. Other military, state firefighting, state wildlife commission, and local sheriff's department units also frequently use the jetport as a refueling point and for training, as well as a home base of operations, as needed, for emergencies. Emergency cargo landings and training related to Sunny Point Military Ocean Terminal located nearby are supported by the jetport. Sunny Point is the largest ammunition port in the United States. Local fire departments use the jetport for training and the Civil Air Patrol trains cadets and provides aerial services for the community.

Communities in Schools Annual Benefit Gala held at Cape Fear Regional Jetport, October 2012 (photo courtesy of Cape Fear Regional Jetport)

The jetport is involved with many community events and often partners with the local chambers of commerce including Southport-Oak Island Area Chamber and Brunswick County Chamber. Cape Fear Regional Jetport has been used to host many community meetings and events including the annual "Big Toy Day" in May and the "Annual Benefit Gala for Children" in October 2012. The gala was held in a corporate hangar. Proceeds from the both fundraising events went to Communities in Schools (CIS) which empowers students in the community to stay in school and be successful in life.

A Relatively Small Investment for a Large Economic Return

Cape Fear Regional Jetport serves as a gateway to the region, providing businesses, tourists, and other visitors with access to Brunswick County and the Southern Cape Fear Coast. Since the 2000s, many people have visited, built homes, and companies have located in the region, due in part to the facility development at the jetport. These individuals and companies continue to pay dividends in the form of jobs, spending, capital investments and taxes to the region benefiting the local community and regional economy.

The *2012 Economic Contribution of Airports in North Carolina* determined Cape Fear Regional Jetport plays a vital role in supporting the region with 600 jobs with an annual payroll of $5.2 million and $61.73 million in economic output for the local and regional economics. This is more than double the jobs and economic contribution provided by the jetport just six years earlier.

Between 1996 and 2012, the federal, state, and local investment into improvements at the jetport reached nearly $30 million. Most of investment was used for land acquisition, the runway extension, and a new parallel taxiway that were completed in the last several years. While this level of investment is significant, the growth of the economic contribution of the jetport since 1996 has been remarkable as depicted in Table 3. The investments made at the jetport have paid off immensely considering an annual economic return of $61.7 million from current jetport operations, up 136 percent from the 2006 annual return of $26.2 million.

Table 3: Economic Impact of Cape Fear Regional Jetport

	1996	2006	2012
Total Jobs	108	261	600
Total Economic Contribution	$4,154,000	$26,179,000	$61,730,000

Source: *Economic Contribution of Airports in North Carolina* (1996, 2006. and 2012)

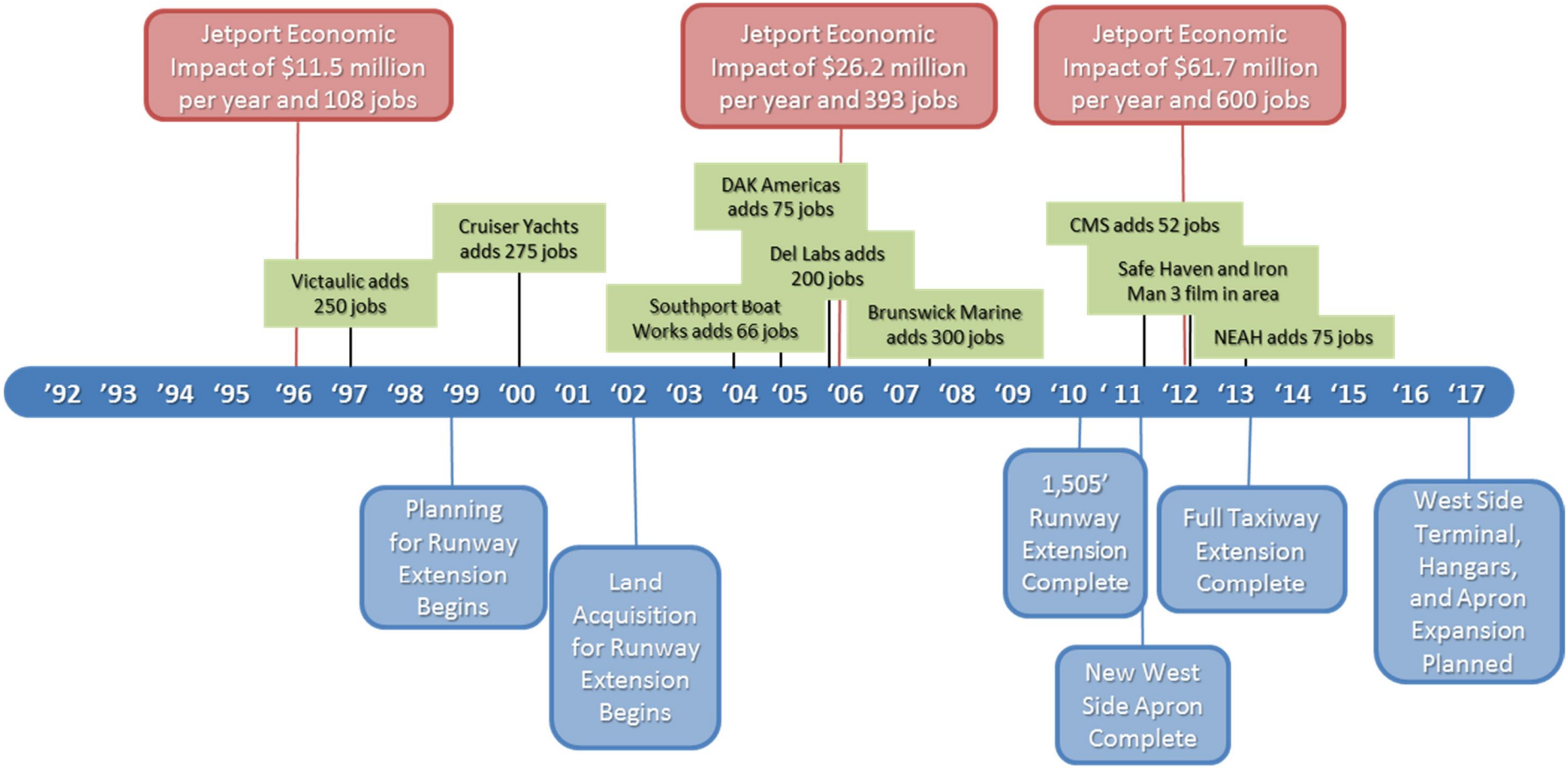
It is important to note that many general aviation airports in North Carolina actually saw a decline in economic contribution between 2006 and 2012 due to the recessionary strains placed on general aviation activity. The jetport not only weathered the difficult recession period, but actually grew substantially due to the construction of the improved jetport facilities and increased activity that has occurred over the last six years.

Although it is difficult to truly quantify the return on investment, the jetport's runway extension and taxiway improvements have indeed had a substantial impact on the regional economy by allowing access by a wider variety of high-end aircraft and new clientele. The jetport is just beginning to realize the return on this investment. Recognizing that an airport is the "front door" to a community and gateway to the region, the new west side development at the jetport, including a new terminal and additional hangar space, will allow for the jetport's image to closer resemble that of the clientele that now use the facility and provide much needed hangar storage for the high-end aircraft accessing the jetport.

The team approach to regional economic development efforts and a unified vision for success has served the community well. New corporate investment into community has coincided with the planning and improvements at the jetport over the last two decades. A timeline of investment into Brunswick County and corresponding capital development at Cape Fear Jetport is depicted in Figure 1. From the second homeowner on Bald Head

Island to real estate developers to sightseeing tours to filming movies to corporate executives, the jetport has served as a key economic driver and will continue to be part of the economic development of the entire region for decades to come.

Figure 1: Timeline of Jetport Facility Improvements, Economic Impact, and Business Announcements in Brunswick County



Sources: *Economic Contribution of Airports in North Carolina* (1996. 2006 and 2012), Brunswick County EDC, Cape Fear Regional Jetport, and North Carolina DOT

Mount Airy/Surry County Airport
Case Study

Overview

The City of Mount Airy is situated in picturesque northwestern North Carolina, in the foothills of the Blue Ridge Mountains. It is located just five miles south of the Virginia border, approximately 40 miles northwest of Winston-Salem, and 100 miles north of Charlotte. The City was incorporated in 1885 and is the largest city in Surry County. The community has a deep history and rich character. It strives to preserve its small town charm and the quality of life enjoyed by residents and visitors.

The Mount Airy Micropolitan Statistical Area is part of the Greensboro-Winston-Salem-High Point, NC Combined Statistical Area (CSA). The Micropolitan Statistical Area for Mount Airy encompasses all of Surry County and has a population of 73,673 (2010). Mount Airy's population in 2010 was 10,388 with a projected growth over the next 10 years of 6.3%. Mount Airy and Surry County are also part of the Piedmont Triad geographical region. Mount Airy is a great place to live with nationally recognized schools, a low cost of living index, excellent seasonal weather, and abundant local heritage and culture.

KEY FACTS

Becoming a First Class Business Airport (slated for completion by 2018) 5,500' x 100' runway, apron expansion, new hangar development, new state of the art terminal, full service FBO

Anticipated Airport Improvement Investment (2010-2025): $30 million in federal, state, and local funding

Highest General Aviation Airport Economic Contribution in State: $222 million annually

Major Airport Corporate Tenants: Pike Electric, Renfro, Insteel, SouthData, Eagle Carports

Community Economic Growth:

"The runway extension is key to improving access to the entire region. Current corporate users' fleet choices have been limited by the 4,300' runway length. Many people are flying to Winston-Salem to access the region. A longer runway will open the door for more charter/air taxi. New facilities will allow the airport to become a regional focal point. The economic impact associated with this development is anticipated to be large."

– John Springthorpe, Chairman of Surry County Airport Authority and

During much of the last century, the local economic base in Mount Airy and Surry County depended primarily on textile and furniture production. In the last two decades, the textile industry in the U.S. and Surry County has waned and shifted to foreign manufacturers. Additionally, the recent recession has further impacted many of the businesses in the community putting the local economy is at a crossroad.

Historically, the Mount Airy/Surry County Airport has played an important role in the success of local companies, providing convenient access to customers and suppliers. Local leaders realize that they must diversify their economy and have determined that the development of a business class airport would help them achieve this goal. There is currently a 1,200-foot long runway extension and road relocation project underway

at Mount Airy/Surry County Airport, expected to be complete in 2016. A 5,500-foot long runway will be capable of accommodating most corporate aircraft. In addition, a new general aviation terminal and ramp area is planned. When these projects are completed, the airport will be well positioned to help the community attract new industries and provide jobs for its residents through the next century.

A Transitioning Economy

A historical look at the region's economy provides perspective to today's economic opportunities. Mount Airy's first cotton factory opened in the 1840's and the railroad arrived in June 1888. The local granite quarry, which is now the world's largest open-faced granite quarry, began large-scale production in 1889. Tobacco farming was also key to the local industry in the late 1800s. The first furniture factory began work in 1895. Booming growth in the textile industry in the region followed World War I. World War II spurred additional production in plastics, concrete works, and construction companies.

Throughout much of the 20th century, the textile and apparel industries held a fundamental role in North Carolina's economy, providing thousands of jobs and revenue for local economies like Mount Airy and the other towns of Surry County including Elkin, Dobson, and Pilot Mountain. However, the turn of the century brought dramatic declines in employment in the textile industry with the closings of or layoffs at many plants in the county due to global competition, increasing costs, and technological advancements. The economic recession in the U.S. that began in 2007 also hit the industry hard. The largest textile mills in Surry County, including Gildan/Kentucky Derby Hosiery, Renfro, Hanesbrands, Spencers, Intex, and Perry Manufacturing, have all had closings and/or major layoffs since 1999.

The recent recession has also had a major impact on other businesses in the region. Furniture manufacturers including West Point Home, Vaughn Bassett, and Henredon have closed plants in Surry County in the last five years. Several other businesses including food manufacturer Harvest Time, construction company, John S. Clark, and trucking company, LC Transportation have shut down local operations as well.

Over 10,000 people in Surry County have lost their jobs in the county over the last 15 years. The concentration of the workforce in a few industries

• • •

The Surry County Economic Development Partnership, Inc. describes the current business backdrop as follows:

- *Modern Mount Airy remains a backdrop for apparel and textile production; close relationships between local corporations and the community is one visible legacy of the city's long list of headquartered operations.*
- *Mount Airy's economic roots can be traced to the world's largest open-faced granite quarry, not far away.*
- *The Ararat River, along with other powerful, picturesque waterways, helped shape one of*

has left Surry County vulnerable to economic or business fluctuations. The county unemployment rate skyrocketed to 13.8% in 2010 up from 3.6% in 2000.

Diversity, The Way to Future Prosperity

The trend is slowly changing. By the summer of 2013, the unemployment rate was under 9%. The textile, manufacturing, and farming industries that have defined Surry County for generations are now transforming into an economy that is increasingly driven by the service industry, small businesses, and tourism. New industries have begun to diversify the industrial base. Industries in the food processing, automotive parts manufacturing, and technology sectors have recently located to Surry County. While several of the textile and furniture manufacturing businesses still remain, the economic future of Surry County will look much different from its past with the new and more diverse industries that will call Surry County home.

Table 1 presents the largest employers in Surry County. The second largest employer, Pike Electric, has a corporate flight department located on the airport and relies on the airport to conduct business operations. Renfro and Eagle Carports also have corporate aircraft based at Mount Airy/Surry County Airport.

Table 1: Surry County's Largest Employers

Employer	Industry	No. of Employees
Surry County Board of Education	Education & Health Services	1,000+
Pike Electric	Construction	1,000+
Wayne Farms	Manufacturing	500-999
Hugh Chatham Memorial Hospital	Education & Health Services	500-999
Northern Hospital Of Surry	Education & Health Services	500-999
Wal-Mart	Trade, Transportation & Utilities	500-999
County Of Surry	Public Administration	500-999
Surry Community College	Education & Health Services	500-999
Renfro Corporation	Manufacturing	250-499
Mount Airy City Schools	Education & Health Services	250-499
Lowes Home Centers	Trade, Transportation & Utilities	250-499
Food Lion	Trade, Transportation & Utilities	250-499
Workforce Carolina	Professional & Business Services	250-499
City Of Mount Airy	Public Administration	100-249
Hanesbrands	Manufacturing	100-249
MVP Group International	Manufacturing	100-249
Nester Hosiery	Manufacturing	100-249
Mountain Valley Hospice & Palliative	Education & Health Services	100-249
Barnhardt Manufacturing Company	Manufacturing	100-249
WLA Inc.	Trade, Transportation & Utilities	100-249
4 P S Payroll Service	Professional & Business Services	100-249

Carolina Carports	Manufacturing	100-249
McDonalds	Leisure & Hospitality	100-249
Leonard Buildings & Truck Access	Manufacturing	100-249
The L. S. Starrett Company	Manufacturing	100-249
SouthData, Inc.	Document Processing	100-249
Source: NC Employment Security Commission, 2013		

Developing fresh ideas for attracting target businesses while embracing the community's quality of life will continue to lead Mount Airy, Surry County, and Mount Airy/Surry County Airport down the path of success. As shown in Table 2, Surry County has seen existing and new companies invest nearly $223 million into local facilities over the last 10 years, which has resulted in nearly 1,500 new jobs by 39 companies.

Table 2: New and Expanding Employers in Surry County since 2003

Company	Industry	Jobs	Investment
Advanced Electronic Services (AES)	Electronic Components	30	$1,500,000
CK Technologies	Truck and Bus Parts Manufacturer	50	$19,000,000
Poli Twine	Rope and Twine Manufacturer	8	$8,000,000
Miller Brothers	Sawmill	7	$1,000,000
United Plastics	Plastic Products Manufacturer	12	$700,000
Interface Fabrics	Furniture Fabric Production	80	$500,000
Astro Pneumatics	Industrial Tool Supplier	20	$200,000
Zenith Logistics	Transportation Services	52	$2,300,000
Insteel Industries	Concrete Product Manufacturer	9	$7,500,000
Vaughn Bassett	Furniture Manufacturer	25	$4,900,000
Winston Distribution	Advertising Material Distribution	40	$4,350,000
Ottenweiler Company	Steel Fabrication Manufacturer	96	$6,500,000
Granite Tactical Vehicles	Armored Vehicle Manufacturer	20	$2,500,000
Bodet & Horst	Textile Manufacturer/Distributor	10	$500,000
Central States Manufacturing	Building Materials Manufacturer	45	$4,500,000
Catalina Tempering	Hand and Edge Tool Manufacturer	20	$2,500,000
Wound About	Rope and Twine Manufacturer	6	$200,000
Advantage Industrial Service	Material Handling Equipment and Repairs	7	$225,000
Harvest Time Bread	Bread and Bakery Products	38	$4,500,000
Pittsburgh Glass Works	Automotive Glass Manufacturer	260	$85,000,000
MVP Group, Inc	Home Products Manufacturer	67	$10,600,000
Elastix	Polymer Rubber Manufacturer	51	$3,000,000
Prism Medical Products	Medical Equipment and Supplies	20	$300,000
Burton Signworks	Sign Manufacturer	12	$150,000
Advanced Electronic Services (AES)	Electronic Components	30	$1,100,000
Willow Tex, Inc	Textile Manufacturer/Distributor	45	$7,000,000
Awesome Products	Cleaning Products Manufacturer	140	$22,000,000
Shenandoah Furniture	Furniture Manufacturer	48	$2,500,000
ASMO	Motor Manufacturer	21	$1,500,000
Wayne Farms	Poultry Processing Plant	94	$4,800,000
Dusty Trail Conversion	Retirement Community	12	$500,000

Kentucky Derby Hosiery	Hosiery Manufacturer	18	$1,500,000
Basalt Specialties	Textile Manufacturer	12	$2,000,000
Henredon Furniture	Furniture Manufacturer	50	$200,000
Champion Printing	Printer	5	$3,000,000
NCFI	Plastic Foam Manufacturer		$1,700,000
Galaxy Filters	Tobacco Products Manufacturer	8	$1,000,000
Rock Solid Dimensional Stone	Stone Product Manufacturer	10	$1,400,000
SouthData	Document Management	92	$12,100,000
Source: Surry County Economic Development Partnership			

Airport is Key to Past and Future Economic Success

Over the last 45 years, the Mount Airy/Surry County Airport has played an important role in building the local economy. The airport opened in 1968 with a 3,500-foot long by 75-foot wide runway. A non-precision approach was added in the mid-1970s. With the urging of several local companies, a runway extension to 4,300 feet and a partial parallel taxiway was added in 1990. Insteel, the largest manufacturer of steel wire reinforcing products in the world and headquartered in Mount Airy since 1953, was the first local business to build a corporate hangar at the airport in 1989 and continues to have a corporate flight department located at the airport. Flying a Cessna 525 CitationJet, Insteel utilizes the airport several times a week to access its nine manufacturing plants throughout the U.S. as well as major customers. Two large textile and apparel manufacturers, Spencer and Renfro, also built corporate hangars at the airport in the mid-1990s to support their local headquarter operations. Although Spencer shut down all local operations in 2007, Renfro Corporation continues to fly weekly to customer and plant locations. Today, the Spencer hangar is fully occupied and SouthData is constructing a new corporate hangar to open in mid-2014.

In 1997, Pike Electric, the largest private employer in Surry County, moved its corporate campus to private property adjacent to the east side of Mount Airy/Surry County Airport. This location was chosen, in part, due to their ability to build a large corporate hangar on their property and access the airport with a through-the-fence agreement. Today, Pike Electric uses two Cessna Citation XLS aircraft to conduct daily business operations. Kenneth Shelton, Pike Electric's Aviation Department Manager, notes that "Pike Electric employs more than 5,000 people across the United States and they are all supported out of the facilities that adjoin the Mount Airy/Surry County Airport. Pike is growing and a strong contributor to the state and local economy. The airport is an integral part of our transportation needs at Pike Electric."

While the local economy is slowly coming out of the recession in part due to diversifying its base, the airport's business aviation operations have remained strong and continue to grow. Table 3 presents the most frequent corporate users. It is estimated that each of these companies utilizes the Mount Airy/Surry County Airport on a weekly basis if not

more frequently. Despite the strong presence of corporate users, the existing runway length of 4,300 feet limits the type corporate aircraft that can safely use the airport.

Table 3: Frequent Corporate Users of Mount Airy/Surry County Airport

Company	Aircraft	Based at Airport
Pike Electric	Citation XLS (2)	Yes
InSteel	CJ2+	Yes
Renfro	Lear 35	Yes
SouthData	TBM 850	Yes
Carolina Carport	KingAir 200	Yes
Advanced Electronics	Navajo	Yes
Techform	PiperAerostar	Yes
Barber Trucking	Cessna 421	No
Russell Corp	Various	No
Private Individual/Lobbyist in Washington DC	Piper Comanche	Yes

Source: Mount Airy/Surry County Airport Authority

A runway extension for Mount Airy/Surry County Airport would have its challenges and complexities including a road relocation and major earthmoving work. But the reasons for the community to pursue a runway extension were plentiful. Community and business leaders could not overlook the loss in economic impact and opportunities associated the limited runway length and the inability to accommodate many business jets that was occurring. The following benefits hope to be achieved with airport improvements:

- Better Support for Existing Corporate Users: Several of the companies with aircraft based at the airport, including Pike Electric, have noted that the existing runway length has prohibited the purchase of larger aircraft. As the company continues to grow, it will be important that the larger aircraft can be accommodated at the airport.

We will have over 500 operations at Mount Airy/Surry County this year and we fly over 400 hours per year on each Cessna Citation 560XLS aircraft, valued over $14 million. It is estimated that the aircraft will burn 185,000 gallons of Jet-A fuel, of which at least 50% is purchased at Mount Airy. While we are productive with the aircraft we operate, the runway extension will enable us to be more so as well as add a significant safety buffer. We are growing and potentially will need larger, more capable aircraft.

- Kenneth Shelton, Aviation

- Accommodate Potential Corporate Users: The airport repeatedly hears from potential customers that they are using other more distant airports including Winston-Salem and Martinsville to access the region. When Pittsburgh Glassworks was choosing its site for a new manufacturing plant, they flew into Smith Reynolds Airport in Winston-Salem, since it was the closest airport that could accommodate

their business jet aircraft. Russell Corporation is another company that frequently utilizes a different airport that can accommodate their Citation III and King Air 200 aircraft and then drive to Mount Airy. The runway extension will allow nearly all business aircraft to operate at Mount Airy/Surry County Airport. The airport will make it more convenient for business executives to travel to and from Surry County to visit manufacturing facilities, to meet with vendors, to conduct business negotiations, and to perform other critical functions needed for businesses to prosper.

- Charter/Fractional Ownership Services: The runway length of 5,500 feet and a full parallel runway will meet the insurance requirements of many corporate jet aircraft operators including fractional ownership and charter services such as Citation Air and Executive Jet Management (NetJets).

- Provide Access to Primland: Mount Airy/Surry County Airport is the closest airport (22 miles) to Primland, a luxury resort located just over the Virginia border in the Blue Ridge Mountains. Primland is a 12,000 acre eco-conscious retreat offering world class golf, dining, and outdoor activities. Due to the remote location and the high-end clientele that it serves, many of the visitors to Primland arrive to via general aviation aircraft. The resort partners with NetJets, and currently promotes the use of Blue Ridge Airport in Martinsville, Virginia (46 miles from Primland) which has a runway length of 5,002 feet. Once the runway extension is complete at Mount Airy/Surry County, the airport will be able to safely accommodate more business jet aircraft and provide the most convenient access to Primland.

- Support Local Tourism: The airport currently plays an active role in supporting local tourism. Visitors arriving via air partake in many local sites and music and arts festivals as well as accessing the Yadkin Valley Wine Region. Mount Airy is Andy Griffith's hometown, is the home to many Mayberry-related sites including the Andy Griffith Museum and Playhouse, and hosts Mayberry Days festival each September. Every fall the town also hosts the Autumn Leaves Festival and visitors use the airport to attend the festival. The airport is also used for air tours during the festival. The Yadkin Valley wine region is a vibrant river valley known as "Napa of the East" and consists of nearly 40 wineries. Yadkin Valley wine was started in 2003 and has quickly become well known for its high quality wines. Improvements to the Mount Airy/Surry County Airport will improve the access to the local attractions and provide more opportunities for tourists to access the region.
- Marketing Tool: Transportation infrastructure including roads, railroad, and the airport are all important assets the county uses when valuating development opportunities. Specifically, Mount Airy/Surry County Airport is viewed as a tool to advance economic development activities and support additional growth. The Surry County Economic Development Partnership recognizes the importance of the

Mount Airy/Surry County Airport as an economic development tool for the community, touting its advantages, accessibility, and convenience and incorporating it into their marketing and economic development strategy. The airport improvements will act as a catalyst for even more business development.

- Increased Economic Impact: The economic impact associated with this development is anticipated to be large, as the airport improvements can be used as a tool to attract new businesses and create jobs as well as provide improved access for corporate and tourism-related visitors.

A Relatively Small Investment for a Large Economic Return

Mount Airy/Surry County Airport serves as a gateway to the region, providing businesses, tourists, and other visitors with access to northwestern North Carolina. The *2012 Economic Contribution of Airports in North Carolina* determined Mount Airy/Surry County Airport plays a vital role in supporting the region with 1,940 jobs that have an annual payroll of $41.4 million and $222.0 million in economic output for the local and regional economics (see Table 4). Additionally, the airport provides another $5.4 million to the state and local tax base. This economic contribution by the airport is the highest among all general aviation airports in North Carolina. This is due in part to the reliance of Pike Electric and other local companies at the airport to conduct business operations.

Table 4: Economic Impact of Mount Airy/Surry County Airport 2012

Total Economic Contribution	$222,030,000
Total Jobs	1,940
Estimated Payroll Income	$41,420,000
State and Local Taxes	$5,369,000

Source: *Economic Contribution of Airports in North Carolina* 2012

Between 2010 and 2025, the federal, state, and local investment at the airport are anticipated to reach $30 million. Most of the investment is for land acquisition, road relocation, and the runway extension that will be complete in the next several years. A summary of the planned improvements is presented in Table 5. While this level of investment is significant, the growth of the airport's economic contribution will be measured when the improvements are completed to understand the full economic impact of the airport's development. The investments made at the airport will no doubt pay off immensely in the long run.

Table 5: Mount Airy/Surry County Airport Improvement Projects (2010- 2025)

RUNWAY EXTENSION PROJECTS	
Land acquisition	$3,530,000
Planning (ALP, EA, BCA)	$200,000

Design/Permitting/Mitigation	$1,060,000
Road Relocation	$5,500,000
Utilities Relocation	$1,230,000
Extension site prep, paving, lighting	$3,800,000
Runway Total	$15,320,000
OTHER AIRPORT IMPROVEMENTS	
North Ramp Expansion	$4,360,000
Airfield Improvements	$4,920,000
Future Development	$5,630,000
TOTAL DEVELOPMENT COSTS	$30,230,000

Source: North Carolina Department of Transportation

Based on the impact of similar improvements at other airports statewide and nationally, it is expected that the runway extension and other improvements at Mount Airy/Surry County will have a substantial impact on the regional economy by allowing access by a wider variety of business class aircraft and new clientele. Recognizing that an airport is the "front door" to a community and gateway to the region, the new north side development at the airport, including a new terminal and additional hangar space, will allow for the airport's image to closer resemble that of the clientele that will use the facility and provide much needed hangar storage for the corporate aircraft accessing the airport. In addition, the airport will be able to support a new full service FBO, aircraft maintenance, and flight school.

It has been witnessed at airports across the country that new corporate investment into a community coincides with the improvements and investments such as those planned for Mount Airy/Surry County Airport. Companies may locate in the region or the number of visitors may increase substantially, due in part to the facility development at the airport. These individuals and companies continue to pay dividends in the form of jobs, spending, capital investments, and taxes to the region benefiting the local community and regional economy.

Visualizing a Successful Future in the 21st Century

Mount Airy and Surry County have a deep history and rich character that offers a wealth of opportunities to businesses and provides residents with an enhanced quality of life. The region is well connected by highways, railroad, and an airport. For a community to attract and retain companies and industries with national and global ties, having a first-class business airport is vital. Globally-connected corporate users require airports with safe instrument approaches leading to properly-sized runways, attractive terminal facilities, customer-friendly FBOs, and convenient aviation services.

Mount Airy has a pristine location and a high quality of life while maintaining a low cost of doing business.

This combination makes

Mount Airy very attractive to business and industry.

All key organizations (Airport Board, Economic Development, Chambers of Commerce, etc.) and leaders (mayors and county administrators) within the community fully support the development of Mount Airy/Surry County Airport. Having experienced significant job

loss early in the 21st century, they understand that the economic development road ahead of them will be difficult. They also recognize that the planned runway extension and airport improvements will give them a regional advantage and will position them well in attracting new businesses to Surry County. The team approach to regional economic development efforts and a unified vision for success will benefit the community well. The airport has served as a key economic driver and will continue to be part of the economic development of the entire region for decades to come.

Statesville Regional Airport
Case Study

Statesville Regional Airport

The evolution of a first-class business airport

Overview

Statesville sits at the crossroads of Interstates 77 and 40 in Iredell County, North Carolina, an hour's drive from Charlotte or Greensboro. Since 1993, more than 100 new businesses have located in the Statesville region and nearly as many existing companies have expanded or updated their local operations. This phenomenal growth represents more than $1 billion in investment and accounts for more than 8,500 new jobs. It is no wonder that Site Selection Magazine has consistently ranked Statesville as one of the top "micropolitan" areas since 2000. The Statesville-Mooresville metro area has also received Site Selection Magazine's top award for manufacturing plant locations.

KEY FACTS

Community Economic Growth: 8,500+ new jobs and $1 billion local investment since 1993

First Class Airport Facilities: 7,005' runway, Precision Instrument Approach, Full Service FBO, 25+ based corporate jets

Growth in Airport Economic Contribution: $21.1M in 2012 compared to $2.8 M in 1996

20-Year Airport Improvement Investment: $27M in federal, state, and local funding

Major Airport Corporate Tenants: Lowe's, NASCAR, Newell Rubbermaid, Champion Air

With more than 160,000 estimated residents in Iredell County in 2012, the area's population has increased by more than 29 percent in each of the last two decades. The percentage increase in population in Iredell County exceeds that of the State of North Carolina by nearly 10 percent. With a thriving population and robust economy, community leaders are energetic and passionate about their community. They work together to enhance the quality of life of residents and strive to ensure that visitors and businesses also enjoy the lifestyle the community has to offer.

Statesville Regional Airport boasts an impressive 7,005-foot long runway, capable of accommodating more than 95% of all corporate jet aircraft flying today. The airport has extensive landside facility development and a well-equipped general aviation terminal building. Beginning in the late 1980s, community leaders and elected officials began the process of learning about the value of the airport and today, even the most conservative city leaders are some of the strongest advocates for Statesville Regional Airport and its development. Since the early 2000s, these same community leaders and elected officials make annual trips to Washington, D.C. to advocate for aviation and their airport. They realize that the airport is an economic engine and they would likely not be where they are today without it.

The City of Statesville is the owner/sponsor of the airport and fully supports its growth. Additionally, the City is fortunate to have Iredell County as a funding partner for airport

development projects. This joint funding force speaks volumes to the local support that Statesville Regional Airport receives.

The diversified economic base in the greater Statesville area, as shown in Table 1, is a significant part of the community's success and economic growth over the last 25 years. Manufacturing, healthcare, and distribution centers are the top employment industries in the region.

Table 1: Top 15 Major Employers – Greater Statesville Area

Employer	Industry	Number of Employees
Iredell/Statesville Schools	Education	2,720
Iredell Memorial Hospital	Healthcare	1,500
Iredell County Government	Government	1,134
Lowe's Regional Distribution Center	Home Improvements	823
Piedmont Healthcare	Healthcare	720
JC Penny Logistics	Apparel Goods Distribution	620
Davis Regional Medical Center	Healthcare	492
Kewaunee Scientific	Laboratory Furniture	480
Doosan Infracore-Portable Power	Manufacturing	474
Engineered Sintered Components	Manufacturing	450
Manheim Statesville	Auto Auction	443
City of Statesville	Government	416
Wal-Mart	Retail	397
ASMO of NC, Inc	Electric Motors	307
Pratt Industries	Corrugated Boxes	240

Source: Statesville Regional Development, November 2012

An Airport is Born

In 1935, a small airport opened in Statesville and was privately owned by John White Moore and Fred Slane. A few years later in 1942, the City of Statesville purchased the "heart" of the airport and graded two crosswind runways, 3,500 feet long and 2,700 feet long. On August 18, 1949, the Civil Aeronautics Administration, now the Federal Aviation Administration, approved the Statesville Airport to enter the federal airport program.

During the 1950s, the local community put together a cooperative funding effort with the City of Statesville to develop the airport and the two runways were paved. However, between 1959 and 1970, very little was done to improve Statesville Airport other than to install runway lights on the north/south runway and install a rotating beacon on the field.

Major Companies and Institutions Utilizing Statesville Regional Airport

G&B Oil Company - Energy
Commonwealth Aviation - Aviation
Coastal Defense – Defense Training
GL Wilson Building Company - Construction
Clayton Motors - Automotive
B&D Thermal Protection Consulting- Consulting
Geneva Liberty Steel – Metal Stamping
Air Quest Aviation – Air Charter
Thompson Management – Property Management
Pennington Seed – Agri-Business
Summerland – Air Charter
Pridgeon & Clay – Metal Stamping
Poly-Flex - Manufacturing
Oakland Foods – Food Processing
Lowe's – Home Improvement
MK Aviation – Aircraft Parts & Services
House of Raeford - Food Processing
Dycom Industries – Contracting Services
Chicago Soft – IT Software
Champion Air – Air Charter
Newell Rubbermaid – Consumer/Commercial Products
Ashley Furniture Industries – Furniture Manufacturing
Alabama Farmers Cooperative – Agri-Business
*NASCAR**

**Industry category includes multiple individuals who flew into Statesville Regional Airport*

Statesville Airport got its first taste of corporate activity in 1978 with Clark Equipment Company. The City extended the east/west (Runway 10/28) runway from 2,300 feet long to 4,800 feet long so the company's corporate jets could operate in and out of Statesville Airport. This 2,500-foot long extension required the rerouting and closing of two roads around the airport, Bethlehem Church Road and Mundy Road. In the fall of 1978, Statesville Flying Service opened its doors as the airport's fixed-base operator (FBO).

Nearly two years later, on October 31, 1980, the 2,500-foot long extension of Runway 10/28 was completed and Clark Equipment Company's jet landed at the airport as promised. In an effort to encourage additional corporate activity, the City installed an underground jet fuel tank.

By the end of the 1980s, the City completed construction of a new terminal, a new ramp area, and a full-length parallel taxiway. Runway 10/28 was also extended 200 feet to an ultimate length of 5,000 feet. Working with the City, Statesville Flying Service constructed 20,000 square feet of new hangar space, relocated a 5,000-square foot maintenance hangar, and outfitted and furnished a new terminal building. During this time, a relationship built on trust and professionalism was beginning to form between the City, the airport, and Statesville Flying Service.

At the Crossroads and Racing Forward

Mirroring the national economic boom in the 1990s, Statesville's highly skilled workforce grew throughout the 1990s and the area experienced low unemployment rates. Early in the decade, the racing industry, specifically NASCAR, contributed millions to the economy

surrounding Charlotte including Statesville. As early as 1990, corporate hangars were built at Statesville Airport for NASCAR drivers including Michael Waltrip and Dale Earnhardt.

The next wave of expansion experienced by Statesville Airport began in 1992 with navigational improvements and a taxiway extension. These new improvements allowed for greater accessibility in poor weather conditions. Shortly after these improvements were implemented, Statesville Flying Service built an additional 10,000-square foot hangar to address the demand of users wanting storage space for aircraft.

In the mid-1990s, Champion Air, an air charter company located at the airport since 1989, conducted a cost study to determine the financial implications of continuing to base their operation at Statesville Airport versus relocating to Concord Regional Airport. Their internal findings determined that due to Charlotte Douglas International Airport's airspace restrictions, it was more cost effective to continue to base their operations at Statesville Airport than to relocate to Concord Regional Airport which is closer to Charlotte Douglas International.

"In my opinion the Statesville Airport is one of the best examples of a private-public partnership. We take the risk in building the above-ground improvements and the City finances infrastructure such as lighting, runways, water and sewer." – Phil Hazel, Statesville Flying Service

This wave of airport investment that occurred in the 1990s did so alongside significant economic development within the community. Between 1993 and 1999, companies expanding existing operations and new companies locating within the community invested more than $280 million. One large announcement during this time was by ASMO North Carolina, a global automotive supplier that chose Statesville to be its regional headquarters for North America in 1988. In 1993, the company hired approximately 200 new employees and invested $30 million into its 360,000-square foot facility. Other companies located in the community have expanded as well including Bartlett Milling, a family-owned regional feed company, and Accuma Corporation, a leader in injection molding.

Headquartered in Mooresville, North Carolina, less than 20 miles south of Statesville in Iredell County, Lowe's is the second largest home improvement company in the U.S. and has had a substantial impact on Statesville. Lowe's invested more than $40 million in the local economy in 1995 when it built a Regional Distribution Facility that would eventually supply eight states in the Mid-Atlantic and Southeast regions of the U.S. Lowe's Statesville Regional Distribution Facility employed approximately 300 people when it opened. Within a decade, the company invested an additional $12 million to expand the distribution center and now employs more than 800 people.

Moving Heaven and Earth

Even with airport improvements being made in the 1990s and the local economy experiencing significant investment, Statesville Airport had yet to transform from just another general aviation airport that supports pleasure flying and a handful of businesses to a first-class business airport with an impact that was far reaching. This was all about to change.

In 2000, Lowe's announced it was building a new corporate campus just down the road in Mooresville. With the announcement of a Fortune 500 company moving to Iredell County, Lowe's became the impetus for development that occurred at the airport in the early 2000s. The City eagerly tried to attract Lowe's corporate aviation department to Statesville Airport. The third wave of expansion at the airport began in the early 2000s when the City of Statesville approved the closure of the north/south runway for corporate hangar development and committed to lengthening the runway, improving navigational aids, and providing tax incentives to a potential corporate [Lowe's] user and tenant. Significant activities that coincided with the City's expansion projects included the investment of an additional 12,000 square foot hangar by Statesville Flying Service, the arrival of several corporate tenants, and a strengthening local economy.

Lowe's conducted its own study to select the appropriate airport for its corporate aviation department in the early 2000s. Billy Shomaker, Director of Aviation for Lowe's noted several items that swayed it towards the selection of Statesville Regional Airport. These included: location, runway length, advanced instrument approaches, proximity to good highways, traffic flow, taxes, willingness to work together, and incentives. Finally in 2003, Lowe's announced that it would move its aviation department from Wilkesboro to Statesville Regional Airport.

> "Our selection of the Statesville Airport has proven to meet all of the objectives we planned for."
> – Billy Shomaker, Director of Aviation, Lowe's

In 2004, the airport changed its name from Statesville Municipal Airport to Statesville Regional Airport and with more than $14 million in airport improvements being completed in 2007, Statesville Regional Airport entered a new and exciting time. Airport improvement projects completed included lengthening Runway 10/28 to 7,005 feet, extending the parallel taxiway, installing an instrument landing system, and building 54,000 square feet of hangar space, 230,000 square feet of ramp space, 6,000 square feet of office space, and a 148-space parking lot.

In 2005, four NASCAR teams, Dale Earnhardt Jr, Greg Biffle, Michael Waltrip, and Evernham Motorsports signed leases for new hangar projects at the airport. All four teams have corporate flight departments based at their hangars. Bill Freeman with Michael Waltrip Racing stated that one of the reasons they came to Statesville Regional Airport in 2004 and have remained is because "Statesville understands that the majority of corporate aircraft based at SVH (Statesville Regional Airport) are corporate tools that increase productivity, competitiveness, employment, and steady public revenue."

"We chose Statesville because it is near our key facilities and customers, which enables us to operate more efficiently, and because Statesville has a first-class facility in a location with a good quality of life for our employees' families." –Randy Alwes, Newell Rubbermaid's Chief Pilot

At the end of 2007, Newell Rubbermaid Inc., a Fortune 500 Atlanta-based company, announced it would be moving its aviation operations and three of its aircraft to the airport in 2008. Statesville Flying Service developed a 24,000-square foot corporate hangar area for Newell Rubbermaid's $3 million corporate flight operations center and signed a 10-year lease with the company.

The growth at the airport in the 2000s mirrored local economic growth. Similar to the enormous investment impact that was realized in the 1990s in the Statesville area, the 2000s were a time of continued significant economic growth. The City of Statesville, Statesville Chamber of Commerce, and Greater Statesville Development Corporation (GSDC) have targeted businesses within specific industries to locate in Statesville. In doing so, they are also realizing a positive side effect – vendors of these targeted businesses have begun to locate in the area so they can be closer to their clients. Between 2000 and 2012, more than 4,800 new jobs were added and more than $684 million was invested by new and existing companies in Statesville to build and/or expand facilities. Three of the largest impacts on the local economy in the 2000s included the expansion of Kewaunee Scientific, the arrival of Providencia USA, and hometown company G.L Wilson Building Company playing an integral role in welcoming these companies by providing construction services.

Headquartered in Statesville since 1955, Kewaunee Scientific, a laboratory furniture manufacturer, expanded several times in the 2000s. The most significant expansion occurred in 2010 when it began a $13 million major renovation and expansion of its facilities. This project added more than 100 new jobs. In 2009, Kewaunee Scientific became the ninth fastest-growing small business on Fortune's Small Business 100 list.

Providencia USA, a non-woven product manufacturer based in Brazil, announced plans to build its first North American facility in Statesville in 2008. Due to a downturn in the U.S. economy, the company delayed its move until 2010. In 2010, the company located in

Statesville and quickly announced that it would be expanding its manufacturing facility to include a new 90,000-square foot facility that would house $130 million in new equipment and add nearly 80 new jobs at the facility.

G.L. Wilson Building Company, a regional commercial and industrial construction company, has been headquartered in Statesville since 1945 and is licensed to do business in more than a dozen states. G.L. Wilson has also constructed and expanded numerous facilities in its hometown of Statesville, further expanding the idea of community teamwork. The building company has helped Providencia USA, Kewaunee Scientific, Kook's Custom Headers, ASMO North Carolina, Champion Air, and Statesville Flying Service all expand over the years. G.L. Wilson Building Company bases its corporate aircraft at Statesville Regional Airport and uses it regularly to conduct meetings and visit project sites in the Southeast U.S.

Teamwork Makes the Dream Work

Without the City of Statesville, Iredell County, Statesville Chamber of Commerce, and Statesville Regional Airport all on the same page and working toward the same goal, Statesville Regional Airport would not have evolved to be the first-class business airport that it is today. Statesville Regional Development actively promotes the airport when new residents or business prospects inquire about the community and/or the airport.

Since the 1980s, Statesville Regional Airport has been successful in partnering with corporate tenants for hangar development. In addition, the airport works closely with tenants on matters such as communicating issues that could affect operations, broadening the understanding of both government and private/corporate operators, and working together on numerous occasions to sponsor emergency drills for responding to an aircraft accident.

With county tax rates in the bottom 10% of the state, the school district receiving the Malcolm Baldridge National Quality Award in 2008, and the City twice being honored with the title "All America City" (1997 and 2009), the Statesville area and airport have been rewarded by hard work. Statesville Mayor Costi Kutteh has stated that, "we have two focuses in economic development, recruiting new business and helping existing businesses to expand." Today the airport represents nearly 10% of the city's tax base thanks to teamwork and visionary decisions that have benefited the community and Statesville Regional Airport. One example of visionary decisions that have paid off includes the addition of provisions within lease agreements for corporate hangars that tenants must guarantee a minimum of $5 million in tax base at all times during the life of the lease.

Due to community leadership, the region has reaped the rewards of being progressive in their economic development strategy. Statesville Mayor Costi Kutteh "believes front-end planning – along with a healthy respect for tradition – will help the town embrace its future." Developing fresh ideas for attracting target businesses while embracing the community's quality of life will continue to lead Statesville, Iredell County, and Statesville Regional Airport down the path of success. As shown in Table 2, Statesville has seen existing and new companies invest more than $1 billion into facilities over the last 20 years, which has resulted in more than 8,500 new jobs by nearly 250 companies.

"The City of Statesville believes that front-end planning – along with a healthy respect for tradition – will help the town embrace its future." – Costi Kutteh, Mayor of the City of Statesville

Table 2: Announced New/Expending Industry Activity (1993-2012)

	Announced Investment	Announced Jobs	# of Announced New/ Expanding Activity
1993	$46,150,000	828	19
1994	$4,000,000	409	11
1995	$78,500,000	657	10
1996	$7,500,000	249	9
1997	$61,950,000	385	5
1998	$37,700,000	389	14
1999	$41,750,000	295	10
2000	$76,000,000	861	12
2001	$20,100,000	243	7
2002	$23,800,000	733	14
2003	$55,750,000	220	16
2004	$117,750,000	310	18
2005	$35,000,000	616	16
2006	$21,311,000	283	16
2007	$81,700,000	666	18
2008	$174,825,000	391	19
2009	$9,900,000	287	7
2010	$14,550,000	182	7
2011	$85,750,000	440	9
2012	$9,100,000	88	5
TOTAL	*$1,003,086,000*	*8,532*	*242*

Source: Statesville Regional Development (2012)
*Of the 242 announced projects, 138 of the projects did not disclose their investment figures.

Economic Benefits and Return on Investment

Airports are vital in today's global marketplace and a longer runway can take you further today than ever before thanks to technology and innovation. Statesville Regional Airport connects its residents and businesses with the rest of North Carolina, the nation, and the global economy. The *2012 Economic Contribution of Airports in North Carolina* determined Statesville Regional Airport plays a vital role in supporting the region with 200 total jobs that have an annual payroll of $5.5 million and is responsible for $21.1 million in economic output to the local and regional economies. As shown in Table 3, the increase in economic impacts that Statesville Regional Airport has realized between 1996 and 2012 has been substantial. The investments made at the airport have paid off dividends for Statesville.

Table 3: Economic Impact of Statesville Regional Airport

	1996	2012	Percent Change 1996-2012
Total Jobs	42	200	376%
Total Payroll	$1,231,489	$5,480,000	344%
Total Economic Contribution	$2,786,079	$21,090,000	656%

Source: *Economic Contribution of Airports in North Carolina* (1996 and 2012)

While t

The results of airport economic impact analyses are extremely useful in explaining the importance of airports, yet it does not fully capture the potential return on investment of various investments made at an airport. Even though airports can be catalysts for economic development, investment in airports does not necessarily stimulate economic growth. However, investment in airports coupled with market area characteristics and a supportive community is what drives the return on investment and stimulates economic growth.

Statesville Regional Airport is a leading example of how airports, with the appropriate resources and a supportive community, 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. These two examples are just a few of the hundreds of companies that utilize the airport each year to efficiently conduct their business operations.

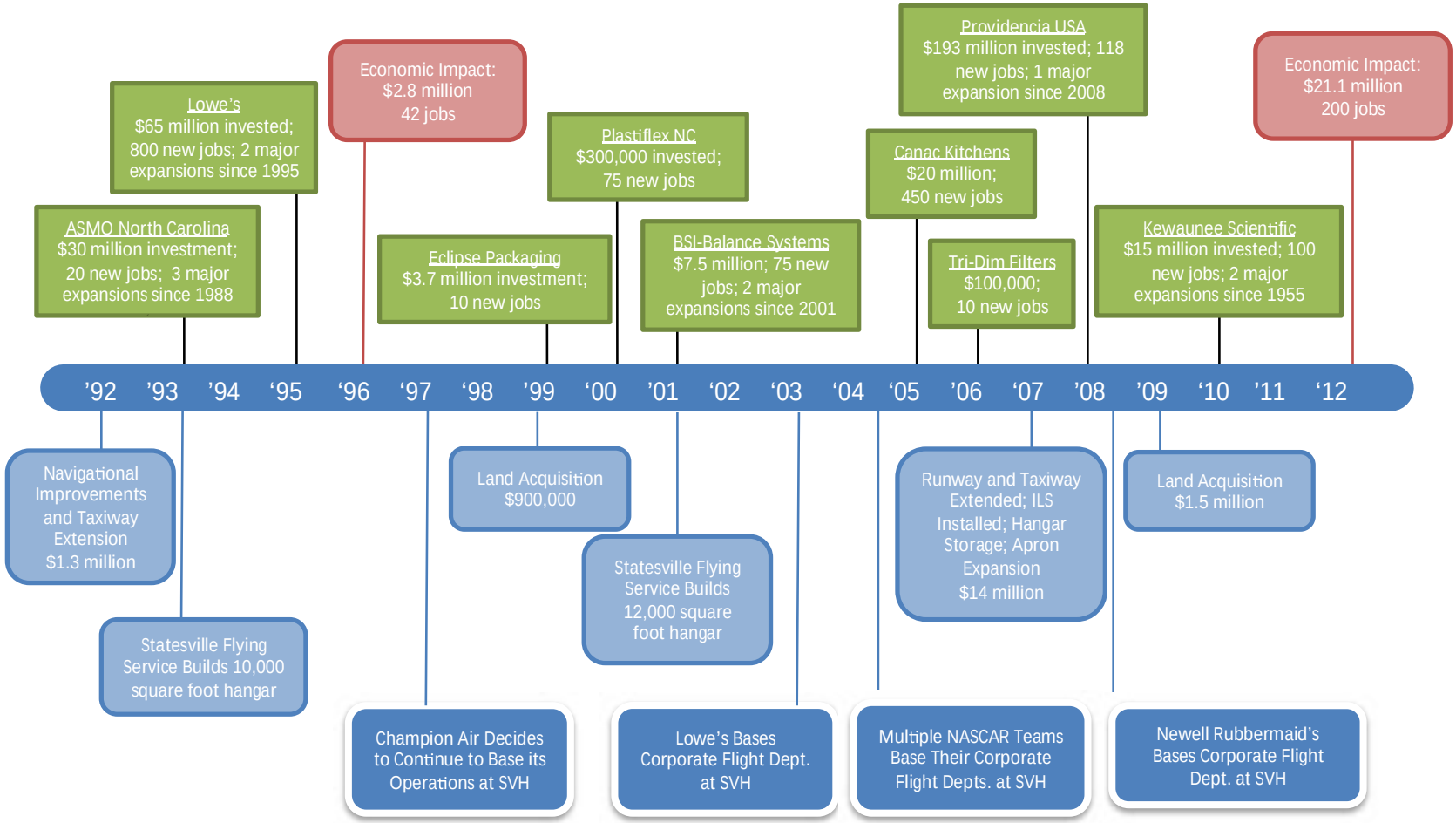
Since 1992, federal, state, and local investment into improvements at the Statesville Regional Airport has been more than $27 million. The majority of this investment was related to the runway extension, a full parallel taxiway, an instrument landing system (ILS), land acquisition, and pavement maintenance projects. While this level of investment

is significant, the economic contribution of the airport has grown by 376% since 1996 as shown in Table 3. During this same time period, the City has realized more than $1 billion in investment into the community. Figure 1 graphically depicts the correlation between investments being made at the airport and those investments being made within the community. As shown, the airport has been an integral part of regional economic growth and will continue into the future. The City's motto reveals the secret to their success very simply and eloquently - "where it all comes together."

Statesville Regional Airport

The evolution of a first-class business airport

Figure 1: Business Development & Airport Investment in Statesville/Iredell County



Source: *Economic Impact of Publicly-Owned Airports in North Carolina* (1996 and 2012), Statesville Regional Development, Statesville Regional Airport, and North Carolina DOT