STATE AIRPORT SYSTEM PLAN

Prepared for:

New Jersey Department of Transportation

February 2007

Prepared by:

Wilbur Smith Associates
6600 Clough Pike
Cincinnati, OH 45244

"The preparation of this document was financed in part through a planning grant from the Federal Aviation Administration (FAA) as approved under the Airport and Airway Improvement Act of 1982. The contents of this report reflect the views of the Consultant, which is responsible for the fact and the accuracy of the data depicted herein, and do not necessarily reflect the official views or policy of the FAA. Acceptance of the report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein, nor does it indicate that the proposed development is environmentally acceptable in accordance with applicable public laws."

TABLE OF CONTENTS

CHAPTER THREE – AIRPORT ROLES

CHAPTER FOUR – PROJECTIONS OF AVIATION DEMAND

CHAPTER FIVE – BENCHMARKING ANALYSIS

CHAPTER SIX – SYSTEM ADEQUACY ANALYSIS

CHAPTER SEVEN – GEOGRAPHIC COVERAGE ANALYSIS

CHAPTER EIGHT – SYSTEM RECOMMENDATIONS

CHAPTER NINE – PROJECTIONS OF AIRPORT AVIATION DEMAND

CHAPTER TEN – RECOMMENDED DEVELOPMENT PLAN

LIST OF EXHIBITS

INTRODUCTION

CHAPTER ONE – INVENTORY

CHAPTER FOUR – PROJECTIONS OF AVIATION DEMAND

CHAPTER FIVE – BENCHMARKING ANALYSIS

CHAPTER SEVEN – GEOGRAPHIC COVERAGE ANALYSIS

CHAPTER EIGHT – SYSTEM RECOMMENDATIONS

LIST OF TABLES

INTRODUCTION

CHAPTER ONE – IVENTORY

CHAPTER TWO – TRENDS ANALYSIS

CHAPTER THREE – AIRPORT ROLES

CHAPTER FOUR – PROJECTIONS OF AVIATION DEMAND

CHAPTER FIVE – BENCHMARKING ANALYSIS

CHAPTER SIX – SYSTEM ADEQUACY ANALYSIS

CHAPTER SEVEN – GEOGRAPHIC COVERAGE ANALYSIS

CHAPTER EIGHT – SYSTEM RECOMMENDATIONS

CHAPTER NINE – PROJECTIONS OF AIRPORT AVIATION DEMAND

CHAPTER TEN – RECOMMENDED DEVLEOPMENT PLAN

TECHNICAL APPENDIX A – CAPACITY ANALYSIS

I. INTRODUCTION

The last comprehensive review of New Jersey's airport system was completed in 1990. Since that time, aviation, both nationally and in New Jersey, has experienced significant changes. The State Airport System Plan (SASP) provides an analysis of each public-use airport and an overview of New Jersey's overall air transportation needs for the next 20 years.

Several key facts related to aviation and airports in New Jersey were important considerations in the SASP development process. The following data provides a framework for examining the recently completed SASP and current New Jersey Department of Transportation policies:

- Current aeronautic statistics for the State of New Jersey indicate:
  - over 4,000 civil aircraft are based in the State
  - the State has over 15,000 resident pilots and based airmen
  - there are 45 public use airports, one public use heliport and one public use seaplane base in the State
  - 19 of the State's public-use airports are publicly owned
  - 28 of the State's public-use airports are privately owned
  - there are over 360 licensed heliports/helistops in the State

- In 1950, there were 82 public use airports in the State, in 2006 there are 47 public-use facilities. Historically, New Jersey has lost public-use airports to other private development at a rate of one airport every 18 to 24 months. The last new public use airport, Spitfire Aerodrome in Gloucester, was built in 1983. Since that time, 14 of New Jersey's public use airports have permanently closed.

- New Jersey is unique in that approximately 60 percent of its public use airports are privately owned. Public-use airports in other states are typically publicly owned and funded. New Jersey's privately owned public-use airports are being steadily closed and converted to non-aviation use resulting in landside and airside capacity constraints.

The ultimate goal of the SASP is to provide another tool for the Division of Aeronautics to use in identifying specific projects and funding priorities that will allow individual airports to better meet the current and anticipated needs of New Jersey airport users.

II. RECENT NEW JERSEY INITIATIVES

With the recent election and the ensuing transition in government, many transportation initiatives, including the SASP, were re-examined. New Jersey, like most states, has recently been affected by an economic downturn at a time when already scarce transportation resources are required to maintain an aging and increasingly burdened transportation system. In an effort to meet the growing funding needs of the State's entire transportation system, the Governor and certain committees, established through executive orders, have established policy initiatives for dealing with transportation maintenance, development, and funding issues. These policy initiatives are presented, and their relationship and potential impacts to the SASP are summarized and examined in the following sections.

A. Executive Order No. 43 – Establishment of Blue Ribbon Commission

Executive Order No. 43, signed on January 7, 2003, established a Blue Ribbon Commission to examine and make recommendations regarding important transportation issues facing New Jersey over the next ten years. The Commission was charged with identifying the means necessary to address pressing transportation issues and making recommendations for consideration during renewal of the States' Transportation Trust Fund. Included in the executive order are the following characteristics of the State's transportation system and policy directives of the current administration:

- A vital transportation system in New Jersey is essential for the health and well being of the State's communities, working families, and economy.
- New Jersey is already the most densely populated state in the country and its population is expected to grow by one million people by the year 2020.
- New Jersey's public transportation system is over capacity and suffering from ten years of deferred maintenance.
- The aging transportation infrastructure in New Jersey poses a significant and ongoing safety and security concern.
- Improving the transportation system to meet the needs of the 21st century is an important goal of the current administration, especially as it relates to reducing congestion, enhancing safety, and improving the quality of life for all working families in New Jersey.

A key tenet of Executive Order No. 43 is that since the needs of the State's transportation system outweigh resources available, it is vitally important to identify and prioritize transportation needs and allocate available resources by incorporating the principles of "Fix it First" and "Smart Growth." These principles are summarized as follows in the executive order:

- **Fix it First** – Fix it First strategies will focus efforts on improving aging infrastructure first, instead of pursuing an expansion policy.
- **Smart Growth** – Smart Growth principles will focus and direct transportation investments into the redevelopment of older urban and suburban areas, protect existing open space, conserve natural resources, increase transportation options and transit availability, reduce automobile traffic and dependency, stabilize property taxes, and provide affordable housing.

In addition, Executive Order No. 43 requires that New Jersey transportation entities, including the Department of Transportation, include in their capital investment strategy a process that will expedite projects determined to advance the principles of "Fix it First" and "Smart Growth" and give these types of projects priority treatment. Examples of such projects identified in the Executive Order include, but are not limited to, preserving and rehabilitating bridges and roadways, increasing capacity for all modes of public transportation, eliminating bottlenecks, preserving and rehabilitating airports, improving rail freight services, improving ferry services, enhancing safety, and making New Jersey communities more livable.

B. Blue Ribbon Commission Report

The Blue Ribbon Commission, established by Executive Order No. 43, was charged with addressing potential financial issues related to New Jersey's aging transportation system. The Commission submitted its report to the Governor and the New Jersey Legislature in November 2003. The Blue Ribbon Commission Report examined all modes of public transportation in the State. The Commission's findings related to pressing aviation issues and policy initiatives for the State's public use airport system are summarized as follows:

- The number of general aviation airports in New Jersey has declined precipitously over the past several decades. In 1950, the State had 82 public use airports; now there are 45 plus one public-use seaplane base and one heliport. The loss of general aviation airports has significant economic, tourism, and open space preservation implications for New Jersey.

- A viable small aircraft airport system helps alleviate demands on the State's major hub airports by diverting small general aviation aircraft. New Jersey is unique with respect to this challenge because approximately 60 percent of its public-use airports are privately owned and especially vulnerable to closure and conversion to non-transportation purposes.

- The primary objective of the NJDOT Aviation program is to protect the core airport system. It applies a fix-it-first policy to airports by focusing on preservation and improvement of airports without expanding runway lengths. Over the next 10 years, NJDOT needs to work with New Jersey's general aviation airport owners to bring all facilities to a state of good repair with required safety upgrades. Similar to the SASP, the Blue Ribbon Commission Report identifies a core system of airports which contribute significantly to the State system and require special considerations related to preserving, maintaining, and developing efficient airport facilities.

- The investment needs of the Aviation program over the next ten years are estimated at approximately $340 million. This figure represents approximately $14 million per year in funding for the ongoing infrastructure program and an additional $20 million in annual funding for preservation of the core airport system. The annual funding requirement of the ongoing infrastructure program, approximately $14 million per year, is comparable to the annual funding requirement of the recommended development plan identified for the State's public-use airport system in the SASP.

- Preservation of core system airports is only permanently achieved by outright public purchase or the public purchase of airport development rights.

  Since 1998, with a combination of Federal, State, and Local funds, the following airports have been acquired outright, or their development rights have been purchased:

- Greenwood Lake Airport – outright purchase by State
- Trinca Airport – outright purchase by Green Township
- Lincoln Park Airport –purchase of development rights
- Central Jersey Regional Airport – purchase of development rights
- South Jersey Regional Airport – outright purchase by State

Discussions are currently underway to preserve the following airports, which may result either in outright purchase or in purchase of development rights, with a combination of Federal, State, and Local funds:

- Monmouth Executive Airport
- Sussex County Airport
- Blairstown Airport
- Camden County Airport
- Sky Manor Airport
- Alexandria Airport
- Essex County Airport
- Spitfire Aerodrome
- Vineland-Downstown Airport

Many of the policy initiatives identified by the current Administration and the Blue Ribbon Commission are consistent with the goals, visions, and recommendations of the SASP. The findings and recommendations of the SASP can be meshed with the well-defined policies and initiatives of the Administration to develop a cohesive vision for the future of New Jersey's system of public use airports.

C. Executive Order No. 78 – Establishment of General Aviation Review Commission

In response to continued pressures on the State's system of general aviation airports, Executive Order No. 78 was issued which established the General Aviation Review Commission in October, 2003. Key proclamations included in the Executive Order include the following:

- The continued long-term loss of public use general aviation airports is the biggest single threat to the future viability of New Jersey's overall aviation system.

- New Jersey is committed to both arresting the decline of its existing general aviation airport infrastructure and preserving and rehabilitating its core airport system, consistent with the principles of "Fix-it-First" and "Smart Growth."

The purpose of the General Aviation Review Commission is to examine and evaluate the current status and future prospects of New Jersey's general aviation airport system given the framework of the system trends and policies identified in the Executive Order.

The specific charge of the Commission as identified in the Executive Order includes the following:

- Inventory New Jersey's existing public-use general aviation airport facilities and identify the role each facility plays vis-à-vis its location within the State and the demands of its users.

- Consider solutions and alternatives for the preservation of the existing public-use general aviation airports, including but not limited to the public acquisition of privately owned airports and/or the purchase of airport development rights.

- Develop recommendations and strategies for the preservation and rehabilitation of existing public-use general aviation airports, consistent with the principles of "Fix-it-First" and "Smart Growth."

The SASP Technical Report, its wealth of compiled data, and ancillary projects could help the General Aviation Review Commission successfully complete its intended role. The role that the Commission plays in interpreting SASP recommendations and meshing them with "Fix-it-First" and "Smart Growth" policies will be a vital step in shaping the future of New Jersey's system of general aviation airports.

III. SASP OVERVIEW

The SASP examined all aviation facilities in the State that are currently licensed, operating, and open for public use. The airports range in size from single, turf-runway facilities to large, multi-runway scheduled service hub facilities. The system also includes a seaplane base and a public-use heliport. The majority of New Jersey's airports strictly support the operation of general aviation aircraft. General aviation aircraft include all aircraft not flown by commercial airlines, air cargo carriers, or the military. Both publicly and privately owned airports are included in the system. However to be included in the New Jersey system, an airport must be open for public use.

The overall system planning process included detailed tasks that identified and evaluated the existing functional roles that airport facilities play in the system. In addition, adequacies and deficiencies of the existing system were examined. Based on this analysis, a recommended development plan for the system of airports was prepared. The recommended development plan identifies the core system of airports and the specific projects required to ensure that New Jersey's system meets current Federal Aviation Administration (FAA) or New Jersey Department of Transportation (NJDOT) standards. In addition, the recommended development plan will ensure that New Jersey's airport system will adequately serve the current and anticipated future needs of the State's aviation users.

Important initial components of the SASP planning process include the following:

- **Inventory** - The NJDOT Division of Aeronautics maintains the NJDOT Airport Information Management System (AIMS), a database of information on airports in the State. This database is continually updated to reflect facility improvements, additional facilities, and changes in activity levels at all system airports. Updated data is collected by Division of Aeronautics staff through several processes: airport licensing, on-site inspections, and periodic coordination with airport management/staff. The SASP used the existing database as an initial source of airport inventory data. On-site inventory visits were conducted for each system airport during which all existing inventory data was verified and other data relevant to the system planning process was collected. In addition, other sources, such as FAA databases and previous NJDOT Division of Aeronautics studies, provided additional information regarding New Jersey's airports. A SASP database was developed to store all data collected as part of the inventory process. The database of inventory data was the foundation from which many SASP analyses were conducted through the planning process.

- **Trends Analysis -** Preparing a comprehensive statewide plan for the public-use airports in the New Jersey system required a detailed understanding of recent and anticipated trends in the aviation industry as a whole, as well as an understanding of current economic conditions and demographic trends affecting New Jersey. Because the future development and facility requirements of New Jersey's system of public-use airports may be impacted relevant future trends, a detailed analysis of historic and projected aviation, demographic, and socioeconomic trends was conducted in the SASP.

- **Determination of Current Airport Roles -** An important initial step in analyzing the future requirements of New Jersey's airport system was examining the existing system and identifying those airports that currently make up the core system. In this analysis, New Jersey's current core airport system was identified by examining each airport's functional role within the system and its current contribution to the overall system.

- **Projections of Aviation Demand -** Forecasts of aviation demand were developed for all system airports. These forecasts identify projected levels of activity at each airport in the short, mid, and long-term ranges as well as project future based aircraft and fleet mix. These forecasts were developed in accordance with FAA standards and reflect historic activity trends, projected FAA trends, and anticipated demographic and economic trends in New Jersey.

- **Benchmarking Analysis –** The benchmarking analysis measured how the existing airport system was performing relative to benchmarks identified for use in the SASP by NJDOT and the study's Strategic Advisory Committee. A variety of benchmarks were identified within each of the following performance criterion identified in the SASP:

    - Accessibility
    - Aviation Activity
    - Development Potential
    - Economic Contribution
    - Existing Infrastructure

SASP benchmarks serve as goals or standards of measure for the existing and future airport system. The outcome of the benchmark analysis was interpreted in a System Adequacy Analysis that identified specific areas in which the airport system required improvement to better serve the State's citizens.

- **Options Analysis -** Adequacies and deficiencies of the State's existing airport system were identified in the System Adequacy Analysis. The Options Analysis examined potential means of addressing identified deficiencies. Options for system improvement were comparatively examined to determine the most feasible and most beneficial way in which the performance of the State's airport system could be improved over the planning period.

It was through the completion of these tasks that the SASP was able to identify and quantify system deficiencies, examine options to address deficiencies, and identify recommended system improvements.

A. SASP System Recommendations

For the Aviation Activity, Development Potential, Existing Infrastructure, and Design Standards performance measures, recommended actions were identified in the SASP for improving system performance. Improving system performance relative to the benchmarks used in the SASP is contingent upon the Division of Aeronautics' ability to implement the recommendations, over time, and to continuously monitor the system's progress relative to goals that were established in the system planning process.

Recommendations for the Accessibility benchmark, primarily related to system coverage, identify airports that should be upgraded or reclassified to a different airport functional level in order to improve overall system performance. One key SASP recommendation relates to the identification of each airport's recommended future role in the system. The recommended airport system is comprised of the following functional level classifications:

- **Scheduled Service Airports -** Scheduled Service airports are intended to support commercial airline activities. Where capacity constraints do not limit, this functional level of airport can also support general aviation activities including corporate/executive operations, business, recreational activities and flight training.

- **Advanced Service Airports –** Advanced Service airports are intended to support corporate/executive and private use general aviation activities. In some cases, these airports are in major metropolitan areas and are intended to function as relievers to larger, more congested, Scheduled Service airports. These airports should be able to accommodate some of the largest and most demanding corporate jet aircraft in the operational fleet. Where operational and/or capacity constraints do not limit, this level of facility can also support recreational general aviation activities and flight training.

- **Priority General Service Airports –** Priority General Service airports contribute significantly to the system and should ideally be upgraded to the Advanced Service functional level. However, existing constraints at airports in the Priority General Service functional level may make expansion at these airports, specifically related to runway lengths and approach types, extremely unlikely or unfeasible. For those airports included in the Priority General Service functional level, minimum facility and service objectives have been identified. The SASP recommends that any airport included in the Priority General Service functional level be developed to the fullest extent possible in efforts to comply with the Advanced Service functional level objectives. Where meeting the Advanced Service facility and service objectives is impossible or unfeasible, the minimum facility and service objectives of the Priority General Service airport functional level should be applied.

- **General Service Airports –** General Service airports are intended to support smaller corporate aircraft, such as twin-engine aircraft, and the operation of general aviation aircraft for business and pleasure. This functional level of airport is intended support a variety of uses (business, pleasure, and training), while providing the majority of the system's operational and storage capacity for single and multi-engine piston aircraft.

- **Basic Service Airports –** Basic Service airports include facilities with paved or turf runways that support small general aviation aircraft, such as single and light twin-engine aircraft, storage and operation. This level of airport supports private pilots that may be flying for business or pleasure and require minimal support facilities and services.

- **Special Service Facilities –** Special Service Facilities include heliports, gliderports, seaplane bases, balloonports, and ultralight facilities that primarily support components of aviation demand other than fixed wing aircraft.

As airports are reclassified into the recommended functional levels, the Division of Aeronautics should work to bring them into compliance with the facility and service objectives that the SASP identified for their respective airport functional level.

Table I-1 presents a summary of the recommendations developed through the SASP planning process for improving the performance of New Jersey's public-use airport system relative to the study's performance measures.

Table I-1 SYSTEM RECOMMENDATIONS SUMMARY

PERFORMANCE MEASURE	RECOMMENDATION
Aviation Activity	
Existing Airfield Capacity	Operational capacity enhancement projects at constrained airports
Development Potential	
Planning Documents	Scheduled Service - Updated every 5 years Advanced Service - Updated every 5 years Priority General Service - Updated every 5 years General Service - Completed every 10 years or as needed Basic Service - Completed as needed
Airport Ownership/Obligation	Continuously monitor airport ownership and grant obligation characteristics
Existing Infrastructure	
Facility and Service Objectives	Prioritized improvements
Design Standards	
Runway Taxiway Separation	Implement system performance improvements
Width of Primary Runway	Implement system performance improvements
Runway Safety Area Compliance	Implement system performance improvements
Pavement Condition Index	Implement system performance improvements
Airport System Coverage	
Upgrade to Advanced Service	Bergen County Airport (new) Cape May County Airport Hammonton Municipal Airport Old Bridge (or new airport)
Include in Priority General Service	Central Jersey Regional Airport Cross Keys Airport Lincoln Park Airport Linden Airport Solberg-Hunterdon Airport South Jersey Regional Airport
Upgrade to General Service	Camden County Airport Eagles Nest Airport
	Spitfire Aerodrome
	Vineland Downstown
Core Candidate Airports - Paved	Aeroflex-Andover Field Hackettstown
	Newton Red Lion Newton Airport
Core Candidate Airports - Unpaved	Bucks Kroelinger Li Calzi Little Ferry Seaplane Base Red Wing Southern Cross Trinca Airport Twin Pine Airport

Source: Wilbur Smith Associates

The recommended future role of each system airport and its location in New Jersey is graphically depicted in **Exhibit I-1**.

The SASP's Recommended Development Plan identifies airport-specific facility needs based on the recommended system improvements summarized in Table I-1.

B. Recommended Development Plan

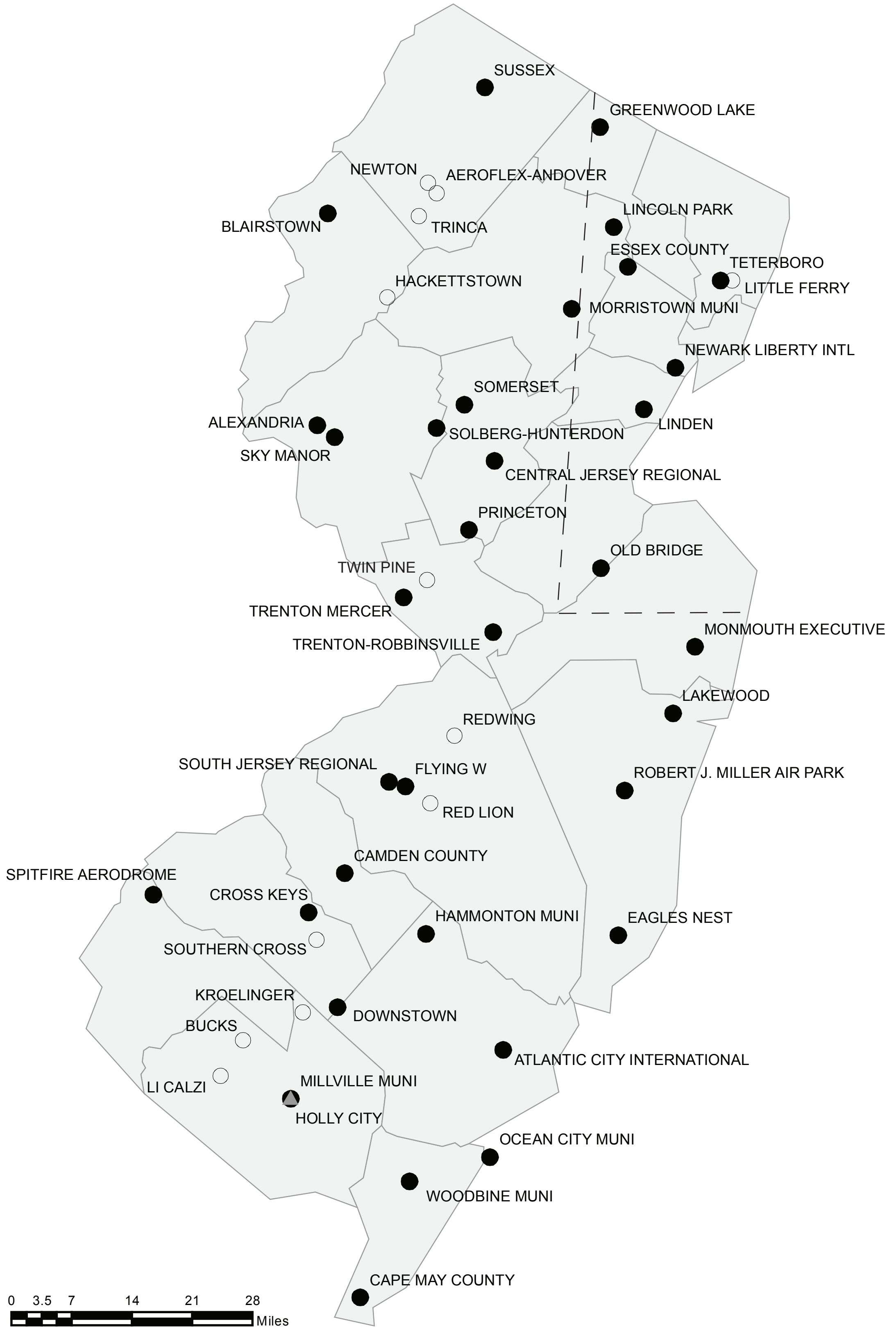
The Recommended Developed Plan is the result of the SASP planning process that compared existing facilities and services at system airports to the facility and service objectives identified for each airport based on its recommended functional level/role in the system. Facility and service objectives represent facility and service goals based on recommended roles, and the types of users anticipated for each functional level of airport in the system. Through the comparison of existing facilities, recommended functional level, and facility and service objectives, specific development needs were identified for each system airport. These development needs include all infrastructure development projects and project costs associated with bringing each system airport into compliance with the facility and service objectives for its recommended role. Airport operating costs and routine maintenance costs are not included in this analysis.

Table I-2 presents estimated project costs for the recommended development plan by airport functional level.

Table I-2
RECOMMENDED DEVELOPMENT PLAN
ESTIMATED PROJECT COST BY FUNCTIONAL LEVEL

Airport Functional Level	Total Estimated Project Costs	Percentage of System Total
Scheduled Service	$ 9,987,024	6.24%
Advanced Service	$ 66,294,899	41.43%
Priority General Service	$ 38,378,404	23.98%
General Service	$ 30,460,057	19.03%
Basic Service	$ 12,216,341	7.63%
Duplicative Basic Service	$ 2,707,941	1.69%
System Total	**$ 160,044,666**	**100.0%**

Source: Wilbur Smith Associates



System Airports

Core Airports

Scheduled Service
Atlantic City International
Newark Liberty International
Trenton Mercer

Advanced Service
Cape May County
Essex County
Hammonton Municipal
Millville Municipal
Monmouth Municipal
Morristown Municipal
Robert J. Miller
Teterboro
Two New Airports – Northeast NJ

Priority General Service
Central Jersey Regional
Cross Keys
Lincoln Park
Linden
Solberg-Hunterdon
South Jersey Regional

General Services
Alexandria Field
Blairstown
Camden County
Eagles Nest
Flying W
Greenwood Lake
Lakewood
Princeton
Ocean City Municipal
Old Bridge
Sky Manor
Spitfire Aerodrome
Somerset
Sussex
Trenton-Robbinsville
Downstown
Woodbine Municipal

Core Candidate Airports

Paved
Aeroflex-Andover Field
Hackettstown
Newton
Red Lion

Unpaved
Bucks
Kroelinger
Li Calzi
Little Ferry Seaplane Base
Red Wing
Southern Cross
Trinca
Twin Pine

Public Use Heliports

Holly City

Critically underserved region where demand could support two additional general aviation airports

STATE AIRPORT SYSTEM PLAN

EXHIBIT I-1

Recommended Airport System

N
W E
S

The recommended development plan provides a framework through which the Division of Aeronautics can improve the performance of the existing airport system and develop a system that adequately supports system demands in the future. The estimated costs of the recommended development plan summarized in Table I-2 are consistent with estimates of ongoing infrastructure program costs presented in the Blue Ribbon Commission Report. These costs represent estimates of the infrastructure development costs necessary to allow system airports to adequately serve their role in the State's future airport system. Other costs associated with the preservation of the core airport system and the routine maintenance of existing facilities may also be incurred.

IV. THE FUTURE OF NEW JERSEY'S AVIATION SYSTEM

A key goal identified by the current Administration, pursued by NJDOT, and reflected in the SASP is the proactive preservation of the existing system of public use airports in New Jersey. Preventing the continuation of 50-years of decline of the State's public use airport system should be the primary priority of the aviation capital program. A "Fix it First" approach will be the primary strategy for preserving general aviation facilities and services. Through its implementation of this approach, NJDOT will invest in the rehabilitation and improvement of existing facilities, and, consistent with the principles of "Smart Growth," within existing property lines and land use patterns, where practicable.

The policy directive identified to preserve system airports names two categories of system airports, core airports and core candidate airports. Core system airports are to be acquired, preserved, and/or rehabilitated because of their vital importance to the airport system. Initiatives for improving and preserving core candidate airports are to be pursued so that they can continue to provide operational and storage capacity for aviation users. Core and core candidate airports are identified in following sections and their respective characteristics and applicable policy initiatives are described in more detail.

Policy initiatives have also been identified for implementation on a system-wide basis. One important issue impacting the entire New Jersey public-use airport system is a lack of adequate aircraft storage capacity. Many New Jersey airports currently have no available quality aircraft storage space, including paved tie-down areas or hangars. This situation limits the ability of the airport system to accommodate growing numbers of based aircraft and denies aircraft owners/operators the ability to base aircraft at the airport that is most efficient for them. Development and redevelopment of the groundside aircraft storage facilities at system airports should be a top priority of the NJDOT airport capital aid program.

NJDOT airport capital aid program regulations should be reviewed to eliminate obstacles that would prevent the Division of Aeronautics from accomplishing the following improvements at system airports:

- Redevelop groundside facilities at general aviation airports to maximize efficiency and capacity to the greatest degree practicable within the existing airport property line footprint

- Increase groundside aircraft storage capacity throughout the State's system of public use airports

- Construct additional paved tiedown spaces

- Construct additional hangars, both t-hangars and conventional

In addition to these objectives, other important policy initiatives to be pursued by NJDOT include continued efforts to promote airport/aircraft safety and security and launching initiatives for improving airport and community relations.

A key strategy pursued by NJDOT, and reflected in the SASP, is the proactive preservation of the existing system of public use airports in New Jersey. A "Fix it First" investment strategy will be used to preserve general aviation facilities and services. Through its implementation of this approach, NJDOT will invest in the rehabilitation and improvement of existing facilities, and, consistent with the principles of "Smart Growth," do so within existing property lines and land use patterns, where practicable.

Consistent with the findings of the SASP, the Division of Aeronautics has identified two categories of system airports, core airports and core candidate airports. Core airports house approximately 90 percent of the system's based aircraft and are those that are essential to the future aviation system in New Jersey. Approximately 10 percent of system aircraft are based at core candidate airports. These core candidate airports, if improved, could provide needed landside storage capacity in the State and potentially reduce capacity constraints at core airports. The following investment strategies have been identified for core and core candidate airports:

- **Core Airports –** investment goals at core airports include the public acquisition of privately-owned airports and the preservation and rehabilitation of core airports through the use of federal and State funds. SASP functional levels included in the core airports category are Scheduled Service, Advanced Service, Priority General Service, and General Service.

- **Core Candidate Airports –** investment goals at core candidate airports include preservation and improvement of these facilities through the use of State funds. Basic Service and Duplicative Basic Service Airports identified in the SASP are in the core candidate airport category.

The SASP used a system leveling or stratification approach and to determine how each airport currently contributes to the New Jersey system, ultimately identifying the system's core and core candidate airports. Based on system benchmarking and coverage analyses that focused on adequately meeting the State's future transportation needs, each airport's recommended future functional role in the system was determined. Functional role classification identified for core and core candidate airports include the following:

Core Airports	**Core Candidate Airports**
Scheduled Service	Basic Service
Advanced Service	Duplicative Basic Service
Priority General Service	
General Service	

The location of system airports and their recommended functional classification are presented in Exhibit I-1.

It is within the framework of these core airport and core candidate airport classifications that NJDOT will pursue future airport improvements that will enable the State's public use airport system to best serve the needs of New Jersey's aviation users. The core airports in New Jersey will be preserved and/or acquired and rehabilitated in a manner that maximizes their efficiency through the use of federal and State funds. The core candidate airports will continue to be preserved and improved with the use of State funds in an effort to maximize their utility and storage capacity, where appropriate. Airport improvements at both categories of airports will be consistent with the State's Fix-it-First and Smart Growth policy initiatives.

CHAPTER ONE
INVENTORY

I. INTRODUCTION

This chapter presents an inventory of existing conditions for the 53 public-use facilities currently identified as part of the New Jersey Airport System. This system includes all aviation facilities that are currently licensed, operating, and open for public use. The airports range in size from single, turf-runway facilities to large, multi-runway scheduled service hub facilities. The system also includes a seaplane base and four public use heliports. The majority of New Jersey's airports support the operation of general aviation aircraft. General aviation aircraft include all aircraft not flown by scheduled service airlines or the military. Both publicly- and privately-owned airports are included in the system, however, as previously stated, to be included in the system, an airport must be open for public use.

The overall system planning process being used in this analysis includes detailed tasks that will examine the adequacies and deficiencies of the existing system. Based on this analysis, a recommended development plan for the system of airports will be prepared. This recommended development plan will identify projects required to ensure that New Jersey airports meet current Federal Aviation Administration (FAA) and New Jersey Department of Transportation (NJDOT) standards. In addition, the recommended development plan will ensure that New Jersey's airport system will adequately support current and projected future demands. An important initial step in the system planning process, however, is the compilation of existing data regarding facilities and activity levels at each system airport.

This chapter explains the process used to collect inventory data and presents summary inventory data in succinct form. For the sake of brevity, much of the inventory information included in this chapter is presented in tabular form and is accompanied by text providing a brief description. The purpose of the inventory and data collection process is to develop an accurate database, representative of a "snap-shot in time" view of the existing system, that can be used throughout the study. The information presented in this chapter was last updated in December 2002.

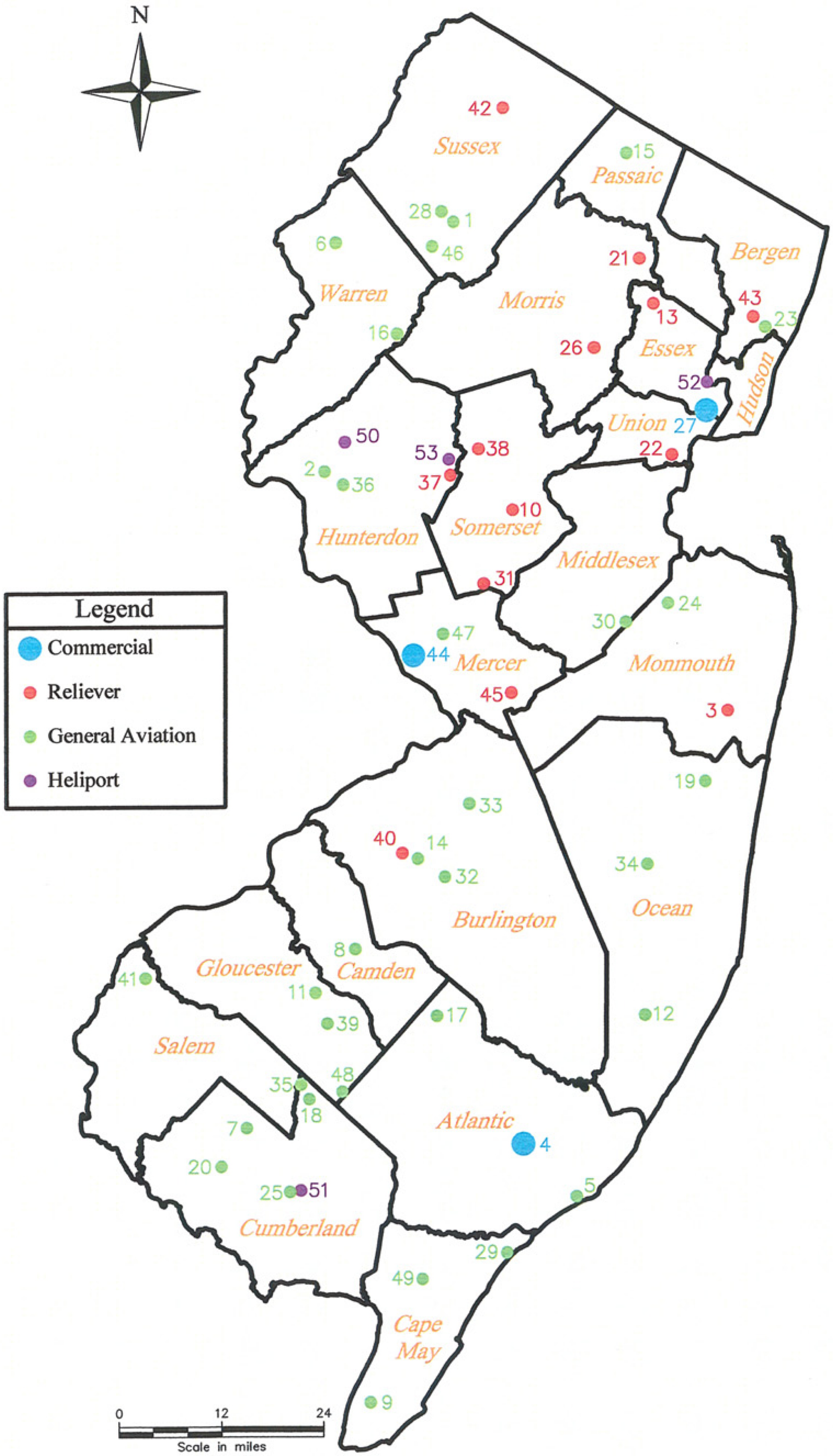
II. SUMMARY OF EXISTING AIRPORT SYSTEM

As previously stated, the existing system of public-use facilities in New Jersey includes 48 airports, four heliports, and one seaplane base. **Exhibit 1-1** illustrates the general location of the airports and seaplane base currently included in the New Jersey aviation system. In Exhibit 1-1, airports are identified in the following categories based on the types of activity that they accommodate:

- **Scheduled Service –** Airports that currently support scheduled, airline activity are categorized in Exhibit 1-1 as scheduled service airports.

- **Reliever –** Reliever airports are generally described by the FAA as those airports typically located in major metropolitan areas that divert general aviation activity from larger scheduled service airports. By providing general aviation pilots with an attractive alternative destination, reliever airports minimize delay and congestion at the larger scheduled service airports, and provide safe and efficient general aviation access to larger metropolitan areas. New Jersey's 13 FAA designated reliever airports are presented in Exhibit 1-1.

- **General Aviation –** New Jersey's public use airports that do not support scheduled service airline operations and are not currently identified as reliever airports are categorized as general aviation airports in Exhibit 1-1.



Airport Key	
1	Aeroflex–Andover Field
2	Alexandria Field
3	Monmouth Executive
4	Atlantic City International
5	Bader Field
6	Blairstown
7	Bucks
8	Camden County
9	Cape May County
10	Central Jersey Regional
11	Cross Keys
12	Eagles Nest
13	Essex County
14	Flying W
15	Greenwood Lake
16	Hackettstown
17	Hammonton Municipal
18	Kroelinger
19	Lakewood
20	Li Calzi Airpark
21	Lincoln Park
22	Linden
23	Little Ferry Seaplane Base
24	Marlboro
25	Millville Municipal
26	Morristown Municipal
27	Newark Liberty International
28	Newton
29	Ocean City Municipal
30	Old Bridge
31	Princeton
32	Red Lion
33	Red Wing
34	Robert J. Miller Airpark
35	Rudy's
36	Sky Manor
37	Solberg–Hunterdon
38	Somerset
39	Southern Cross
40	South Jersey Regional
41	Spitfire Aerodrome
42	Sussex
43	Teterboro
44	Trenton–Mercer
45	Trenton–Robbinsville
46	Trinca
47	Twin Pine
48	Vineland–Downstown
49	Woodbine Municipal
50	Coach–N–Paddock Heliport
51	Holly City Heliport
52	Newark Heliport
53	Ryland Inn Heliport/Balloonport

NEW JERSEY STATE AIRPORT SYSTEM PLAN

Airport Locations in New Jersey

Exhibit 1-1

For statewide transportation planning purposes, New Jersey has been divided into six Mobility Strategy Areas (MSAs). These MSAs are geographic regions of the State, each of which is comprised of two or more counties, that were developed to facilitate long-range planning for transportation resources in New Jersey. To promote coordination with other transportation planning studies, **Table 1-1** lists New Jersey's public-use airports by MSA and county.

Table 1-1
NEW JERSEY PUBLIC-USE AIRPORTS

Mobility Strategy Area	Airport Name	County
MSA 1 - Northeast	Essex County	Essex
	Linden	Union
	Little Ferry Seaplane Base	Bergen
	Newark Liberty International	Essex
	Teterboro	Bergen
MSA 2 – Northwest	Aeroflex-Andover	Sussex
	Blairstown	Warren
	Greenwood Lake	Passaic
	Hackettstown	Warren
	Lincoln Park	Morris
	Morristown Municipal	Morris
	Newton	Sussex
	Sussex	Sussex
	Trinca	Sussex
MSA 3 – Central	Alexandria Field	Hunterdon
	Central Jersey Regional	Somerset
	Old Bridge	Middlesex
	Princeton	Somerset
	Sky Manor	Hunterdon
	Solberg-Hunterdon	Hunterdon
	Somerset	Somerset
MSA 4 – Shore/E. Central	Eagles Nest	Ocean
	Lakewood	Ocean
	Marlboro	Monmouth
	Monmouth Executive	Monmouth
	Robert J. Miller Airpark	Ocean
MSA 5 - Southwest	Camden County	Camden
	Cross Keys	Gloucester
	Flying W	Burlington
	Red Lion	Burlington
	Red Wing	Burlington
	South Jersey Regional	Burlington
	Southern Cross	Gloucester
	Trenton-Mercer	Mercer
	Trenton-Robbinsville	Mercer
	Twin Pine	Mercer
	Vineland Downstown	Gloucester

Table 1-1 NEW JERSEY PUBLIC-USE AIRPORTS, Continued		
Mobility Strategy Area	**Airport Name**	**County**
MSA 6 - South	**Atlantic City International**	Atlantic
	Bader Field	Atlantic
	Bucks	Cumberland
	Cape May County	Cape May
	Hammonton Municipal	Atlantic
	Kroelinger	Cumberland
	Li Calzi	Cumberland
	Millville Municipal	Cumberland
	Ocean City Municipal	Cape May
	Rudy's	Cumberland
	Spitfire Aerdrome	Salem
	Woodbine Municipal	Cape May

Note: Those airports currently providing access to commercial airline service are bolded.
Source: NJDOT

In addition to the State's 49 public-use airports, four public-use heliports are also included in New Jersey's current aviation system. **Table 1-2** summarizes the location and ownership of the State's four public-use heliports. These public-use heliports are publicly- and privately-owned facilities that support business, recreational, emergency medical, and other transportation needs throughout the State.

Table 1-2 NEW JERSEY PUBLIC USE HELIPORTS			
Heliport	**Associated City/County**	**MSA**	**Ownership**
Coach-N-Paddock Heliport	Hampton/Sussex	MSA 2	Private
Holly City Heliport	Millville/Cumberland	MSA 6	Public
Newark Heliport	Newark/Essex	MSA 1	ublic
Ryland Inn Heliport/Balloonport	Whitehouse/Hunterdon	MSA 3	Private

Source: NJDOT

The State' public-use heliports play an important role in the aviation system by supporting a specific component of aviation demand in New Jersey.

III. INVENTORY PROCESS

The NJDOT Division of Aeronautics has maintained the NJDOT Airport Information Management System (AIMS), a database of information on airports in the State, for a number of years. Since its inception, this database has been continually updated to reflect facility improvements, construction of additional facilities, and changes in activity levels at all system airports. Updated data is collected by Division of Aeronautics staff through several processes including airport licensing, on-site inspection, and periodic coordination with airport management/staff. Since this database represents the most complete and updated information on New Jersey airports, it was used as the primary source for collection of airport inventory data in this analysis.

In addition, many other reliable sources, such as FAA databases and previous NJDOT Division of Aeronautics studies, provide additional information regarding New Jersey's airports. The following specific sources of information were used, where necessary, to supplement data in the NJDOT AIMS:

- FAA Northeast U.S. Terminal Procedures
- FAA Northeast U.S. Airport/Facility Directory
- NJDOT Airport Directory
- NJDOT Economic Impact of New Jersey's General Aviation Airports
- Regional Aviation System Plan for the Delaware Valley
- Numerous individual Airport Master Plans and Airport Layout Plans (ALP)

A State Airport System Plan (SASP) database was developed to store all data collected as part of the inventory process. Within the database, tables have been developed to present general categories of data on an airport-by-airport basis. These tables provide the necessary framework for storing, maintaining, and analyzing inventory data. In addition, these tables will be used throughout this chapter to summarize airport facility and activity data for system airports.

IV. AIRPORT INVENTORY DATA

Airport inventory data for this analysis has been collected, organized, and presented for the following major categories:

- General Airport Information
- Airport Planning Documents
- Airside Facilities
- Landside Facilities
- Visual and Navigation Aids
- Airport Activity Statistics
- Based Aircraft Data

A. General Airport Information

Basic airport ownership information from the NJDOT AIMS database is presented in **Table 1-3**. Summary data for each airport is presented in the table for the following categories:

- **Associated City –** The primary city or borough that each airport serves is identified.

- **Airport Name –** The official name of each facility is presented.

- **Airport Identifier –** The three-character code that is assigned to each airport by the FAA for identification purposes is presented.

- **Airport Sponsor –** Private citizens, municipalities, airport authorities and other owners of each airport are presented.

- **Level of Service (LOS) –** The LOS that each airport provides is identified. Scheduled service airports are those airports that currently provide access to scheduled, airline service. All other airports are identified as general aviation. Those general aviation airports identified with an asterisk currently possess a Commercial Operating Certificate under FAR Part 139 and are licensed to accommodate scheduled operations, however, this type of activity does not currently occur on the airport.

  In order to obtain and hold a Part 139 Certificate, airports are required to meet and/or provide a higher level of security and safety measures. These requirements are extensive and include the following key items:

  - Airport Rescue and Fire Fighting (ARFF) services for scheduled airline service
  - Passenger screening and security check-in for passengers on scheduled airline flights
  - Airport and airfield security systems including fencing, gates, and surveillance
  - Daily airport field inspections and condition reporting procedures

  It is important to note, that although those general aviation airports that hold a Part 139 Certificate do not currently support scheduled airline service, they do meet all requirements to accommodate airline service, should that service be initiated.

- **Ownership –** The type of ownership, either public or private, is identified for each system airport. Private owners include individuals or companies. Public owners include municipalities, counties, and authorities. Somewhat unique to New Jersey, approximately two-thirds of the State's general aviation airports are privately owned and operated.

- **Status Within the National Plan of Integrated Airport Systems (NPIAS) –** The current classifications of those airports in the NPIAS are presented. The NPIAS is a FAA plan that identifies those airport facilities that are considered important to the national airport system. Airports included in the NPIAS are eligible for FAA funding for improvements to, and the development of, public use facilities. The airports included in the NPIAS are classified in the following categories based on the types of activity occurring at the facility, the levels of activity occurring, and the airports role in national and regional aviation systems. NPIAS airports are classified into two major categories, commercial and general aviation. Within each major category, airports are further classified based on the types and levels of activity occurring at each facility.

  The NPIAS major categories and subcategories are described below:

  Commercial NPIAS Airport – NPIAS airports that receive scheduled passenger service.

- **Primary (PR) –** Primary commercial service airports are those NPIAS airports that receive scheduled commercial passenger service and enplane over 10,000 passengers on an annual basis.

- **Secondary (S) –** Secondary commercial service airports are those NPIAS airport that receive scheduled commercial passenger service and enplane between 2,500 and 10,000 passengers on a annual basis.

General Aviation NPIAS Airport – NPIAS airports that do not receive scheduled passenger service are categorized as general aviation airports. Within the general aviation category, subcategories include reliever airports and general aviation airports.

- **Reliever (RL) –** Reliever airports are either publicly or privately-owned general aviation airports in the NPIAS that relieve airport congestion in a metropolitan area by providing the general aviation user with an attractive alternative airport to divert their operations from a larger, more congested, scheduled service service airport. Reliever airports must meet <u>one</u> of the following criteria to fulfill their designation[1]:

  - Current activity level of at least 50 based aircraft, or 25,000 annual itinerant operations (non-training flights that arrive or depart an airport), or 35,000 annual local operations (training operations or a departure or arrival that stays within a 20-mile radius of a particular airport).

  - Installation or proposed installation of a precision instrument landing system when the FAA Regional Director has determined that the airport is a desirable location for instrument training activity.

  In addition, the relieved airport must meet <u>both</u> criteria:

  - Commercial service airport that serves a standard metropolitan statistical area with a population of at least 250,000 persons or at least 250,000 annual enplaned passengers.

  - Operates at 60 percent its capacity, or operated at such a level before being relieved by one or more reliever airports.

  Some exceptions do apply, but generally an airport must meet the above criteria to be considered a reliever.

- **General Aviation (GA) –** Those NPIAS airports that do not receive scheduled passenger traffic and do not meet the reliever criteria presented above, are classified as general aviation NPIAS airports.

Thirty-five (35) of the State's airports are currently included in the NPIAS. As shown in Table 1-3, NPIAS airports in New Jersey currently consist of three primary commercial

[1] FAA Order 5090.3B

service airports, 13 reliever airports, and 19 general aviation airports. In New Jersey, all 13 reliever airports are designated relievers to either Newark or Philadelphia International airports. Each airport classified as a primary commercial service or general aviation airport in the NPIAS is publicly owned. Of the 13 reliever airports currently in the NPIAS, nine are privately-owned and 4 are publicly-owned.

Table 1-3
AIRPORT OWNERSHIP

Associated City	Airport Name	Airport Identifier	Sponsor	LOS	Ownership	NPIAS
Andover	Aeroflex-Andover Field	12N	NJ Forest Fire Service	GA	Public	
Pittstown	Alexandria Field	N85	Atmoterre Limited Partnership	GA	Private	GA
Belmar/Farmingdale	Monmouth Executive	BLM	Mr. Ed Brown	GA	Private	RL
Atlantic City	Atlantic City International	ACY	S. Jersey Transportation Authority	Comm	Public	PR
Atlantic City	Bader Field	AIY	City of Atlantic City	GA	Public	GA
Blairstown	Blairstown	1N7	Mr. Steve Parker	GA	Private	GA
Bridgeton	Bucks	00N	Mr. Joseph Di Orio	GA	Private	
Berlin	Camden County	19N	Garden State Aviation, Inc.	GA	Private	GA
Wildwood	Cape May County	WWD	DRBA	GA*	Public	GA
Manville	Central Jersey Regional	47N	Mr. Joseph Horner	GA	Private	RL
Cross Keys	Cross Keys	17N	Mr. Andrew Weiner	GA	Private	GA
West Creek	Eagles Nest	31E	Kummings Eagles Nest Airport, Inc.	GA	Private	
Caldwell	Essex County	CDW	Essex County	GA	Public	RL
Lumberton	Flying W	N14	Cave Holdings, LLC	GA	Private	GA
West Milford	Greenwood Lake	4N1	NJDOT	GA	Public	GA
Hackettstown	Hackettstown	N05	Mr. Donald Schwanda	GA	Private	
Hammonton	Hammonton Municipal	N81	Town of Hammonton	GA	Public	GA
Vineland	Kroelinger	29N	B.D.G.S., Inc.	GA	Private	
Lakewood	Lakewood	N12	Township of Lakewood	GA	Public	GA
Bridgeton	Li Calzi Airpark	N50	Estate of Alan B. Li Calzi	GA	Private	
Lincoln	Lincoln Park	N07	Lincoln Park Airport, Inc.	GA	Private	RL
Linden	Linden	LDJ	City of Linden	GA	Public	RL
Little Ferry	Little Ferry Seaplane Base	2N7	Mr. Anastasios Georgas	GA	Private	
Matawan	Marlboro	2N8	Mr. Ken Parker	GA	Private	
Millville	Millville Municipal	MIV	City of Millville	GA	Public	GA
Morristown	Morristown Municipal	MMU	Town of Morristown	GA	Public	RL
Newark	Newark International	EWR	PANY & NJ	Comm	Public	PR
Newton	Newton	3N5	Jump Family	GA	Private	
Ocean City	Ocean City Municipal	26N	City of Ocean City	GA	Public	GA
Old Bridge	Old Bridge	3N6	Madison, Inc.	GA	Private	GA
Princeton/Rocky Hill	Princeton	39N	Mr. Ken Nierenberg	GA	Private	RL
Vincentown	Red Lion	N73	Affiliated Air Services, Inc.	GA	Private	GA
Jobstown	Red Wing	2N6	Central Jersey R.W., Inc.	GA	Private	
Toms River	Robert J. Miller Airpark	MJX	County of Ocean	GA	Public	GA
Vineland	Rudy's	25N	Mr. Rudolph Chalow	GA	Private	
Pittstown	Sky Manor	N40	Mr. Kent Linn	GA	Private	GA
Readington	Solberg-Hunterdon	N51	Solberg Aviation Company	GA	Private	RL
Somerville	Somerset	SMQ	Mr. G. Walker	GA	Private	RL

Table 1-3 AIRPORT OWNERSHIP, Continued						
Associated City	***Airport Name***	***Airport Identifier***	***Sponsor***	***LOS***	***Ownership***	***NPIAS***
Williamstown	Southern Cross	C01	Mr. Edward Carter	GA	Private	
Mount Holly	South Jersey Regional	VAY	Aviation Industrial Realty	GA	Private	RL
Pedricktown	Spitfire Aerodrome	7N7	Mr. Jack Fetsko	GA	Private	GA
Sussex	Sussex	FWN	Mr. Paul Styger	GA	Private	RL
Teterboro	Teterboro	TEB	PANY & NJ	GA*	Public	RL
West Trenton	Trenton Mercer	TTN	County of Mercer	Comm	Public	PR
Robbinsville	Trenton-Robbinsville	N87	Miry Run Country Club	GA	Private	RL
Andover	Trinca	13N	Tranquility Aero Corp.	GA	Private	GA
Pennington	Twin Pine	N75	Mr. William Weasner	GA	Private	
Vineland	Vineland Downstown	28N	Downstown Aero Crop Service, Inc.	GA	Private	
Woodbine	Woodbine Municipal	1N4	Woodbine Port Authority	GA	Public	GA

* = FAR Part 139, Commercial Operating Certificate

Sources: NJDOT

B. Airport Planning Documents

Planning documents, such as Airport Master Plans and Airport Layout Plans (ALP), help identify an airport's present status and future goals. Economic impact studies quantify the amount of economic activity that airports generate and help to identify how important an airport is to the economy. Each of these types of studies provides valuable information related to the existing conditions of New Jersey airports. In addition, these studies may also be referenced in the SASP during the development of future activity forecasts, airport facility requirements, and other components of the overall project. **Table 1-4** identifies, for each system airport, the year in which the most recent master plan, ALP, or economic impact study for each airport was completed. Those airports that have not completed such studies are also noted. Brief definitions of the airport studies listed in Table 1-4 are as follows:

- **Airport Master Plan –** A document detailing an airport's existing facilities, current and future activity levels, and future facility requirements and development plans.

- **Airport Layout Plan –** The physical plan of an airport showing the layout of existing and proposed airport facilities.

- **Economic Impact Study –** Study analyzing an airport's contribution to the regional and local economy.

As shown in Table 1-4, twenty-three (33) GA airports have a Master Plan and/or an ALP.

Table 1-4
AIRPORT PLAN INFORMATION

Airport Name	Master Plan	Airport Layout Plan	Economic Impact Study
Aeroflex-Andover Field	2002	2002	1996
Alexandria Field	1997	1997	1996
Monmouth Executive	None	2001	1996
Atlantic City International	1992	1999	---
Bader Field	None	1992	None
Blairstown	2000	2000	1996
Bucks	None	None	None
Camden County	2002	2002	1996
Cape May County	2002	2002	1996
Central Jersey Regional	2001	2001	1996
Cross Keys	2002	2002	1996
Eagles Nest	2002	2002	None
Essex County	1990	1995	1996
Flying W	1997	1997	1996
Greenwood Lake	1997	1997	1996
Hackettstown	None	None	None
Hammonton Municipal	1994	1994, Pen & Ink Change 2000	1996
Kroelinger	None	None	None
Lakewood	1997	2000	1996
Li Calzi Airpark	None	None	None
Lincoln Park	1988	1988	1996
Linden	1992	2000	1996
Little Ferry Seaplane Base	None	None	None
Marlboro	None	None	1996
Millville Municipal	1997	2002	1996
Morristown Municipal	1985	2001	1996
Newark International	None	1997, Pen & Ink Change 2000	---
Newton	None	None	None
Ocean City Municipal	2000	2000	1996
Old Bridge	2002	2002	1996
Princeton	1996	1997	1996
Red Lion	2000	2001	1996
Red Wing	None	None	None
Robert J. Miller Airpark	1992	1992	1996
Rudy's	None	None	None
Sky Manor	1998	1998	1996
Solberg-Hunterdon	1997	1998	1996
Somerset	1996	1996	1996
Southern Cross	None	None	None
South Jersey Regional	1997	1997	1996
Spitfire Aerodrome	None	None	1996

Table 1-4
AIRPORT PLAN INFORMATION, Continued

Airport Name	Master Plan	Airport Layout Plan	Economic Impact Study
Sussex	1997	1997	1996
Teterboro	1990	1991	1996
Trenton-Mercer	1997	1997	1996
Trenton-Robbinsville	2000	2001	1996
Trinca	1996	1996	1996
Twin Pine	None	None	None
Vineland Downstown	None	None	1996
Woodbine Municipal	1983	2002	1996

Sources: NJDOT; Economic Impact of New Jersey's General Aviation Airports, 1996; Inventory Data 2/18/02

C. Airside Facilities

Airside facilities at an airport consist of runways, taxiways, and their associated lighting facilities. The primary component of an airport, and the most important airside facility, is an airport's runway. Runways support the transition of aircraft from ground to air, and can be considered the lifeline of an airport's operation. Taxiways serve as a path for aircraft to move from one part of the airport to another. If a taxiway does not exist, the runway must fulfill the taxiway's purpose. **Table 1-5** contains summary information regarding airside facilities at New Jersey's system airports. The following data is provided in Table 1-5:

- **Runway Designation** – The runway designation, as determined by its magnetic heading, is presented for each runway in the system.
- **Runway Length** – The length of each system runway is presented.
- **Runway Width** – The width of each system runway is presented
- **Runway Surface Type** – The runway surface type, such as concrete, asphalt, or turf, of each system runway is presented.
- **Runway Strength (1,000 lbs**.) - The maximum aircraft weight that each system runway can accommodate on a regular basis without excessive pavement wear is presented.
- **Pavement Condition Index (PCI)** – The PCI, which ranges from 0-100, with 100 being the best pavement condition, of each system runway is presented. The PCI takes into consideration the level, amount, and type of deterioration, if any, of the pavement surface.
- **Runway Lighting** – The type of lighting, according to intensity, that exists on each system runway, is presented. Those types of runway lighting identified in the table include Low Intensity Runway Lighting (LIRL), Medium Intensity Runway Lighting (MIRL), and High Intensity Runway Lighting (HIRL).

- **Taxiway –** The presence or absence of a taxiway for each system runway is noted. A full-length taxiway is a taxiway that spans the entire length of the primary runway. A partial-length taxiway spans only part the length of its associated primary runway.

- **Airport Reference Code (ARC) -** The ARC is used to relate airport design criteria to the operational and physical characteristics of the aircraft intended to operate on a specific runway at an airport.[2] A runway's ARC is comprised of two components, Aircraft Approach Category and Airplane Design Group, as described in **Table 1-6**:

Table 1-6
AIRPORT REFERENCE CODE

Aircraft Approach Category		Airplane Design Group	
Category	**Speed**	**Group**	**Wingspan Size**
A	Speed of less than 91 knots	I	Up to but not including 49'
B	91 knots up to but <121 knots	II	49' up to but not including 79'
C	121 knots up to but <141 knots	III	79' up to but not including 118'
D	141 knots up to but <166 knots	IV	118' up to but not including 171'
E	166 knots or more	V	171' up to but not including 214'
		VI	214' up to but not including 262'

Source: Federal Aviation Administration

The current ARC for each system runway in New Jersey is also presented in Table 1-5.

[2] FAA Advisory Circular 150/5300-13

Table 1-5
AIRSIDE FACILITIES

Airport Name	Runway Designation	R/W Length	R/W Width	R/W Surface Type	R/W Strength (,000 lbs)	PCI	R/W Lighting	Taxiway	ARC
Aeroflex-Andover Field	03/21	1981	50	Asphalt	---	73	MIRL	Full	B-I
Alexandria Field	08/26	2550	50	Asphalt	---	91	MIRL	Full	B-I
	13/31	1810	100 (22' paved)	Ashp/Turf	---	45	None	None	B-I
Monmouth Executive	03/21	3707	50	Asphalt	---	95	LIRL-NSTD	Full	B-I
	14/32	7300	80	Asphalt	---	98	MIRL-NSTD	Full	C-III
Atlantic City International	04/22	6144	150	Asphalt	900	---	HIRL	Full	C-III
	13/31	10000	180	Asphalt	350	---	HIRL	Full	D-V
Bader Field	04/22	2596	100	Asphalt	12.5	---	MIRL	Full	B-I
	11/29	2948	100	Asphalt	23	---	MIRL	Full	B-I
Blairstown	07/25	3100	70	Asphalt	---	99	MIRL	Full	B-I
Bucks	18/36	1900	150	Turf	N/A	N/A	None	None	A-I
Camden County	05/23	3102	45	Asphalt	12.5	65	MIRL	Full	B-I
Cape May County	01/19	4998	150	Asphalt	120	81	HIRL	Full	C-III
	10/28	4998	150	Asphalt	120	80	MIRL	Full	C-III
	14/32	4000	150	Asphalt	93	59	None	None	B-II
Central Jersey Regional	07/25	3509	50	Asphalt	30	84	MIRL	Full	B-II
Cross Keys	09/27	3500	50	Asphalt	13	80	LIRL	Full	B-I
Eagles Nest	14/32	3200	60	Asphalt	12.5	---	None	None	B-I
Essex County	04/22	4553	80	Asphalt	30	73	MIRL	Full	B-II
	09/27	3721	75	Asphalt	12.5	97	MIRL	Full	B-II
Flying W	01/19	3496	75	Asphalt	12.5	94	MIRL	Full	B-I
Greenwood Lake	06/24	4000	60	Asphalt	---	84	LIRL	Full	B-I
Hackettstown	05/23	2200	40	Asphalt	5	95	None	None	B-I
Hammonton Municipal	03/21	3602	75	Asphalt	12.5	---	LIRL	Full	C-II
Kroelinger	10/28	2188	190	Turf	N/A	N/A	None	None	A-I
Lakewood	06/24	3457	60	Asphalt	25	100	MIRL	Full	B-I
Li Calzi Airpark	12/30	2773	100	Turf	N/A	N/A	None	None	A-I
Lincoln Park	01/19	2942	40	Asphalt	---	94	MIRL	Partial	B-I
Linden	09/27	4137	100	Asphalt	42	73	MIRL	Full	B-II
Little Ferry Seaplane Base	01/19	5500	150	Water	---	---	None	---	---
Marlboro	09/27	2156	50	Asphalt	---	91	LIRL	Full	B-I
Millville Municipal	10/28	6002	150	Asphalt	175	90	MIRL	Full	C-III
	14/32	5057	150	Concrete	125	82	MIRL	Full	B-II
Morristown Municipal	05/23	5999	150	Asphalt	80	86	HIRL	Full	C-III
	12/30	3998	150	Asphalt	30	89	MIRL	Full	B-II
Newark International	H1/H1	40	40	Asphalt	---	---	None	---	---
	04L/22R	8200	150	Asphalt	873	---	HIRL	Full	D-V
	04R/22L	9300	150	Asphalt	873	---	HIRL	Full	D-V
	11/29	6800	150	Asphalt	873	---	HIRL	Full	C-III
Newton	06/24	2546	45	Asphalt	---	15	None	None	B-I
Ocean City Municipal	06/24	2977	60	Asphalt	13	100	MIRL	Full	B-I
Old Bridge	06/24	3594	50	Asphalt	---	100	MIRL	Full	B-I

Table 1-5
AIRSIDE FACILITIES, Continued

Airport Name	Runway Designation	R/W Length	R/W Width	R/W Surface Type	R/W Strength (,000 lbs)	PCI	R/W Lighting	Taxiway	ARC
Princeton	10/28	3500	75	Asphalt	15	100	MIRL	Full	B-II
Red Lion	05/23	2940	50	Asphalt	12.5	93	MIRL	Full	B-I
Red Wing	06/24	1830	80	Turf	N/A	N/A	None	None	A-I
	11/29	2040	80	Turf	N/A	N/A	LIRL	None	A-I
Robert J. Miller Airpark	H1/H1	50	50	Asphalt	---	---	None	---	---
	06/24	5949	100	Asphalt	12	---	HIRL	Full	C-III
Rudy's	08/26	2400	100	Turf	N/A	N/A	None	None	A-I
Sky Manor	07/25	2439	52	Asphalt	12.5	86	MIRL	Full	B-I
Solberg-Hunterdon	04/22	3735	50	Asphalt-Turf	---	92	MIRL	Full	B-II
	10/28	2456	160	Turf	N/A	N/A	None	None	A-I
	13/31	3440	200	Turf	N/A	N/A	None	None	A-I
Somerset	08/26	2200	100	Turf	N/A	N/A	None	None	A-I
	12/30	2735	65	Asphalt	---	89	MIRL	Full	B-I
	17/35	1900	200	Turf	N/A	N/A	None	None	A-I
Southern Cross	09/27	2400	80	Turf	N/A	N/A	LIRL	None	A-I
South Jersey Regional	08/26	3911	50	Asphalt	30	65	MIRL	Partial	B-I
Spitfire Aerodrome	07/25	2419	50	Asphalt	12.5	56	LIRL	Full	B-I
Sussex	03/21	3499	75	Asphalt	---	98	LIRL	Full	B-I
Teterboro	01/19	7000	150	Asphalt	100	84	HIRL	Full	C-III
	06/24	6013	150	Asphalt	100	95	HIRL	Full	C-III
Trenton Mercer	H1/H1	64	64	Asphalt	---	---	None	---	---
	H2/H2	64	64	Asphalt	---	---	None	---	---
	H3/H3	64	64	Asphalt	---	---	None	---	---
	06/24	6006	150	Asphalt	320	99	HIRL	Full	C-III
	16/34	4800	150	Asphalt	320	84	MIRL	Full	B-III
Trenton-Robbinsville	11/29	4275	80	Asphalt	25	92	MIRL	Full	B-I
Trinca	06/24	1924	200	Turf	N/A	N/A	None	None	A-I
Twin Pine	12/30	2200	100	Turf	N/A	N/A	None	None	A-I
Vineland Downstown	02/20	2251	100	Turf	N/A	N/A	LIRL	None	A-I
Woodbine Municipal	01/19	3304	150	Asphalt	120	65	MIRL	Stub	B-II
	12/30	3073	75	Asphalt	120	63	MIRL	Partial	B-II

Sources: NJDOT; Northeast US Airport/Facility Directory, 2000

As shown in Table 1-5, New Jersey's 49 public use airports contain sixty-eight (68) runways. Forty (40) of the runways have full parallel taxiways, and six have partial taxiways. Runway lengths range from 1,810 feet for the secondary runway at Alexandria Field, to 10,000 feet at Atlantic City International. Of the general aviation airports, Monmounth Executive has the longest runway at 7,300 feet. Currently, 53 runways, or seventy-eight (78) percent of system runways, are paved, and 57 runways, or 76 percent of the total number of system runways, have lighting.

D. Landside Facilities

Landside facilities include terminal buildings, other airport buildings, fuel farms, hangars and T-hangars, aprons, and parking facilities. Data regarding the landside facilities at each New Jersey system airport was collected and is summarized in **Table 1-7**. Landside facility data provides information related to the types and levels of services provided to aviation users at each of the airports. Table 1-7 includes the following landside facility data for each system airport:

- **Fuel Type** – The types of aviation fuel available at each system airport is presented. Types of aviation fuel available include jet fuel (JetA), 100 octane low-lead fuel (100LL), 80 octane gasoline (80), and motor vehicle fuel (MoGas).

- **T-Hangars (units)** – T-hangar units are covered, individual aircraft storage areas. The number of T-hangar units at each New Jersey airport is presented in Table 1-7.

- **Conventional Hangar Space (square feet)** – Estimated total conventional hangar space at each system airport is presented. Conventional hangars are free-standing, covered buildings used to store one or more aircraft. For larger airports with more than 100,000 square feet of conventional hangar space a detailed estimate was not prepared.

- **Paved Apron Area** – Apron areas are paved areas used for the parking of aircraft. Apron areas typically provide access to terminal, tenant, and/or fueling facilities.

- **Tie-Downs (spaces)** – Aircraft tie-down spaces are individual, outdoor locations where aircraft are tied down and stored.

Table 1-7
LANDSIDE FACILITIES

Airport Name	Fuel Type	T-Hangars (units)	Hangars (square feet)	Paved Apron Area (sq yds)	Tie-Downs
Aeroflex-Andover Field	100LL	none	18,000	12,000	38 unpaved
Alexandria Field	80, 100LL	50	17,000	3,110	2 paved, 26 unpaved
Monmouth Executive	100LL, Jet A	97	148,600	39,000	40 paved, 58 unpaved
Atlantic City International	100LL, Jet A			large	
Bader Field	100LL	8	none	28,210	100 paved
Blairstown	100LL	40	14,500	4,400	8 paved, 32 unpaved
Bucks	---	24	none	none	6 unpaved
Camden County	100LL, Jet A	9	none	6,110	20 paved, 30 unpaved
Cape May County	100LL, Jet A	18	>100,000	large	450 paved
Central Jersey Regional	80, 100LL, Jet A	39	2,375	8,890	56 paved, 13 unpaved
Cross Keys	100LL	10	4,500	400	37 paved, 24 unpaved
Eagles Nest	---	none	none	12,675	3 unpaved
Essex County	100LL, Jet A	62	42,000	90,000	332 paved, 4 unpaved
Flying W	100LL, Jet A	70	10,500	32,000	70 paved, 10 unpaved
Greenwood Lake	100LL	12	6,700	280,000	123 paved, 16 unpaved
Hackettstown	80, 100LL	none	6,600	none	50 unpaved
Hammonton Municipal	100LL, Jet A	none	13,500	6,600	21 paved, 45 unpaved
Kroelinger	---	10	25,000	none	none
Lakewood	100LL	6	2,400	11,428	31 paved, 15 unpaved
Li Calzi Airpark	---	none	10,000	none	4 unpaved
Lincoln Park	100LL, Jet A	14	40,000	10,000	60 paved, 80 unpaved
Linden	100LL, Jet A	48	14,400	3,560	110 paved
Little Ferry Seaplane Base	---	---	---	---	---
Marlboro	100LL	18	2,700	280	100 paved, 15 unpaved
Millville Municipal	100LL, Jet A	10	115,060	34,190	56 paved, 12 unpaved
Morristown Municipal	100LL, Jet A	40	361,350	65,330	173 paved
Newark International	100LL, Jet A	none	>100,000	large	>50
Newton	---	none	none	none	4 paved, 4 unpaved
Ocean City Municipal	100LL	29	none	37,400	100 paved
Old Bridge	100LL	88	5,500	31,875	35 paved
Princeton	100LL, Jet A	48	12,000	17,020	80 paved, 20 unpaved
Red Lion	100LL	14	10,400	1,800	4 paved, 35 unpaved
Red Wing	---	none	3,400	none	15 unpaved
Robert J. Miller Airpark	100LL, Jet A	44	21,000	40,888	84 paved, 3 unpaved
Rudy's	---	none	5,000	none	6 unpaved
Sky Manor	80, 100LL	77	7,000	16,600	1 paved, 21 unpaved
Solberg-Hunterdon	80, 100LL, Jet A	none	15,000	6,000	58 paved, 26 unpaved
Somerset	100LL, Jet A	65	29,200	42,000	21 paved, 129 unpaved
Southern Cross	100LL	6	3,800	none	16 unpaved
South Jersey Regional	100LL, Jet A	40	41,600	30,222	120 paved, 60 unpaved

Table 1-7
LANDSIDE FACILITIES, Continued

Airport Name	Fuel Type	T-Hangars (units)	Hangars (square feet)	Paved Apron Area (sq yds)	Tie-Downs
Spitfire Aerodrome	100 LL	10	2,500	3,200	40 paved
Sussex	80, 100LL	50	6,600	8,890	40 paved, 50 unpaved
Teterboro	100LL, Jet A	none	412,000	large	Over 100 paved
Trenton Mercer	100LL, Jet A	43	387,190	168,800	80 paved
Trenton-Robbinsville	100LL	18	46,400	12,370	40 paved
Trinca	80,100LL	none	500	none	8 unpaved
Twin Pine	---	5	none	none	35 unpaved
Vineland Downstown	100LL	12	9,100	335	1 unpaved
Woodbine Municipal	100LL	25	4,900	7,610	22 paved, 30 unpaved

Sources: Northeast U.S. Airport/Facility Directory, 2000; NJDOT Airport Directory; Master Plans; ALPs

Thirty-eight (38) general aviation airports have operational fuel facilities. Many offer 100LL fuel, and 18 provide Jet A fuel. For those airports providing T-hangars, the number of units ranges from one at Sussex to 206 at Sky Manor. The majority of the airports possess conventional hangars, with square footage ranging from approximately 2,500 square feet at Lakewood, to over 100,000 square feet at Teterboro, Millville Municipal and Cape May County. Tie-downs are located at all airports, except for Kroelinger, Li Calzi Airpark, and Vineland Downstown.

E. Visual And Navigation Aids

There are various types of visual aid, navigational aids (NAVAIDS), and instrument approaches available at the State's airports. This portion of the SASP inventory is intended to provide information concerning the types of visual and navigational aids, approaches, and air traffic control facilities available to the flying public at each facility.

Table 1-8 provides information regarding the availability of specific visual and navigational aids. Data presented in Table 1-8 generally falls into three major categories, visual aids, navigation aids, and approaches.

- **Visual Aids –** Available visual aids at each New Jersey public use airport are presented in Table 1-8. Where applicable, visual aids are identified with the specific runway ends that they serve. Brief descriptions of the visual aids available at New Jersey airports are as follows:

  - **Precision Approach Path Indicators (PAPI) -** A lighting system providing vertical guidance to pilots.

  - **Visual Approach Slope Indicators (VASI) -** A second type of lighting system providing vertical guidance to pilots.

- **Runway End Identifier Lights (REIL) -** Strobe lights located at a runway end to help identify the landing threshold at night.

- **Rotating Beacon** - A rotating white & green light that helps pilots locate the airport at night.

- **Wind Indicator** - Indicates the wind direction using windsocks, wind-tees, and other devices.

- **Segmented Circle -** A visually prominent circle of markers, in which a wind indicator is located.

❑ **NAVAIDS –** NAVAIDs include any visual or electronic device, either airborne or on the ground, that provides point-to-point guidance information or position data to an aircraft in flight. NAVAIDs support approach paths that can be divided into two categories, precision and non-precision.

- **Instrument Landing System (ILS) -** Provides pilots with electronic guidance for horizontal aircraft alignment, descent gradient, and position until visual contact with the runway is attained. A full ILS (with an electronic glide slope and localizer) is the primary type of precision approach system in the USA. By definition, a procedure that provides both vertical guidance (via a glide slope), and horizontal guidance (via a localizer) to aircraft is a <u>precision</u> instrument approach. Currently, seven airports in New Jersey have ILS precision approach capabilities.

The presence of a localizer only, or other radio NAVAIDS providing horizontal guidance (e.g., NDB, VOR or GPS), indicates the availability of a <u>nonprecision</u> approach to the airport. These are also listed in Table 1-8.

- **Localizer (LOC) –** Transmits electronic signal used by pilots to establish and maintain the aircraft's horizontal position until visual contact with the runway is attained

- **Approach Lighting System (ALS) -** Configurations of lights positioned symmetrically along the extended runway centerline.

- **Very-High Frequency Omnidirectional Radio (VOR)** - A radio signal from an on or off airport facility used for non-precision procedures to aid in instrument approaches. A "c" in the table indicates a circling approach.

- **Distance Measuring Equipment (DME) -** Used in combination with a VOR procedure, but includes distance information. A "c" in the table indicates a circling approach.

- **Global Positioning System (GPS)** - A procedure based upon radio signals from a network of navigational satellites. A "c" in the table indicates a circling approach.

- **Non-directional Beacon (NDB)** - A radio signal from an on or off airport facility used for non-precision procedures. An NDB is considered an older and less accurate system than a VOR.

- **Air Traffic Control Tower (ATCT) –** Those New Jersey airports with ATCT on-site are also identified in Table 1-8. ATCT are on-airport facilities where personnel control flight operations within an airport's designated airspace, as well as the operation of aircraft and vehicles on the ground.

Seventy-six (76) percent of the airports have instrument approach procedures (DME, VOR, GPS, NDB), and six have air traffic control towers. For airports that do not have instrument approach procedures, only visual approaches can be made. As shown, the State's airports vary greatly regarding their visual guidance and NAVAID capabilities.

Table 1-8
VISUAL & NAVIGATIONAL AIDS

Airport Name	*PAPI*	*VASI*	*REIL*	*Beacon*	*Wind Ind.*	*Seg. Circle*	*ILS*	*Loc.*	*ALS*	*DME*	*VOR*	*GPS*	*NDB*	*ATCT*
Aeroflex-Andover Field				X	X	X					X-C	X		
Alexandria Field				X	X						X	X		
Monmouth Executive				X	X	X		X			X-C	X		
Atlantic City International	04,13	31,22		X	X		X	X	X	X	X	X		X
Bader Field	11		11,29	X	X	X					X	X		
Blairstown				X	X						X	X		
Bucks					X									
Camden County	23			X	X				X		X-C	X		
Cape May County	01,19,10,28			X	X	X		X		X	X	X		
Central Jersey Regional				X	X						X-C	X		
Cross Keys					X						X	X		
Eagles Nest					X									
Essex County		22		X	X	X		X				X	X	X
Flying W	01,19		01,19	X	X						X-C	X		
Greenwood Lake	06,24		06,24	X	X						X	X		
Hackettstown					X									
Hammonton Municipal	03,21			X	X	X					X-C	X		
Kroelinger					X						X-C	X-C		
Lakewood				X	X						X	X		
Li Calzi Airpark					X									
Lincoln Park		01		X	X							X	X	
Linden		09,27	09,27	X	X							X-C		
Little Ferry Seaplane Base					X									
Marlboro	27	9	09,27	X	X					X	X	X		

Table 1-8
VISUAL & NAVIGATIONAL AIDS, Continued

Airport Name	*PAPI*	*VASI*	*REIL*	*Beacon*	*Wind Ind.*	*Seg. Circle*	*ILS*	*Loc.*	*ALS*	*DME*	*VOR*	*GPS*	*NDB*	*ATCT*
Millville Municipal	10,28,14,32			X	X		X	X	X	X	X	X	X	
Morristown Municipal	30		05,30	X	X	X	X	X	X			X	X	X
Newark International	22R,04R,29	11	22R,11,29	X	X		X		X	X	X	X	X	X
Newton					X									
Ocean City Municipal	06,24				X	X					X	X		
Old Bridge		06,24	06,24	X	X	X					X	X		
Princeton				X	X					X	X	X		
Red Lion	05,23			X	X	X					X-C	X-C		
Red Wing					X									
Robert J. Miller Airpark	06,24			X	X	X	X	X			X	X		
Rudy's					X						X-C	X-C		
Sky Manor	07,25		07,25		X						X	X		
Solberg-Hunterdon					X						X	X		
Somerset				X	X					X	X	X		
Southern Cross					X									
South Jersey Regional	08,26			X	X	X					X	X		
Spitfire Aerodrome	07,25				X									
Sussex				X	X						X-C	X		
Teterboro		01,24	01,19, 24	x	X		X	X	X	X	X	X	X	X
Trenton Mercer		24,16,34	24,16, 34	X	X		X		X	X	X	X	X	X
Trenton-Robbinsville	29			X	X	X		X			X	X	X	
Trinca					X									
Twin Pine					X									
Vineland Downstown					X									
Woodbine Municipal	19		12,19, 30	X	X	X					X-C	X		

Sources: NJDOT; Northeast U.S Terminal Procedures, 1999; Northeast U.S. Airport/Facility Directory

F. Airport Activity Statistics

Activity at an airport can be critical in determining an airport's role within the statewide system. Aviation activity can also highlight which airports may need expanded facilities to meet existing or increasing future demand. Also important is the type of aircraft that is currently using the airport. This helps to classify the airport's role and purpose in comparison to other airports in the State.

Table 1-9 provides information regarding the most recent activity level at each airport, and the type of operations (one landing and one takeoff equals two operations). The operation types include:

- Commercial: Schedule airlines.
- Air taxi (charter): On-demand charter service.
- Local: A general aviation training (touch-and-go) operation or departure or arrival that stays within a 20-mile radius of a particular airport.
- Itinerant: A non-training general aviation flight that arrives or departs an airport.
- Military: All operations by military aircraft.

Table 1-9
AIRPORT ACTIVITY STATISTICS

Airport Name	*Annual Operations*	*Commercial*	*Air Taxi*	*GA Local*	*GA Itinerant*	*Military*	*Source, Year*	*Enplanements*
Aeroflex-Andover Field	24,826	0	0	14,896	9,930	0	ASCP, 1999	---
Alexandria Field	29,863	0	0	17,918	11,945	0	ASCP, 1999	---
Monmouth Executive	57,229	0	9,000	40,600	7,629	0	ASCP, 2000	---
Atlantic City International	134,469	14,862	12,501	30,754	29,881	46,471	FAA, 2000	415,514
Bader Field	10,683	0		3,205	7,478		ASCP, 2000	---
Blairstown	23,228	0	0	13,937	9,291	0	ASCP, 1999	---
Bucks	900	0	0	900	0	0	Sponsor, 2001	---
Camden County	16,143	0	0	10,493	5,650	0	DVRPC, 1999	---
Cape May County	20,192	0	0	8,017	12,175	0	ASCP, 2000	---
Central Jersey Regional	38,686	0	1,000	22,492	14,994	200	ASCP, 1999	---
Cross Keys	37,540	0	0	24,401	13,139	0	DVRPC, 1999	---
Eagles Nest	50	0	0	0	50	0	Sponsor, 2000	---
Essex County	198,990	0	85	93,146	105,759	0	FAA, 2000	---
Flying W	39,361	0	0	25,585	13,776	0	DVRPC, 1998	---
Greenwood Lake	29,523	0	0	17,714	11,809	0	ASCP, 1999	---
Hackettstown	19,000	0	0	15,000	4,000	0	Sponsor, 2001	---
Hammonton Municipal	15,080	0		7,540	7,540	0	ASCP, 2000	---
Kroelinger	2,400	0	0	1,500	900	0	Sponsor, 2001	---
Lakewood	15,765	0	0	10,248	5,517	0	ASCP, 2000	---
Li Calzi Airpark	4,000	0	0	2,500	1,500	0	Sponsor, 2001	---
Lincoln Park	58,453	0	0	35,072	23,381	0	ASCP, 1999	---
Linden	36,502	0	0	20,076	16,426	0	ASCP, 2000	---
Little Ferry Seaplane Base	40	0	0	40	0	0	Sponsor, 2001	---
Marlboro	27,527	0	0	17,893	9,634	0	ASCP, 2000	---
Millville Municipal	43,760	0	0	28,445	15,315	0	ASCP, 2000	---
Morristown Municipal	271,074	0	6,370	92,980	171,656	68	FAA, 2000	---
Newark International	461,420	340,421	101,249	0	19,616	134	Sponsor, 2000	16,112,546
Newton	10,695	0	0	7,487	3,208	0	ASCP, 1999	---
Ocean City Municipal	20,164	0	0	8,066	12,098	0	ASCP, 2000	---
Old Bridge	24,787	0	0	16,112	8,675	0	ASCP, 1997	---
Princeton	50,622	0	0	30,373	20,249	0	ASCP, 1999	---
Red Lion	15,373	0	800	9,220	5,353	0	DVRPC, 1998	---

Table 1-9
AIRPORT ACTIVITY STATISTICS, Continued

Airport Name	*Annual Operations*	*Commercial*	*Air Taxi*	*GA Local*	*GA Itinerant*	*Military*	*Source, Year*	*Enplanements*
Red Wing	12,500	0	0	11,000	1,500	0	Sponsor, 2001	---
Robert J. Miller Airpark	37,267	0	6,067	18,000	11,200	2,000	ASCP, 1997	---
Rudy's	150	0	0	100	50	0	Sponsor, 2001	---
Sky Manor	26,372	0	100	15,823	10,449	0	ASCP, 1999	---
Solberg-Hunterdon	37,282	0	0	22,369	14,913	0	ASCP, 1999	---
Somerset	40,789	0	3,950	24,458	12,356	25	ASCP, 1999	---
Southern Cross	3,200	0	0	2,000	1,200	0	Sponsor, 2001	---
South Jersey Regional	59,466	0	2,250	37,345	19,871	0	DVRPC, 1999	---
Spitfire Aerodrome	8,363	0	0	7,527	836	0	DVRPC, 2000	---
Sussex	34,026	0	110	20,411	13,480	25	ASCP, 1999	---
Teterboro	282,900	220	43,000	7,497	231,795	388	FAA, 2000	---
Trenton Mercer	144,971	609	7,571	66,384	66,871	3,536	FAA, 2000	79,102 (2000)
Trenton-Robbinsville	29,762	0	0	22,842	6,920	0	DVRPC, 2000	---
Trinca	11,395	0	0	9,686	1,709	0	ASCP, 1997	---
Twin Pine	12,000	0	0	8,000	4,000	0	Sponsor, 2000	---
Vineland Downstown	15,350	0	0	14,500	850	0	Sponsor, 2000	---
Woodbine Municipal	19,250	0	40	12,510	6,660	40	ASCP, 2000	---
Total	2,513,388	356,112	194,093	927,062	983,234	52,887		16,528,060

Sources: NJDOT; FAA, DVRPC

The information source is also given, with the year that the data was obtained. The sources include the Annual Statewide Counting Program (ASCP), Delaware Valley Regional Planning Commission Counting Program (DVRPC), FAA, and the airport sponsor. Enplanement data (the number of scheduled passengers departing an airport per year) are also provided for the three scheduled service airports. Being that the majority of the airports are used for general aviation, most of the airports' annual operations are divided between general aviation local and general aviation itinerant operations. As described above, local general aviation operations are typically conducted for training purposes and stay within an airport's traffic pattern. Itinerant general aviation operations include all non-local operations. It is important to note that prior to the initiation of DVRPC and ASCP counts, operational estimates for non-towered airports were often "best guesses." Therefore, direct comparisons to earlier operational figures may lead to erroneous conclusions.

Total annual operations at New Jersey airports range from as few as 40 at Little Ferry Seaplane Base, to over 460,000 at Newark Liberty International. Statewide, approximately 2.5 million operations occurred in 2000.

The following facts pertain only to general aviation airports for the calendar year 1999:

- Average number of annual operations: 40,300
- Percent local operations: 51
- Percent itinerant operations: 49

- Average number of local operations: 20,700
- Average number of itinerant operations: 18,300

Based aircraft are another measure that can be used to determine an airport's role and significance within the system. **Table 1-10** displays the most recent count available for each system airport's total number of based aircraft by type. The aircraft types include:

- Single engine
- Multi-engine
- Jets
- Helicopters
- Other: gliders, ultra-light

The total number of based aircraft ranges from zero at several locations to 399 at Essex County. Of the based aircraft at general aviation airports, 78 percent are single engine, 11 percent are multi-engine, and five percent are jets. Statewide, there are 4,203 based aircraft at the 49 public use airports. Again, it is important to note that based aircraft counts represent a "snapshot in time" view. The number of aircraft at any facility can fluctuate as pilots buy or sell aircraft, move, etc.

Table 1-10
BASED AIRCRAFT

Airport Name	*Total Based Aircraft*	*Single Engine*	*Multi-Engine*	*Jets*	*Helicopters*	*Other*
Aeroflex-Andover Field	54	51	2	0	1	0
Alexandria Field	97	91	4	0	2	0
Monmouth Executive	219	178	19	8	14	0
Atlantic City International	29	10	7	8	4	0
Bader Field	13	13	0	0	0	0
Blairstown	159	124	7	0	0	28
Bucks	28	27	1	0	0	0
Camden County	52	48	1	0	1	0
Cape May County	71	43	24	0	1	0
Central Jersey Regional	111	96	10	0	1	4
Cross Keys	62	60	2	0	0	0
Eagles Nest	2	2	0	0	0	0
Essex County	399	313	69	2	15	0
Flying W	82	75	6	0	1	0
Greenwood Lake	57	52	4	0	0	1
Hackettstown	54	54	0	0	0	0
Hammonton Municipal	67	55	3	0	1	8
Kroelinger	3	3	0	0	0	0
Lakewood	83	80	3	0	0	0
Li Calzi Airpark	3	3	0	0	0	0
Lincoln Park	104	98	6	0	0	0
Linden	129	95	16	0	18	0
Little Ferry Seaplane Base	0	0	0	0	0	0

Table 1-10
BASED AIRCRAFT, Continued

Airport Name	Total Based Aircraft	Single Engine	Multi-Engine	Jets	Helicopters	Other
Marlboro	91	80	2	0	1	8
Millville Municipal	98	62	31	5	0	0
Morristown Municipal	325	205	45	53	22	0
Newark International	12	0	0	10	2	0
Newton	9	6	1	0	0	2
Ocean City Municipal	29	27	2	0	0	0
Old Bridge	94	82	10	0	2	0
Princeton	162	120	35	0	7	0
Red Lion	53	50	3	0	0	0
Red Wing	11	0	0	0	0	11
Robert J. Miller Airpark	113	91	17	4	1	0
Rudy's	1	1	0	0	0	0
Sky Manor	89	80	5	0	2	2
Solberg-Hunterdon	85	78	7	0	0	0
Somerset	199	161	24	0	2	12
Southern Cross	24	24	0	0	0	0
South Jersey Regional	176	138	26	2	2	8
Spitfire Aerodrome	34	30	1	0	3	0
Sussex	143	132	6	0	1	0
Teterboro	216	70	27	103	16	0
Trenton-Mercer	150	66	22	18	13	31
Trenton-Robbinsville	66	60	5	0	1	0
Trinca	15	15	0	0	0	0
Twin Pine	30	24	1	0	0	5
Vineland Downstown	25	22	3	0	0	0
Woodbine Municipal	75	67	2	0	1	5
Total	4,203	3,262	459	213	135	125

Source: NJDOT

V. SUMMARY

The data supplied in this chapter will be used and referred to extensively throughout the rest of the system plan. As mentioned earlier, the data provides a framework that allows us to proceed with further analysis and evaluation of New Jersey's airports.

Finally, several facts regarding the current state system are provided below:

- System airports 49
- System heliports 4
- Number of Airports in NPIAS: 26
- Airports with paved runways: 39
- Airports with multiple paved runways: 12
- Airports with paved runways $\geq$ 7,000 feet: 4

- Airports with paved runways $\geq$ 5,000 feet:	8 (including the 4 airports above)
- Airports with only turf runways:	9
- Airports with an Instrument Approach:	37
- Airports with Air Traffic Control Towers:	6
- Airports designated as relievers:	13
- Privately owned airports	31

CHAPTER TWO
TRENDS ANALYSIS

In preparing a comprehensive statewide plan for the public use airports in the New Jersey system, it is important to have a general understanding of recent and anticipated trends in the aviation industry as a whole, as well as an understanding of current economic conditions and demographic trends affecting New Jersey. When these trends are considered, it is important to review factors that could impact the use of scheduled service aviation, general aviation, as well as the funding sources that support both components of aviation activity. Some trends in the aviation industry will undoubtedly have a greater impact on New Jersey than others.[1]

I. NEW JERSEY ECONOMIC CONDITION

A healthy statewide economy and a healthy statewide airport system are in many cases inter-related. Businesses and individuals continue to rely on the access to safe, efficient, and quick transportation that airports provide. The access to the national air transportation system that New Jersey airports provide benefits the State's businesses in terms of their ability to serve more markets, increase sales, and increase employment. As businesses grow and succeed, in many cases, their demand for aviation services also grows. As this simplified explanation indicates, airports help promote a healthy economic environment, and a healthy economic environment can lead to a healthy aviation system.

The following is an analysis of New Jersey's general economic condition. Data for the gross state product (GSP) for New Jersey will be examined for the period 1990 through 1998. Examination of this data will show where New Jersey currently ranks in the country in terms of total GSP as well as GSP growth over the period 1990 through 1997. The relative strength of New Jersey's economy, as measured through GSP and GSP growth, will be an important consideration when future demands on the State's aviation system are developed. In addition to GSP data, other supplemental data regarding New Jersey's economy will also be presented.

GSP is defined by the Bureau of Economic Analysis of U.S. Department of Commerce as the total gross output, minus intermediate inputs, also known as the total value added in production by the labor and property located in a state. The GSP is often considered the counterpart to the U.S. Gross National Product (GNP), and is used to measure the health of each state's economy as well as each state's contribution to the national economy. Examining New Jersey's GSP statistics, including total dollar value as well as growth, will help characterize the general health of the State's economy as well as its relative importance and growth in the national economy.

Table 2-1 presents summary information related to New Jersey's GSP and the U.S. GNP for the period 1990 through 1998.

[1] This portion of the System Plan was completed prior to September 11, 2001. Aviation trends experienced since September 11, 2001 are incorporated later in the plan.

Table 2-1
COMPARISON OF GROSS STATE/NATIONAL PRODUCT (1990-1998) IN MILLIONS

	1990	1995	1996	1997	1998	Average Annual Growth Rate ('90-'98)
New Jersey	$216,941	$271,297	$285,528	$303,580	$319,201	4.95%
United States	$5,411,353	$7,309,516	$7,715,901	$8,240,312	$8,745,219	6.18%

Source: Bureau of Economic Analysis, U.S. Department of Commerce

As shown in Table 2-1, New Jersey's GSP grew from approximately $217 billion in 1990 to approximately $319 billion in 1998, representing an average annual growth rate of approximately 4.95 percent. In comparison, the U.S. GNP grew at an average annual rate of approximately 6.18 percent over the same period. Statistics from the U.S. Department of Commerce, Bureau of Economic Analysis indicated that for 1998, New Jersey ranked 8th in the nation in terms on GSP. For comparison purposes, New Jersey ranked 9th in the nation in terms of population in 1999. The top ten producing states in 1998 and their associated GSPs are presented below (in millions):

- California $1,118,945
- New York $706,886
- Texas $645,596
- Illinois $425,679
- Florida $418,851
- Pennsylvania $364,039
- Ohio $341,070
- **New Jersey** **$319,201**
- Michigan $294,505
- Georgia $253,769
- Massachusetts $239,379

As the data above indicates, New Jersey's statewide economy is one of the most productive, in terms of GSP, in the nation. This GSP data was further analyzed to examine average annual growth rates over the period 1990 to 1998. During this period, the top five growth states in terms of GSP, and their associated average annual growth rates, are listed below:

- Nevada 9.00%
- Arizona 8.67%
- Utah 8.38%
- Colorado 8.35%
- Oregon 7.71%

In this analysis, New Jersey ranked 36th in GSP growth over the period, with an average annual growth rate of approximately 4.95 percent. The U.S. GDP increased at an average annual rate of 6.18 percent over the same period. New Jersey ranked between North Dakota, with average annual growth rate of 4.97 percent, and Pennsylvania, with an average annual growth rate of 4.83 percent. Average annual GSP growth rates throughout the nation between 1990 and 1998 ranged from a high of 9.00 percent in Nevada to a low of -0.27 percent in Alaska.

However, due to disparities in total GSP in U.S. states, average annual growth rates may not accurately depict GSP growth in terms of gross dollar terms. The top ten states in terms of gross increase in GSP over the period 1990 to 1998, and their associated gross dollar increase, are presented below (in millions):

- California $320,708
- Texas $257,497
- New York $204,784
- Florida $160,811
- Illinois $149,228
- Pennsylvania $114,335
- Georgia $112,431
- Ohio $110,949
- Michigan $103,805
- **New Jersey $102,260**

The GSP data presented above indicates that New Jersey may be a relatively mature economy. Characteristics of a mature state economy would include a relatively low average annual GSP growth rate, but a high GSP dollar value. Although New Jersey's GSP growth over the period examined ranked in the bottom half of all states, it was tenth in terms of gross increase in total GSP. In general, New Jersey's economy is dynamic and the overall trend of GSP growth for the State should be anticipated to continue. In summary, New Jersey has historically been, and is anticipated to continue to be, one of the major contributors to the national economy.

II. NEW JERSEY DEMOGRAPHIC TRENDS

The initial step in examining historic and anticipated future trends in New Jersey aviation is to understand the current demographic trends in the State. Analysis of New Jersey's demographic trends will be important to forecasting future demand for aviation facilities throughout the State. The demographic trends analysis that will be conducted in the SASP will identify specific trends, in specific areas throughout the State, related to population, employment, and income.

Examination of these demographic factors will help identify trends that may directly influence the demand for aviation services in a given area. In general, those areas experiencing strong growth in population, employment, and income tend to have a relatively higher propensity to use aviation services. Conversely, those areas experiencing stagnant or limited growth may have a lower propensity to use aviation services. However, in those areas experiencing limited or stagnant growth, improved transportation services, including improved airport facilities, may act as a catalyst to promote future economic growth.

Historic and anticipated future demographic trends for the State of New Jersey, presented by county, will be summarized in the following sections:

- Population
- Per Capita Personal Income
- Unemployment

A. Population

Table 2-2 presents historic and projected population in New Jersey. Data presented in Table 2-2 indicates that based on 2000 population projections, New Jersey's top five populous counties and their associated total populations, listed in order from most populous to fifth most populous, are as follows:

- Bergen 856,800 persons
- Essex 750,700 persons
- Middlesex 734,800 persons
- Monmouth 611,800 persons
- Hudson 550,900 persons

Table 2-2
NEW JERSEY POPULATION

	1990 Census Data	*Projected 2000*	*Gross Population Increase (1990-2000)*	*Average Annual Growth Rate (1990-2000)*	*Projected 2000*	*Projected 2006*	*Projected 2010*	*Gross Population Increase (2000-2010)*	*Projected Average Annual Growth Rate (2000-2010)*
New Jersey	7,747,750	8,191,300	443,550	*0.93%*	8,191,300	8,436,600	8,601,500	410,200	*0.49%*
County:									
Atlantic	224,327	244,900	20,573	*1.47%*	244,900	26,080	270,100	25,200	*0.98%*
Bergen	825,380	856,800	31,420	*0.62%*	856,800	873,300	884,300	27,500	*0.32%*
Burlington	395,066	429,700	34,634	*1.41%*	429,700	450,500	464,600	34,900	*0.78%*
Camden	502,824	508,300	5,476	*0.18%*	508,300	514,200	516,400	8,100	*0.16%*
Cape May	95,089	99,400	4,311	*0.74%*	99,400	101,600	103,300	3,900	*0.39%*
Cumberland	138,053	142,000	3,947	*0.47%*	142,000	142,800	143,400	1,400	*0.10%*
Essex	777,964	750,700	-27,264	*-0.59%*	750,700	752,300	753,400	2,700	*0.04%*
Gloucester	230,082	252,700	22,618	*1.58%*	252,700	263,300	269,900	17,200	*0.66%*
Hudson	553,099	550,900	-2,199	*-0.07%*	550,900	553,800	556,000	5,100	*0.09%*
Hunterdon	107,802	127,400	19,598	*2.82%*	127,400	135,700	140,900	13,500	*1.01%*
Mercer	325,824	332,900	7,076	*0.36%*	332,900	338,400	342,600	9,700	*0.29%*
Middlesex	671,811	734,800	62,989	*1.50%*	734,800	774,700	806,200	71,400	*0.93%*
Monmouth	553,093	611,800	58,707	*1.70%*	611,800	637,500	654,700	42,900	*0.68%*
Morris	421,361	465,200	43,839	*1.66%*	465,200	486,200	499,500	34,300	*0.71%*
Ocean	433,203	494,200	60,997	*2.22%*	494,200	520,400	538,200	44,000	*0.86%*
Passaic	470,864	483,700	12,836	*0.45%*	483,700	486,100	486,900	3,200	*0.07%*
Salem	65,294	66,300	1,006	*0.26%*	66,300	66,700	66,900	600	*0.09%*
Somerset	240,245	294,100	53,855	*3.43%*	294,100	320,800	338,800	44,700	*1.42%*
Sussex	130,943	146,500	15,557	*1.89%*	146,500	153,000	157,700	11,200	*0.74%*
Union	493,819	498,300	4,481	*0.15%*	498,300	499,600	500,200	1,900	*0.04%*
Warren	91,607	100,800	9,193	*1.61%*	100,800	104,800	107,400	6,600	*0.64%*

Source: New Jersey Department of Labor, Division of Labor Market & Demographic Research, March 1999

As shown in Table 2-2, New Jersey has experienced an average annual population growth rate of approximately 0.93 percent over the period from 1990 to 2000. Those counties experiencing the strongest growth rates over the period included Hunterdon, Ocean, and Sussex counties, each of which experienced an average annual growth rate of over 1.75 percent. Both Essex and Hudson counties experienced negative population growth over the historic period.

Data from the New Jersey Department of Labor indicates that total statewide population is projected to grow at an average annual rate of approximately .49 percent over the period 2000 to 2010. County specific forecasts from the same source will be summarized below.

Those counties anticipated to have population growth greater than the State's (.49%), and their projected average annual population growth rate, are as follows:

- Somerset 1.42%
- Hunterdon 1.01%
- Atlantic .98%
- Middlesex .93%
- Ocean .86%
- Burlington .78%
- Sussex .74%
- Morris .71%
- Monmouth .68%
- Gloucester .66%
- Warren .64%

Those counties anticipated to have population growth lower than the State's (.49%), and their projected average annual population growth rate, are as follows:

- Cape May .39%
- Bergen .32%
- Mercer .29%
- Camden .16%
- Cumberland .10%
- Hudson .09%
- Salem .09%
- Passaic .07%
- Essex .04%
- Union .04%

Those counties that are projected to be the top five most populous in New Jersey in 2010 are listed below. The counties, and their projected total populations, are presented from most populous to fifth most populous.

- Bergen 884,300 persons
- Middlesex 806,200 persons

- Essex 753,400 persons
- Monmouth 654,700 persons
- Hudson 556,000 persons

Because of the wide variation in terms of total population in New Jersey's counties, analysis of average annual growth rates may not necessarily provide all the data needed to look at future population trends. In 2000, total projected population in New Jersey counties ranged from 856,800 persons in Bergen County to 66,300 persons in Salem County. Because of this variation, the statistical analysis of average annual growth rates presented above may not necessarily accurately depict the gross population increases the are projected for New Jersey counties. All those New Jersey counties projected to have gross population increases over 25,000 persons between 2000 and 2010 are presented below, along with their gross population increases:

- Middlesex 71,400 persons
- Somerset 44,700 persons
- Ocean 44,000 persons
- Monmouth 42,900 persons
- Burlington 34,900 persons
- Morris 34,300 persons
- Bergen 27,500 persons
- Atlantic 25,200 persons

All New Jersey counties not included in the list above are projected to experience gross population increases over the same period that are anticipated to be less than 17,200 persons.

These historic and projected population trends will be important factors in examining the future demands for New Jersey's aviation system.

B. Per Capita Personal Income

Table 2-3 presents per capita personal income for New Jersey residents for the years 1990 through 1998. Table 2-3 presents historic data regarding New Jersey per capita personal income for the years 1990 and 1995 through 1998. The top five counties in terms of 1998 per capita personal income are presented below:

- Somerset $49,594
- Morris $47,915
- Bergen $47,101
- Hunterdon $42,471
- Mercer $37,551

Table 2-3
NEW JERSEY PER CAPITA INCOME

	1990	1995	1996	1997	1998	Average Annual Growth Rate (1990-1998)
New Jersey	$24,766	$29,277	$30,795	$32,582	$34,383	4.19%
County:						
Atlantic	$24,277	$28,072	$29,536	$30,062	$31,738	3.41%
Bergen	$32,870	$38,821	$41,015	$43,714	$47,101	4.60%
Burlington	$21,854	$25,218	$26,559	$28,202	$29,556	3.85%
Camden	$20,419	$23,745	$24,920	$26,240	$27,360	3.73%
Cape May	$21,133	$24,579	$25,789	$27,423	$28,297	3.72%
Cumberland	$17,469	$20,047	$20,682	$21,557	$22,756	3.36%
Essex	$24,615	$29,356	$30,653	$31,847	$33,102	3.77%
Gloucester	$18,919	$22,026	$23,040	$24,801	$25,995	4.05%
Hudson	$19,767	$23,477	$24,692	$25,882	$26,970	3.96%
Hunterdon	$28,930	$35,033	$37,049	$40,047	$42,471	4.92%
Mercer	$26,373	$31,685	$33,452	$35,557	$37,551	4.52%
Middlesex	$24,209	$28,418	$29,937	$31,688	$33,289	4.06%
Monmouth	$25,902	$30,235	$31,814	$33,707	$35,626	4.06%
Morris	$31,645	$39,478	$42,090	$45,285	$47,915	5.32%
Ocean	$20,896	$23,907	$24,810	$26,059	$26,815	3.17%
Passaic	$20,567	$23,519	$23,981	$25,302	$26,748	3.34%
Salem	$19,195	$23,118	$24,319	$25,118	$26,234	3.98%
Somerset	$33,686	$41,651	$44,391	$47,164	$49,594	4.95%
Sussex	$22,207	$25,414	$26,715	$27,891	$29,180	3.47%
Union	$26,304	$30,970	$32,725	$34,695	$37,340	4.48%
Warren	$21,182	$24,279	$25,259	$26,732	$28,093	3.59%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, June 15, 2000

As shown in Table 2-3, between 1990 and 1998 New Jersey statewide per capita personal income has increased at an average annual growth rate of approximately 4.19 percent. Those counties experiencing the strongest growth in per capita income include Morris, Somerset, and Hunterdon counties. In general, these counties also offer the highest per capita income levels in the State. Cumberland, Passaic, and Ocean counties experienced the lowest growth rate and also have relatively low income levels.

The following counties experienced average annual growth in per capita income over the period 1990 to 1998 that was greater than statewide growth (4.19 percent) over the same period:

❑ Morris	5.32%
❑ Somerset	4.95%
❑ Hunterdon	4.92%
❑ Bergen	4.60%
❑ Mercer	4.52%
❑ Union	4.48%

The following counties experienced average annual growth in per capita income over the period 1990 to 1998 that was lower than statewide growth (4.19 percent) over the same period:

❑ Middlesex	4.06%
❑ Monmouth	4.06%
❑ Gloucester	4.05%
❑ Salem	3.98%
❑ Hudson	3.96%
❑ Burlington	3.85%
❑ Essex	3.77%
❑ Camden	3.73%
❑ Cape May	3.72%
❑ Warren	3.59%
❑ Sussex	3.47%
❑ Atlantic	3.41%
❑ Cumberland	3.36%
❑ Passaic	3.34%
❑ Ocean	3.17%

C. Unemployment

Table 2-4 presents historic unemployment data for New Jersey counties for 1990 and the years 1995 through 1999. As shown in Table 2-4, the statewide unemployment rate for 1999 was approximately 4.6 percent. County unemployment rates throughout the State ranged from 2.1 percent in Hunterdon County to 10.1 percent in Cape May County in 1999. New Jersey counties that had a 1999 unemployment rate equal to or less than the statewide rate are presented below, along with their associated average unemployment rates over the period:

❑ Hunterdon	2.1%
❑ Somerset	2.5%
❑ Morris	2.8%
❑ Burlington	3.3%
❑ Sussex	3.5%
❑ Bergen	3.7%
❑ Middlesex	3.8%
❑ Monmouth	4.0%
❑ Mercer	4.0%
❑ Warren	4.2%

- Gloucester 4.5%
- Ocean 4.6%
- Camden 4.6%

Table 2-4
NEW JERSEY UNEMPLOYMENT

	1990	1995	1996	1997	1998	1999
New Jersey	5.1	6.4	6.2	5.1	4.6	4.6
County:						
Atlantic	6.2	8.6	8.4	7.4	7.8	7.2
Bergen	3.9	5.8	5.3	4.4	3.6	3.7
Burlington	4.6	5.0	4.8	3.8	3.4	3.3
Camden	5..9	6.4	6.0	4.9	4.5	4.6
Cape May	7.7	12.1	11.8	10.9	10.3	10.1
Cumberland	7.5	9.8	9.9	8.6	8.9	8.6
Essex	6.3	7.7	7.8	6.5	5.6	5.7
Gloucester	5.6	6.5	6.2	4.9	4.6	4.5
Hudson	7.3	9.3	9.2	7.8	7.3	7.2
Hunterdon	2.7	3.2	3.1	2.4	2.2	2.1
Mercer	4.4	5.4	5.7	4.6	4.1	4.0
Middlesex	4.5	5.5	5.2	4.2	3.7	3.8
Monmouth	4.1	5.4	5.3	4.4	4.0	4.0
Morris	3.2	4.3	4.0	3.3	2.8	2.8
Ocean	5.1	6.2	6.1	5.4	4.8	4.6
Passaic	6.4	8.6	8.3	6.8	5.8	6.2
Salem	5.3	6.5	7.2	5.6	5.0	4.7
Somerset	2.9	3.8	3.4	2.8	2.6	2.5
Sussex	4.2	5.7	5.3	4.3	3.6	3.5
Union	5.4	6.5	6.3	5.4	4.8	4.8
Warren	4.3	5.7	5.5	4.5	4.0	4.2

Source: New Jersey Department of Labor, Labor Market & Demographic Research, March 1, 2000

New Jersey counties that had a higher average unemployment rate in 1999 than the statewide rate are presented below, along with their associated average unemployment rates over the period:

- Salem 4.7%
- Union 4.8%
- Essex 5.7%
- Passaic 6.2%
- Hudson 7.2%
- Atlantic 7.2%
- Cumberland 8.6%
- Cape May 10.1%

D. Summary

Demographic data for New Jersey and its 21 counties has been presented in the previous sections. Analysis of the three socioeconomic factors included in this study indicates that New Jersey's counties have varied in relation to recent trends in population growth, per capita income growth, and average unemployment rates. By comparing recent socioeconomic trends in each county to statewide averages for each factor, those counties outperforming statewide trends can be identified. **Table 2-5** summarizes the data presented in Table 2-2, Table 2-3, and Table 2-4 and shows which counties are outperforming statewide trends for each of the socioeconomic factors examined. In addition, Table 2-5 also includes the total number of socioeconomic factors in which each county is outperforming the State.

Table 2-5
NEW JERSEY SOCIOECONOMIC TRENDS

COUNTY	OUTPERFORMING STATE RELATIVE TO PROJECTED AVERAGE ANNUAL POPULATION GROWTH	OUTPERFORMING STATE RELATIVE TO AVERAGE ANNUAL PER CAPITA INCOME GROWTH	OUTPERFORMING STATE RELATIVE TO UNEMPLOYMENT RATE (1999)	FACTORS IN WHICH COUNTY IS OUTPERFORMING STATE
Atlantic	✓			1
Bergen		✓	✓	2
Burlington	✓		✓	2
Camden			✓	1
Cape May				0
Cumberland				0
Essex				0
Gloucester	✓		✓	2
Hudson				0
Hunterdon	✓	✓	✓	3
Mercer		✓	✓	2
Middlesex	✓		✓	2
Monmouth	✓		✓	2
Morris	✓	✓	✓	3
Ocean	✓		✓	2
Passaic				0
Salem				0
Somerset	✓	✓	✓	3
Sussex	✓		✓	2
Union		✓		1
Warren	✓		✓	2

Source: Wilbur Smith Associates

As shown in Table 2-5, the following New Jersey counties are outperforming statewide trends in each of the three demographic factors included in this analysis:

- Hunterdon
- Morris
- Somerset

The following counties are outperforming statewide trends in two factors:

- Bergen
- Burlington
- Gloucester
- Mercer
- Middlesex
- Monmouth
- Ocean
- Sussex
- Warren

The following counties were outperforming statewide trends in one factor that was included in this analysis:

- Atlantic
- Camden
- Union

Finally, the following counties were under performing relative to each of the statewide trends identified in this analysis:

- Cape May
- Cumberland
- Essex
- Hudson
- Passaic
- Salem

III. NATIONAL AVIATION TRENDS

Trends in the commercial airline industry could substantially impact air service in New Jersey, particularly as they relate to how the State's demand for commercial airline travel will be served in the future. Trends in general aviation are also important to consider since almost every airport in the New Jersey System, even the air carrier airports, accommodates some segment of general aviation activity. Furthermore, the vast majority of New Jersey airports support only general aviation aircraft operations. Having an understanding of the general aviation industry is important to developing statewide projections of future demand for this component of the industry. Included in this examination of general aviation trends will be a discussion of changing patterns in the business use of general aviation aircraft.

Recent trends affecting federal and state funding resources for aviation will also be examined as they relate to New Jersey airports. The availability of funds at both the state and national level is a factor that can substantially impact an airport system's maintenance and development. Recent legislation, including the Federal Aviation Investment and Reform Act for the 21st Century (AIR-21), will substantially impact airport funding throughout the nation and New Jersey. Historic funding characteristics in New Jersey as well as anticipated future funding trends will be thoroughly examined in this section.

This chapter documents trends in each of the various components of aviation identified above. Trends presented in this chapter are generally for the U.S. as a whole, and they are intended to provide a general frame of reference for the reader of this report. This trends analysis sets the stage for an understanding of how aviation activity in New Jersey compares to aviation in the country, and it establishes a basis for predicting how aviation may be expected to grow and change in the future. Having this frame of reference is essential to realistic projections of statewide aviation demand and to identifying viable alternatives for improving New Jersey's airport system.

A. Trends Affecting Scheduled Service Airports

Currently, the following three New Jersey airports support scheduled passenger traffic; Newark International Airport, Atlantic City International Airport, and Trenton-Mercer Airport. A brief description of these airports, as well as recent passenger activity statistics follows.

- Newark Liberty International Airport – Newark Liberty International Airport (EWR) is operated by The Port Authority of New York and New Jersey and is located in Essex and Union Counties approximately 16 miles from midtown Manhattan. As of October 1, 2000, Newark Liberty International Airport was served by 45 scheduled commercial airlines. In 1999, the airport accommodated over 455,500 total aircraft operations, processed almost 33.3 million total passengers, and enplaned/deplaned over one million tons of air cargo and over 123,000 tons of airmail. Recently completed airport improvement projects include the opening of a new international arrivals facility and initiation of monorail service in 1996. In addition, major improvement projects including the Terminal A "relifing" project, modernization of Terminal B common public areas, and the Continental Global Gateway Project have all been completed since 1999, or are currently underway.

- Atlantic City International Airport - The South Jersey Transportation Planning Authority, an agency of the State of New Jersey, operates Atlantic City International Airport (ACY). Atlantic City International Airport is located in Atlantic County and is approximately 10 miles from downtown Atlantic City. As of October 1, 2000, the airport was served by two scheduled commercial airline carriers; Spirit Airlines and Continental Airlines. In addition, several charter operators provide frequent service at the airport for casino patrons and others. The airport has experienced a trend of strong growth in passenger activity over recent years, and in 1998 the airport served over one million total passengers for the first time in its history. In 1999, it was estimated that the airport enplaned almost 410,000 passengers. Recent airport improvements include a terminal expansion project completed in 1996, apron and taxiway improvement completed in

1997, and a recent parking improvement project that expanded the airports available parking by 75 percent, to 1,100 total spaces. The airport is also home to the FAA William J. Hughes Technical Center, a New Jersey Air National Guard base, and a new maintenance facility for Raytheon Aircraft Services.

- Trenton-Mercer Airport – Trenton-Mercer Airport (TTN) serves a diverse array of scheduled service and general aviation users. As of October 1, 2000, the airport was served by one scheduled service airline, Shuttle America, which provided service to Greensboro, Boston, and Buffalo. A recent environmental assessment analyzed planned airport improvements including a terminal expansion project.

Recent trends affecting scheduled service passenger activity at U.S. airports will be summarized in the following sections.

B. Recent Trends In Commercial Airline Service

The airline industry operates in a perpetual state of adjustment and change. During the last 20 years, the United States experienced unprecedented expansion of air carrier capacity and large investments by carriers to control the flow of traffic through networks of hub airports. In various markets, there have been documented skirmishes between the major carriers and new entrants. Where competition prevailed, air passengers reaped the rewards of low airfares. At single carrier hubs and local airports, passengers paid, on average, much higher fares. In the late 1980s, the carriers lost millions of dollars. Those losses had a profound effect on the way airlines operated. Some of the most dramatic changes that occurred included the sudden and complete shutdown of several hub operations and the demise of several flagship carriers, notably Eastern Airlines, Braniff, and Pan Am.

The 1990s ushered in a new period of mergers, global alliances, and joint marketing agreements as well as domestic alliances between major and regional carriers. In addition, there been have significant structural changes in the way airlines conduct business. The airlines have examined every aspect of their operations to reduce costs. A “shifting downstream” of service to smaller communities marked the mid-1990s. The regional carriers, with lower labor costs, came into their own. Shorter haul service to hub airports was turned over to the regional carriers and they provided high frequency, turboprop service to and from their major carrier affiliate’s hub airport. For many communities, the turboprops were never fully accepted. As the domestic system solidified, the major carriers have re-entered this segment of the airlines business by acquisition of the regional carriers and by replacement of turboprops with regional jets. This process has left smaller cities with few options for air service.

Four major factors that have helped to shape the development of today’s industry are as follows:

- **A robust, but cyclical economy –** trends in commercial passenger boardings, when compared to the U.S. Gross Domestic Product, indicate a direct relationship between periods of GDP growth and decline to periods of increases and decreases in the total number of U.S. commercial passenger boardings. These trends clearly indicate that the airline industry and commercial passenger traffic are significantly impacted by upturns and downturns in the U.S. economy. Since the early 1990s, the steady growth in the U.S.

economy has resulted a lengthy period of significant increases in total commercial passenger traffic.

- **Over expansion of the airline industry in the late 1980s –** The over expansion of the airline industry that was experienced in the late 1980s was a major factor that caused airlines to lose over $13 billion during the early 1990s, the largest losses ever experienced. As a result of these losses, airlines were forced to re-evaluate their systems and make the following changes;

  - Major adjustments to their route structures, concentrating on the most profitable routes
  - Increase seating capacity and maximize frequencies to achieve higher load factors
  - Eliminate secondary connecting hubs and introduce point-to-point service in the larger markets
  - Focus on the development of strategic marketing alliances with regional carriers in the U.S. and other airlines abroad
  - Rationalize aircraft fleets that on average, offered lower operating costs

- **Widespread adoption of similar, successful strategies by each of the major carriers –** The 3 to 5-year long term planning horizons under which most airlines operate allow them to observe and quickly emulate the successful strategies of their competitors. This copycat approach to providing air service has resulted in several episodic waves of strategic changes by the airlines. The following are examples of these types of actions that have been taken by most major airlines:

  - Development of hub fortresses to capture and control traffic flows,
  - Initiation of frequent flyer programs
  - Code sharing alliances with regional carriers
  - Replacement of jets with turboprop aircraft in short haul markets
  - Emulation of Southwest Airlines
  - Abandonment/Reduction of 19-seat aircraft
  - Replacement of turboprops with regional jets
  - Acquisition of whole or part of code-sharing partners

  Widespread adoption of these strategies has intensified their impact on air service within the U.S.

- **Technological advances including computer reservation systems, yield management, and e-commerce –** The use of computers has had a profound impact on the air carrier industry from the standpoint of operations, marketing, pricing, and ticket distribution. One of the most significant changes has been the ability of airlines to implement Yield Management Systems that allow them to constantly track price, bookings, and fare information for many airlines. These systems allow airlines to have up-to-the-minute information about passenger demand and fares, which allows their pricing departments to constantly adjust fares, frequently over one million times per day, to adjust the number of seats and airfares to maximize load factors and revenues. In addition, the recent growth in the use of electronic and paperless tickets and the direct purchase of tickets from the airlines, as opposed to the traditional travel agent process, has also significantly impacted the industry.

C. Anticipated Future Trends In Commercial Airline Service

The preceding description of historic commercial airline trends are the background from which the Federal Aviation Administration (FAA) has developed forecasts of future levels of commercial passenger activity. The FAA, in ***FAA Aerospace Forecasts, Fiscal Years 2000-2011,*** reflects anticipated strong growth over the next decade in both domestic and international passenger activity at U.S. airports. The following paragraphs summarize the FAA's forecasts of future commercial airline passenger activity.

Based on the FAA's forecast of continued, yet slowing, economic expansion in the U.S., commercial passenger enplanements in the U.S. are anticipated to experience sustained growth. The FAA projects that total domestic passenger enplanements will increase from approximately 611.2 million in 1999 to approximately 944.7 million in 2011, representing an average annual growth rate of approximately 3.6 percent.

FAA forecasts of international passenger activity are based on the assumption that the world economy (based on international GDPs) will grow at a pace that exceeds the U.S. GDP growth over the forecast period. Based on this assumption, international passenger enplanements are projected to increase from approximately 53.3 million in 1999 to approximately 101.7 million in 2011. This growth represents a relatively robust forecasted average annual growth rate of approximately 5.1 percent. The strongest growth in total international passenger traffic is anticipated to be experienced in the Latin American markets and Pacific markets, forecast to grow at an average annual rate of approximately 6.1 percent and 6.0 percent, respectively. Average annual growth rates in the Atlantic and Canadian markets are projected at approximately 4.3 percent and 3.6 percent, respectively.

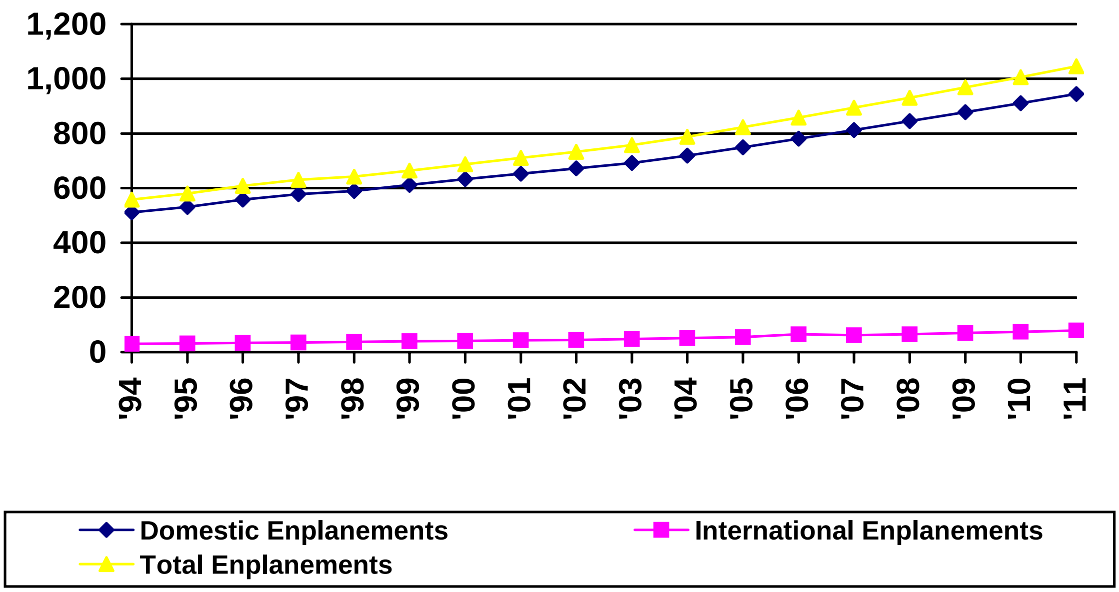
Table 2-6 presents a summary of historic passenger enplanement levels at U.S. airports and the FAA's domestic and international passenger enplanement forecasts through 2011.

Table 2-6
U.S. HISTORIC AND PROJECTED ENPLANEMENTS (IN MILLIONS)

Year	Domestic Enplanements	International Enplanements	Total Enplanements
Historical			
1994	511.3	46.3	557.6
1995	531.1	48.6	579.7
1996	558.1	50.0	608.1
1997	578.3	52.3	630.6
1998	589.3	53.1	642.4
1999	611.2	53.3	664.5
Average Annual Growth Rate	3.6 %	2.9 %	3.6 %
Forecast			
2000	632.5	55.6	688.1
2001	652.4	58.1	710.5
2002	672.3	60.9	733.2
2003	692.6	64.7	757.3
2004	719.6	68.7	788.3
2005	749.9	72.8	822.7
2006	781.3	76.9	858.2
2007	812.5	81.2	893.7
2008	844.8	86.0	930.8
2009	877.4	91.0	968.4
2010	910.4	96.2	1,006.6
2011	944.7	101.7	1,046.4
Average Annual Growth Rate	3.6 %	5.5 %	3.9 %

Source: FAA Aerospace Forecasts, Fiscal Years 2000 - 2011

Domestic and international passenger enplanement data presented in the previous table is depicted in the following graph.



Source: FAA Aerospace Forecasts, Fiscal Years 2000 - 2011

In summary, current FAA forecasts for commercial passenger activity in the U.S. project stable and relatively strong growth in both domestic and international enplanements at U.S. airports. Domestic passenger enplanements are projected to increase at an average annual rate of approximately 3.6 percent from 1999 to 2011, the same growth rate experienced at U.S. airports between 1994 and 1999. International passenger enplanements are projected to increase at an average annual rate of approximately 5.5 percent over the forecast period, a rate significantly greater than the 2.9 percent average annual growth rate experienced in this category of enplanements between 1994 and 1999.

D. Trends Affecting General Aviation Airports

General aviation aircraft are all aircraft that are not flown by airlines or the military. This class of aircraft operates at each New Jersey airport. Following a decline that lasted throughout most of the 1980's and into the mid-1990's, the general aviation industry and general aviation activity appear to be revitalized. Prior to 1994, declines in the number of manufacturers and shipments of single-engine aircraft continued to indicate a sagging general aviation industry. Other indicators such as active aircraft, hours flown, and active pilots, all of which are important indicators of the overall health of the general aviation industry, also declined annually during that time period. The impact of this downturn was the decline in production of new aircraft from almost 18,000 aircraft in 1978 to 928 aircraft in 1994. This decline in the production of new aircraft resulted in the loss of approximately 100,000 jobs in the industry. The enactment of the General Aviation Revitalization Act of 1994, which established an 18-year Statute of Repose on all general aviation aircraft and components, in terms of liability to the manufacturer, signaled a significant change in the industry. This Act spurred manufacturers such as Cessna and Piper Aircraft to reenter the single-engine piston manufacturing sector. In January 1997, Cessna produced its first new single-engine aircraft since 1986. New piston aircraft are also being produced domestically by Lancer International, Diamond Aircraft, and Mooney.

The positive impacts that the Act has had on the general aviation industry since its passage are currently reflected in general aviation activity statistics. Since 1994, activity statistics indicate an increase in general aviation activity at FAA air traffic facilities, an increase in the active general aviation aircraft fleet size, and record shipments and billings of fixed-wing general aviation aircraft. These recent positive trends in the general aviation industry are anticipated to continue into the future due to a number of factors including the following:

- Construction of new aircraft manufacturing facilities
- Expansion of existing manufacturing facilities
- Increased expenditures on research and development of aircraft and avionics intended to make flying even safer and easier to learn

In addition, the general aviation industry is giving increased attention to "learn to fly" educational and promotion activities that should bring new pilots and aircraft mechanics into the industry.

Specific trends related to general aviation activity, as identified in the Fiscal Year 2000 FAA Aerospace Forecasts developed by the U.S. Department of Transportation, will be identified in following sections. These anticipated future trends will be discussed in terms of the number of aircraft shipments and billings, active aircraft and pilots, changes in the active aircraft fleet mix, and business use of general aviation aircraft.

1. Aircraft Shipments and Billings

The General Aviation Manufacturers Association (GAMA) tracks and reports total shipments and billings of general aviation aircraft. GAMA statistics for 1999 indicate continued strong growth in the sales of general aviation aircraft, both piston and turbojet. During 1999, general aviation aircraft shipments totaled 2,504 aircraft, an increase of approximately of 12.8 percent over 1998. This represents the fifth consecutive year of increased demand for general aviation aircraft. Statistics also indicate that growth in turboprop and jet aircraft shipments are outpacing other sectors of the general aviation aircraft market. A number of factors contribute to this increase in general aviation aircraft shipments including the production of new aircraft such as the Boeing Business Jet, the general strength of the U.S. economy, increases in the number of fractional ownership arrangements, and increases in the number of traditional corporate flight departments among U.S. businesses.

In addition, GAMA tracks total billings of general aviation aircraft, for both domestic and international customers. During 1999, aircraft billings totaled over $7.8 billion, an increase of approximately 34 percent over total billings in 1998. Included in this increase is a strong growth experienced in international billings. Currently, international general aviation shipments and billings represent over 20 percent of the U.S. manufactured aircraft.

Table 2-7 presents total general aviation aircraft shipments and billings, on an annual basis, over the time period 1990 through 1999.

Table 2-7
GENERAL AVIATION AIRCRAFT SHIPMENTS AND BILLINGS

Year	Total General Aviation Aircraft Shipments	Total General Aviation Aircraft Billings ($ millions)
1990	1,144	2,007.5
1991	1,021	1,968.3
1992	941	1,839.6
1993	964	2,143.8
1994	928	2,357.1
1995	1,077	2,841.9
1996	1,130	3,126.5
1997	1,569	4,674.3
1998	2,200	5,873.9
1999	2,504	7,843.6
Average Annual Growth Rate (1990-1999)	*9.1%*	*16.4%*

Source: GAMA

The statistics presented by GAMA illustrate the continued strength of the general aviation aircraft manufacturing industry. In addition to the significant increases in total shipments and billings of general aviation aircraft, it is important to note that the strongest growth appears to be occurring in the jet and turbo-prop segments of the market. The growth in these segments can be attributed to increased business use of aircraft, and their desire to operate safe, efficient, and high performance aircraft. These high performance aircraft require airport facilities to be developed to a relatively higher and more demanding standard, a factor that will be considered as system development plans are identified in this analysis.

2. Active Pilots

In 1999, the four major segments of the pilot population; student pilots, private pilots, commercial pilots, and airline transport pilots, each experienced growth. As a result, the total number of active pilots increased to 640,113 pilots in 1999, an increase of almost 22,000 pilots compared to 1998. One of the strongest growth rates was experienced in the student pilot population, which increased by approximately 4.4 percent. These students represent the future of general aviation and are not only learning to fly for recreational reasons but also because of career opportunities created by the needs of air carriers, fractional ownership providers, and corporate flight departments. Also worthy of noting is the 2.9 percent growth rate experienced in instrument rated pilots in 1999. Currently, approximately 57.5 percent of the total active pilot population is instrument-rated, another reflection of the increased sophistication of aircraft and pilot.

The FAA has developed forecasts of the future pilot population, by certificate type, based on historic trends as well as anticipated future trends. These projections estimate that the total active pilot population in the U.S. will increase from 640,113 in 1999 to 824,490 by 2011, representing an average annual growth rate of approximately 2.1 percent.

Table 2-8 presents the FAA forecasts of the active pilot population, by pilot certificate type, on an annual basis over the forecast period.

Table 2-8
HISTORIC AND PROJECTED PILOT POPULATIONS

Year	Student	Private	Commercial	Airline Transport	Other 1/	Total
Historical						
1994	96,254	284,236	138,728	117,434	17,436	654,088
1995	101,279	261,399	133,980	123,877	18,649	639,184
1996	94,947	254,002	129,187	127,486	16,639	622,261
1997	96,101	247,604	125,300	130,858	16,479	616,342
1998	97,736	247,226	122,053	134,612	16,671	618,298
1999	102,000	258,749	124,261	137,642	17,461	640,113
Avg. Annual Growth Rate	*1.2 %*	*-1.9 %*	*-2.2 %*	*3.2 %*	*.03 %*	*-0.4 %*
Forecast						
2000	106,100	260,700	126,200	139,700	17,696	650,396
2001	110,300	267,400	128,400	144,400	17,936	668,436
2002	114,700	272,000	130,600	149,500	18,140	684,940
2003	119,300	277,500	133,300	154,400	18,345	702,845
2004	124,000	283,700	136,300	159,300	18,544	721,844
2005	128,300	288,000	138,300	164,000	18,744	737,344
2006	132,700	291,400	139,900	169,300	18,943	752,243
2007	137,000	294,600	141,500	174,400	19,137	766,637
2008	141,000	297,600	142,900	180,000	19,347	780,847
2009	145,000	300,600	144,300	186,000	19,561	795,461
2010	148,800	303,600	145,800	192,000	19,771	809,971
2011	152,500	306,600	147,300	198,100	19,990	824,490
Avg. Annual Growth Rate	*3.4 %*	*1.4 %*	*1.4 %*	*3.1 %*	*1.1 %*	*2.1 %*

Note: 1/ Other pilot category includes pilots with recreational, rotor craft only, and glider only certificates.
Source: FAA U.S. Civil Airmen Statistics and FAA Aerospace Forecasts, Fiscal Years 2000 - 2011

The data presented above show relatively strong growth, ranging from an average annual rate of 1.4 percent in the private and commercial pilot categories to an average annual rate of 3.4 percent in the student pilot category. The strong growth anticipated in the student pilot category is important to note because of the potential impacts that this growing number of pilots may have on all components of general aviation activity in the future. Student pilots, in most cases, will graduate to become active private, commercial, and/or airline transport pilots, which in turn may impact overall active aircraft fleet and general aviation activity statistics.

3. Aircraft Fleet

The FAA annually tracks the number of active aircraft in the U.S. Active aircraft are those aircraft that are currently registered and fly at least one-hour during the year. By tracking this information, the FAA is able to identify trends in the total number of active aircraft as well as the types of aircraft operating in the active fleet. Since 1994, statistics indicated that the active aircraft fleet has been steadily increasing, FAA projections indicate that this trend is anticipated to continue. Based on FAA estimates, the active general aviation aircraft fleet is anticipated to increase from 206,530 aircraft in 1999 to 230,995 in 2011, representing an average annual growth rate of approximately 0.9 percent. FAA forecasts for the total active aircraft fleet, as well as each major type of aircraft, are summarized in **Table 2-9**.

Table 2-9
HISTORIC AND PROJECTED ACTIVE AIRPORT FLEET MIX

Year	SE Piston	ME Piston	Turboprop	Turbo Jet	Rotor Craft 1/	Other 2/	Total
Historical							
1994	127,351	14,801	4,092	3,914	4,728	18,050	172,936
1995	137,049	15,739	4,995	4,559	5,830	19,917	188,089
1996	137,401	16,150	5,716	4,424	6,570	20,869	191,129
1997	140,038	16,017	5,619	5,178	6,785	18,772	192,414
1998	144,234	18,729	6,174	6,066	7,426	22,082	204,710
1999	145,250	18,750	6,250	6,400	7,590	22,290	206,530
Average Annual Growth Rate	2.7 %	4.8 %	8.8 %	10.3 %	9.9 %	4.3 %	3.6 %
Forecast							
2000	146,400	18,750	6,340	6,820	7,745	22,600	208,655
2001	147,600	18,750	6,430	7,240	7,895	22,910	210,825
2002	148,800	18,750	6,520	7,660	8,010	23,230	212,970
2003	150,000	18,750	6,610	8,080	8,135	23,550	215,125
2004	151,200	18,750	6,700	8,500	8,240	23,880	217,270
2005	152,400	18,750	6,790	8,910	8,355	24,210	219,415
2006	153,400	18,750	6,870	9,320	8,465	24,540	221,345
2007	154,400	18,750	6,950	9,725	8,575	24,880	223,280
2008	155,400	18,750	7,030	10,125	8,690	25,220	225,215
2009	156,400	18,750	7,100	10,520	8,805	25,570	227,145
2010	157,400	18,750	7,170	10,910	8,920	25,920	229,070
2011	158,400	18,750	7,240	11,295	9,040	26,270	230,995
Average Annual Growth Rate	0.7 %	0 %	1.2 %	4.8 %	1.5 %	1.4 %	0.9 %

Notes: 1/ Includes both piston and turbine rotorcraft.
2/ Includes aircraft classified by FAA as experimental and other.
Source: FAA Aerospace Forecasts, Fiscal Years 2000 – 2011

As shown in the preceding table, the total active aircraft fleet is forecast to experience an average annual growth rate of under one percent. One of the most important trends identified in these forecasts is the relatively strong growth anticipated in active jet and turboprop aircraft. This trend illustrates a movement in the general aviation community towards higher performing, more demanding aircraft. A trend that will impact the types of activities occurring at general aviation airports and the types of facilities that may be required at those airports.

Forecast data presented by the FAA indicates that each component of the general aviation aircraft fleet mix will either remain steady (multi engine piston) or grow in terms of total number of active aircraft. This FAA data indicates that jet and other aircraft will be the only components of the general aviation aircraft fleet mix that will see their share of the active fleet grow over the forecast period. Jet aircraft are anticipated to grow from approximately 3 percent of the active general aviation fleet mix in 1998 to approximately 5 percent of the active fleet by 2011, indicating the relative increase in sophistication that is anticipated in the active aircraft fleet and pilot population. The “other” category of aircraft are also forecast to become a larger component of the active fleet, primarily because of growth in experimental aircraft, growing from approximately 11 percent of the fleet to 12 percent of the fleet by 2011.

Current and/or forecasted trends affecting general aviation can be summarized as follows:

- Recent and continued increases in the number of annual general aviation aircraft shipments

- Growth in the number of licensed pilots augmented by a relatively strong growth in the number of student pilots

- Moderate growth in the active aircraft fleet and a trend towards the operation of more demanding and more sophisticated jet aircraft as opposed to piston or turbo-prop aircraft

4. Business Use of General Aviation Aircraft

Many businesses throughout the U.S. depend on scheduled commercial service airlines, as well as general aviation aircraft, to add to their productivity and efficiency. New Jersey's airports are essential to economic progress of the citizens and businesses of New Jersey. Without these airports, the State would be severely hampered in its ability to participate in an increasingly global community and marketplace. Air transportation makes possible the quick movement of millions of people and billions of dollars worth of goods to markets around the world. New Jersey needs to be able to compete in those markets, and there is often no practical alternative to air transportation. Similarly, the growth of a competitive domestic economy depends more and more on our ability to move by air.

A major benefit of New Jersey’s airports is the State's ability to use air transportation to support its competitive advantage in a global economy. Today's economy can present commercial opportunities at any time and in any place. To remain competitive and take advantage of those opportunities, the businesses of New Jersey must be able to move people and products anywhere in the world safely, quickly, and conveniently. Air transportation is the preeminent means for commerce and communication among people, with long-range jet aircraft providing nonstop air service to major cities. In addition to the use of scheduled commercial airline services, more and more businesses throughout the nation are looking to general aviation aircraft, and the flexibility and efficiency that they provide, to support their domestic and international business operations.

Many of the nation's leading employers that use general aviation as a business tool are members of the National Business Aircraft Association (NBAA). Data from NBAA shows that many of the top U.S. businesses use general aviation aircraft. The NBAA's *Business Aviation Fact Book 2000* indicates that approximately 70 percent of all businesses included in the *Fortune 500* operate general aviation aircraft. In addition, 90 of the *Fortune 100* companies operate general aviation aircraft. A detailed analysis conducted for NBAA in 1998 also indicated that among the *Fortune 500* there were more than twice as many companies operating general aviation aircraft as nonoperators.

Business use of general aviation aircraft can range from the rental of small single-engine aircraft to multiple aircraft corporate fleets that are supported by dedicated flight crews and mechanics. The use of general aviation aircraft allows employers to efficiently transport priority personnel and air cargo. Businesses use general aviation aircraft to link multiple office locations and to reach existing and potential customers. The use of business aircraft by smaller companies has escalated as various chartering, leasing, time-sharing, interchange agreements, partnerships, and management contracts have emerged. NBAA statistics support this claim by indicating that the number of flight departments among all the nation's businesses increased from 6,584 in 1991 to 8,778 in 1999, an increase of approximately 33 percent. Fractional ownership arrangements have also experienced a recent trend of rapid growth. In 1998, NBAA estimated that 1,125 companies used fractional ownership arrangements, by 1999 that number had grown to 1,693 companies, a growth of over 50 percent in a single year.

Regardless of how the aircraft are owned or what type of aircraft is flown, businesses choose to use general aviation because it provides safe, efficient, flexible, and reliable transportation. Of all the benefits provided to business by general aviation, flexibility is the most valued by all businesses using general aviation aircraft. While there are many reasons that businesses use general aviation in their day-to-day operation, some of the most important factors, according to the businesses themselves, are as follows:

- Flexibility
- Time Savings
- Reliability
- Safety
- Improved Marketing Efficiency
- Facility/Branch Office Control
- Personnel Development Training
- Privacy and Comfort
- Efficiency
- Security

One other benefit that is becoming increasingly important to both employees and employers using general aviation aircraft for business travel is that it minimizes non-business hours away from home. Using business aircraft increases the flexibility of scheduling and provides rapid, safe, and efficient access to meeting locations. These factors allow employees using general aviation aircraft to travel to and from their destination in less time than would be required in a traditional commercial service airline schedule that includes layovers, delays, and other time-consuming events. The positive effect that minimizing non-business time away from home has on employee morale and productivity is impossible to measure, yet growing in importance.

The use of general aviation as a business tool adds to productivity and to the bottom line. According to an NBAA survey of key *Forbes and Fortune 500* companies, those businesses that use general aviation aircraft on a routine basis significantly outperform businesses that do not use general aviation aircraft. Performance indicators such as annual sales, number of employees, value of assets, and annual income are significantly higher for employers using general aviation aircraft.

IV. NEW JERSEY AVIATION TRENDS

Trends affecting New Jersey airports will be discussed in the following sections. The national aviation trends previously presented in this analysis will be important to this study, however, recent trends in New Jersey may not necessarily correspond to national trends. Comparison of New Jersey's recent aviation trends to those of the nation as a whole may help to highlight the extent to which future trends in New Jersey may correspond to projected national trends.

Recent New Jersey general aviation trends will be discussed in the following sections:

- Trends Affecting New Jersey Scheduled Service Airports
- Trends Affecting New Jersey General Aviation Airports

A. Trends Affecting New Jersey Scheduled Service Airports

There are currently three scheduled service airports in New Jersey and six scheduled service airports in neighboring states that affect scheduled service activity in New Jersey. New Jersey's three scheduled service airports include:

- Newark Liberty International Airport
- Atlantic City International Airport
- Trenton Mercer Airport

In addition, the scheduled airports in neighboring states that are used by many New Jersey residents include:

- John F. Kennedy International Airport (New York)
- Laguardia International Airport (New York)
- Lehigh Valley International Airport (Pennsylvania)
- New Castle County Airport (Delaware)
- Philadelphia International Airport (Pennsylvania)
- Wilkes-Barre/Scranton International Airport (Pennsylvania)

Because New Jersey's airports are impacted by their proximity to neighboring airports in other states, it is important to examine trends at each of the airports identified above. Potential scheduled service passengers, as well as local and itinerant general aviation pilots, choose to use individual airports for a number of reasons including cost, convenience, types of facilities and services provided, and other intangible factors. These choices can affect overall activity levels at each of the airports.

Activity statistics for commercial passenger enplanements and aircraft operations at New Jersey and neighboring scheduled service airports will be presented in the following sections. In addition to activity levels 1990 and the years 1995 through 1999, average annual growth rates experienced over the period 1990 to 1999 will also be presented.

Data presented in the following tables was collected from several sources including the Federal Aviation Administration's Terminal Area Forecast (TAF) and the NJDOT AIMS database, it should be noted that 1999 statistics in most of these tables are forecasted estimates, not actual counts.

1. Scheduled Service Passenger Enplanements

Table 2-10 presents historic passenger enplanement data for New Jersey's three scheduled service airports and the six neighboring scheduled service airports included in this analysis. As shown in Table 2-10, the strongest average annual enplanement growth rates over the period 1990 through 1999 were experienced at Trenton-Mercer Airport and New Castle County Airport. This statistically strong growth is the result of the introduction of significantly expanded scheduled service at these facilities over the period by Eastwind and Shuttle America at Trenton-Mercer Airport and by Shuttle America at New Castle County Airport in Wilmington, Delaware for a portion of 1999. Scheduled service passenger enplanements at Newark Liberty International Airport grew from over 11 million in 1990 to approximately 16.6 million in 1999, representing an average annual growth rate of approximately 4.65 percent. Enplanements at Atlantic City International Airport grew at an average annual rate of approximately 0.95 percent, increasing from 376,486 enplanements in 1990 to almost 410,000 enplanements in 1999.

At neighboring scheduled service airports, passenger enplanement growth between 1990 and 1999 ranged from negative growth at Laguardia International Airport and Wilkes-Barre Scranton International Airport to an average annual growth rate of approximately 4.75 percent at Philadelphia International Airport.

In general, the data presented in Table 2-10 depicts relatively stable passenger growth throughout the region. The three airports with the lowest total number of enplanements in 1999, Trenton-Mercer, New Castle County, and Wilkes-Barre/Scranton, have seen their passenger growth rates be directly affected by changes in the levels and types of scheduled service provided by airlines at those airports.

Table 2-10
SCHEDULED SERVICE AIRPORT ENPLANEMENTS

NJ Airport	*1990*	*1995*	*1996*	*1997*	*1998*	*1999**	*Average Annual Growth Rate (1990-1999)*
Atlantic City Intl.	376,486	269,166	378,260	424,110	393,940	409,972	0.95%
Newark Liberty International	11,010,985	13,446,484	14,222,038	15,162,431	16,112,546	16,573,597	4.65%
Trenton-Mercer	9,653	4,569	64,265	79,783	86,389	88,422	27.90%
Neighboring Airport	***1990***	***1995***	***1996***	***1997***	***1998***	***1999****	***Average Annual Growth Rate (1990-1999)***
John F. Kennedy Intl.	14,450,132	14,332,130	15,261,684	15,605,841	15,379,686	15,741,533	0.96%
Laguardia Intl.	11,407,887	10,387,115	10,323,129	10,800,154	11,116,169	11,362,937	-0.04%
Lehigh Valley Intl.	426,174	466,075	465,873	458,879	474,477	496,896	1.72%
New Castle County	3,291	452	460	393	841	52,841	36.13%
Philadelphia Intl.	7,999,606	8,849,175	9,039,527	10,433,050	11,470,165	12,147,909	4.75%
Wilkes-Barre/Scranton Intl.	242,678	220,870	236,067	220,468	218,250	232,880	-0.46%

* = Forecasted

Source: FAA Terminal Area Forecast

2. Aircraft Operations at Scheduled Airports

Total aircraft operations at scheduled service airports are comprised of scheduled service and general aviation aircraft operations. The number of scheduled service operations that occur at a scheduled airport is primarily driven by the type of airline service provided at that airport as well as the number of enplanements occurring at that facility. General aviation operations at scheduled service airports are influenced by the number of transient business aircraft using those facilities, as well as the presence of based general aviation aircraft that could be used for business, training, or recreational purposes. Because of capacity constraints and differences in aircraft operational characteristics, most general aviation pilots avoid operating at busy scheduled service airports. As the data presented in **Table 2-11** indicates, at airports such as Newark Liberty International, Philadelphia International, John F. Kennedy International, and Laguardia International few, if any, general aviation operations occur on an annual basis. Smaller scheduled service airports, however, such as Trenton Mercer Airport, currently play an important role in accommodating business and recreational general aviation aircraft operations.

Table 2-11 presents historic data regarding total aircraft operations, split between scheduled service and general aviation operations, at scheduled service airports in New Jersey and some neighboring airports. Data are presented for the years 1990 and 1995 through 1999.

Table 2-11
TOTAL OPERATIONS AT SCHEDULED SERVICE AIRPORTS

NJ Airport	*Operation Type*	*1990*	*1995*	*1996*	*1997*	*1998*	*1999 1/*	*Average Annual Growth Rate (1990-1999)*
Atlantic City International	Commercial	27,660	25,513	24,971	26,800	31,900	32,071	1.66%
	GA	97,272	89,617	86,156	99,540	105,694	106,866	1.05%
	Total	124,932	115,130	111,127	126,340	137,594	138,937	1.19%
Newark Liberty International	Commercial	360,190	408,441	423,968	449,088	441,670	443,272	2.33%
	GA	23,958	20,262	19,463	18,600	19,567	19,229	-2.41%
	Total	384,148	428,703	443,431	467,688	461,237	462,501	2.08%
Trenton-Mercer	Commercial	3,704	1,163	3,866	3,997	4,615	4,751	2.80%
	GA	150,284	144,546	118,823	107,085	106,365	133,673	-1.29%
	Total	153,988	145,709	122,689	111,082	110,980	138,424	-1.18%
Neighboring Airport	*Operation Type*	*1990*	*1995*	*1996*	*1997*	*1998*	*1999 1/*	*Average Annual Growth Rate (1990-1999)*
John F. Kennedy Intl.	Commercial	321,517	329,532	345,307	346,590	345,839	339,758	0.62%
	GA	20,758	15,731	15,204	15,715	15,689	15,703	-3.05%
	Total	342,275	345,263	360,511	362,305	361,528	355,461	0.42%
Laguardia Intl.	Commercial	341,354	327,806	322,432	334,783	336,505	346,019	0.15%
	GA	23,611	19,063	20,186	18,928	19,699	19,159	-2.29%
	Total	364,965	346,869	342,618	353,711	356,204	365,178	0.01%
Lehigh Valley Intl.	Commercial	35,674	34,351	34,780	37,253	38,324	38,864	0.96%
	GA	101,533	118,208	101,989	102,451	104,550	106,040	0.48%
	Total	137,207	152,559	136,769	139,704	142,874	144,904	0.61%
New Castle County	Commercial	3,615	3,087	2,756	2,503	4,532	9,482	11.31%
	GA	198,389	162,895	143,465	147,124	139,624	139,624	-3.83%
	Total	202,004	165,982	146,221	149,627	144,156	149,106	-3.32%
Philadelphia Intl.	Commercial	349,678	356,806	354,199	403,414	413,513	426,867	2.24%
	GA	55,411	52,342	51,922	56,102	51,779	52,277	-0.64%
	Total	405,089	409,148	406,121	459,516	465,292	479,144	1.88%
Wilkes-Barre/ Scranton Intl.	Commercial	24,834	17,074	20,938	19,251	18,038	22,487	-1.10%
	GA	42,245	46,859	35,324	50,227	55,784	52,882	2.53%
	Total	67,079	63,933	56,262	69,478	73,822	75,369	1.30%

Notes: 1/ TAF Projection

Source: FAA Terminal Area Forecast

3. General Aviation Based Aircraft at Scheduled Airports

Table 2-12 presents data regarding based general aviation aircraft at the scheduled service airports being examined in this analysis. As previously stated, many general aviation aircraft operators prefer not to base aircraft at larger scheduled airports due to the congestion and constrained operating conditions that are associated with airports such as Newark Liberty International, Philadelphia International, John F. Kennedy International, and Laguardia

International. Smaller scheduled service airports, however, and their relatively high level of facility development are important in accommodating based general aviation aircraft, including corporate and business type aircraft. Table 2-12 presents bases aircraft data for the years 1990 and 1995 through 1999.

As shown in Table 2-12, based aircraft numbers at these scheduled service airports have fluctuated over the period. Lehigh Valley International Airport and Wilkes-Barre/Scranton International Airport are the only scheduled service airports examined that have experienced a positive average annual growth rate in based aircraft over the 1990 to 1999 period. The declines experienced at the other scheduled service airports could indicate a desire of the aircraft owner/operators to move general aviation aircraft to less congested reliever and general aviation airports. Such a trend of moving general aviation aircraft to these general aviation airports has a positive impact on the system in that it increases capacity at the scheduled service airports and promotes activity at the less congested general aviation airports.

Table 2-12
TOTAL BASED AIRCRAFT AT SCHEDULED SERVICE AIRPORTS

NJ Airport	***1990***	***1995***	***1996***	***1997***	***1998***	***1999 1/***	***Average Annual Growth Rate (1990-1999)***
Atlantic City Intl.	64	43	35	39	39	29	-8.42%
Newark Liberty International	16	12	12	12	12	12	-3.15%
Trenton-Mercer	173	158	166	166	166	166	-0.46%
Neighbor Airport	***1990***	***1995***	***1996***	***1997***	***1998***	***1999***	***Average Annual Growth Rate (1990-1999)***
John F. Kennedy Intl.	0	0	0	0	0	0	0.00%
Laguardia Intl.	8	0	0	0	0	0	-100.00%
Lehigh Valley Intl.	98	123	121	102	102	103	0.55%
New Castle County	256	272	317	253	253	253	-0.13%
Philadelphia Intl.	72	39	47	51	51	51	-3.76%
Wilkes-Barre/Scranton Intl.	36	57	57	45	45	45	2.51%

Notes: 1/ NJDOT AIMS Data, also presented in Chapter 1: *Inventory*
Source: FAA Terminal Area Forecast

B. Trends Affecting New Jersey General Aviation Airports

Data regarding historic activity levels at New Jersey general aviation airports is presented in the following sections. Airport activity data typically provides a good indication of not only the total amounts of activity occurring at an airport, but also recent increases or declines in activity levels that may have been experienced at New Jersey facilities. Data will be presented for the following components of airport activity:

- General Aviation Aircraft Operations at General Aviation Airports
- General Aviation Based Aircraft at General Aviation Airports

Data is presented for 1990 and the years 1995 through 1999. Data sets for 1990 and the years 1995 through 1998 are taken from FAA Terminal Area Forecasts. All data that is presented for 1999 is taken from the current NJDOT AIMS database.

1. General Aviation Aircraft Operations at General Aviation Airports

Historic total operations data for New Jersey general aviation airports is presented in **Table 2-13**. It is important to note that during the time period for which airport specific and statewide operations data is presented, a significant change occurred in the manner in which the data is collected. Prior to 1997, aircraft operations data represents "best guess" estimates that were made by airport managers/operators at general aviation airports not having an aircraft control tower. In many instances, these "best guess" estimates of aircraft operations may have been inflated based on the subjective nature of the process. However, beginning in 1997, a statewide counting program was initiated at New Jersey general aviation airports by the Delaware Valley Regional Planning Commission (DVRPC). Data collected through the counting program is based on a statistically valid procedure, and therefore, represents a much more accurate count of aircraft operations. Based on this new counting procedure, the decrease in total operations from approximately 2.7 million operations in 1990 to approximately 1.2 million in 1999 may not necessarily indicate that fewer ***actual*** aircraft operations occurred.

Table 2-13
TOTAL OPERATIONS AT GENERAL AVIATION AIRPORTS

NJ Airport	*1990*	*1995*	*1996*	*1997*	*1998*	*1999 1/*	*Average Annual Growth Rate (1997-1999)*
Aeroflex-Andover Field	---	---	---	23,141	---	24,826	3.58%
Alexandria	---	---	---	27,427	---	29,863	4.35%
Bader Field	22,664	14,200	14,200	11,600	11,600	11,600	0.00%
Blairstown	50,600	38,300	38,300	32,873	---	23,228	-15.94%
Bucks	---	---	---	---	---	860	NA
Camden County	26,088	---	---	---	---	16,143	NA
Cape May County	42,433	40,300	40,300	29,941	---	---	NA
Central Jersey Regional	41,700	38,700	36,400	26,599	---	37,486	18.71%
Cross Keys	105,000	115,000	90,000	90,000	37,540	---	NA
Eagles Nest	---	---	---	---	---	50	NA
Essex County	254,856	225,611	219,369	212,601	239,015	239,015	6.03%
Flying W	---	---	---	---	39,361	---	NA
Greenwood Lake	8,250	9,700	33,500	35,244	---	29,523	-8.48%
Hackettstown	---	---	---	---	---	1,900	NA
Hammonton Municipal	59,800	61,850	61,850	24,858	---	---	NA
Kroelinger	---	---	---	---	---	1,500	NA
Lakewood	33,810	33,810	33,810	25,454	---	---	NA
Li Calzi Airpark	---	---	---	---	---	200	NA
Lincoln Park	180,200	169,000	43,000	56,365	---	58,453	1.84%

Table 2-13
TOTAL OPERATIONS AT GENERAL AVIATION AIRPORTS, Continued

NJ Airport	*1990*	*1995*	*1996*	*1997*	*1998*	*1999 1/*	*Average Annual Growth Rate (1997-1999)*
Linden	192,992	60,300	59,300	69,499	---	---	NA
Little Ferry Seaplane Base	---	---	---	---	---	40	NA
Marlboro	---	---	---	25,012	---	---	NA
Millville Municipal	110,000	90,000	43,470	43,470	---	---	NA
Monmouth Executive	244,350	275,347	263,353	66,152	---	---	NA
Morristown Municipal	245,041	277,066	206,093	261,493	259,080	259,080	-0.46%
Newton	---	---	2,635	2,635	---	10,695	101.47%
Ocean City Municipal	66,008	66,000	18,205	18,205	---	---	NA
Old Bridge	21,720	42,250	24,787	24,787	---	---	NA
Princeton	23,520	27,800	46,436	43,436	---	50,622	7.96%
Red Lion	25,025	41,800	41,800	---	15,373	---	NA
Red Wing	---	---	---	---	---	12,500	NA
Robert J. Miller Airpark	---	---	---	37,267	---	---	NA
Rudy's	---	---	---	---	---	5,800	NA
Sky Manor	46,120	46,120	32,417	32,417	---	26,372	-9.80%
Solberg-Hunterdon	87,000	86,800	36,173	36,173	---	37,282	1.52%
Somerset	170,255	170,200	41,565	41,565	---	40,764	-0.97%
Southern Cross	---	---	---	---	---	---	NA
South Jersey Regional	58,159	53,351	---	---	---	---	NA
Spitfire Aerodrome	38,850	33,850	7,600	3,990	---	---	NA
Sussex	---	---	---	---	34,134	34,026	NA
Teterboro	212,766	195,853	193,260	188,384	213,538	213,538	6.47%
Trenton-Robbinsville	307,700	35,520	30,440	30,440	30,440	44,329	20.68%
Trinca	3,140	7,000	11,395	11,491	11,576	11,395	-0.42%
Twin Pine	---	---	---	---	---	12,000	NA
Vineland Downstown	---	---	---	---	---	13,700	NA
Woodbine Municipal	35,040	36,040	15,762	15,762	---	---	NA
Total	2,713,087	2,291,768	1,685,420	1,548,281	891,657	1,246,790	-10.26%

Notes: 1/ NJDOT AIMS Data, also presented in Chapter 1: *Inventory*
---/ Data Not Available
NA/ Not Applicable

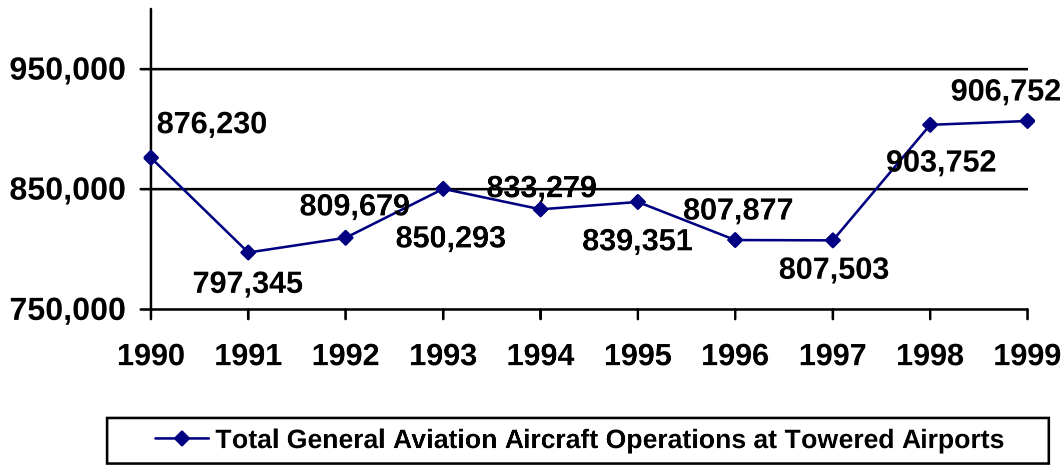
Source: FAA Terminal Area Forecast

Because of the inconsistency in general aviation operations statistics that resulted from improvements made to the operations counting procedures, total general aviation aircraft operations counts were collected from the six New Jersey airports the have FAA Air Traffic Control Towers (ATCT). Those towered airports for which data was collected include:

- Atlantic City International Airport
- Essex County Airport
- Morristown Municipal Airport
- Newark Liberty International Airport

- Teterboro Airport
- Trenton-Mercer Airport

ATCT general aviation operation data was collected from the FAA Air Traffic Activity Data System (ATADS). Air traffic controllers at FAA towers count and classify each operation that occurs at their facility. As a result, tower counts provide data on actual operations counts and, therefore, historic data for the period from 1990 to 1999 can accurately be compared and actual operations trends at these airports can be identified. The following graph summarizes total general aviation aircraft operations at towered airports in New Jersey for the period 1990 through 1999:



Source: FAA Air Traffic Activity Data System (ATADS), December 20, 2000.

As the data presented above indicates, total general aviation operations at New Jersey's towered airports increased from 876,230 operations in 1990 to 906,752 operations in 1999, representing an average annual growth rate of approximately 0.40 percent. Within this period, a significant increase in general aviation operations occurred between 1997 and 1999. Total general aviation operations at towered airports increased from 807,503 operations in 1997 to 906,752 operations in 1999. This increase represents an average annual growth rate over the three-year period of approximately 6.0 percent.

NJDOT AIMS data indicates that 1,246,790 general aviation operations were counted at New Jersey general aviation airports in 1999. ATADs data indicates that approximately 906,800 operations occurred at New Jersey's towered airports in 1999. Although the data presented above does not include data for all airports, it does represent a substantial amount of the State's total general activity, and it provides the most accurate means for comparing general aviation activity statistics for the period 1990 through 1999.

Because of the inconsistency seen in historic operations data as a result of a change in the methodology used to collect the data, direct comparisons of data for individual airports and the statewide total over the period examined can not be developed. However, because operations data presented for the year 1999 represents a significantly more accurate count, it will be used as a baseline from which to project future operations levels at general aviation airports in New Jersey.

2. General Aviation Based Aircraft at General Aviation Airports

Table 2-14 presents based aircraft data for New Jersey's general aviation airports. Based aircraft are those general aviation aircraft that are permanently stored at an airport in either aircraft storage hangar units or tied-down. Based aircraft numbers at airports frequently fluctuate based on a number of factors including pilot preferences and availability of aircraft storage hangar units. Individual airport data, as well as statewide totals, for based aircraft are presented in Table 2-14.

Table 2-14
GENERAL AVIATION BASED AIRCRAFT

NJ Airport	1990	1995	1996	1997	1998	1999 1/	Average Annual Growth Rate
Aeroflex-Andover Field	---	---	---	---	---	68	NA
Alexandria Field	---	---	---	---	98	102	NA
Bader Field	6	6	6	6	6	15	10.72%
Blairstown	186	166	166	159	159	159	-1.73%
Bucks	---	---	---	---	---	22	NA
Camden County	66	66	40	52	52	52	-2.61%
Cape May County	72	71	69	64	64	67	-0.80%
Central Jersey Regional	245	220	162	148	148	157	-4.82%
Cross Keys	132	132	78	76	76	65	-7.57%
Eagles Nest	---	---	---	---	---	1	NA
Essex County	363	366	366	360	360	374	0.33%
Flying W	83	93	90	93	93	76	-0.97%
Greenwood Lake	53	50	69	68	68	45	-1.80%
Hackettstown	---	---	---	---	---	62	NA
Hammonton Municipal	59	59	59	59	59	59	0.00%
Kroelinger	---	---	---	---	---	6	NA
Lakewood	68	84	84	83	83	83	2.24%
Li Calzi Airpark	---	---	---	---	---	4	NA
Lincoln Park	190	180	184	184	184	93	-7.63%
Linden	141	119	128	128	128	129	-0.98%
Little Ferry Seaplane Base	---	---	---	---	---	0	NA
Marlboro	---	---	---	---	---	37	NA
Millville Municipal	107	107	115	68	68	105	-0.21%
Monmouth Executive	244	285	232	219	219	219	-1.19%
Morristown Municipal	341	416	322	322	322	325	-0.53%
Newton	---	---	16	16	16	6	NA
Ocean City Municipal	36	36	36	32	32	30	-2.01%
Old Bridge	25	74	102	103	103	112	18.13%

Table 2-14
GENERAL AVIATION BASED AIRCRAFT, Continued

NJ Airport	*1990*	*1995*	*1996*	*1997*	*1998*	*1999 1/*	*Average Annual Growth Rate*
Princeton	152	142	148	152	152	150	-0.15%
Red Lion	101	34	34	53	53	78	-2.83%
Red Wing	---	---	---	---	---	13	NA
Robert J. Miller Airpark	---	---	---	---	103	100	NA
Rudy's	---	---	---	---	---	4	NA
Sky Manor	102	96	97	97	97	102	0.00%
Solberg-Hunterdon	66	113	113	113	113	78	1.87%
Somerset	178	212	205	205	205	205	1.58%
Southern Cross	---	---	---	---	---	0	NA
South Jersey Regional	---	---	192	192	192	228	NA
Spitfire Aerodrome	92	35	28	28	28	30	-11.71%
Sussex	---	---	---	---	158	145	NA
Teterboro	354	398	289	289	289	216	-5.34%
Trenton-Robbinsville	128	52	61	61	61	71	-6.34%
Trinca	25	23	21	24	24	22	-1.41%
Twin Pine	---	---	---	---	---	28	NA
Vineland Downstown	---	---	---	---	---	22	NA
Woodbine Municipal	26	26	26	42	42	47	6.80%
Total	3,641	3,661	3,538	3,496	3,855	4,012	1.08%

Notes: 1/ NJDOT AIMS Data, also presented in Chapter 1: *Inventory*
---/ Data Not Available
NA/ Not Applicable

Source: FAA Terminal Area Forecast

As shown in Table 2-14, statewide total based aircraft at general aviation airports in New Jersey increased from 3,641 aircraft in 1990 to 4,012 aircraft in 1999, representing an average annual growth rate of approximately 1.08 percent. **Table 2-15** summarizes based aircraft data for New Jersey's general aviation airports. In Table 2-15, those airports that experienced an average annual growth rate greater than the statewide growth rate over the period 1990 to 1999 are presented, as well as those airports that experienced growth rates below the statewide rate. Those airports for which there is insufficient historical data are excluded.

Table 2-15 NEW JERSEY GENERAL AVIATION AIRPORT BASED AIRCRAFT		
General Aviation Airport Based Aircraft Percentage Change (1990-1999)		
Greater than Statewide Growth Rate (1.08%)	*Between Statewide Growth Rate (1.08%) and Zero*	*Negative Growth*
Bader Field Lakewood Old Bridge Solberg-Hunterdon Somerset Woodbine Municipal	Essex County Hammonton Municipal Sky Manor	Monmouth Executive Blairstown Camden County Cape May County Central Jersey Regional Cross Keys Flying W Greenwood Lake Lincoln Park Linden Millville Municipal Morristown Ocean City Municipal Princeton Red Lion Teterboro Trenton-Robbinsville Trinca

Source: NJDOT

Because based aircraft numbers at New Jersey's airports fluctuate on a frequent basis, and because historic data is not available for all airports, the data presented in Table 2-14 and Table 2-15 for the years 1990 and 1995 through 1998 may be somewhat misleading. Based aircraft data for the year 1999 was taken from the NJDOT AIMS database and represents the most thorough and up-to-date data available. Because NJDOT AIMS data is collected from a variety of sources including on-site counts and inspections, 1999 data will be used as the baseline for projections of future based aircraft that will be developed in a following section of this analysis.

3. Business Use of New Jersey General Aviation Airports

To business travelers, the use general aviation aircraft presents an opportunity to increase efficiency and significantly reduce travel times. According to the Report of the New Jersey General Aviation Study Commission, "Business aircraft reduce not only flight time, but also total travel time by providing point-to-point service and by their ability to utilize smaller airports closer to final destinations." In a society where time is a precious commodity, general aviation has become a necessary tool used by many companies to conduct business efficiently.

It is typically financially beneficial, because of reduced travel times and lower overall operating costs, for businesses to locate their headquarters or facilities near airports. In addition, most businesses have specific facility requirements that must be met in order for them to permanently base a corporate aircraft at an airport. As business aircraft continue to become more demanding, and more expensive, these facility requirements become even more important. For these reasons, and as stated in the Report of the General Aviation Study Commission, a declining state aviation system could lead to the relocation of businesses to other states with more adequate aviation systems. [2]

For a number of reasons, including their location relative to major industrial and financial centers, New Jersey general aviation airports provide a home base for a number of business aircraft. Some major companies currently basing corporate aircraft at New Jersey airports include the following:

- AlliedSignal
- BASF
- Schering-Plough
- Union Camp
- American Home Products
- Warner Lambert
- Hoffman-LaRoche
- Barnes & Noble
- Becton-Dickinson
- Merck
- Colgate-Palmolive
- Metromedia
- Loews Corporation
- Philip Morris
- Sony Aviation
- Ronson Aviation
- Unisys Corporation
- Amerada Hess
- Dow Jones
- Johnson & Johnson
- Pfizer Inc.

As this list indicates, New Jersey general aviation airports are used frequently as a base for corporate aircraft. In addition, these airports also support aircraft operations by corporate aircraft associated with companies located across the country and throughout the world. These other companies that do not base aircraft at New Jersey airports but may use them on a frequent basis also benefit significantly from New Jersey's general aviation airports.

V. TRENDS AFFECTING FEDERAL AND STATE FINANCIAL RESOURCES FOR AVIATION

Funding for airport improvement projects is an important issue when considering the future needs of New Jersey's aviation system. In order to meet the needs of the communities and users that they serve, airports typically rely on funding sources in addition to their own revenue. The ability of individual airport sponsors to identify funding sources and successfully obtain funding directly impacts development of those facilities. This section of the SASP will examine the different funding sources that are available to support airport and airport system development. This examination will include a brief overview of the three major sources of airport improvement funds, examination of historic funding levels, and anticipated trends that may affect federal and State resources available for airport development projects in the future. Specific attention will be given to examining the potential impacts that the passage of the Federal Aviation Investment and Reform Act for the 21st Century (AIR-21) may have on New Jersey's airports.

[2] Report of the General Aviation Study Commission, 1997

In general, funding for capital improvement projects can be generated from three major sources: federal, state, and local funds. A brief description of each source of funding is presented below.

A. Federal Funding

Federal funds are distributed back to the nation's airport system by the FAA in the form of Airport Improvement Program (AIP) grants from the Aviation Trust Fund. The Aviation Trust Fund, in its present general form, was originally established in 1970 and has been amended on numerous occasions since then. The purpose of the Aviation Trust Fund is to establish as source of funds, collected only from the users of the nation's airport system, that can be used to fund airport improvements at system airports. The current AIP legislation provides both entitlement funds (enplanement, cargo, and apportionment) and discretionary funds for projects that are eligible according to FAA Order 5100.38A, "Airport Improvement Handbook." General types of projects that are eligible to be funded with AIP grants include those projects that:

- Preserve or enhance safety, security, or capacity of the national air transportation system
- Reduce noise or mitigate noise impacts resulting from an airport
- Furnish opportunities for enhanced competition between or among air carriers

Table 2-16 presents total AIP funding for the fiscal years 1996 through 2000.

Table 2-16
HISTORICAL AIP FUNDING (BILLIONS)

	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000
Total AIP Funding	$1.38	$1.46	$1.50	$1.95	$1.85

Source: FAA Airports Financial Assistance Division

One of the major sources of funds for the Aviation Trust Fund is a ticket tax levied on each scheduled service airline ticket sold in the U.S. This ticket tax ensures that the users of the nation's aviation system are responsible for funding its improvement.

Airports with scheduled service receive grant funds each fiscal year based on the number of passengers that it enplaned the prior calendar year. These are referred to as "enplanement" entitlement funds. Commercial service airports are given entitlement funding based on a graduated methodology developed by the FAA that equates to a lower per enplanement entitlement for the airport as that airport's total enplanement level increases. This process is used to offset funding disparity, to the extent possible, that results from the vastly different level of enplanements that occur at U.S. airport's, from less than 10,000 enplanements per year at small airports to tens of millions of enplanements at major hub airports. In addition, there is a cap on the total amount of enplanement entitlement funding that an individual airport can receive in any given year, this cap only affects that nation's largest scheduled service airports.

Scheduled service airports can also receive cargo funding based on the landed weight of cargo aircraft. This cargo entitlement is also calculated based on a graduated methodology similar to the enplanement entitlement methodology described above. In addition, federal AIP apportionment funds are available to each state's eligible general aviation airports. The FAA allocates funds for general aviation airports in each state based on a formula that considers the size and population of the state. General aviation airports compete for these funds based on the federal priority of each project.

Airports also compete for federal discretionary funds, which are awarded based on priority ratings given to each potential project by the FAA. The prioritization process ensures that the most important and most beneficial projects are the first to be completed, given the availability of adequate discretionary funds.

As a general rule, airport projects that are related to non-revenue producing facilities, such as airfield improvements and land acquisition, are eligible for up to 90 percent federal funding. Only those airports deemed as being crucial to the national system, those airports included in the National Plan of Integrated Airport Systems (NPIAS), are eligible for federal funding. It is important to note, however, that all airports included in the NPIAS are not necessarily eligible for federal funding. In addition, the use of federal AIP funds at any airport requires local matches from state and sponsor/owner sources.

B. AIR 21

AIR-21 is complex legislation that contains a number of changes from previous Airport Improvement Program (AIP) budget authorizations undertaken in conjunction with the Aviation Trust Fund. New procedures for distributing funds to the nation's airports have been developed in AIR-21, and a number of AIP procedures have been revised or amended. The overall outcome of the AIR-21 legislation is that, when it is signed by the President and the funds are appropriated by Congress, the resources available for airport improvement and development projects at U.S. airports will significantly increase. In addition to providing for a significant increase in federal funds available for airport improvement projects at primary commercial service airports, AIR-21 outlines new procedures that will provide states and smaller general aviation airports with dramatic increases in funding that can be used, and/or saved or "bankrolled", to support important projects at smaller general aviation airports.

Table 2-17 presents a comparison of the FY 2000 (October 1999 through September 2000) AIP budget and the anticipated FY 2001 AIR-21 budget. As the table shows, significant increases are expected in all types of funding.

Table 2-17
COMPARISON OF FY 2000 AND 2001 (AIR-21) AIP

Fund Category	FY 2000 AIP	FY 2001 AIP (AIR-21)
Entitlements	$1,100,512,335	$2,004,840,795
Small Airport Fund	$142,204,990	$274,936,625
Discretionary Set-Asides	$231,147,417	$355,758,049
Other Discretionary	$377,135,258	$564,464,531
TOTAL	**$1,851,000,000**	**$3,200,000,00**

Source: House Transportation and Infrastructure Committee Staff

As shown in Table 2-17, the AIP funds anticipated to be available to support airport projects at U.S. airports are anticipated to increase from approximately $1.85 billion to approximately $3.2 billion. The major funding changes identified in AIR-21 are summarized below:

- Minimum passenger entitlement for Primary airports (those airports enplaning at least 10,000 passengers per year) is currently increased from $500,000 to $650,000. When AIP is authorized, at the $3.2 billion level, the minimum entitlement will increase to $1 million.

- Total entitlement amounts for cargo activity (only airports with over 100 million pound of gross landed weight annually) will increase from 2.5 percent of AIP funding to 3 percent.

- When the AIP level is authorized at $3.2 billion or more, states apportionment will increase to 20 percent of the budget, or approximately $640 million at the $3.2 billion level. At this point, an annual apportionment program will be implemented in which general aviation airports will receive the lesser of $150,000 or 1/5 of the most recently published estimates of 5-year costs under the NPIAS. The total of these general aviation entitlements in each state are subtracted from that state's apportionment dollars for that fiscal year and the remaining amount is appropriated to the state.

- The maximum PFC was increased from $3.00 per enplanement to $4.50 per enplanement. Those airports that due increase their PFC to $4.50 will have to forego 75 percent of their federal passenger entitlement monies and meet a variety of specific provisions identified in AIR-21.

The changes described above have a significant impact on total funding available at the federal level, increasing the AIP budget from approximately $1.85 billion to $3.2 billion. In addition to the overall budget increase, many of the changes identified in AIR-21 will directly impact airport funding at the state and local levels. Based on estimates of FY 2001 AIP funding, assuming the authorization of AIR-21, the FAA estimates that state apportionment to New Jersey will increase from approximately $5.6 million in FY 2000 to almost $10.5 million in FY 2001. Included in this increase in state apportionment will be apportionment moneys for some of New Jersey's smaller general aviation airports. For FY 2001, the FAA estimates that New Jersey general aviation airport apportionment under AIR-21 will range from $40,000 at Central Jersey Regional Airport to $150,000 at 16 general aviation airports throughout the State. The total estimated amount of state apportionment funding available to New Jersey's 19 eligible general aviation airports (only those airports in the NPIAS) is approximately $2.6 million.

A final important component of AIR-21 is that it is a multi-year plan that will include fiscal years 2001 through 2003. The funding increases that are included in AIR-21 will, therefore, continue through 2003. This is important because it will allow individual airports and states to plan for airport improvements over the three-year period, instead of the single year periods included in the previous, most recent AIP authorizations. Because of this change, airports will be able to implement multi-year development plans that had previously been impossible because of uncertainty about future funding levels. In addition, general aviation airport entitlements will be able to be saved over the three-year period to allow these smaller airports to "bankroll" their apportionment for use on major projects. In general, these new AIR-21 provisions will allow NJDOT to implement a multi-year development plan at individual airports and for the system of airports, and therefore give NJDOT better ability to meet not only airport-specific improvement goals but also system-wide goals.

C. State Funding

As a block grant state, New Jersey has the authority to determine how AIP grants are distributed to eligible NPIAS airports, excluding primary commercial service airports, within the State. The state block grant program was initiated on October 1, 1989, for three states, Illinois, Missouri, and North Carolina. Since that time, the program has been extended to include nine states, one of which is New Jersey. Specific requirements of block grant states are presented in FAR Part 156, however, as a general rule, only those projects eligible for AIP funding are eligible to be funded under the block grant program.

NJDOT has developed an internal, FAA approved process that is used to determine project funding prioritization. Some factors examined in the NJDOT prioritization process include the type of improvement projects proposed at system airports, current activity levels at airports with proposed projects, and airport roles within the State system. This prioritization process is required because, on an annual basis, project funding requests received by NJDOT are significantly larger than the amount of federal funds made available through the block grant program. Although AIR 21, as described in a following section, may increase the total amount of federal funds available to NJDOT for disbursement through the block grant program, it is anticipated that funding shortfalls will continue in future years.

In addition to federal funds, NJDOT is also charged with disbursing State funds to New Jersey system airports using the same project prioritization process.

VI. TRENDS SUMMARY

Data presented in this chapter regarding economic, demographic, and aviation activity trends for the U.S. and New Jersey can be summarized as follows:

- Economic/Demographic Trends

    - New Jersey continues to be one of the nation's top ten largest producers, in terms of Gross State Product (GSP), and the State experienced on the top increases, in total dollars, in GSP over the period from 1990 to 1998.

    - Within the State, Hunterdon, Morris, and Somerset Counties have historically been, and are projected to remain, strong performers based on the economic and demographic trends and projections examined in this analysis.

- Over the period from 2000 to 2010, Middlesex, Somerset, Ocean, and Monmouth Counties are projected to have the largest increases in gross county population in the State.

- National Aviation Trends

  - Total U.S. domestic scheduled service passenger enplanements are projected to increase from 611.2 million in 1999 to 944.7 million in 2011, representing an average annual growth rate of approximately 3.6 percent.

  - FAA forecasts project positive growth in most components of national general aviation activity including all classes of certified pilots. The strongest growth rate, an average annual growth rate of approximately 3.4 percent, is anticipated for student pilots.

  - The total active general aviation aircraft fleet over the period 1999 to 2011 is projected to grow at an average annual rate of approximately 0.9 percent. The strongest growth within the aircraft fleet is anticipated to occur in the general aviation jet aircraft category which is expected to increase at an average annual rate of approximately 4.8 percent.

- New Jersey Aviation Trends

  - Total commercial passenger enplanements at New Jersey's three scheduled service airports increased from approximately 11.4 million passengers in 1990 to approximately 17.1 million in 1999, representing an average annual growth rate of approximately 4.6 percent.

  - In 1999, over 1.5 million total general aviation operations occurred at New Jersey's airports. In addition, over 480,000 total operations were conducted by scheduled service passenger aircraft at New Jersey's airports.

  - Total general aviation operations at New Jersey's towered airports increased from 876,230 operations in 1990 to 906,752 operations in 1999, representing an average annual growth rate of approximately 0.40 percent.

  - Total based aircraft at New Jersey's system airports increased from 3,894 in 1990 to 4,219 in 1999, representing an average annual growth rate of approximately 0.90 percent.

These tasks will be considered in subsequent SASP tasks to determine how to best develop the New Jersey airport system to meet the State's air transportation and economic needs.

CHAPTER THREE
AIRPORT ROLES

An important initial step in analyzing the future requirements of an airport system is examining the existing system and identifying those airports that currently make up the core system. In this analysis, New Jersey's current core airport system will be identified by examining each airport's functional role within the system and its current contribution to the overall system. It is from this determination of the core system and current functional role of each airport in the system that future airport-specific and system wide development plans will be developed.

In order to identify each airport's current functional role in the system, a detailed analysis based on system performance criteria was conducted. These performance criteria are broad in nature and can be applied to the wide variety of aviation facilities currently existing in the State. By analyzing each system airport in relation to the performance criteria identified for this analysis, the relative contribution that each airport provides to the system will be identified. Based on this analysis, airports in the existing system will be classified in different functional levels based on the ***current*** types and levels of activity occurring at each airport.

It is important to note that the current functional level identified for each system airport is based on a "snapshot in time" analysis of present conditions and is used only as a starting point in this system planning process. Based on analysis that will be conducted throughout the system planning process, including forecasting future levels of activity for the system and examining anticipated trends in demographics and national aviation trends, the future functional role or level for each system airport will be identified.

I. PERFORMANCE CRITERIA

The performance criteria identified for use in this analysis are broad in nature, but are factors that can be considered to describe and define an adequate airport system. These factors can also be used to determine how each airport is currently contributing to the system, thereby establishing its current functional role in the existing system. For this particular analysis, five factors were chosen to classify system airports into functional levels. These five factors, referred to as performance criteria, are listed below:

- Accessibility
- Aviation Activity
- Development Potential
- Economic Contribution
- Existing Infrastructure

II. AIRPORT FUNCTIONAL LEVELS

Before the adequacy of the airport system can be measured, it is first necessary to determine how each airport is currently performing and what each airport is currently contributing to the system. In other words, each airport's functional role within the system must be determined. To identify a functional role for each of the system airports, the performance criteria presented above were examined.

As previously described, the performance criteria used in this analysis were based initially on FAA guidelines, and supplemented through the review of criteria used by other states and planning agencies for similar analyses. With an initial base of performance criteria, input from the Division of Aeronautics was sought at the initiation of this analysis. Following descriptions of and discussions regarding the proposed performance criteria, minor revisions to the performance criteria were made based comments from the Division of Aeronautics. Following the establishment of the five performance criteria to be used in this analysis, members of the consultant team met with Division of Aeronautics staff to assign "importance weightings" to each performance criteria. Although each performance criterion identified for use in this analysis is important to the statewide system, some criteria are relatively more important than others. Importance weightings take these relative levels of importance into consideration, and allow them to be used in the system stratification process.

In the weighting process, each performance criterion was rated on a scale from one to four, with four signifying that the criterion was perceived to be of the highest importance and one signifying a criterion of lesser importance. It was possible to assign the same importance weighting to more than one of the performance criteria. The results of this process lead to the following weights being assigned to each of the performance criterion used in this analysis:

PERFORMANCE CRITERIA	IMPORTANCE WEIGHTING
Accessibility	3
Aviation Activity	4
Development Potential	2
Economic Contribution	1
Existing Infrastructure	4

With these importance weightings assigned, the next step was to rate each individual airport on its current performance relative to each performance criterion. In the rating process, measurable subcategories were identified for each performance criterion. Each performance criterion and the associated measurable subcategories analyzed for each airport in this process are listed below:

- Accessibility
  - Population within a 30-minute drive time
  - Drive time to a 4-lane/Interstate highway
  - Number of businesses within a 30-minute drive time
  - Number of registered pilots within a 30-minute drive time
- Aviation Activity
  - Total number of based aircraft (2000)
  - Total number of aircraft operations (1999)
  - Based aircraft fleet mix (2000)
- Development Potential
  - Airside
  - Landside

- Economic Contribution
  - Total economic impact reported in the 1996 Economic Impact of General Aviation in New Jersey study, adjusted for 1999 activity levels.
- Existing Infrastructure
  - Primary runway length
  - Primary runway pavement condition index (PCI)
  - Type(s) of approach available
  - Number of aircraft storage units

Each system airport was given an actual numeric rating for each of the individual measurable subcategories listed above. In this rating process, 10 signified the highest rating while one signified the lowest rating. Ratings ranging from 10 through 8 were considered to be in the "high" range, ratings beginning with seven and extending through four were considered to be in the "medium" range, and ratings from three down to zero were considered to be in the "low" range. For each of the five performance criteria, airports were grouped into the high, medium, and low categories based on their actual numeric scores for the measurable subcategories examined. The following sections summarize the process, briefly explain the performance criteria and measurable factors used, and present the outcome of the rating process. It is important to note that airports in each table are shown alphabetically within each scoring range.

Later in this analysis, the adequacy of New Jersey's existing airport system will be established by determining how the system is currently performing. The first step in this process, however, is to use the performance criteria to determine, on a general level, the relative contribution that each airport is currently providing the overall system. Based on this analysis, each airport's current functional level, or relative level of importance based on contribution, within the system will be identified.

A. Accessibility

An adequate airport system can be measured by the accessibility, frequently measured by drive times, that it provides to system users. In addition, the role of each airport within the system can also be influenced by accessibility measures. By examining accessibility factors, system airports can be categorized into functional roles based on the differing degrees of accessibility that they provide. By examining accessibility as a performance criterion, those airports that support densely concentrated population centers, as well as those system airports that provide access to more remote areas within the State can be identified. Subsequently these airports can be developed according to the needs associated with differing roles.

The ability of New Jersey's airport system to effectively provide coverage for the different components of aviation demand is most readily measured by accessibility factors. An adequate airport system should provide reasonable drive times for the State's major population centers to an airport that provides scheduled airline service. To support commerce, tourism, and other aspects of the State's economy, most major population and business centers should also be served by aviation facilities that can adequately support business class aircraft. Citizens throughout the State should also be within a reasonable drive time of smaller general aviation facilities that can support recreational use. In addition, identifying those airports that serve distinct market areas within the State is also a very important consideration when examining how individual airports are currently functioning within the State system.

Determining how New Jersey's airports are functioning within the State system also involves determining the level of competition among airports in the same geographic market area. While some market areas in the State have sufficient demand to support multiple system airports, other markets may have more limited demand. When there are competing airports in these lower demand areas, it can result in a dilution of demand in the market area to the point where operators find it difficult or impossible to be financially self-sufficient. In addition, due to scarce funding resources, duplicating investments at airports in these lower demand areas may also be detrimental to the overall system.

Specific accessibility factors that were examined for each airport in this analysis include: total population within a 30-minute drive time of the airport, number of businesses within a 30-minute drive time of the airport, drive time from the airport to a major highway, and the number of registered pilots within a 30-minute drive time of the airport.

Table 3-1 summarizes the results of the rating process for accessibility factors. Table 3-1 shows how the airports rated when grouped into high, medium, and low categories. Airports are presented in alphabetical order and not necessarily in the rank order in which they scored based on the numeric rating process.

Table 3-1
ACCESSIBILITY RATING SUMMARY

ASSOCIATED CITY	AIRPORT NAME	ACCESSIBILITY RATING
Andover	Aeroflex-Andover Field	L
Pittstown	Alexandria Field	L
Atlantic City	Atlantic City International	L
Atlantic City	Bader Field	L
Blairstown	Blairstown	L
Bridgeton	Bucks	L
Berlin	Camden County	M
Wildwood	Cape May County	L
Manville	Central Jersey Regional	M
Cross Keys	Cross Keys	L
West Creek	Eagles Nest	L
Caldwell	Essex County	H
Lumberton	Flying W	M
West Milford	Greenwood Lake	L
Hackettstown	Hackettstown	L
Hammonton	Hammonton Municipal	L
Vineland	Kroelinger	L
Lakewood	Lakewood	M
Bridgeton	Li Calzi Airpark	L
Lincoln	Lincoln Park	M
Linden	Linden	H

Table 3-1
ACCESSIBILITY RATING SUMMARY, Continued

ASSOCIATED CITY	AIRPORT NAME	ACCESSIBILITY RATING
Little Ferry	Little Ferry Seaplane Base	H
Matawan	Marlboro	M
Millville	Millville Municipal	L
Belmar/Farmingdale	Mommouth Executive	M
Morristown	Morristown Municipal	H
Newark	Newark Liberty International	H
Newton	Newton	L
Ocean City	Ocean City Municipal	L
Old Bridge	Old Bridge	M
Princeton/Rocky Hill	Princeton	M
Vincentown	Red Lion	M
Jobstown	Red Wing	M
Toms River	Robert J. Miller Airpark	L
Vineland	Rudy's	L
Pittstown	Sky Manor	L
Readington	Solberg-Hunterdon	M
Somerville	Somerset	M
Mount Holly	South Jersey Regional	M
Williamstown	Southern Cross	L
Pedricktown	Spitfire Aerodrome	M
Sussex	Sussex	L
Teterboro	Teterboro	H
West Trenton	Trenton-Mercer	M
Robbinsville	Trenton-Robbinsville	M
Andover	Trinca	M
Pennington	Twin Pine	M
Vineland	Vineland Downstown	L
Woodbine	Woodbine Municipal	L

Source: Wilbur Smith Associates

B. Aviation Activity

One of the primary missions of all system airports is the quick, convenient, and safe transportation of people and goods. An adequate system of airports must have ample airside and landside facilities to process the movement and storage of aircraft and to meet the varying levels and types of demands at system airports. Aviation activity, therefore, was selected as a performance criterion in this analysis to help identify the current contribution of each airport in the system as well as the functional role that each airport plays in the overall system.

Activity levels at New Jersey airports vary significantly based on a number of factors including airport locations relative to metropolitan and business centers, existing facilities at airports, and roadside access to airports. Examination of aviation activity factors such as total aircraft operations, total based aircraft, and based aircraft fleet mix can provide information that identifies the functional role, as well as the primary types of users, of each New Jersey airport.

Airport activity levels at airports throughout the State are directly impacted by the types activities occurring at the facilities as well the types of aircraft and operators using the facilities. Some airports in New Jersey primarily support recreational pilots and training activities, these airports may have a high level of local operations and provide storage facilities for a large number of single engine aircraft. Other New Jersey airports, such as Teterboro, are used primarily by corporate aircraft flying to or from the New York City metropolitan area to access clients and customers throughout the world. These business type airports might have a significant number of based jet and multi-engine aircraft, the type of aircraft frequently used for executive transport. Newark International Airport, a major scheduled service hub airport, supports thousands of commercial airline operations on a daily basis, however, because of limited land areas the airport may not support any based aircraft.

Aviation activity factors that were examined in this analysis include total aircraft operations, total based aircraft, and aircraft fleet mix at each system airport. Each system airport was ranked and rated based on the activity factors presented above to help determine how New Jersey's airports currently support the operations of varied aviation users, including commercial service users, business users, recreational users, and training operators. It is important to understand the component of aviation demand that each system airport supports so that the various facility demands associated with different users can be planned. Activity ratings for New Jersey's airports are presented in **Table 3-2**.

Table 3-2
ACTIVITY RATING SUMMARY

ASSOCIATED CITY	AIRPORT NAME	ACTIVITY RATING
Andover	Aeroflex-Andover Field	M
Pittstown	Alexandria Field	M
Atlantic City	Atlantic City International	M
Atlantic City	Bader Field	L
Blairstown	Blairstown	M
Bridgeton	Bucks	L
Berlin	Camden County	L
Wildwood	Cape May County	M
Manville	Central Jersey Regional	M
Cross Keys	Cross Keys	M
West Creek	Eagles Nest	L
Caldwell	Essex County	H
Lumberton	Flying W	M
West Milford	Greenwood Lake	L
Hackettstown	Hackettstown	L
Hammonton	Hammonton Municipal	M
Vineland	Kroelinger	L
Lakewood	Lakewood	M
Bridgeton	Li Calzi Airpark	L

Table 3-2
ACTIVITY RATING SUMMARY, Continued

ASSOCIATED CITY	AIRPORT NAME	ACTIVITY RATING
Lincoln	Lincoln Park	M
Linden	Linden	M
Little Ferry	Little Ferry Seaplane Base	L
Matawan	Marlboro	L
Millville	Millville Municipal	M
Belmar/Farmingdale	Monmouth Executive	M
Morristown	Morristown Municipal	H
Newark	Newark Liberty International	M
Newton	Newton	L
Ocean City	Ocean City Municipal	L
Old Bridge	Old Bridge	M
Princeton/Rocky Hill	Princeton	M
Vincentown	Red Lion	L
Jobstown	Red Wing	L
Toms River	Robert J. Miller Airpark	M
Vineland	Rudy's	L
Pittstown	Sky Manor	M
Readington	Solberg-Hunterdon	M
Somerville	Somerset	M
Mount Holly	South Jersey Regional	M
Williamstown	Southern Cross	L
Pedricktown	Spitfire Aerodrome	L
Sussex	Sussex	M
Teterboro	Teterboro	H
West Trenton	Trenton-Mercer	M
Robbinsville	Trenton-Robbinsville	M
Andover	Trinca	L
Pennington	Twin Pine	L
Vineland	Vineland Downstown	L
Woodbine	Woodbine Municipal	L

Source: Wilbur Smith Associates

C. Development Potential

The ability of system airports to expand and/or improve to support future activity levels is an important measure of the existing airport system. Airports often need to provide additional facilities and services to meet growing demand, to serve larger aircraft, or to meet their functional role in the statewide airport system. Therefore, having a system of airports that exhibits the ability to be expanded is another factor that can be used to determine airport functional roles within the system. An airport's expansion potential can be assessed from two standpoints, its ability to accommodate additional or improved facilities related to its runway and taxiway system and its ability to accommodate landside facilities such as hangars, aircraft parking aprons, auto parking, FBO facilities, and terminal buildings. In both cases, maintaining and/or acquiring a sufficient land envelope around system airports to support future development needs is important to the success of the overall system. The need to provide expanded facilities, however, must be considered in tandem with the human and natural environment.

There are several factors that can inhibit or even preclude airport expansion opportunities. These factors include environmental constraints, man-made development, financial limitations, and topographical features. While some constraints to development can be overcome with unconstrained investment, the overall cost benefit ratio for such expansion must be considered. Some airports in the State appear to have fewer constraints to expansion than others. In some instances, however, airports that can be more readily expanded are not located in high demand areas. Nevertheless, identifying those airports that can more readily be expanded helps to establish the adequacy of the airport system and to determine each airport's system function.

Airports and communities in New Jersey can help support the ability of system airports to expand. One way that this can be accomplished is through regular and timely updates of airport master plans and layout plans. By periodically reviewing long term development requirements, the need for expansion projects can be identified and steps taken to help insure that development projects can be implement. By adopting height zoning or other land use controls, communities throughout the State can help to insure continued safe and compatible airport operations. In addition, by monitoring and controlling development around airports, communities can help to support each airport's future expansion needs.

Table 3-3 summarizes the results of the development potential rating process. For this criterion, each airport's ability to accommodate future landside and airside improvements was rated separately and then averaged to reflect each airport's ability to meet this criterion.

Table 3-3
DEVELOPMENT POTENTIAL RATING SUMMARY

ASSOCIATED CITY	AIRPORT NAME	DEVELOPMENT POTENTIAL RATING
Andover	Aeroflex-Andover Field	L
Pittstown	Alexandria Field	M
Atlantic City	Atlantic City International	M
Atlantic City	Bader Field	L
Blairstown	Blairstown	M
Bridgeton	Bucks	H
Berlin	Camden County	L
Wildwood	Cape May County	H
Manville	Central Jersey Regional	M
Cross Keys	Cross Keys	M
West Creek	Eagles Nest	M
Caldwell	Essex County	L
Lumberton	Flying W	M
West Milford	Greenwood Lake	L
Hackettstown	Hackettstown	L
Hammonton	Hammonton Municipal	H
Vineland	Kroelinger	M

Table 3-3
DEVELOPMENT POTENTIAL RATING SUMMARY, Continued

ASSOCIATED CITY	AIRPORT NAME	DEVELOPMENT POTENTIAL RATING
Lakewood	Lakewood	M
Bridgeton	Li Calzi Airpark	L
Lincoln	Lincoln Park	L
Linden	Linden	L
Little Ferry	Little Ferry Seaplane Base	L
Matawan	Marlboro	L
Millville	Millville Municipal	H
Belmar/Farmingdale	Monmouth Executive	M
Morristown	Morristown Municipal	L
Newark	Newark Liberty International	M
Newton	Newton	M
Ocean City	Ocean City Municipal	L
Old Bridge	Old Bridge	L
Princeton/Rocky Hill	Princeton	L
Vincentown	Red Lion	L
Jobstown	Red Wing	L
Toms River	Robert J. Miller Airpark	H
Vineland	Rudy's	L
Pittstown	Sky Manor	M
Readington	Solberg-Hunterdon	H
Somerville	Somerset	L
Mount Holly	South Jersey Regional	M
Williamstown	Southern Cross	L
Pedricktown	Spitfire Aerodrome	M
Sussex	Sussex	L
Teterboro	Teterboro	L
West Trenton	Trenton-Mercer	M
Robbinsville	Trenton-Robbinsville	L
Andover	Trinca	L
Pennington	Twin Pine	L
Vineland	Vineland Downstown	L
Woodbine	Woodbine Municipal	H

Source: Wilbur Smith Associates

D. Economic Contribution

New Jersey's businesses, citizens, and tourists rely heavily on the safe and efficient access to transportation that the State's airports provide through their accommodation of commercial and general aviation aircraft operations. Travel by air is vitally important to economic development and diversification in New Jersey, especially with the movement to a truly global economy. In addition to the economic efficiencies gained by aviation users, airport tenants and ancillary businesses create a significant number of jobs and economic activity statewide. Airports that contribute significantly to local, regional, and statewide economies are obviously playing an important role in New Jersey's airport system.

Recognizing the significant role that aviation plays in New Jersey's economy, the Division of aeronautics undertook a statewide economic impact study in 1996 to measure the economic contribution of all system airports. Data regarding each airport's economic impact from that study was used as a performance criterion to measure each airport's contribution to the state economy and the State aviation system.

For the economic contribution criterion, results from New Jersey's 1996 Economic Impact of General Aviation Airports Study were adjusted to reflect current general aviation activity levels, and each airport was rated based its updated total impact estimates. **Table 3-4** summarizes how the airports scored in this category.

Table 3-4
ECONOMIC CONTRIBUTION RATING SUMMARY

ASSOCIATED CITY	AIRPORT NAME	ECONOMIC CONTRIBUTION RATING
Andover	Aeroflex-Andover Field	L
Pittstown	Alexandria Field	L
Atlantic City	Atlantic City International	H
Atlantic City	Bader Field	L
Blairstown	Blairstown	L
Bridgeton	Bucks	L
Berlin	Camden County	L
Wildwood	Cape May County	M
Manville	Central Jersey Regional	L
Cross Keys	Cross Keys	L
West Creek	Eagles Nest	L
Caldwell	Essex County	M
Lumberton	Flying W	L
West Milford	Greenwood Lake	L
Hackettstown	Hackettstown	L
Hammonton	Hammonton Municipal	M
Vineland	Kroelinger	L
Lakewood	Lakewood	L
Bridgeton	Li Calzi Airpark	L
Lincoln	Lincoln Park	L
Linden	Linden	M
Little Ferry	Little Ferry Seaplane Base	L
Matawan	Marlboro	L
Millville	Millville Municipal	H
Belmar/Farmingdale	Monmouth Executive	M
Morristown	Morristown Municipal	H
Newark	Newark Liberty International	H
Newton	Newton	L
Ocean City	Ocean City Municipal	L

Table 3-4
ECONOMIC CONTRIBUTION RATING SUMMARY, Continued

ASSOCIATED CITY	AIRPORT NAME	ECONOMIC CONTRIBUTION RATING
Old Bridge	Old Bridge	L
Princeton/Rocky Hill	Princeton	L
Vincentown	Red Lion	L
Jobstown	Red Wing	L
Toms River	Robert J. Miller Airpark	L
Vineland	Rudy's	L
Pittstown	Sky Manor	L
Readington	Solberg-Hunterdon	L
Somerville	Somerset	L
Mount Holly	South Jersey Regional	M
Williamstown	Southern Cross	L
Pedricktown	Spitfire Aerodrome	L
Sussex	Sussex	L
Teterboro	Teterboro	H
West Trenton	Trenton-Mercer	H
Robbinsville	Trenton-Robbinsville	L
Andover	Trinca	L
Pennington	Twin Pine	L
Vineland	Vineland Downstown	L
Woodbine	Woodbine Municipal	L

Source: Wilbur Smith Associates

E. Existing Infrastructure

A considerable amount of local, private, State, and Federal investment has gone into the development of New Jersey's existing airport system. Further, there are many airside and landside facilities at airports throughout the State that have a substantial remaining useful life. Therefore, it is important to consider and to maximize the return on historic investment, where possible, in New Jersey's airport system.

When airports in the State system are categorized by functional level, a set of facilities and services that should ideally be in place at airports in each functional grouping can be established. By identifying how airports in each functional level meet established facility and service objectives, the adequacy of New Jersey's airport system can be further determined. From the investment perspective, it is also desirable for airports in the system to comply with applicable FAA design standards for their established airport reference code (ARC). To leverage maximum federal investment in New Jersey's airport system, it is important for system airports to comply with applicable design standards for their OFAs, RSAs, and RPZs. Standards for these critical safety areas vary in accordance with each airport's ARC. The adequacy of the airport system can also be measured by identifying those airports that provide runway lengths that are sufficient to meet FAA design standards, as well as the needs of the critical aircraft operating at airports in the State.

While the major focus of investment is usually on new capital development projects, it is considered equally important to invest in the maintenance of existing facilities, especially in terms of pavement. New Jersey has an on-going pavement management plan which helps to identify and direct investment in terms of maintaining pavements at all system airports. Ideally, pavement on each airport's primary runway should have a pavement condition index (PCI) of 75 or greater. A PCI of 75 or greater indicates a good condition for the airport's primary runway and helps to establish the adequacy of the State's airport system.

Specific performance measures related to existing infrastructure that were examined in this analysis include the length of each airport's the primary runway, that runway's PCI, most demanding type of approach available at the airport, and the number of aircraft storage units available. **Table 3-5** summarizes the ratings for system airports in the existing infrastructure category.

Table 3-5
EXISTING INFRASTRUCTURE RATING SUMMARY

ASSOCIATED CITY	AIRPORT NAME	EXISTING INFRASTRUCTURE RATING
Andover	Aeroflex-Andover Field	L
Pittstown	Alexandria Field	M
Atlantic City	Atlantic City International	M
Atlantic City	Bader Field	M
Blairstown	Blairstown	M
Bridgeton	Bucks	L
Berlin	Camden County	M
Wildwood	Cape May County	M
Manville	Central Jersey Regional	M
Cross Keys	Cross Keys	M
West Creek	Eagles Nest	L
Caldwell	Essex County	M
Lumberton	Flying W	M
West Milford	Greenwood Lake	M
Hackettstown	Hackettstown	L
Hammonton	Hammonton Municipal	M
Vineland	Kroelinger	L
Lakewood	Lakewood	M
Bridgeton	Li Calzi Airpark	L
Lincoln	Lincoln Park	M
Linden	Linden	M
Little Ferry	Little Ferry Seaplane Base	L
Matawan	Marlboro	M
Millville	Millville Municipal	H
Belmar/Farmingdale	Monmouth Executive	H
Morristown	Morristown Municipal	M
Newark	Newark Liberty International	H
Newton	Newton	L

Table 3-5
EXISTING INFRASTRUCTURE RATING SUMMARY, Continued

ASSOCIATED CITY	AIRPORT NAME	EXISTING INFRASTRUCTURE RATING
Ocean City	Ocean City Municipal	M
Old Bridge	Old Bridge	M
Princeton/Rocky Hill	Princeton	M
Vincentown	Red Lion	M
Jobstown	Red Wing	L
Toms River	Robert J. Miller Airpark	H
Vineland	Rudy's	L
Pittstown	Sky Manor	M
Readington	Solberg-Hunterdon	M
Somerville	Somerset	M
Mount Holly	South Jersey Regional	M
Williamstown	Southern Cross	L
Pedricktown	Spitfire Aerodrome	L
Sussex	Sussex	M
Teterboro	Teterboro	H
West Trenton	Trenton-Mercer	H
Robbinsville	Trenton-Robbinsville	M
Andover	Trinca	L
Pennington	Twin Pine	L
Vineland	Vineland Downstown	L
Woodbine	Woodbine Municipal	M

Source: Wilbur Smith Associates

F. Outcome

Once each airport was rated and scored numerically on its current performance relative to the each of the five performance criteria, the importance weighting for each criterion was applied to the airport's score for each criterion. Each airport's total score (rating times the importance weighting) for each of the five performance criteria was summed. The objective of this exercise was to group the airports into functional levels based on their current contribution to New Jersey's airport system and the airport's current role in meeting statewide aviation needs.

Based on the rating, weighting, and ranking process previously described, system airports were assigned to one of the following five functional levels:

- Scheduled Service Airports
- Advanced Service Airports
- General Service Airports
- Basic Service Airport
- Other Facilities

Table 3-6 presents New Jersey airports, in alphabetical order, within the five functional levels presented above.

Table 3-6
AIRPORT FUNCTIONAL LEVELS

SCHEDULED SERVICE AIRPORTS	
Airport Name	**Associated City**
Atlantic City International	Atlantic City
Newark Liberty International	Newark
Trenton-Mercer	Trenton
ADVANCED SERVICE AIRPORTS	
Airport Name	**Associated City**
Monmouth Executive	Belmar/Farmington
Essex County	Caldwell
Millville Municipal	Millville
Morristown Municipal	Morristown
Robert J. Miller	Toms River
South Jersey Regional	Mount Holly
Teterboro	Teterboro
GENERAL SERVICE AIRPORTS	
Airport Name	**Associated City**
Alexandria Field	Pittstown
Blairstown	Blairstown
Cape May County	Wildwood
Central Jersey Regional	Manville
Cross Keys	Cross Keys
Flying W	Lumberton
Greenwood Lake	West Milford
Hammonton Municipal	Hammonton
Lakewood	Lakewood
Lincoln Park	Lincoln
Linden	Linden
Marlboro	Matawan
Old Bridge	Old Bridge
Princeton	Princeton
Red Lion	Vincentown
Sky Manor	Pittstown
Solberg-Hunterdon	Readington
Somerset	Somerville
Sussex	Sussex
Trenton-Robbinsville	Robbinsville
Woodbine Municipal	Woodbine
BASIC SERVICE AIRPORTS	
Airport Name	**Associated City**
Aeroflex-Andover Field	Andover
Bader Field	Atlantic City
Bucks	Bridgeton

Table 3-6
AIRPORT FUNCTIONAL LEVELS, Continued

Airport Name	Associated City
Camden County	Berlin
Eagles Nest	West Creek
Hackettstown	Hackettstown
Kroelinger	Vineland
Li Calzi Airpark	Bridgeton
Newton	Newton
Ocean City Municipal	Ocean City
Red Wing	Jobstown
Rudy's	Vineland
Southern Cross	Williamstown
Spitfire Aerodrome	Pedricktown
Trinca	Andover
Twin Pine	Pennington
Vineland Downstown	Vineland
SPECIALTY FACILITIES	
Airport Name	**Associated City**
Coach-N-Paddock Heliport	Hampton
Little Ferry Seaplane Base	Little Ferry
Holly City Heliport	Millville
Newark Heliport	Newark
Ryland Heliport/Balloonport	Whitehouse

Source: Wilbur Smith Associates

III. FACILITY AND SERVICE OBJECTIVES

Once system airports are grouped by functional level, it is desirable to identify facilities and services that should generally be available at airports included in the five functional categories. These facility and service objectives will be used in this analysis to examine the adequacy of the State's existing airport system as well as identify future facility requirements that may be needed, as airports may change functional roles within the system.

It is important to note that facility and service objectives delineated in this section should be considered only as objectives, not necessarily requirements. It is possible that airports included in or recommended for one of the functional levels may for one or more reasons not be able to comply with certain facility or service objectives. An airport's inability to meet the facility and service objectives for its functional level does not necessarily preclude that airport from remaining in or being upgraded to a particular level.

Facility and service objectives for each of the functional levels within the New Jersey airport system were developed using various factors which include facility standards developed for other state systems, FAA standards, as well as input from Division of Aeronautics staff and the Study Advisory Committee. In general, these facility and service objectives reflect the needs that the users of each specific functional level of airport in the system have in order to safely and efficiently support their operations at those facilities. Facility and service objectives for airports in the New Jersey system, by functional airport level, are presented in **Table 3-7**.

Table 3-7
FACILITY AND SERVICE OBJECTIVES

Scheduled Service Airports:	
ARC:	C-III or greater
Primary RWY Length:	Minimum of 6,000 feet
Primary RWY Width:	At least 150 feet
Primary RWY Strength:	60,000 Pounds
Taxiway:	Full Parallel
Navigational Aids:	CAT-II Precision Approach
Visual Aids:	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI
Lighting:	HIRL, CLTDZ Lights
Weather:	ASOS/AWOS or Tower
Services:	Phone, Restrooms, FBO, Maintenance, Jet Fuel, AvGas, Ground Transportation
Facilities:	Local and Itinerant Aircraft Parking Apron, Local and Itinerant Aircraft Storage, Air Carrier and General Aviation Terminal, Air Carrier and General Aviation Auto Parking
Advanced Service Airports:	
ARC:	C-II or greater
Primary RWY Length:	Minimum of 5,000 feet
Primary RWY Width:	At least 100 feet
Primary RWY Strength:	30,000 Pounds (accommodates all large B-II aircraft)
Taxiway:	Full Parallel for Primary Runway
Navigational Aids:	Precision Approach
Visual Aids:	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI
Lighting:	HIRL, MITL
Weather:	ASOS/AWOS
Services:	Phone, Restrooms, FBO, Maintenance, Jet Fuel, AvGas, Ground Transportation
Facilities:	Local and Itinerant Aircraft Parking Apron, Local and Itinerant Aircraft Storage, General Aviation Terminal, General Aviation Auto Parking
General Service Airports:	
ARC:	B-I or greater
Primary RWY Length:	Minimum of 3,500 feet
Primary RWY Width:	To Meet ARC
Primary RWY Strength:	12,500 Pounds
Taxiway:	Full parallel, Partial Parallel, Connectors, or Turnarounds
Navigational Aids:	Non-Precision Approach
Visual Aids:	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI
Lighting:	MIRL, Taxiway Lighting/Reflectors
Weather:	Not Required
Services:	Phone, Restrooms, Fuel (Avgas)
Facilities:	Paved Aircraft Parking Apron, Aircraft Storage Units, Public Building Area,
Basic Service Airports:	
ARC:	B-I or less
Primary RWY Length:	2,200 feet or greater
Primary RWY Width:	At least 60 feet
Primary RWY Strength:	Up to 12,500 Pounds

Table 3-7
FACILITY AND SERVICE OBJECTIVES, Continued

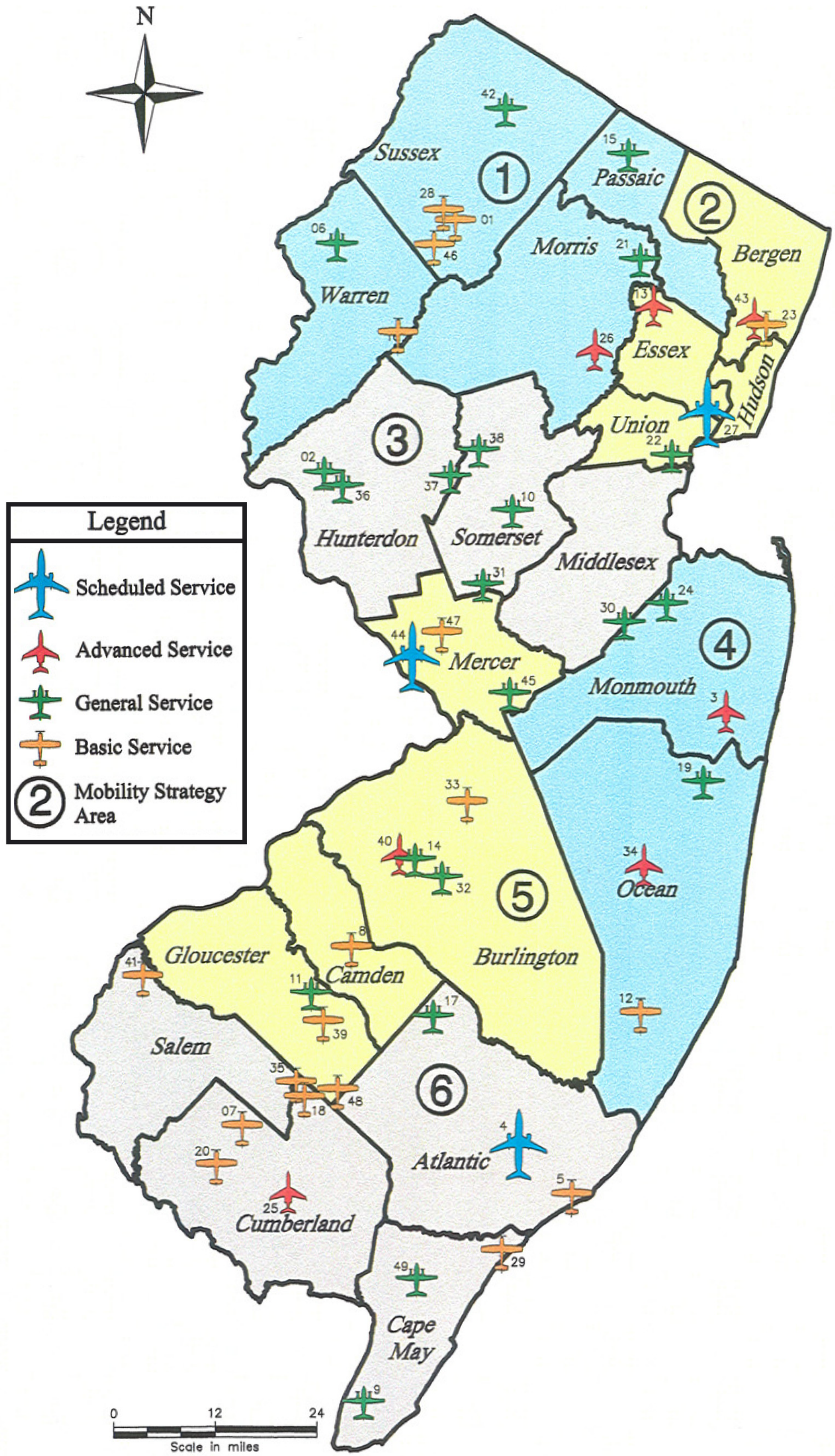
Taxiway:	Stub and Turnaround
Navigational Aids:	Not Required
Visual Aids:	Wind Cone
Lighting:	Not Required
Weather:	Not Required
Services:	Phone, Restrooms
Facilities:	Paved or Unpaved Aircraft Parking Apron, Auto Parking

Source: Wilbur Smith Associates

CHAPTER FOUR
PROJECTIONS OF AVIATION DEMAND

The development of general aviation activity projections for New Jersey's airport system is a critical step in assessing the need for and phasing of future development requirements. These activity projections assist in determining the future role of airports within the State system, evaluating the ability of the existing system to accommodate projected aviation demand, and planning future airside and landside facilities for the system.

For the purpose of the New Jersey State Airport System Plan (SASP), projections of statewide and regional based aircraft and general aviation operations were prepared. Projections of aviation demand for system airports will be presented in a subsequent chapter. For statewide transportation planning purposes, New Jersey has been divided into six Mobility Strategy Areas (MSAs). As defined by the New Jersey DOT, these MSAs are geographic regions of the State, each of which is comprised of two or more counties, that were developed to facilitate long-range planning for transportation resources. Projections of aviation demand using 2000 as a base year were made for each MSA. The MSAs in New Jersey consist of the following regions: Northeast, Northwest, Central, Shore/East Central, Southwest, and South. Presented in the **Table 4-1** are the 49 public use airports in each of New Jersey's six Mobility Strategy Areas. **Exhibit 4-1** graphically presents the MSAs in New Jersey.



Airport Key

1	Aeroflex–Andover Field
2	Alexandria Field
3	Monmouth Executive
4	Atlantic City International
5	Bader Field
6	Blairstown
7	Bucks
8	Camden County
9	Cape May County
10	Central Jersey Regional
11	Cross Keys
12	Eagles Nest
13	Essex County
14	Flying W
15	Greenwood Lake
16	Hackettstown
17	Hammonton Municipal
18	Kroelinger
19	Lakewood
20	Li Calzi Airpark
21	Lincoln Park
22	Linden
23	Little Ferry Seaplane Base
24	Marlboro
25	Millville Municipal
26	Morristown Municipal
27	Newark Liberty International
28	Newton
29	Ocean City Municipal
30	Old Bridge
31	Princeton
32	Red Lion
33	Red Wing
34	Robert J. Miller Airpark
35	Rudy's
36	Sky Manor
37	Solberg–Hunterdon
38	Somerset
39	Southern Cross
40	South Jersey Regional
41	Spitfire Aerodrome
42	Sussex
43	Teterboro
44	Trenton–Mercer
45	Trenton–Robbinsville
46	Trinca
47	Twin Pine
48	Vineland–Downstown
49	Woodbine Municipal

STATE AIRPORT SYSTEM PLAN

New Jersey MSA's

Exhibit 4-1

Table 4-1
MOBILITY STRATEGY AREAS IN NEW JERSEY

MSA 1 - Northeast	MSA 2 – Northwest	MSA 3 – Central
Essex County	Aeroflex-Andover Field	Alexandria Field
Linden	Blairstown	Central Jersey Regional
Little Ferry Seaplane Base	Greenwood Lake	Old Bridge
Newark Liberty International	Hackettstown	Princeton
Teterboro	Lincoln Park	Sky Manor
	Morristown Municipal	Solberg-Hunterdon
	Newton	Somerset
	Sussex	
	Trinca	

MSA 4 – Shore/E. Central	MSA 5 - Southwest	MSA 6 - South
Eagles Nest	Camden County	Atlantic City International
Lakewood	Cross Keys	Bader Field
Marlboro	Flying W	Bucks
Monmouth Executive	Red Lion	Cape May County
Robert J. Miller Airpark	Red Wing	Hammonton Municipal
	South Jersey Regional	Kroelinger
	Southern Cross	Li Calzi Airpark
	Trenton Mercer	Millville Municipal
	Trenton-Robbinsville	Ocean City Municipal
	Twin Pine	Rudy's
	Vineland Downstown	Spitfire Aerodrome
		Woodbine Municipal

Source: NJDOT

The assumptions and methodologies used to prepare aviation demand projections for the airports included in the New Jersey SASP are discussed in the following sections:

- Trend Overview
  - Based Aircraft
  - Operations
  - Socioeconomic Factors
- Aviation Projections
  - Based Aircraft
  - General Aviation Operations

Existing projections of based aircraft, operations, and demographics used in the analysis contain a variety of planning horizons. All projections from other sources are presented as reported. Projections of aviation demand prepared for the SASP use a 20-year planning period. The base year for SASP projections is 2000.

I. TREND OVERVIEW

A general approach often used to develop aviation forecasts is to identify historical relationships between statewide and U.S. aviation activity. For the SASP, however, reliable historical data for the State were not available for various activity indicators.

Prior to 1997, aircraft operations data at non-towered New Jersey airports represented "best guess" estimates by airport managers or operators. In many instances, these "best guess" estimates of aircraft operations may have been inaccurate, since a statistically valid counting program was not in place. In 1997, Delaware Valley Regional Planning Commission (DVRPC), under contract with the NJDOT, initiated an aircraft-counting program in order to obtain more reliable general aviation activity data. The program monitors aircraft activity at paved non-towered airports in New Jersey every three to four years. These recent activity counts provide baseline data from which accurate operational projections can be developed. Data collected through the counting program is based on a statistically valid procedure and, therefore, represents a more reliable count of aircraft operations. Activity data secured through the counting program is currently stored in the NJDOT Airport Information Management System (AIMS) database.

Because of the inconsistency seen in historic operations data prior to the implementation of the counting program, direct activity comparisons of historical data prior to 1997 are not possible. As a result of the counting program, operations data for 2000 represent the first verified record of annual general aviation operational activity. Therefore, 2000 data are used as the baseline from which to project future operations at general aviation airports in New Jersey.

Based aircraft numbers at New Jersey's airports fluctuate on a frequent basis and historic data are not available for all airports. Based aircraft counts for 2000 were obtained during the inventory phase of the system plan and represent the most thorough and up-to-date data available.

A. Based Aircraft

Based aircraft are the total number of active general aviation aircraft that are either hangared or tied down at an airport. Based aircraft numbers at airports fluctuate based on a variety of factors, including time of year and pilot storage preferences. The availability of aircraft storage hangar units can greatly influence the number of aircraft based at a particular airport. **Table 4-2** shows the sources that that were considered in developing statewide projections. Projections have been prepared on national, regional, state, and airport-specific levels, based largely on historic growth trends. Each source is described briefly below.

Table 4-2
COMPARISON OF BASED AIRCRAFT GROWTH RATES, HISTORIC AND PROJECTED

Growth Rate Source Area Included In Forecast	Historic Growth Base Year	Historic Growth Out Year	Historic Growth AAG	Projected Growth Base Year	Projected Growth Out Year	Projected Growth AAG
FAA Aerospace Forecasts						
U.S.- Active GA Aircraft	1995	2000	3.30%	2000	2012	0.89%
FAA Terminal Area Forecasts						
U.S.	1989	1999	0.79%	1999	2015	0.59%
Eastern Region	1989	1999	0.69%	1999	2015	0.50%
NJ Airports	1989	1999	0.39%	1999	2015	0.51%
Delaware Valley Regional Planning Commission						
NJ Airports in Metro. Philadelphia	1995	2000	-0.43%	2000	2025	0.94%
Airport Master Plans						
Selected NJ Airports	N/A	N/A	N/A	varies	varies	1.0%

Note: AAG=Average Annual Growth Rate; N/A=not available.
Source: Wilbur Smith Associates

1. FAA Aerospace Forecasts Fiscal Years 2001-2012

The *FAA Aerospace Forecasts Fiscal Years 2001-2012* provides projections for the total U.S. active general aviation fleet. For any given year, the U.S. fleet is defined as the sum of new production flowing into the fleet, the fleet size carried over from the previous year, and the attrition of active aircraft during the current year. An estimated 221,000 active general aviation aircraft were based at U.S. airports in 2000. Nationally, between 1995 and 2000, active general aviation aircraft increased 3.3 percent per year on average. The growth in the aircraft fleet is expected to slow over the FAA's 12-year forecast period, increasing at an average annual growth rate of 0.89 percent between 2000 and 2012. According to the FAA's projection, the active general aviation aircraft fleet is expected to reach 246,000 by 2012.

2. FAA Terminal Area Forecasts

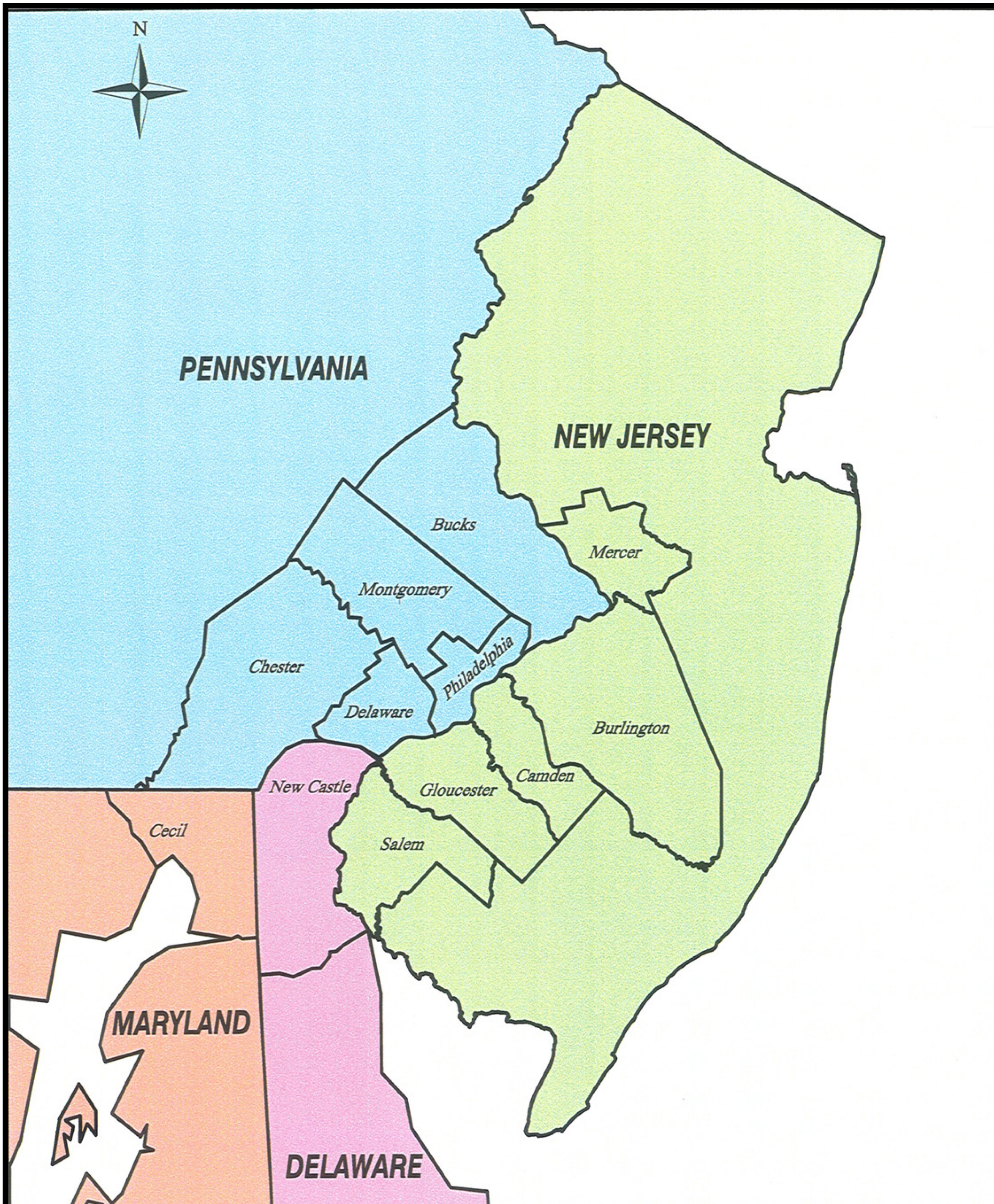
Terminal Area Forecasts (TAF) are the official projections of aviation activity at individual FAA facilities, including FAA towered airports, federally-contracted towered airports, non-federal towered airports, and non-towered airports. Many of the smaller general aviation airports, as well as privately owned public use airports, do not submit their aviation activity to the FAA. In New Jersey, 75 percent of the airports in the system report to the FAA's TAF. Between 1989 and 1999, based aircraft at all U.S. airports reporting to the TAF grew at an average annual growth rate of 0.79 percent. Airports in the FAA-defined Eastern Region grew at a rate just slightly below the national rate (0.69 percent per year on average). The Eastern Region includes airports in the states of Pennsylvania, New York, New Jersey, Maryland, Delaware, West Virginia, and Virginia. New Jersey airports reporting to the TAF experienced a historic average annual rate of growth in based aircraft of 0.39 percent.

FAA TAF projections of based aircraft are updated annually. Between 1999 and 2015, the FAA projects similar rates of growth for based aircraft at all airports in the U.S., FAA's Eastern Region, and New Jersey, growing at average annual rates of 0.59 percent, 0.50 percent, and 0.51 percent, respectively.

3. Delaware Valley Regional Planning Commission (DVRPC) Regional Airport System Plan

The Delaware Valley Regional Planning Commission (DVRPC) is the regional planning agency for the area surrounding metropolitan Philadelphia. DVRPC developed its 2025 Regional Airport System Plan (RASP) for a 12-county area, including Salem, Gloucester, Burlington, Camden, and Mercer counties in New Jersey. The area is shown in **Exhibit 4-2**. According to the DVRPC, the airports in these five New Jersey counties reportedly experienced a decline in based aircraft of 0.43 percent per year, on average, between 1995 and 2000. During this time, DVRPC changed the way it collected data at the airports in its regional system. It is possible that this decline may be due to an overstatement of based aircraft in 1995, rather than to an actual decrease in based aircraft at these New Jersey airports.

As shown in **Table 4-3**, DVRPC projected based aircraft at the eight New Jersey airports located in the Philadelphia Metropolitan region to grow at an average annual rate of 0.94 percent between 2000 and 2025. An additional 183 aircraft are projected to be based at these eight airports by 2025.



STATE AIRPORT SYSTEM PLAN

DVRPC Region

Exhibit 4-2

Table 4-3
BASED AIRCRAFT PROJECTIONS
DELAWARE VALLEY REGIONAL PLANNING COMMISSION

New Jersey Airport	Source	Completion Date	Base Year	Out Year	Based Aircraft 2000	2025	AAG
Camden County	RASP	Dec-00	2000	2025	49	60	0.81%
Cross Keys	RASP	Dec-00	2000	2025	59	70	0.69%
Flying W	RASP	Dec-00	2000	2025	61	100	2.00%
Spitfire Aerodrome	RASP	Dec-00	2000	2025	16	50	4.66%
Red Lion	RASP	Dec-00	2000	2025	63	70	0.42%
South Jersey Regional	RASP	Dec-00	2000	2025	207	225	0.33%
Trenton-Mercer	RASP	Dec-00	2000	2025	158	200	0.95%
Trenton Robbinsville	RASP	Dec-00	2000	2025	79	100	0.95%
NJ Region System Plan Forecast Total					**692**	**875**	**0.94%**

Source: Delaware Valley Regional Planning Commission, Regional Airport System Plan, December 2000.
Note: AAG=Average Annual Growth Rate.

4. Airport Planning Projections

Many of the public use airports in New Jersey have also developed their own projections of aviation activity in conjunction with airport-specific planning documents, including airport layout plans and master plans. **Table 4-4** provides a summary of the based aircraft projections in recent planning documents. Although many of the projections are based on different time periods, the average growth rate for the 12 airports in New Jersey with recent based aircraft projections was 1.0 percent per year.

Table 4-4
BASED AIRCRAFT PROJECTIONS
INDIVIDUAL AIRPORT PLANNING DOCUMENTS

Airport	Source	Date Compl.	Base Year	Out Year	Based Aircraft Base	Out	AAG
Alexandria Field	Airport Layout Plan	1997	1997	2015	94	99	0.3%
Blairstown	Airport Layout Plan	Nov-00	2000	2020	159	198	1.1%
Central Jersey Regional	Airport Layout Plan	Sep-99	1999	2020	133	166	1.1%
Flying W	Airport Layout Plan	1997	1997	2015	92	97	0.3%
Greenwood Lake	Airport Layout Plan	1997	1997	2015	55	58	0.3%
Lakewood	Airport Layout Plan	Sep-97	1994	2010	63	81	1.6%
Millvillle Municipal	Master Plan Update	Jan-96	1993	2015	107	115	0.3%
Ocean City	Airport Layout Plan	Aug-00	2000	2020	46	56	1.0%
Red Lion	Airport Layout Plan	Nov-00	2000	2020	63	78	1.1%
Sky Manor	Airport Layout Plan	May-98	1998	2015	102	107	0.3%
Solberg-Hunterdon	Master Plan	Sep-97	1995	2015	100	157	2.3%
South Jersey Regional	Master Plan	May-97	1995	2010	216	291	2.0%
Sussex	Airport Layout Plan	1997	1997	2015	150	157	0.3%
Trenton-Robbinsville	Master Plan	Sep-00	1999	2019	65	89	1.6%
Woodbine	Airport Layout Plan	Apr-98	1997	2017	40	57	1.8%
Average Growth Rate							**1.0%**

Source: Individual Airport Planning Documents.

B. Operations

An operation is defined as a landing or takeoff; both a landing and takeoff, such as a touch-and-go, would count for two operations. In **Table 4-5**, a comparison of historic and projected growth rates for aircraft operations is presented. The FAA has prepared national operations projections in conjunction with the *Aerospace Forecasts*, as well as with annual airport projections, as part of its *Terminal Area Forecasts*. The DVRPC also developed operations forecasts for New Jersey airports located in the metropolitan Philadelphia area. Another source of projected aviation activity is provided by New Jersey airport planning documents (i.e. forecasts done in conjunction with master plans or ALPs). These various projections provide a basis for preparing New Jersey SASP operational forecasts.

Table 4-5
COMPARISON OF OPERATIONS GROWTH RATES, HISTORIC AND PROJECTED

Growth Rate Source / Area Included In Forecast	Historic Growth			Projected Growth		
	Base Year	Out Year	AAG	Base Year	Out Year	AAG
FAA Aerospace Forecasts						
U.S. Towered Airports	1995	2000	1.9%	2000	2012	2.42%
U.S. (GA Ops Only)	1995	2000	1.8%	2000	2012	2.19%
U.S- GA Hours Flown	1995	2000	3.8%	2000	2012	2.20%
FAA Terminal Area Forecasts						
U.S.- Total	1989	1999	0.5%	1999	2015	1.14%
U.S.- GA only	1989	1999	0.1%	1999	2015	1.00%
Eastern Region-Total	1989	1999	-0.4%	1999	2015	0.93%
Eastern Region-GA only	1989	1999	-0.8%	1999	2015	0.68%
NJ Airports- Total	1989	1999	-3.1%	1999	2015	0.99%
NJ Airports-GA only	1989	1999	-4.3%	1999	2015	0.84%
FAA-Tower Counts						
NJ Towered Airports-Total	1990	2000	0.7%	N/A	N/A	N/A
NJ Towered Airports-GA only	1990	2000	-0.1%	N/A	N/A	N/A
Delaware Valley Regional Planning Commission						
NJ Airports in Delaware Valley	1995	2000	-2.8%	2000	2025	0.71%
Airport Master Plans						
Selected NJ Airports	N/A	N/A	N/A	varies	varies	1.2%

Note: AAG=Average Annual Growth Rate; N/A=not available.
Source: Wilbur Smith Associates

1. *FAA Aerospace Forecasts Fiscal Years 2001-2012*

As part of the *FAA Aerospace Forecast Fiscal Years 2001-2012*, the FAA projected general aviation operations at FAA and contract towered airports only. Between 1995 and 2000, total operations (including commercial activity) at all U.S. towered airports grew at an average annual rate of 1.9 percent, just slightly higher than the growth experienced in general aviation operations, up 1.8 percent per year on average. Total operations are projected to experience strong growth between 2000 and 2012, up 2.42 percent per year on average over the period. The FAA projects general aviation operations to experience a slightly lower average annual growth rate of 2.19 percent.

The FAA also projects the hours flown by general aviation aircraft, another indicator of general aviation activity. Based on results from the 1999 General Aviation and Air Taxi Activity Survey, hours flown grew 3.8 percent on average annually between 1995 and 2000. While the number of active aircraft is projected to grow just 0.89 percent annually between 2000 and 2012, general aviation hours flown are projected to increase 2.2 percent annually over the 12-year period.

2. FAA Terminal Area Forecasts

The FAA also annually forecasts operations by airport as part of the *Terminal Area Forecasts*. While both total and general aviation operations experienced little growth at all U.S. airports reporting to the FAA, TAF data indicates that operations at airports in FAA's Eastern Region actually declined between 1989 and 1999. General aviation operations grew at a rate slightly less than total operations. Between 1999 and 2015, total operations at all U.S. airports are projected to increase at an average annual rate of 1.14 percent. Total operations at airports in the FAA's Eastern region are expected to increase 0.93 percent per year on average. General aviation operations are projected to grow at 1.00 nationally and 0.68 percent in the Eastern Region between 1999 and 2015.

Between 1989 and 1999, total aircraft operations at New Jersey airports that reported to the FAA TAF (75 percent) fell at an average annual rate of 3.1 percent. General aviation operations at these airports declined 4.3 percent annually over the 10-year period. These declines are likely due to the change in reporting discussed in the overview of this section. The operations figures in the FAA TAF for New Jersey airports were likely overstated before the 1997 aircraft-counting program. The FAA TAF projects total operations at New Jersey airports to grow at 0.99 percent between 1999 and 2015. General aviation operations in the State are projected to increase at 0.84 percent per year.

3. FAA Tower Counts

The FAA's Air Traffic Activity Data System (ATADS), which is updated on a monthly basis, is a source of historical air traffic activity for FAA center and towered airports. There are five towered airports in New Jersey: Newark Liberty International, Atlantic City, Trenton Mercer, Teterboro, Morristown Municipal, and Essex County. ATADS data indicated that approximately 1.44 million total operations, including commercial activity, occurred at these airports in 2000, up from 1.35 million in 1990. This represents an average annual growth rate of 0.7 percent over the 10-year period. However, general aviation operations at New Jersey's towered airports declined 0.1 percent per year on average between 1990 and 2000. General aviation operations declined from 876,000 in 1990 to 871,000 in 2000. Although the ATADS data does not include data for all airports, it does represent over one-third of the State's total general aviation activity and provides a relatively accurate means for comparing general aviation activity statistics for the period 1990 through 2000. The FAA does not project operations using the ATADS database.

4. Delaware Valley Regional Planning Commission (DVRPC) Regional Airport System Plan

DVRPC projected operations for the airports in the metropolitan Philadelphia area. These include airports in Salem, Gloucester, Burlington, Camden, and Mercer counties in New Jersey. DVRPC initiated an operations counting program in 1997 at airports in the Delaware Valley. Operations comparisons between 1995 and 2000 data at these airports cannot be accurately drawn due to this difference in reporting methods. DVRPC projects total operations in this region of the State to increase 0.71 percent annually between 2000 and 2025. **Table 4-6** presents the individual airport operations projections completed by DVRPC. It should be noted that these eight airports account for approximately 17 percent of the 2000 operations at New Jersey system airports.

Table 4-6
OPERATIONS PROJECTIONS
DELAWARE VALLEY REGIONAL PLANNING COMMISSION

New Jersey Airport	Source	Completion Date	Base Year	Out Year	Operations 2000	Operations 2025	Operations AAG
Camden County	RASP	Dec-00	2000	2025	16,143	22,000	1.25%
Cross Keys	RASP	Dec-00	2000	2025	37,540	44,000	0.64%
Flying W	RASP	Dec-00	2000	2025	39,361	49,000	0.88%
Spitfire Aerodrome	RASP	Dec-00	2000	2025	3,990	25,000	7.62%
Red Lion	RASP	Dec-00	2000	2025	15,373	18,000	0.63%
South Jersey Regional	RASP	Dec-00	2000	2025	59,466	69,000	0.60%
Trenton-Mercer	RASP	Dec-00	2000	2025	149,058	160,000	0.28%
Trenton Robbinsville	RASP	Dec-00	2000	2025	44,225	49,000	0.41%
NJ Region System Plan Forecast Total					**365,156**	**436,000**	**0.71%**

Source: Delaware Valley Regional Planning Commission, Regional Airport System Plan, December 2000.
Note: AAG=Average Annual Growth Rate.

5. Airport Master Plan Projections

Operations forecasts have been completed for 16 New Jersey airports in recent (since 1995) master planning documents. **Table 4-7** presents the projections for each of the airports. Although the time frames used to project airport operations differ slightly, the average growth rate of the projections was 1.2 percent per year.

Table 4-7
OPERATIONS PROJECTIONS
INDIVIDUAL AIRPORT PLANNING DOCUMENTS

Airport	Source	Date Compl.	Base Year	Out Year	Operations Base	Operations Out	AAG
Alexandria Field	Airport Layout Plan	1997	1997	2015	24,100	28,100	0.9%
Blairstown	Airport Layout Plan	Nov-00	2000	2020	38,300	48,100	1.1%
Central Jersey Regional	Airport Layout Plan	Sep-99	1999	2020	36,400	45,700	1.1%
Flying W	Airport Layout Plan	1997	1997	2015	55,000	64,200	0.9%
Greenwood Lake	Airport Layout Plan	1997	1997	2015	26,700	31,200	0.9%
Lakewood	Airport Layout Plan	Sep-97	1994	2010	33,810	43,497	1.6%
Millvillle Municipal	Master Plan Update	Jan-96	1993	2015	92,976	109,100	0.7%
Newark Liberty Intl. (GA only)	10 Yr Long Range Fcst	2000	2000	2010	19,000	19,000	0.0%
Ocean City	Airport Layout Plan	Aug-00	2000	2020	18,860	22,960	1.0%
Red Lion	Airport Layout Plan	Nov-00	2000	2020	15,400	19,300	1.1%
Sky Manor	Airport Layout Plan	May-98	1998	2015	28,800	33,490	0.9%
Solberg-Hunterdon	Master Plan	Sep-97	1995	2015	63,700	100,000	2.3%
South Jersey Regional	Master Plan	May-97	1995	2010	100,500	135,500	2.0%
Sussex	Airport Layout Plan	1997	1997	2015	32,600	37,780	0.8%
Trenton-Robbinsville	Master Plan	Sep-00	1999	2019	44,329	60,698	1.6%
Woodbine	Airport Layout Plan	Apr-98	1997	2017	21,600	30,780	1.8%
Average Growth Rate							**1.2%**

Source: Individual Airport Planning Documents.
Note: AAG=Average Annual Growth Rate.

C. Demographic Factors

Population and civilian labor force are two indicators of a region's viability and need for aviation services. **Table 4-8** presents historic and projected demographic growth rates for New Jersey. Examination of these demographic factors helps identify trends that may directly influence demand for aviation services. In general, those areas experiencing strong growth in population and labor force tend to have a relatively higher propensity to use aviation services. Conversely, those areas experiencing limited growth may have a lower propensity to use aviation services. However, in those areas experiencing limited growth, improved transportation services, including improved airport facilities, may act as a catalyst to promote future economic growth. Future population and civilian labor force projections provided by the New Jersey Department of Labor indicate that statewide growth trends experienced in the 1990s will continue through 2015. A third indicator of economic vitality is the growth in business aviation. Population and labor force projections, as well as historic growth in business aviation, are discussed below.

Table 4-8
COMPARISON OF SOCIOECONOMIC GROWTH RATES, HISTORIC AND PROJECTED

Growth Rate Source / Area Included In Forecast	Historic Growth			Projected Growth		
	Base Year	Out Year	AAG	Base Year	Out Year	AAG
Population						
NJ Statewide (2000 Census)	1990	2000	0.85%			
NJ Statewide	1990	1998	0.85%	1998	2015	0.65%
Civilian Labor Force						
NJ Statewide	1990	1998E	0.22%	1998	2015	0.94%

Source: New Jersey Department of Labor, Division of Labor Market & Demographic Research, January 2001.
Note: AAG=Average Annual Growth Rate; E=Estimate.

1. Population

According to U.S. Census data, New Jersey's total population reached 8.4 million in 2000, an average annual growth rate of 0.85 percent between 1990 and 2000. This growth is similar to the growth experienced between 1990 and 1998, according to the New Jersey Department of Labor. Population projections, based on 1998 data, for the six MSAs in New Jersey are presented in **Table 4-9**.

By 2015, the New Jersey Department of Labor estimates that nearly 9.3 million people will live in New Jersey, up from 8.3 million in 1998. This represents an average annual growth rate of 0.65 percent. Population growth in the Central and Shore/East Central MSAs will outpace the State's average rate of growth (each will average 1.02 percent growth per year). The South MSA is projected to grow at the same rate as the State. Population in the Northeast, Northwest, and Southwest MSAs is projected to increase at a rate slightly less than the New Jersey average, increasing at rates of 0.40, 0.58, and 0.56 percent per year on average, respectively.

Table 4-9
NEW JERSEY POPULATION PROJECTIONS

Mobility Strategy Area County	1998 Census Estimates	Projected 2015	Gross Population Increase (1998-2015)	Average Annual Growth Rate (1998-2015)
New Jersey Total	**8,293,700**	**9,257,500**	**963,800**	**0.65%**
MSA 1- Northeast	**2,721,600**	**2,914,500**	**192,900**	**0.40%**
Bergen	875,200	953,500	78,300	0.51%
Hudson	570,100	624,300	54,200	0.54%
Union	509,900	536,100	26,200	0.30%
Essex	766,400	800,600	34,200	0.26%
MSA 2- Northwest	**1,213,200**	**1,338,200**	**125,000**	**0.58%**
Sussex	146,600	171,200	24,600	0.92%
Morris	470,700	545,400	74,700	0.87%
Warren	101,000	116,300	15,300	0.83%
Passaic	494,900	505,300	10,400	0.12%
MSA 3- Central	**1,148,600**	**1,365,900**	**217,300**	**1.02%**
Somerset	291,300	377,100	85,800	1.53%
Hunterdon	125,900	148,200	22,300	0.96%
Middlesex	731,400	840,600	109,200	0.82%
MSA 4- Shore/ E. Central	**1,121,100**	**1,333,200**	**212,100**	**1.02%**
Ocean	503,200	619,100	115,900	1.23%
Monmouth	617,900	714,100	96,200	0.85%
MSA 5- Southwest	**1,536,400**	**1,688,900**	**152,500**	**0.56%**
Gloucester	253,900	290,700	36,800	0.80%
Burlington	430,100	484,800	54,700	0.71%
Mercer	337,800	373,000	35,200	0.58%
Camden	514,600	540,400	25,800	0.29%
MSA 6- South	**552,600**	**616,800**	**64,200**	**0.65%**
Atlantic	243,400	287,900	44,500	0.99%
Cape May	100,200	111,300	11,100	0.62%
Cumberland	142,900	150,800	7,900	0.32%
Salem	66,100	66,800	700	0.06%

Source: New Jersey Department of Labor, Division of Labor Market & Demographic Research, January 2001.

2. Civilian Labor Force

Projections of New Jersey's civilian labor force by MSA and county are presented in **Table 4-10**. Future labor force projections by the New Jersey Data Center indicate that the labor force trends exhibited during the 1990s will continue during the next 15 years. By 2015, New Jersey's labor force is expected to reach nearly 4.9 million, up from 4.2 million in 1998. This represents a growth rate of approximately 0.94 percent annually.

Table 4-10
NEW JERSEY CIVILIAN LABOR FORCE PROJECTIONS

Mobility Strategy Area County	1998 Estimates	Projected 2015	Gross Labor Force Increase (1998-2015)	Average Annual Growth Rate (1998-2015)
New Jersey Total	**4,178,200**	**4,894,700**	**716,500**	**0.94%**
MSA 1- Northeast	**1,374,200**	**1,547,000**	**172,800**	**0.70%**
Bergen	447,600	508,200	60,600	0.75%
Hudson	286,800	333,100	46,300	0.88%
Union	261,400	290,300	28,900	0.62%
Essex	378,400	415,400	37,000	0.55%
MSA 2- Northwest	**620,400**	**718,300**	**97,900**	**0.87%**
Sussex	75,700	94,000	18,300	1.28%
Morris	254,500	305,000	50,500	1.07%
Warren	50,900	62,400	11,500	1.21%
Passaic	239,300	256,900	17,600	0.42%
MSA 3- Central	**618,000**	**766,500**	**148,500**	**1.27%**
Somerset	162,800	219,100	56,300	1.76%
Hunterdon	67,600	83,700	16,100	1.26%
Middlesex	387,600	463,700	76,100	1.06%
MSA 4- Shore/ E. Central	**529,400**	**663,400**	**134,000**	**1.34%**
Ocean	219,300	287,900	68,600	1.61%
Monmouth	310,100	375,500	65,400	1.13%
MSA 5- Southwest	**768,100**	**881,400**	**113,300**	**0.81%**
Gloucester	129,200	155,800	26,600	1.11%
Burlington	217,400	252,200	34,800	0.88%
Mercer	167,700	194,300	26,600	0.87%
Camden	253,800	279,100	25,300	0.56%
MSA 6- South	**268,100**	**318,100**	**50,000**	**1.01%**
Atlantic	124,900	157,100	32,200	1.36%
Cape May	46,000	54,400	8,400	0.99%
Cumberland	65,300	73,200	7,900	0.67%
Salem	31,900	33,400	1,500	0.27%

Source: New Jersey Department of Labor, Division of Labor Market & Demographic Research, January 2001.

Although the Northeast MSA represents 32 percent of the State's civilian labor force, the region is projected to increase at a rate less than the overall projected growth rate for the State between 1998 and 2015. Similar to the population projections made by the New Jersey Data Center, the Central and Shore/East Central MSAs are expected to slightly exceed the overall growth of the State, up 1.27 and 1.34 percent, respectively, over the forecast period. Although the South MSA is the smallest region in the State in terms of population and civilian labor force, the South MSA is also expected to exceed the State's projected civilian labor force growth, up 1.01 percent per year on average.

3. Business Aviation

Business aviation is one of the quickest growing portions of general aviation. Business aviation consists of companies and individuals using aircraft as tools used to conduct their business. According to the National Business Aviation Association (NBAA), businesses are rapidly becoming more dependent on general aviation aircraft to conduct business. The following statistics, from the *2000 NBAA Business Aviation Factbook*, illustrate the growth experienced in business aviation:

- The number of companies operating business aircraft in the U.S. has grown more than 40 percent between 1991 and 2000, topping 14,000 aircraft in 2000.
- Charter activity in the U.S. increased 12 percent between 1999 and 2000.
- From 1999 to 2000 the number of companies and individuals using fractional ownership has grown by more than 40 percent.
- According to a 1997 survey, only 14 percent of company employees traveling onboard business aircraft were top management. The remaining 86 percent of passengers consisted of senior managers, middle managers, and professional staff.

Business aviation not only supports the economic vitality of individual companies, but also for the region and state as a whole. In order to support growing business aviation activity in the State, decisions impacting future development of New Jersey's airport system are imperative to the overall economic health of the State.

II. AVIATION PROJECTIONS

To ensure a reasonable preferred forecast, three methodologies were used to project both based aircraft and general aviation operations for each MSA in New Jersey. The projections completed for this chapter represent totally unconstrained forecasts. They do not take individual airport constraints or potential into consideration. Individual airport projections will be developed and discussed in a subsequent chapter.

A. Based Aircraft

Three methodologies were used to project based aircraft for each MSA in New Jersey. One methodology featured a bottom-up approach, which projected based aircraft for each MSA based on population growth projected by the New Jersey Data Center. The second and third methodologies are top-down approaches. A high growth and low growth scenario were used to project statewide based aircraft using a market share approach. Each of these methodologies and their resultant projections, as well as the preferred based aircraft projection, are discussed in the following sections.

1. Bottom-Up Methodology Based on Projected Population Growth

The first methodology used to project based aircraft for each of the MSAs in New Jersey was a bottom-up approach based on projected population growth in each MSA. As shown in **Table 4-11** and discussed in the previous section, according to the New Jersey Data Center, population in the State is expected to grow, up 0.65 percent per year on average between 1998 and 2015. This statewide rate of growth is comparable to the growth in based aircraft projected by various sources, ranging between 0.5 and 1.01 percent per year on average as discussed in the section above. The Central and

Shore/East Central MSAs are projected to see the greatest population growth between 1998 and 2015, exceeding the statewide projected rate of growth.

Table 4-11
BASED AIRCRAFT PROJECTION
BOTTOM-UP PROJECTION

Mobility Strategy Area	1998-2015 Population AAG	Historic 2000	Projected 2005	Projected 2010	Projected 2020
New Jersey Total	**0.65%**	**4,203**	**4,351**	**4,504**	**4,830**
MSA 1- Northeast	0.40%	756	771	787	819
MSA 2- Northwest	0.58%	920	947	975	1,033
MSA 3- Central	1.02%	837	881	926	1,025
MSA 4- Shore/ E. Central	1.02%	508	534	562	622
MSA 5- Southwest	0.56%	731	752	773	817
MSA 6- South	0.65%	451	466	481	513

Source: Wilbur Smith Associates.

To project based aircraft for 2005, 2010, and 2020, New Jersey Data Center's projected rate of population growth was applied to the 2000 level of based aircraft in each MSA. Because Central and Shore/East Central MSAs are projected to experience the largest gains in population, they are also projected to see the largest average annual growth in based aircraft (1.02 percent). The South MSA is projected to grow at the same average annual rate as the State's population, while Northeast, Northwest, and Southwest MSAs are projected to experience based aircraft growth at a rate slightly less than the State's rate of growth. As shown, using this approach and adding all regional projections together, total statewide-based aircraft are projected to increase from 4,203 in 2000 to 4,830 in 2020, an average annual growth rate of 0.70 percent.

2. Top-Down Methodology – High Growth Scenario

Table 4-12 presents based aircraft projections for New Jersey using a high growth scenario employing a top-down methodology. An average annual growth rate of 1.0 was applied to 2000 statewide based aircraft to project 2005, 2010, and 2020 based aircraft for New Jersey. For the SASP projections, the average annual growth rate of 1.0 percent is considered the high growth rate. This rate is approximately the same average growth rate implied in New Jersey's individual airport planning documents. It is also just slightly higher than the growth rate projected by the DVRPC for based aircraft growth for the New Jersey airports in the metropolitan Philadelphia area.

Using this high growth methodology, statewide based aircraft are projected to increase from 4,203 in 2000 to 5,128 in 2020. By applying each MSA's share of statewide based aircraft in 2000 to the projection of statewide based aircraft, individual MSA projections were produced.

Table 4-12 BASED AIRCRAFT PROJECTION TOP-DOWN PROJECTION- HIGH GROWTH SCENARIO					
Mobility Strategy Area	**Historic 2000**	**2000 Market Share**	**Projected 2005**	**Projected 2010**	**Projected 2020**
New Jersey Total	**4,203**	**100.0%**	**4,417**	**4,643**	**5,128**
MSA 1- Northeast	756	18.0%	795	835	922
MSA 2- Northwest	920	21.9%	967	1,016	1,123
MSA 3- Central	837	19.9%	880	925	1,021
MSA 4- Shore/ E. Central	508	12.1%	534	561	620
MSA 5- Southwest	731	17.4%	768	807	892
MSA 6- South	451	10.7%	474	498	550

Source: Wilbur Smith Associates.

3. *Top-Down Methodology – Low Growth Scenario*

A top-down low growth methodology was also used to project based aircraft. Similar to the methodology discussed above, a growth rate was applied to the New Jersey's 2000 statewide based aircraft in order to project statewide based aircraft for 2005, 2010, and 2020. Each MSA was assigned a percentage of the projected statewide based aircraft based on their market share in 2000.

The projection developed using the low growth rate is presented in **Table 4-13**. An average annual growth rate of 0.5 percent was applied to 2000 statewide based aircraft to develop an estimate of statewide based aircraft for future planning milestones. This rate of growth is similar to the rate of based aircraft growth projected in the FAA TAF for the FAA-defined Eastern Region as well as for New Jersey specific airports included in the TAF. This low growth scenario produces a statewide projection of 4,644 based aircraft in 2020, up from 4,203 in 2000.

Table 4-13 BASED AIRCRAFT PROJECTION TOP-DOWN PROJECTION- LOW GROWTH SCENARIO					
Mobility Strategy Area	**Historic 2000**	**2000 Market Share**	**Projected 2005**	**Projected 2010**	**Projected 2020**
New Jersey Total	**4,203**	**100.0%**	**4,309**	**4,418**	**4,644**
MSA 1- Northeast	756	18.0%	775	795	835
MSA 2- Northwest	920	21.9%	943	967	1,017
MSA 3- Central	837	19.9%	858	880	925
MSA 4- Shore/ E. Central	508	12.1%	521	534	561
MSA 5- Southwest	731	17.4%	749	768	808
MSA 6- South	451	10.7%	462	474	498

Source: Wilbur Smith Associates.

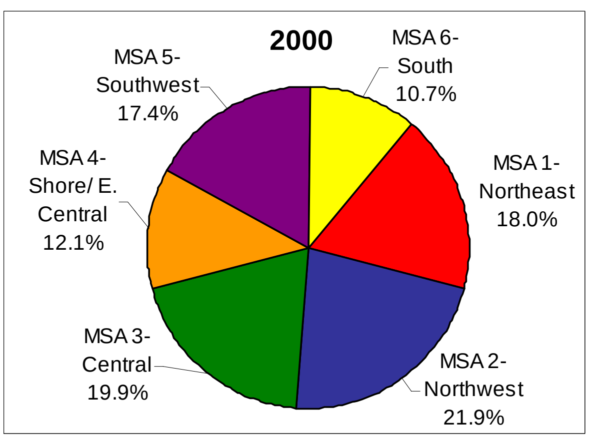
4. Preferred Based Aircraft Projection

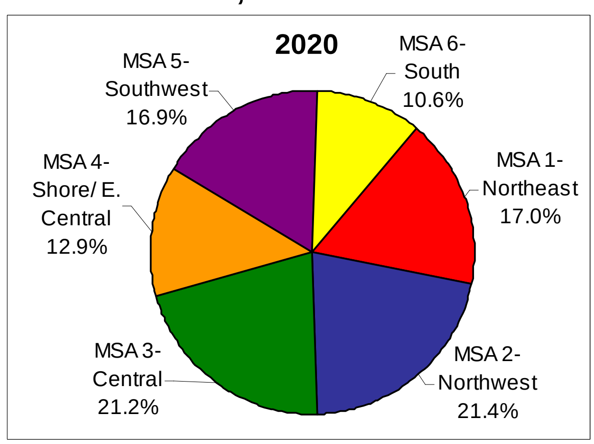
The results from the three based aircraft projection methodologies developed for the SASP were compared for each MSA. In 2000, the New Jersey airports accommodated 4,203 based aircraft. The first methodology, based on projected population growth, produced a 2020 projection of 4,830 based aircraft, an average annual growth rate of 0.70 percent. The second methodology, the high growth top-down methodology, projected 5,128 statewide based aircraft by 2020, up 1.0 percent per year on average. The final methodology was a low growth top-down methodology, which projected 4,644 based aircraft in 2020, representing an average annual growth rate of 0.5 percent.

Although the methodologies produce similar projections of statewide based aircraft, the bottom-up methodology based on projected population growth was chosen as the preferred methodology. This growth rate used in this projection is between the growth rate applied for the other two methodologies, and also takes projected demographic shifts by individual MSA into account.

In **Exhibit 4-3**, each MSA's share of statewide based aircraft in 2000 and 2020 is presented. Although none of the districts' market share of the statewide total changed dramatically over the forecast period, there are a few changes to note. Based on the results of the preferred based aircraft projection methodology, MSA 3-Central, MSA 4-Shore/East Central, and MSA 6-South each increased their share of New Jersey based aircraft by 2020. The Central MSA had the largest increase in projected based aircraft with 188 additional aircraft in 2020. The metropolitan New York City area (MSA 1) lost the greatest share of New Jersey's based aircraft, down from 18.0 percent in 2000 to 17.0 percent in 2020.

Exhibit 4-3
SHARE OF NEW JERSEY BASED AIRCRAFT, BY MSA





Source Wilbur Smith Associates

B. Operations

The projection of operational demand is critical to determining the need for airside improvements throughout New Jersey. Total annual operational demand can consist of several types of activity including air carrier, air taxi, military and general aviation. The general aviation operations projections presented in this section represent total general aviation operational figures in each MSA, with military and commercial activity at the three commercial service airports (Newark Liberty International, Trenton Mercer, and Atlantic City) removed from the total.

Three methodologies were used to project general aviation operations for each MSA to ensure a reasonable forecast. One methodology used was a bottom-up approach. This approach applied the projected rate of growth in civilian labor force to forecast general aviation operations for each MSA. The other two methodologies used to project operations used top-down methodologies. These methodologies projected statewide operations using a market share approach. A high growth scenario and a low growth scenario were used to develop statewide projections. Then, each MSA's share of statewide operations was used to project operations on an individual MSA basis. The three methodologies are discussed below.

5. *Bottom-Up Methodology Based on Projected Civilian Labor Force Growth*

The first general aviation operations forecast utilizes a bottom-up methodology, similar to the bottom-up methodology used for based aircraft projections. This methodology examined the growth projected by the New Jersey Data Center for New Jersey's civilian labor force by each MSA. Projected annual average growth in civilian labor force between 1998 and 2015 was the primary tool in this projection methodology. Growth in civilian labor force is an indicator of an area's future economic vitality and increased business aviation activity. As shown in Table 4-10 and discussed in the previous section, projected civilian labor force data for each MSA show varying degrees of growth. Statewide, the civilian labor force is projected to reach nearly 4.9 million in 2015, up 0.9 percent per year on average between 1998 and 2015. The Shore/East Central, Central, and South MSAs are projected to exceed the statewide growth in civilian labor force, growing at 1.27, 1.34, and 1.01 percent, respectively. The Northwest, Southwest, and Northeast MSAs are projected to grow at a rate less than the New Jersey average annual growth rate.

To project general aviation operations, projected average annual growth in civilian labor force by MSA is applied to each MSA's 2000 general aviation operations. **Table 4-14** presents the 2005, 2010 and 2020 projections of operations using this methodology. Although the growth in civilian labor force is a variable independent of aviation activity, the statewide average annual growth rate of 0.9 percent is a reasonable growth rate compared to other general aviation operations projections completed by the FAA, DVRPC, and individual airport planning documents. As shown in Table 4-14, using the bottom-up methodology, statewide general aviation operations are projected to increase from 1.98 million in 2000 to 2.38 million in 2020.

Table 4-14
GENERAL AVIATION OPERATIONS PROJECTION BOTTOM-UP METHODOLOGY

Mobility Strategy Area	1998-2015 Civilian Labor Force AAG	Historic 2000	Projected 2005	Projected 2010	Projected 2020
New Jersey Total	**0.94%**	**1,982,250**	**2,074,100**	**2,170,500**	**2,377,500**
MSA 1- Northeast	0.70%	537,489	556,600	576,300	618,000
MSA 2- Northwest	0.87%	482,220	503,600	525,900	573,400
MSA 3- Central	1.27%	247,176	263,300	280,400	318,100
MSA 4- Shore/ E. Central	1.34%	135,838	145,200	155,200	177,300
MSA 5- Southwest	0.81%	373,950	389,300	405,400	439,400
MSA 6- South	1.01%	205,577	216,200	227,300	251,300

Source: Wilbur Smith Associates.

1. Top-Down Methodology – High Growth

The second methodology uses the same top-down methodology used to project based aircraft. The growth rate used to project total statewide operations for this high growth scenario is 2.2 percent per year. This is the same rate projected in the *FAA Aerospace Forecasts Fiscal Years 2001-2012* for total hours flown by general aviation airports and general aviation operations at all U.S. towered airports.

Applying an average annual growth rate of 2.2 percent, New Jersey's total operations are projected to increase from 1.98 million in 2000 to nearly 3.06 million in 2020. Once the statewide projection of total annual operations was developed, a projection was assigned to each MSA considering its 2000 market share of the statewide annual operations. The operations projections using this high growth methodology are presented in **Table 4-15**.

Table 4-15
OPERATIONS PROJECTION
TOP-DOWN PROJECTION- HIGH GROWTH SCENARIO

Mobility Strategy Area	Historic 2000	2000 Market Share	Projected 2005	Projected 2010	Projected 2020
New Jersey Total	**1,982,250**	**100.0%**	**2,210,100**	**2,464,200**	**3,063,200**
MSA 1- Northeast	537,489	27.1%	599,300	668,200	830,600
MSA 2- Northwest	482,220	24.3%	537,600	599,500	745,200
MSA 3- Central	247,176	12.5%	275,600	307,300	382,000
MSA 4- Shore/ E. Central	135,838	6.9%	151,500	168,900	209,900
MSA 5- Southwest	373,950	18.9%	416,900	464,900	577,900
MSA 6- South	205,577	10.4%	229,200	255,600	317,700

Source: Wilbur Smith Associates.

2. Top-Down Methodology – Low Growth

The third operations projection methodology was based on a low growth scenario of the top-down methodology discussed above. The growth rate used to project operations for the low growth scenario was based on the historic operations growth at towered airports in New Jersey as well as the DVRPC projections for New Jerseys' airports in the Philadelphia metropolitan area. An average annual growth rate of 0.7 percent was applied to statewide total operations in 2000. As shown in **Table 4-16**, using this low growth scenario, by 2020 total operations in New Jersey are projected to reach nearly 2.28 million. The projected operations were then assigned down to each MSA based on their 2000 market share of statewide operations.

Table 4-16
OPERATION PROJECTION
TOP-DOWN PROJECTION- LOW GROWTH SCENARIO

Mobility Strategy Area	Historic 2000	2000 Market Share	Projected 2005	Projected 2010	Projected 2020
New Jersey Total	**1,982,250**	**100.0%**	**2,052,600**	**2,125,500**	**2,279,000**
MSA 1- Northeast	537,489	27.1%	556,600	576,300	618,000
MSA 2- Northwest	482,220	24.3%	499,300	517,100	554,400
MSA 3- Central	247,176	12.5%	255,900	265,000	284,200
MSA 4- Shore/ E. Central	135,838	6.9%	140,700	145,700	156,200
MSA 5- Southwest	373,950	18.9%	387,200	401,000	429,900
MSA 6- South	205,577	10.4%	212,900	220,400	236,400

Source: Wilbur Smith Associates.

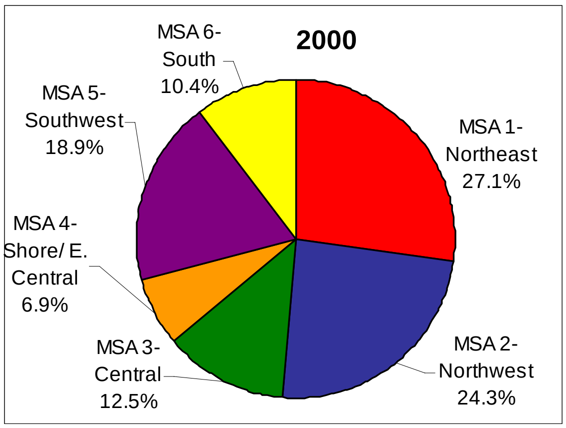
3. Preferred General Aviation Operations Projection

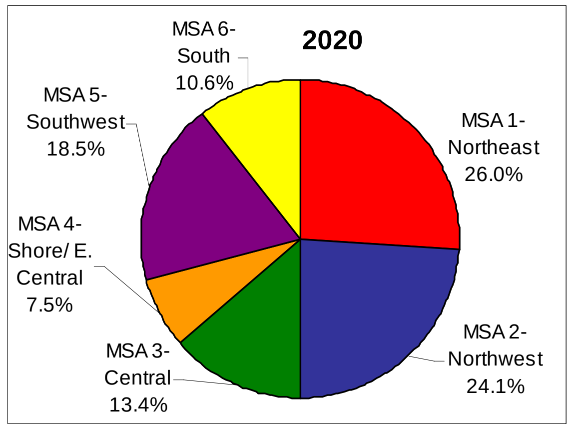
In 2000, 1.98 million general aviation operations occurred at all airports in New Jersey. The first methodology, the bottom-up methodology, produced a 2020 projection of 2.38 million operations. This represents an average annual growth rate of 0.9 percent. The second methodology, a top-down high growth scenario, projected 3.06 million operations in 2020, represents an average annual growth rate of 2.2 percent. The final methodology, a top-down low growth scenario projected 2.28 million operations in 2020, up 0.7 percent per year on average over the 20-year forecast period.

The results from the three system plan methodologies were compared by each MSA in New Jersey. Based on the review of the three methodologies, the bottom-up methodology based on projected civilian labor force growth was selected as the preferred general aviation operations projection. This methodology takes into account the shifting demographic trends by each MSA in order to project general aviation operations. While the Central and Shore/East Central MSA are projected to gain share of the New Jersey general aviation operations by 2020, the Northeast MSA is projected to lose share of the statewide projected operations.

Exhibit 4-4 presents each district's share of statewide general aviation operations in 2000 and 2020. MSA 3-Central, MSA 4-Shore/East Central, and MSA 6-South are each projected to gain share of statewide operations by 2020. MSA 1-Northeast is projected to lose the largest share of New Jersey's general aviation operations by 2020, down 1.2 percent from 2000. MSA 2-Northwest and MSA 5-Southwest are also projected to also experience a slight decline in market share of statewide operations in 2020.

Exhibit 4-4
SHARE OF NEW JERSEY GENERAL AVIATION OPERATIONS, BY MSA





Source: Wilbur Smith Associates.

III. SUMMARY

For the purpose of the SASP, unconstrained projections of aviation demand have been developed for New Jersey by MSA. The forecasts of aviation demand provide the baseline for evaluating the system as a whole and for evaluating the ability of each region to accommodate demand. Individual airport projections will be developed in a subsequent chapter. Three methodologies were used to developed projections of based aircraft and general aviation operations for each MSA. The preferred based aircraft and operations projections were both bottom-up methodologies, based on projected demographic growth as forecasted by the New Jersey Data Center. **Table 4-17** summarizes the preferred projections for based aircraft and general aviation operations.

Table 4-17
STATEWIDE SUMMARY OF PROJECTED ACTIVITY

Mobility Strategy Area	Based Aircraft 2000	Based Aircraft 2020	General Aviation Operations 2000	General Aviation Operations 2020
New Jersey Total	**4,203**	**4,830**	**1,982,250**	**2,377,500**
MSA 1- Northeast	756	819	537,489	618,000
MSA 2- Northwest	920	1,033	482,220	573,400
MSA 3- Central	837	1,025	247,176	318,100
MSA 4- Shore/ E. Central	508	622	135,838	177,300
MSA 5- Southwest	731	817	373,950	439,400
MSA 6- South	451	513	205,577	251,300

Source: Wilbur Smith Associates.

Based on projected population growth, based aircraft in New Jersey are forecast to increase at an average annual growth rate of 0.70 percent per year on average between 2000 and 2020. Statewide based aircraft are projected to reach 4,830 by 2020, up from 4,203 in 2000. Although each MSA is projected to experience growth in based aircraft, MSA 3-Central, and MSA 4-Shore/ East Central are projected to experience the largest gains in statewide share of based aircraft. MSA 1-Northeast is expected to see the largest decline in statewide market share by 2020.

Projections of general aviation operations were based on the anticipated New Jersey civilian labor force growth. Statewide general aviation operations are projected to increase at an average annual rate of 0.94 percent, reaching 2.38 million operations in 2020, up from 1.98 million in 2000. Similar to the preferred based aircraft projection, general aviation operations in the Central and Shore/ East Central MSAs are projected to gain the largest share of statewide operations by 2020. Although the Northeast MSA is projected to see the largest decline in its share of statewide general aviation operations, the region's operations are still projected to grow at an average annual rate of 0.7 percent between 2000 and 2020.

CHAPTER FIVE
BENCHMARKING ANALYSIS

I. INTRODUCTION

Aviation is an important component of New Jersey's transportation and economic infrastructure. Aviation's importance to the State underscores the need for a public use airport system that is capable of meeting all facets of demand, both now and in the future. This phase of the New Jersey Airport System Plan (SASP) contains analysis that supports informed decision-making concerning the statewide airport system.

To determine if, where, and how New Jersey's system of public use airports requires improvement or new airports to improve system performance, a systematic approach is needed. In addition, overlap or duplication of services must be identified. The first step in this approach involved identifying performance measures that are reflective of the goals that have been established for the airport system. Once these performance measures were established, various benchmarks for each measure were then identified and used to "test" how the system currently performs relative to these various performance measures.

The benefits of this approach are twofold. First, it enables New Jersey's unconstrained aviation needs to be identified and evaluated, irrespective of the airport system that is currently in place. By establishing measures that are tied to performance goals for the system, it is possible to determine how the statewide airport system should be functioning under ideal conditions. The approach allows for objectivity in identifying statewide aviation needs; it is not simply a road map to continue business as usual. It also identifies, for planning consideration, the true gaps or shortfalls, as well as areas of overlap or service duplication, in the New Jersey Airport System.

At the same time, however, this approach is pragmatic in its recognition of local, State, and Federal airport-related investment that has taken place historically. If existing airports can be called upon to satisfy benchmarks that are used to evaluate the system, this fact will be recognized in the analysis. The process considers not only an airport's current functional role in the New Jersey Airport System, but constraints that impact either its ability to continue to fulfill its existing role or its ability to play an expanded or upgraded role in promoting and meeting the State's aviation needs.

When the system benchmarking and system adequacies analyses are ultimately concluded, it will provide information on the following:

- What levels of service should the airport system provide to insure that it is not just meeting aviation demand, but also promoting aviation in New Jersey?

- Where are the current gaps or shortfalls in the system?

- Are there surpluses or duplications in the system that should influence future State funding decisions?

- How will current constraints or future demand change system needs and airport roles?

- What options are available for responding to system deficiencies?

- Are new airports needed to satisfy system performance goals/measures, and if so, where and what types?

- How should existing airports be modified to insure that New Jersey has an airport system that responds to system objectives?

This chapter of the SASP will provide answers to several of these questions by measuring the current performance of the system relative to identified goals. Other questions will be addressed in subsequent tasks as system options are identified and evaluated and as recommendations for New Jersey's public use airport system are developed.

The first step in the process to identify the deficiencies, adequacies, or surpluses in the New Jersey airport system was to identify a series of system performance measures. These measures set the standard for the level of service that the New Jersey airport system should ideally provide. These performance measures are tied to the system roles for existing system airports that were established in the preceding task of the SASP. In that task, based on their current function and contribution to the system, New Jersey airports were classified as Scheduled Service, Advanced Service, General Service, Basic Service, or Special Service. While each of these classifications can serve a variety of functions, a general definition of each is presented below:

- **Scheduled Service Airports -** Scheduled Service airports are intended to support commercial airline activities. Where capacity constraints do not limit, this functional level of airport can also support general aviation activities including corporate/executive operations, business, and recreational activities, as well as flight training.

- **Advanced Service Airports –** Advanced Service airports are intended to support corporate/executive and private use general aviation activities. In some cases, these airports are in major metropolitan areas and are intended to function as relievers to larger, more congested, Scheduled Service airports. These airports should be able to accommodate the largest and most demanding corporate jet aircraft in the operational fleet. Where operational and/or capacity constraints do not limit, this level of facility can also support recreational general aviation activities and flight training.

- **General Service Airports –** General Service airports are intended to support smaller corporate aircraft, such as twin-engine aircraft, and the operation of general aviation aircraft for business and pleasure. This functional level of airport is intended support a variety of uses (business, pleasure, and training), while providing the majority of the system's operational and storage capacity for single and multi-engine piston aircraft.

- **Basic Service Airports –** Basic Service airports include facilities with paved or turf runways that support small general aviation aircraft, such as single and light twin-engine aircraft, storage and operation. This level of airport supports private pilots that may be flying for business or pleasure and require minimal support facilities and services.

- **Special Service Facilities –** Special Service Facilities include heliports, gliderports, seaplane bases, balloonports, and ultralight facilities that primarily support components of aviation demand other than fixed wing aircraft.

For the New Jersey Airport System to function at an acceptable level of service, it should strive to meet the following general goals:

- The New Jersey airport system should be accessible from the air. Air accessibility is influenced by the availability of precision or non-precision approaches, weather reporting equipment, such as AWOS and ASOS, and air traffic control towers.

- The New Jersey airport system should be accessible from the ground. Ground accessibility is influenced not only by distance in actual miles, but also by the condition of the roads, the type of roads, and the typical congestion on the roads providing the access. It is recognized that highway congestion can often limit the effective service area of airports in the system. Benchmarks to measure accessibility to New Jersey's airport system need to consider the location of both residents and businesses within the State. It is also recognized that residents and businesses have different accessibility requirements for airports that offer different types of facilities, and that within New Jersey, the presence of private use heliports often coincides with the location of active business centers.

- The New Jersey airport system should be able to accommodate demand both now and in the future. There are operational, environmental, land use, and planning constraints that, individually or in combination, limit an airport's ability to serve near and/or long-term aviation demand. It is important to know where operational and expansion constraints currently exist or where they may exist in the future.

- The New Jersey airport system should be able to respond to foreseen and unforeseen growth in aviation demand. Identifying system airports that have been proactive in planning and protecting for future growth provides one indicator of the system's flexibility to respond to meet future growth. New Jersey's historic reliance on privately owned, public use airports dictates that it is appropriate for the State to have a strategy to identify and secure core system airports. Having an understanding of the current and future role that privately owned system airports play in meeting New Jersey's aviation needs is important to identifying an appropriate strategy for privately owned airports.

- The New Jersey airport system should be comprised of airports that provide facilities and services commensurate with their current or future system role. As part of the previous task in the SASP, the airport system was stratified to reflect the role that each airport currently plays. As the system evaluation progresses in subsequent tasks, analysis may reveal that it is desirable to increase the role currently played by some system airports to address gaps or shortfalls identified in the system; in other instances, that analysis may determine that an airport's current role is appropriate for the 20-year planning period. The analysis may also determine that some airports should be assigned a lower role.

- In addition to stratifying system airports based on their current functional role, facility and service objectives for each airport category (Scheduled Service, Advanced Service, General Service, and Basic Service) were also established. Airports in the New Jersey system should have facilities and services that are matched to their system role.

- The New Jersey airport system should be developed and maintained in such a way so that it meets applicable design standards. As reported by the New Jersey General Aviation Study Commission, airport safety is paramount among all statewide concerns for the State airport system. Design standards for all system airports are established by the FAA, and applicable design standards for each airport are determined by the airport's current or future Airport Reference Code (ARC). To promote safety, airports in the New Jersey system should have runway and taxiway separations that conform to FAA guidelines. The width of the primary surface at each system airport should also meet applicable standards, as should the RSA and OFA dimensions for each system airport's primary runway.

II. BENCHMARKING

The following sections summarize results of the benchmarking process used in the SASP. Benchmarks were identified for measurable performance criterion already established for the system in previous tasks. In general, each performance measure used in the SASP represents a system goal. This process examines specific benchmarks that allow the aviation system to be measured based on how well it is fulfilling these goals. The outcome of this benchmark analysis will identify specific areas in which the existing and/or future system must be improved. The benchmarking analysis provides a report card on how well the existing system is performing. The findings from this analysis will be further examined in Chapter Six, System Adequacy and Options Analysis**.** Graphs be presented in the following sections summarize the results of the benchmarking process and indicate how well the system is currently meeting the goals previously developed. These results depict the adequacy of the existing system relative to system goals.

It is important to note that in the benchmarking analysis, two different types of benchmarks have been identified; action benchmarks and information benchmarks. **Action benchmarks** are those factors for which the performance of the existing system can be measured and future objectives for the system can be set to raise the performance of the existing or planned system. **Information benchmarks** are those that provide background data on the system, but for which the establishment of future objectives may not be practical. Benchmarks presented in the following sections are identified as action benchmarks or information benchmarks.

The benchmarking process for the New Jersey SASP examined the following major performance measures:

- Air Accessibility
- Surface Access
- Aviation Activity
- Development Potential
- Existing Infrastructure
- Design Standards

A. Air Accessibility

Several benchmarks were examined to measure the airport system's ability to provide aircraft access to the State. These benchmarks generally measure the ability of an aircraft operator to fly to an airport that provides a specific facility or service, such as a precision approach, and access people, places, or things located throughout the State. The outcomes from the analysis of air accessibility benchmarks are presented in terms of the percentage of the State's land area that is located within a specified drive time of an airport that provides a specific facility or service. It should be noted that airports outside New Jersey may also provide services that benefit the State. Airports in proximity to the State with coverage areas that extend into New Jersey were included in this analysis.

The general goal for New Jersey's system of public use airports related to air accessibility is summarized below:

AIR ACCESSIBILITY GOAL: New Jersey's system of public use airports should provide adequate access to users from the air.

For this performance measure, the following benchmarks were examined:

- Precision Approach – percentage of the State's land area within a 30-minute drive time from all airports with an ILS approach
- Non-Precision Approach – percentage of the State's land area within a 30-minute drive time of all airports with a non-precision approach
- On-site Weather – percentage of the State's land area within a 30-minute drive time of all airports with on-site weather reporting (ASOS, AWOS, or ATCT)
- Control Tower – percentage of the State's land area within a 30-minute drive time of all airports with an air traffic control tower (ATCT)

The findings from the analysis of these specific air access benchmarks are examined in the following sections. Where appropriate, GIS mapping is included to illustrate airport locations and area coverages.

1. Precision Approach

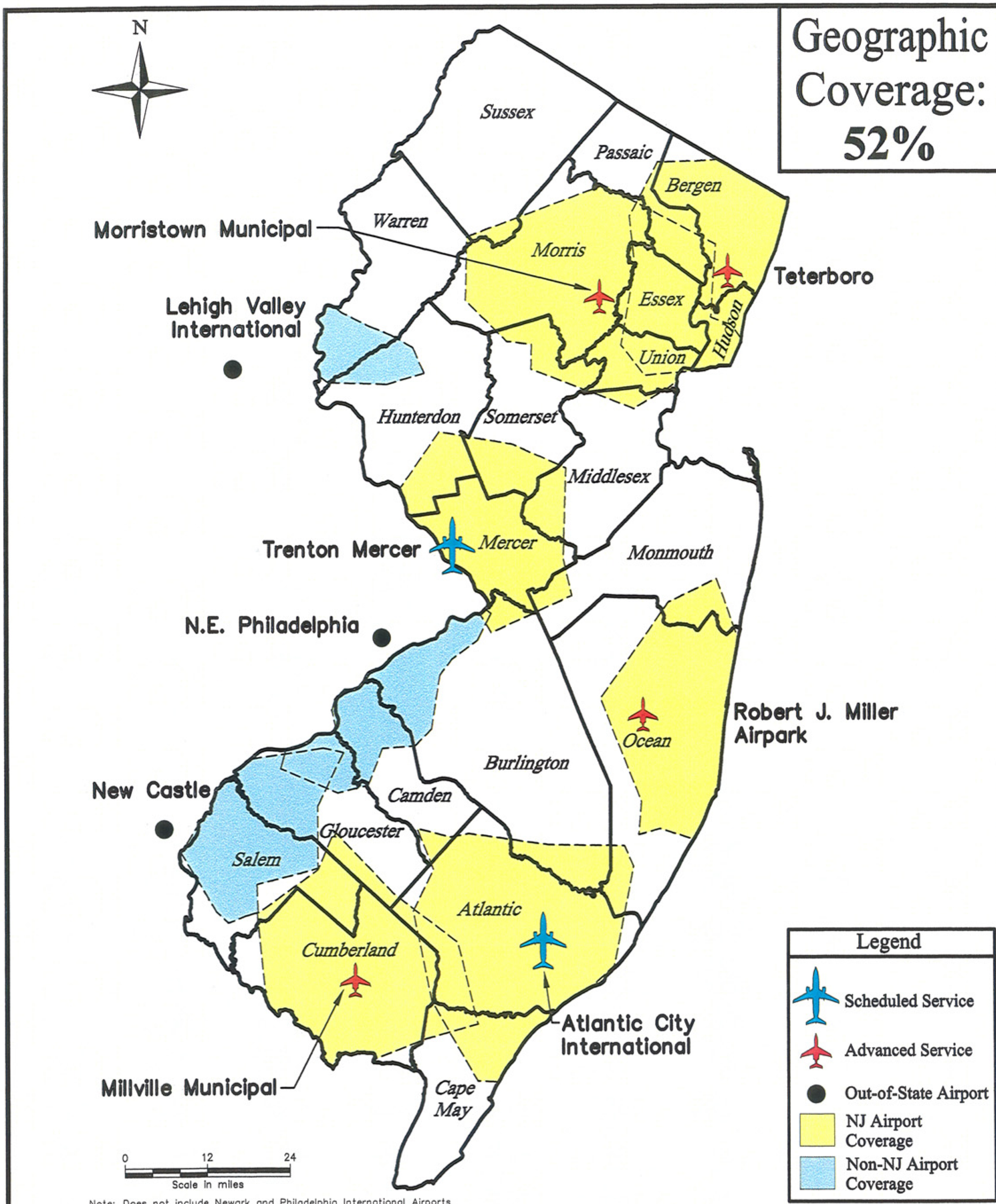
Precision approach systems provide electronic longitudinal and glideslope information to aircraft during their approach and landing procedures. These systems allow aircraft to locate an airport and land on a specific runway during periods of poor visibility and/or inclement weather. Operators of the most demanding general aviation aircraft typically prefer to operate at airports with precision approaches. The reliability that these systems provide is important to business aircraft because it minimizes the periods of time that airports are closed because of poor visibility. Precision approach systems reduce delays related to airport closures, rerouting of aircraft, and ground travel times associated with not being able to access the nearest airport.

The percentage of the State's land area within a 30-minute drive time of an airport with an ILS approach was measured in this analysis. **Exhibit 5-1** summarizes the results of the precision approach analysis. It is important to note that precision approach facilities provided at Newark Liberty International Airport and Philadelphia International Airport are not included in this analysis because capacity and operational characteristics at those airports make it undesirable for them to accommodate additional general aviation demand. As shown in Exhibit 5-1, approximately 52 percent of the State's land area is located within a 30-minute drive time of one of the six New Jersey airports and three airports in neighboring states with a precision approach. Lehigh Valley International Airport and Northeast Philadelphia Airport in Pennsylvania and New Castle County Airport in Delaware each provide precision approach coverage to areas in New Jersey. Those areas that are currently not within a 30-minute drive time of an airport with a precision approach include large portions of Warren, Sussex, Middlesex, Monmouth, and Burlington counties. A goal of providing precision approaches within a 30-minute drive time of 100 percent of the State has been established for the SASP. Possible improvement projects associated with meeting that goal will be identified in a subsequent task.

The findings for the precision approach benchmark can be summarized as follows:

- **Current Outcome –** Approximately **52 percent** of the State's land area is currently located within a 30-minute drive time of an airport with a precision approach.

- **System Goal – 100 percent** of the State's land area should be within a 30-minute drive time of an airport with a precision approach.



STATE AIRPORT SYSTEM PLAN

ILS Coverage

Exhibit 5-1

2. Non-Precision Approach

Similar to precision approaches, non-precision approaches provide electronic information to aircraft during approach and landing. In general, non-precision approach systems provide information that aids in the location of an airport and a specific runway; however, these systems do not provide glide slope information to aircraft during their approach. While not as advanced or expensive to install or maintain as precision approaches, non-precision approaches support airport operations during periods of poor visibility and inclement weather when visual approaches are not possible. Non-precision approaches provide additional reliability to aircraft operators, thereby minimizing weather delays and diversions to other airports.

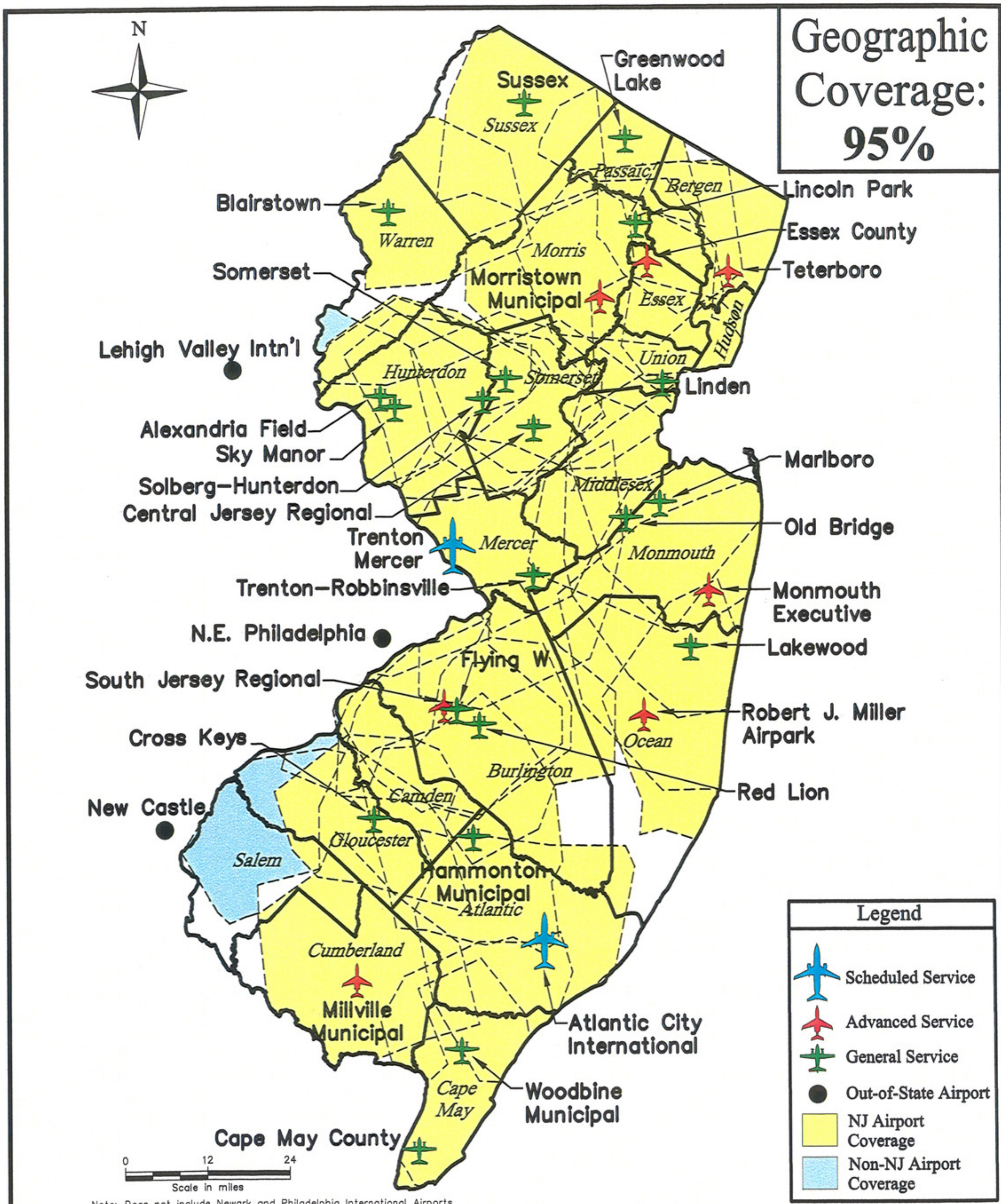
The percentage of the State's land area within a 30-minute drive time of one of the 39 airports with a non-precision approach was calculated in this analysis. **Exhibit 5-2** summarizes the results of the non-precision approach analysis. As shown in Exhibit 5-2, approximately 95 percent of the State's land area is located within a 30-minute drive time of an airport with a non-precision approach. Exhibit 5-2 identifies three airports outside New Jersey that are currently providing the State with non-precision approach coverage. Lehigh Valley International Airport and Northeast Philadelphia Airport in Pennsylvania and New Castle County Airport in Delaware each provide non-precision approach coverage to portions of New Jersey. Those areas that are currently not within a 30-minute drive time of an airport with a non-precision approach include small portions of Warren, Morris, Burlington, Ocean, Salem, and Cumberland counties. It should be noted that the following six Basic Service airports have non-precision approaches: Bader, Rudy's, Ocean City, Kroelinger, Aeroflex-Andover Field, and Camden County airports. These six airports provide exclusive non-precision approach coverage to approximately one-half of one percent (0.5%) of the State's land area.

The SASP has established a goal of providing non-precision approaches within a 30-minute drive-time of the entire land area of the State. The improvement projects associated with meeting that goal will be identified in later project tasks.

The findings of the non-precision approach benchmark are summarized as follows:

- **Current Outcome –** Approximately **95 percent** of the State's land area is located within a 30-minute drive time of an airport with a non-precision approach.

- **System Goal – 100 percent** of the State's land area should be within a 30-minute drive time of an airport with a non-precision approach.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Non-Precision Approach Coverage

Exhibit 5-2

3. On-Site Weather

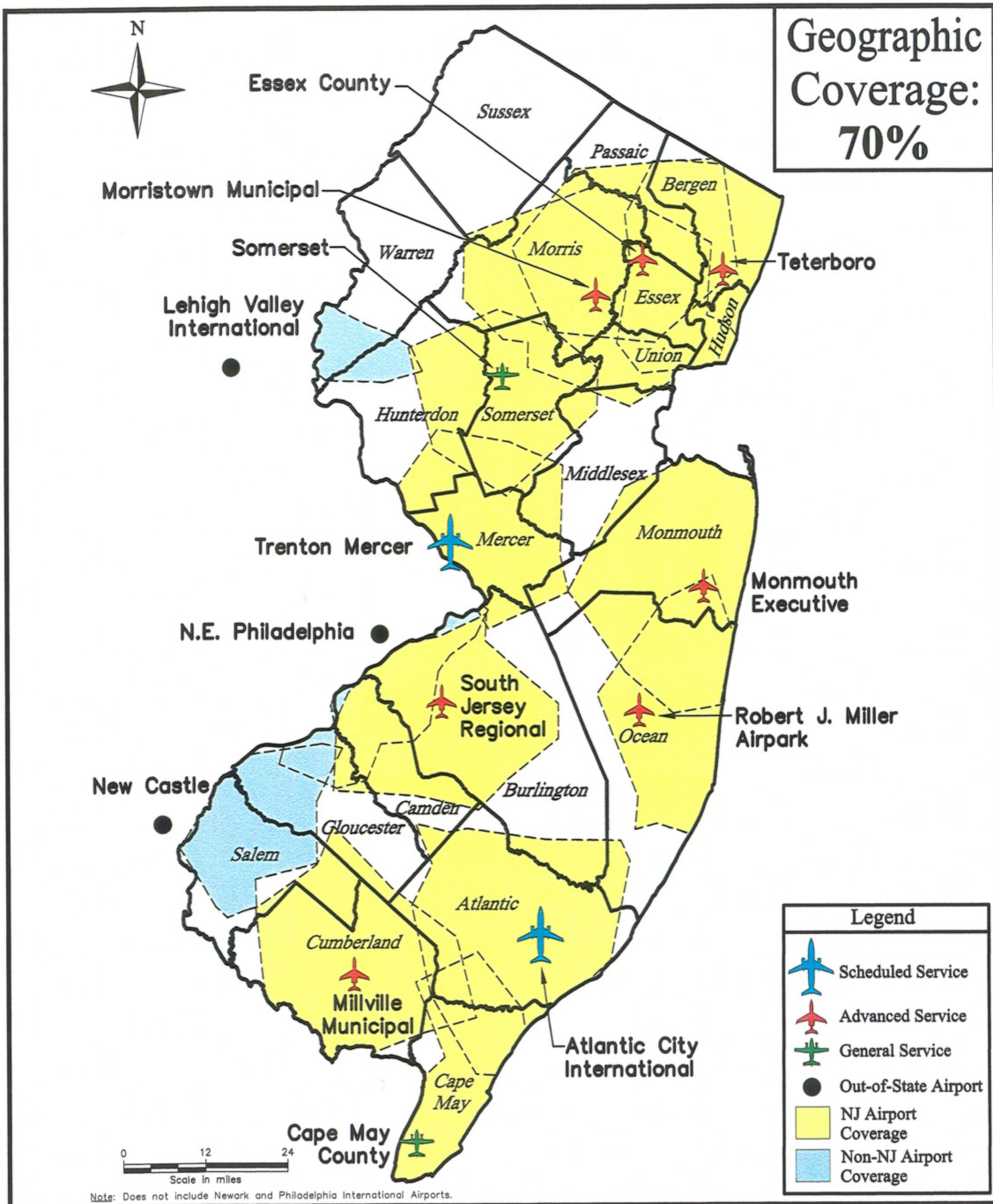
On-site weather reporting equipment at an airport can complement that facility's precision or non-precision approach capabilities, as well as promote an increased safety margin during periods of inclement weather. By providing on-site weather reporting equipment at airports throughout the State, pilots are ensured sufficient information related to weather conditions at their destination airport. This information helps pilots make informed decisions regarding operations during inclement weather. In this benchmark analysis, those airports that currently have an operational automated surface observing system (ASOS), automated weather observing system (AWOS), or air traffic control tower (ATCT) were identified.

The percentage of the State that is located within a 30-minute drive time of an airport with on-site weather reporting equipment is graphically depicted in **Exhibit 5-3**. As shown, approximately 70 percent of the State is located within a 30-minute drive time of one of the 14 airports with a weather reporting system. It should be noted that three airports outside the State have market areas that extend into New Jersey and are currently providing on-site weather reporting coverage to portions of New Jersey. Significant portions of Warren, Sussex, Middlesex, Burlington, Ocean, and Gloucester counties are currently located outside of the 30-minute drive time areas associated with New Jersey and neighboring states' airports that have on-site weather reporting capabilities. The SASP will examine New Jersey-specific projects required to increase land area coverage by weather reporting systems from the current level of 70 percent to a future level of 100 percent.

The findings of the on-site weather analysis can be summarized as follows:

- **Current Outcome –** Approximately **70 percent** of the State's land area is located within a 30-minute drive time of an airport that provides on-site weather reporting services.

- **System Goal – 100 percent** of the State's land area should be within a 30-minute drive time of an airport with on-site weather reporting.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

On-Site Weather Coverage

Exhibit 5-3

4. Air Traffic Control Tower

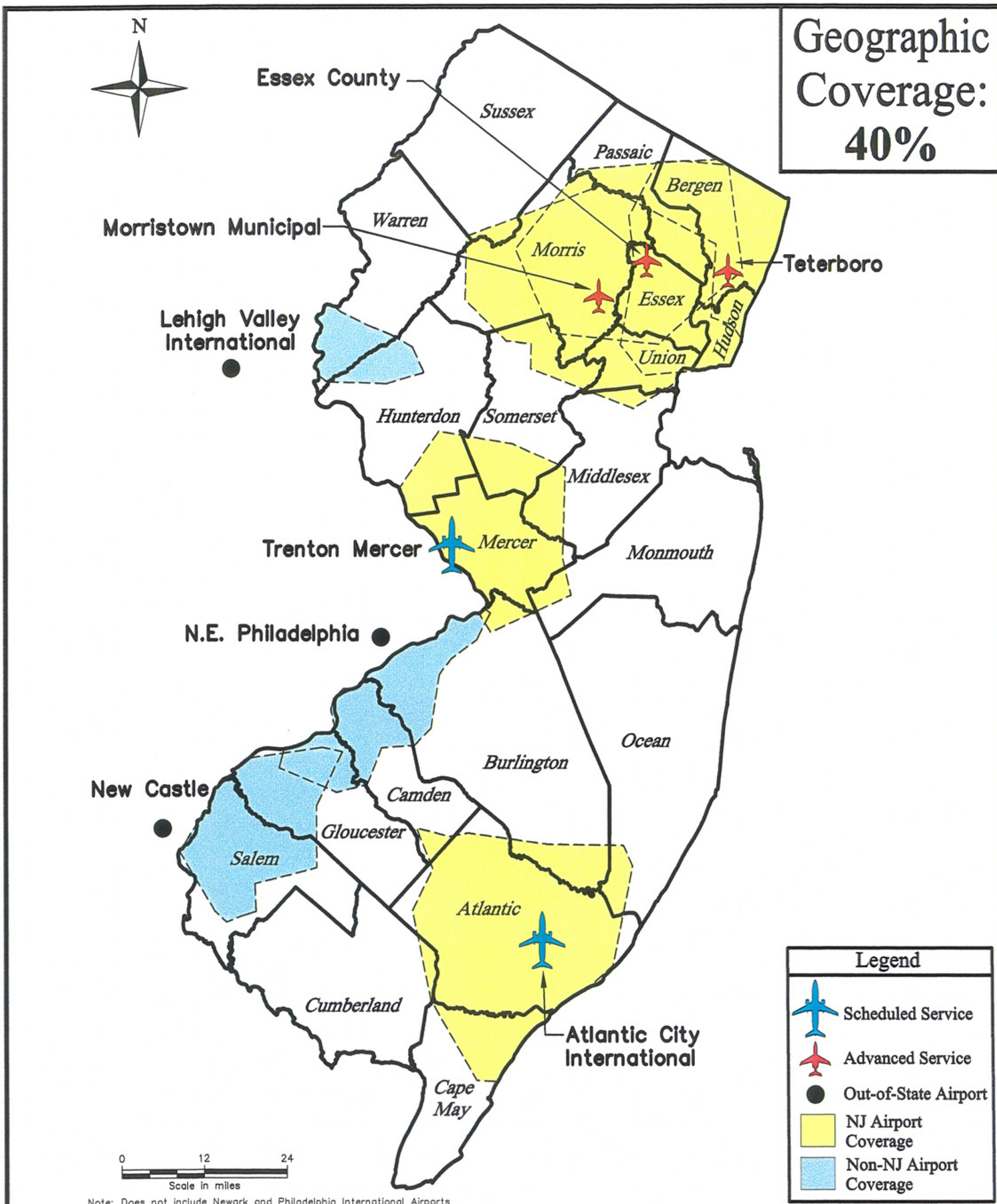
Air Traffic Control Towers (ATCTs) provide services that control airspace and surface movements at some of the State's busiest airports. Many private and corporate operators typically favor the controlled environment of a towered airport due to the increased margin of safety provided during periods of poor visibility, inclement weather, and other circumstances that may limit visual operations.

Exhibit 5-4 graphically depicts that percentage of the State's total land area that is within a 30-minute drive time of a towered airport. As shown in Exhibit 5-4, approximately 40 percent of New Jersey's land area is located within a 30-minute drive time of the eight airports, five in New Jersey and three outside the state, with a tower. It should be noted that currently several airports outside the State have coverage areas that extend into New Jersey. Lehigh Valley International Airport and Northeast Philadelphia Airport in Pennsylvania and New Castle County Airport in Delaware each provide coverage to New Jersey land areas. Those counties that have large areas that lie outside the 30-minute coverage area of a towered airport include Warren, Sussex, Hunterdon, Somerset, Middlesex, Monmouth, Ocean, Burlington, Cumberland, and Cape May counties.

Air accessibility analysis related to ATCT facilities in the State of New Jersey can be summarized as follows:

- **Current Outcome –** Approximately **40 percent** of the State's land area is located within a 30-minute drive time of an airport with an ATCT.

- **System Goal –** Due to the informational nature of this benchmark and the factors outside the State's control that influence this benchmark, no system goal will be developed.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

ATCT Coverage

Exhibit 5-4

B. Surface Accessibility

In addition to providing air accessibility to the State's land area, New Jersey's system of public use airports should be accessible, via the ground, to residents and businesses located throughout the State. The benchmarks examined in the following sections are measures that were developed to identify the percentage of the State's residents and major businesses that are located within a specified drive time of an airport in each of the system's functional levels. Data related to surface accessibility is presented separately for population and businesses, and findings are also presented individually by airport functional level.

The general goal for New Jersey's system of public use airports related to surface accessibility is summarized below:

SURFACE ACCESSIBILITY GOAL: New Jersey's system of public use airports should provide adequate access to users on the ground.

For surface accessibility, the following benchmarks were examined:

- Market Area Coverage (Population)
  - Percentage of the State's population that is within a 60-minute drive time of a Scheduled Service airport
  - Percentage of the State's population that is within a 30-minute drive time of an Advanced Service airport
  - Percentage of the State's population that is within a 30-minute drive time of a General Service airport
  - Percentage of the State's population that is within a 30-minute drive time of a Basic Service airport

- Market Area Coverage (Business)
  - Percentage of the State's businesses that are within a 60-minute drive time of a Scheduled Service airport
  - Percentage of the State's businesses that are within a 30-minute drive time of an Advanced Service airport
  - Percentage of the State's businesses that are within a 30-minute drive time of a General Service airport
  - Percentage of the State's businesses that are within a 30-minute drive time of a Basic Service airport

- Percentage of the State's businesses that are located within a 30-minute drive time of an airport with a paved primary runway at least 5,000 feet long

The outcomes from the analysis of these specific surface access benchmarks are presented in the following sections. Where appropriate, GIS mapping is included to illustrate estimated drive time and market area coverages.

1. Market Area Coverage (Population):

One way of measuring the performance of an airport system is to identify the percentage of total population that is located within a specified driving time of the system's existing airports in each functional level. The functional levels that were developed for the New Jersey SASP include the following:

- Scheduled Service
- Advanced Service
- General Service
- Basic Service
- Special Service

Facilities in the Special Service functional level include heliports, balloon ports and seaplane bases. Due to the nature of these facilities, market area coverages are not included in this analysis.

The findings of the population market area analyses are presented in the following sections.

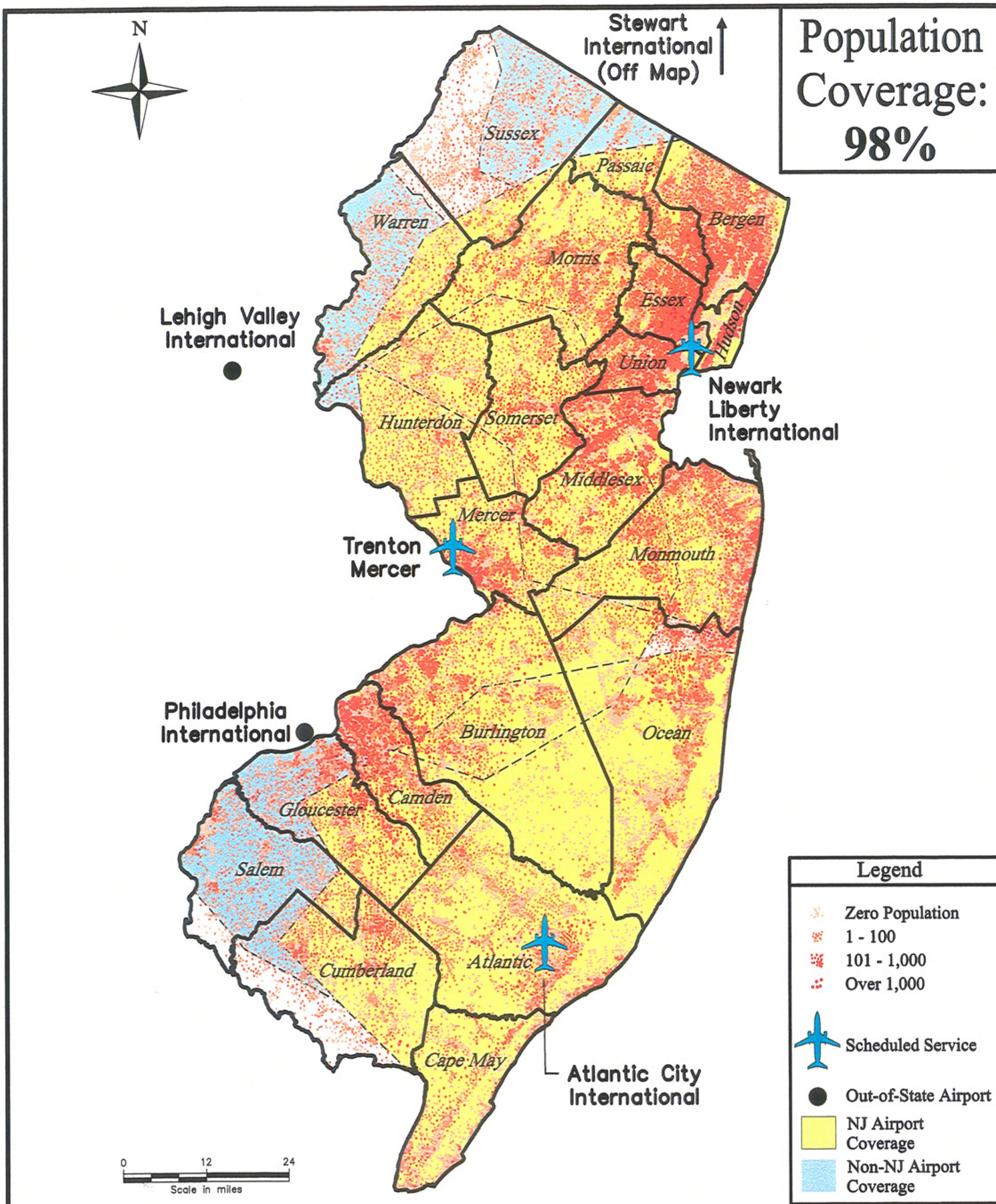
a. Scheduled Service

The findings of the Scheduled Service airport population market coverage analysis are summarized in **Exhibit 5-5**. As shown, approximately 98 percent of New Jersey's population is within a 60-minute drive time of one of six Scheduled Service airports, three in New Jersey and three outside the State, that were included in this analysis. In general, the population that is not within a 60-minute drive time of a Scheduled Service airport is located in the extreme northern and extreme southern areas of the State, including parts of Warren, Sussex, Passaic, Salem, and Cumberland Counties. A small portion of Ocean County is also excluded from the Scheduled Service airport coverage areas. It should be noted that Scheduled Service airports located outside the State are currently serving portions of the New Jersey population. Stewart International Airport in New York, as well as Lehigh Valley International Airport and Philadelphia International Airport in Pennsylvania, have 60-minute drive time coverage areas that extend into New Jersey.

The population market area coverage analysis for Scheduled Service airports can be summarized as follows:

- **Current Outcome** - Approximately **98 percent** of the State's population is within a 60-minute drive time of a Scheduled Service airport.

- **System Goal – 100 percent** of the State's population should be within a 60-minute drive time of a Scheduled Service airport.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Scheduled Service Airport Population Coverage

Exhibit 5-5

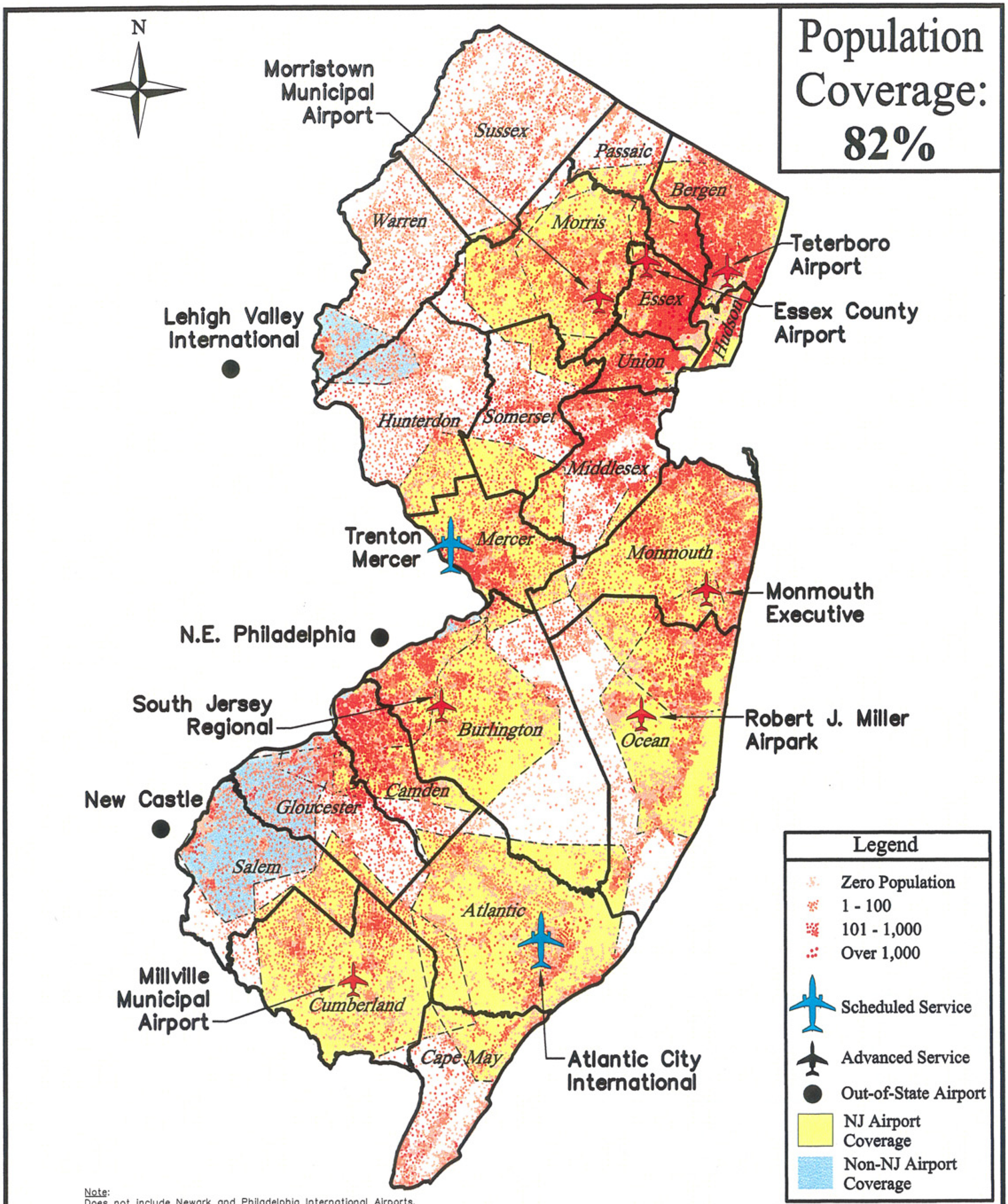
b. Advanced Service

The findings of the Advanced Service airport population market coverage analysis are summarized in **Exhibit 5-6**. As shown, approximately 82 percent of the State's population is within a 30-minute drive time of an Advanced Service airport. It should be noted that several Scheduled Service airports in New Jersey (Trenton Mercer and Atlantic City International) also have the capacity and services to adequately meet Advanced Service needs. Because several airports located outside the State also support the demands for Advanced Service facilities, Lehigh Valley International Airport and Northeast Philadelphia Airport in Pennsylvania and New Castle County Airport in Delaware were included in this analysis. As shown, areas of northern New Jersey, including larger parts of Sussex, Warren, Hunterdon, Somerset, and Middlesex Counties, as well as portions of Burlington, Ocean, and Cape May Counties in central and southern New Jersey area, are outside the 30-minute coverage areas of an Advanced Service airport.

The population market area coverage analysis for Advanced Service airports can be summarized as follows:

- **Current Outcome** - Approximately **82 percent** of the State's population is within a 30-minute drive time of an Advanced Service airport.

- **System Goal – 100 percent** of the State's population should be within a 30-minute drive time of an Advanced Service airport.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Advanced Service Airport Population Coverage

Exhibit 5-6

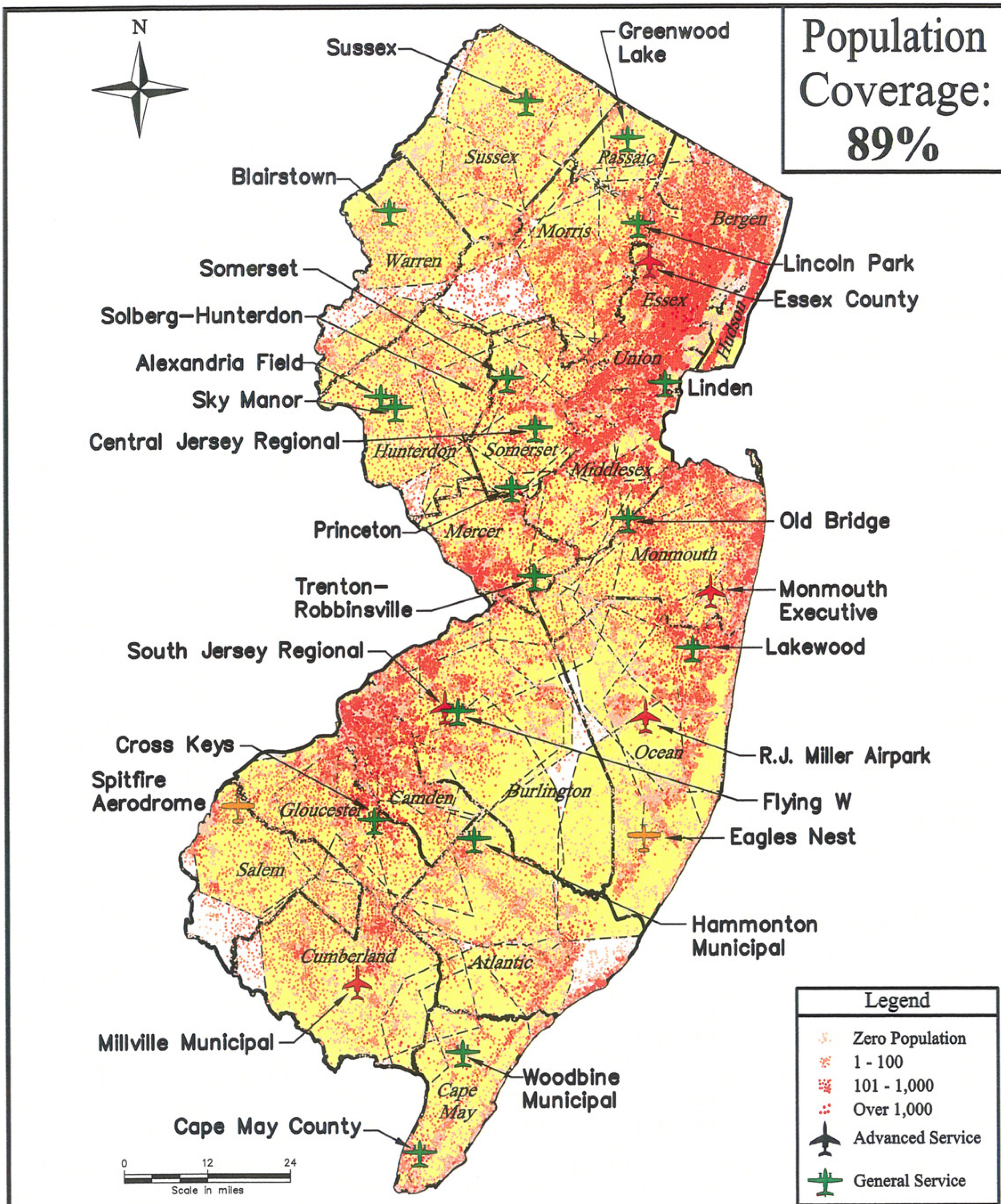
c. General Service

The findings of the General Service airport coverage analysis are summarized in **Exhibit 5-7**. As shown, approximately 89 percent of the State's population is within a 30-minute drive time of an airport that provides the level of facilities and services associated with the General Service functional level of airport. Several Advanced Service airports, including Monmouth Executive, Essex County, Robert J. Miller, Millville Municipal, and South Jersey Regional airports, were included in this analysis because they can sufficiently accommodate General Service demand without compromising airport capacity.

The population market area coverage analysis for General Service airports can be summarized as follows:

- **Current Outcome** - Approximately **89 percent** of the State's population is within a 30-minute drive time of an airport that provides the level of facilities and services associated with the General Service functional level.

- **System Goal –** The system goal for General Service airport coverage is 100 percent of the State's population should be within a 30-minute drive time of an airport that can adequately support operational needs associated with the General Service functional level.



STATE AIRPORT SYSTEM PLAN

General Service Airport Population Coverage

Exhibit 5-7

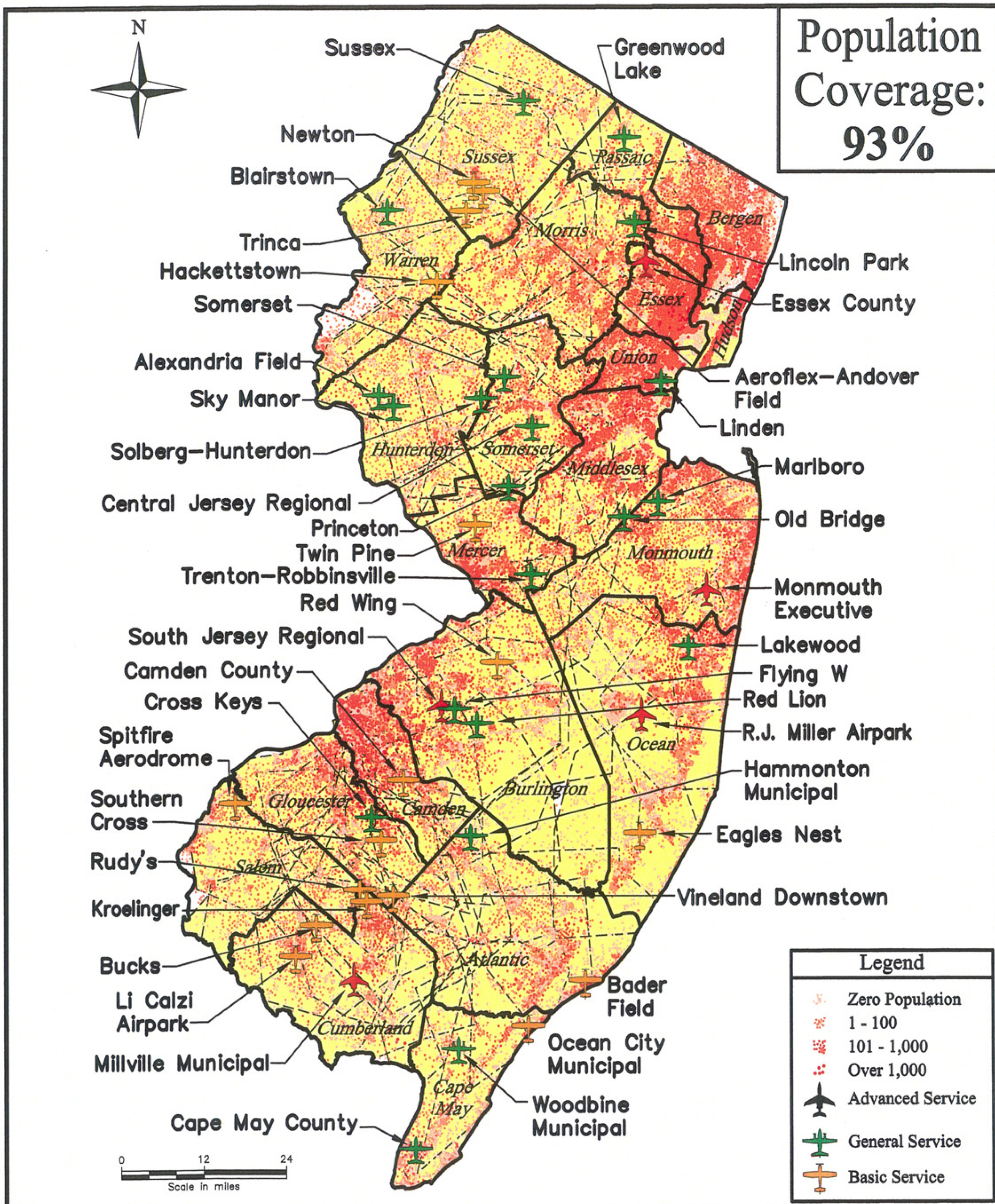
d. Basic Service

The findings of the Basic Service airport coverage analysis are summarized in **Exhibit 5-8**. As shown, approximately 93 percent of the State's population is within a 30-minute drive time of an airport that provides the level of facilities and services associated with the Basic Service functional level of airport. A wide range of airports that have been stratified in the SASP as Advanced, General, and Basic Service airports can accommodate basic service demand.

The population market area coverage analysis for Basic Service airports can be summarized as follows:

- **Current Outcome** - Approximately **93 percent** of the State's population is within a 30-minute drive time of an airport that can support the demand associated with a Basic Service facility.

- **System Goal –** The SASP goal is that 100 percent of the State's population should be within a 30-minute drive time of an airport that can adequately support operational needs associated with the Basic Service functional level.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Basic Service Airport Population Coverage

Exhibit 5-8

2. Market Area Coverage (Businesses):

In addition to population coverage, the market area coverage of New Jersey businesses is also an important factor to consider when measuring the surface accessibility of New Jersey's system of public use airports. For this analysis, businesses within specific industry categories that traditionally have the highest propensity to use aviation services were identified. The locations of these New Jersey businesses are presented in each of the following exhibits. The ability of New Jersey's existing airport system to adequately support the aviation needs of businesses throughout the State is examined in the following sections.

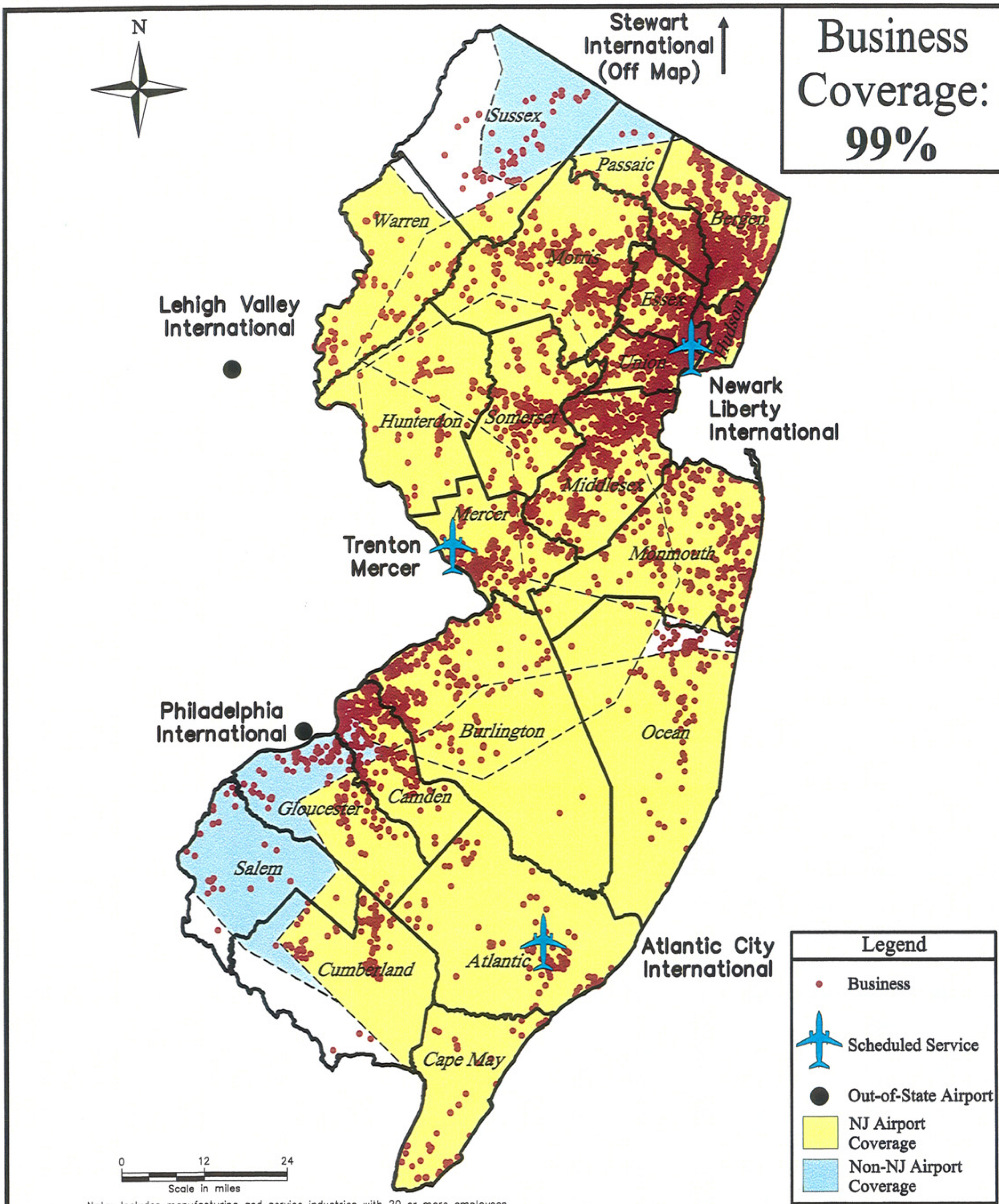
a. Scheduled Service

The findings of the business market area analysis for Scheduled Service airports are presented in **Exhibit 5-9**. As shown, approximately 99 percent of the New Jersey businesses considered in this analysis are located within a 60-minute drive time of a Scheduled Service airport. Scheduled Service airports including Stewart International Airport in New York and Lehigh Valley International Airport and Philadelphia International Airport in Pennsylvania, are included in this analysis because their 60-minute drive time coverage areas extend into portions of New Jersey. Areas of Sussex, Warren, Passaic, Ocean, Salem, and Cumberland Counties are currently excluded from the Scheduled Service airport coverage areas identified in this analysis.

The business market area coverage analysis for Scheduled Service airports can be summarized as follows:

- **Current Outcome** - Approximately **99 percent** of the State's businesses (those included in this analysis) are within a 60-minute drive time of a Scheduled Service airport.

- **System Goal – 100 percent** of the State's businesses should be within a 60-minute drive time of a Scheduled Service airport.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Scheduled Service Airport Business Coverage

Exhibit 5-9

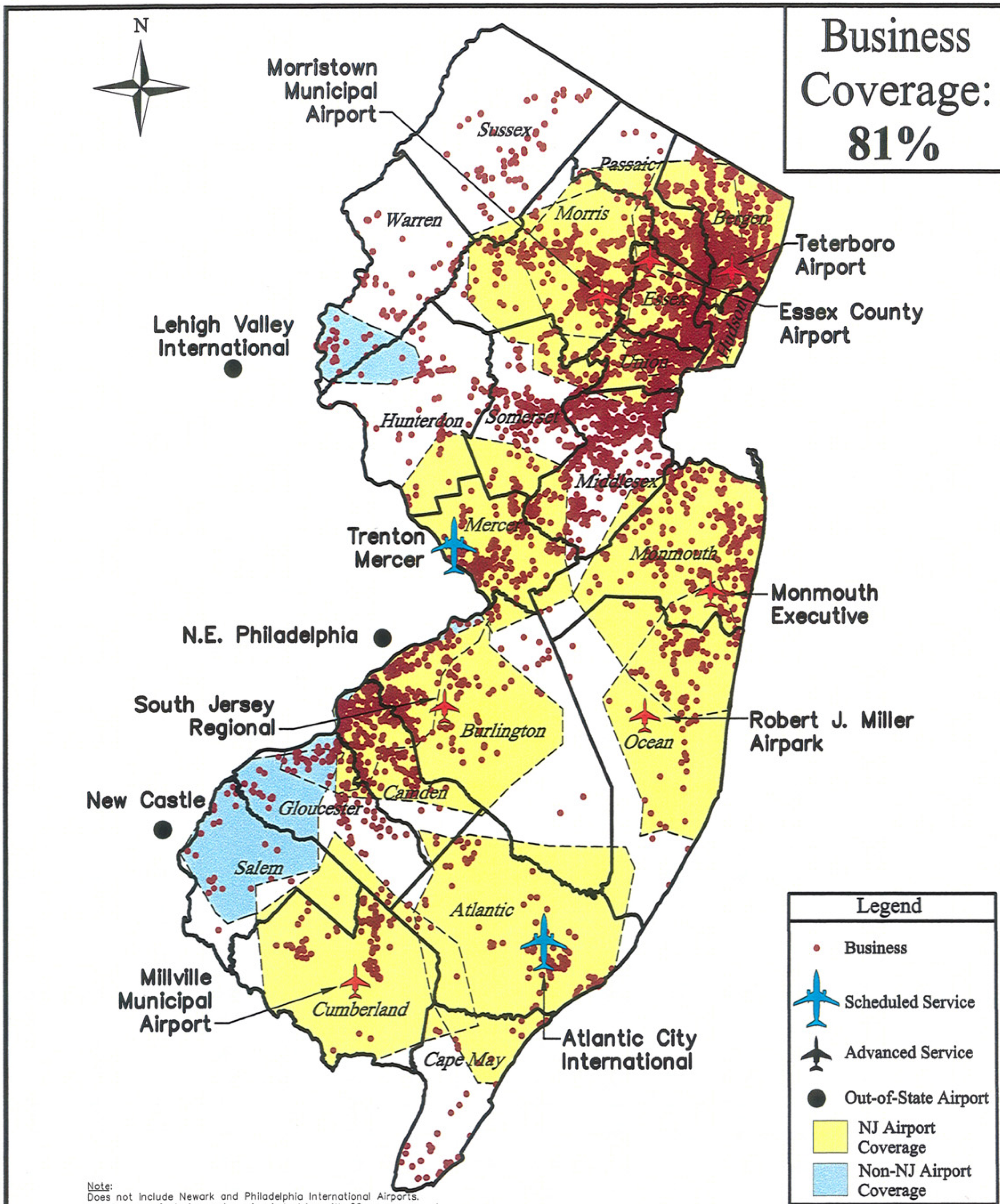
b. <u>Advanced Service</u>

The findings of the business market area coverage analysis for Advanced Service airports are presented in **Exhibit 5-10**. Currently, approximately 81 percent of the State's businesses considered in this analysis are located within a 30-minute drive time of airports that can accommodate Advanced Service demand. As shown in Exhibit 5-10, businesses in areas of northern New Jersey, including larger parts of Sussex, Warren, Passaic, Hunterdon, Somerset, and Middlesex Counties, as well as portions of Burlington, Camden, Gloucester, Ocean, and Cape May Counties in central and southern New Jersey areas are beyond the 30-minute drive time of airports that can accommodate Advanced Service demands. It should be noted that several of New Jersey's Scheduled Service airports, Trenton-Mercer Airport and Atlantic City International Airport, as well as several airports located outside New Jersey, Lehigh Valley International Airport, Northeast Philadelphia Airport, and New Castle County Airport, were included in this analysis because of their ability to provide the facilities and services associated with Advanced Service airports.

The business market area coverage analysis for Advanced Service airports can be summarized as follows:

- **Current Outcome** - Approximately **81 percent** of the State's businesses (those included in this analysis) are within a 30-minute drive time of an Advanced Service airport.

- **System Goal – 100 percent** of the State's businesses should be within a 30-minute drive time of an Advanced Service airport.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Advanced Service Airport Business Coverage

Exhibit 5-10

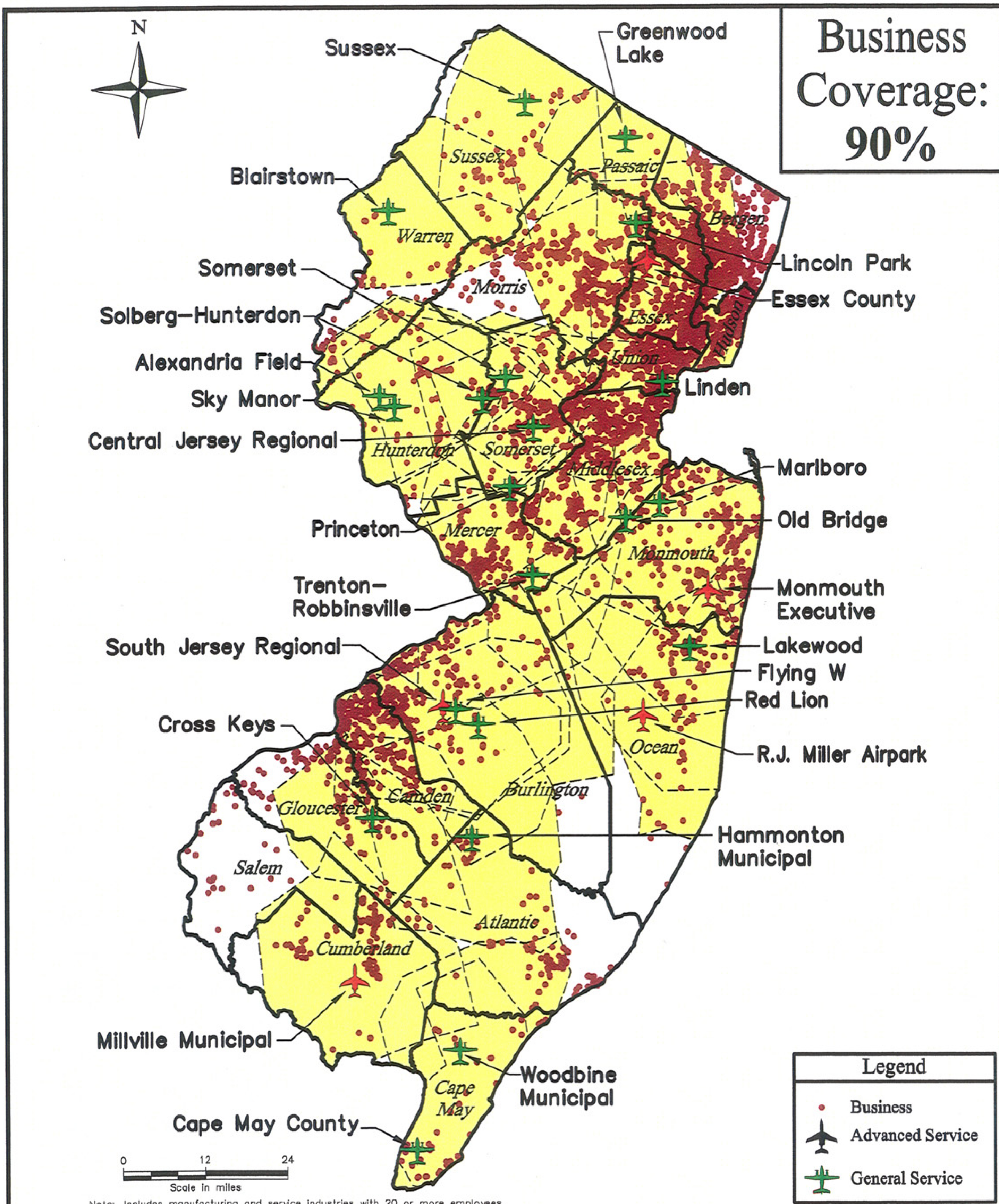
c. General Service

The findings from the business market area coverage analysis for General Service airports are presented in **Exhibit 5-11**. As shown, approximately 90 percent of the State's businesses considered in this analysis are within a 30-minute drive time of an airport that provides the level of facilities and services associated with the General Service functional level of airport. Several Advanced Service airports, including Monmouth Executive, Essex County, Robert J. Miller, Millville Municipal, and South Jersey Regional airports, were included in this analysis because they can accommodate General Service demand without compromising airport capacity.

The business market area coverage analysis for General Service airports can be summarized as follows:

- **Current Outcome** - Approximately **90 percent** of the State's businesses (those included in this analysis) are within a 30-minute drive time of a General Service airport.

- **System Goal –** The SASP goal for General Service coverage is that 100 percent of the State's businesses should be within a 30-minute drive time of an airport that can adequately support operational needs associated with the General Service functional level.



STATE AIRPORT SYSTEM PLAN

General Service Airport Business Coverage

Exhibit 5-11

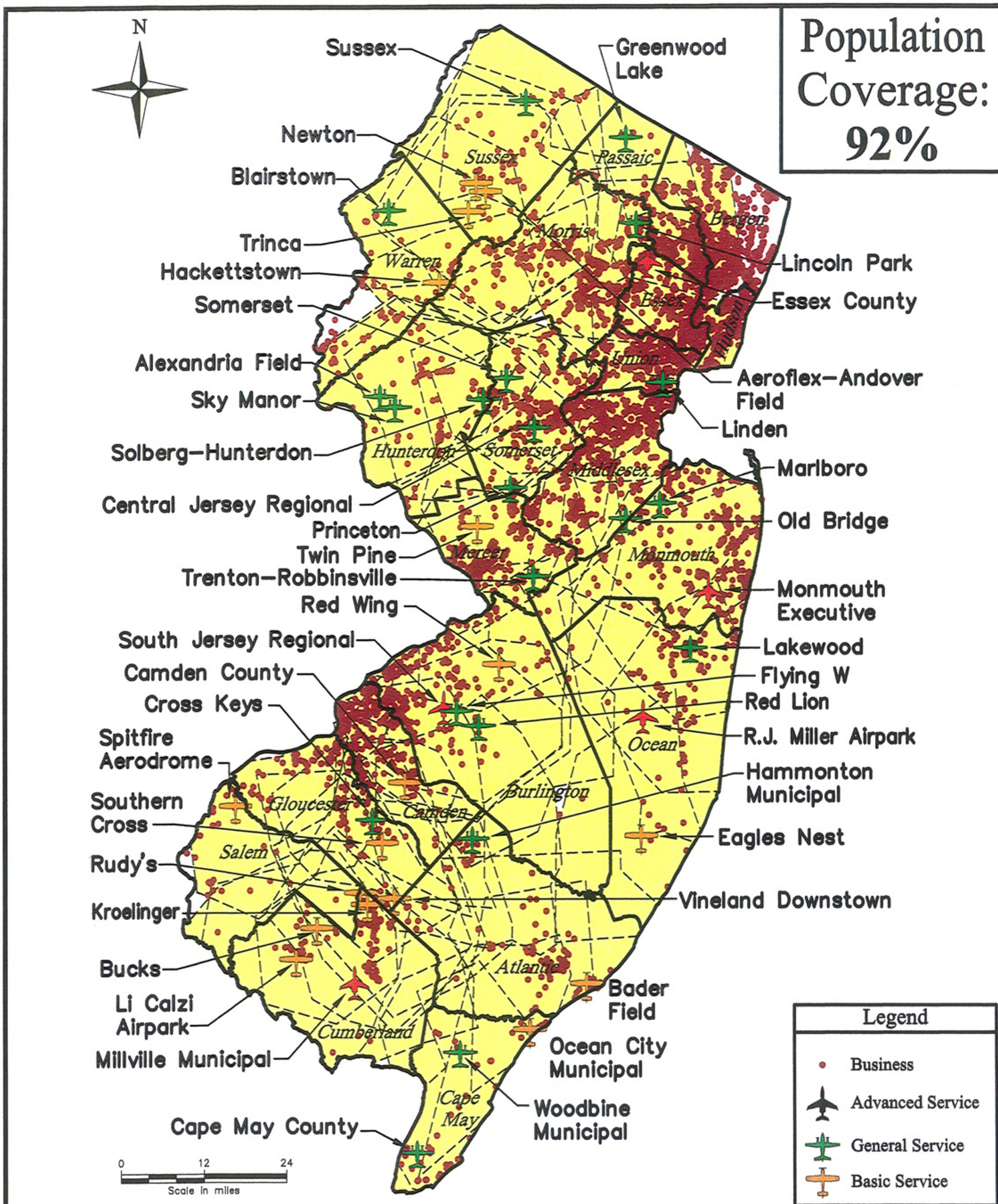
d. Basic Service

The findings of the business market area coverage analysis for Basic Service airports are presented in **Exhibit 5-12**. As shown, approximately 92 percent of the State's businesses considered in this analysis are within a 30-minute drive time of an airport that provides facilities and services associated with the Basic Service airports. Basic Service demand can be accommodated by a wide range of airports, including airports that have been stratified in the SASP as Advanced and General Service airports. Advanced Service airports that can accommodate Basic Service demand, include Monmouth Executive, Essex County, Robert J. Miller, Millville Municipal, and South Jersey Regional airports. Each General Service airport identified in the New Jersey system can also accommodate Basic Service demand.

The business market area coverage analysis for Basic Service airports can be summarized as follows:

- **Current Outcome** - Approximately **92 percent** of the New Jersey businesses included in this analysis are within a 30-minute drive time of a Basic Service airport or an airport that can support the demand associated with a Basic Service facility.

- **System Goal –** The SASP goal is that 100 percent of the State's businesses should be within a 30-minute drive time of an airport that can adequately support operational needs associated with the Basic Service functional level.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Basic Service Airport Business Coverage

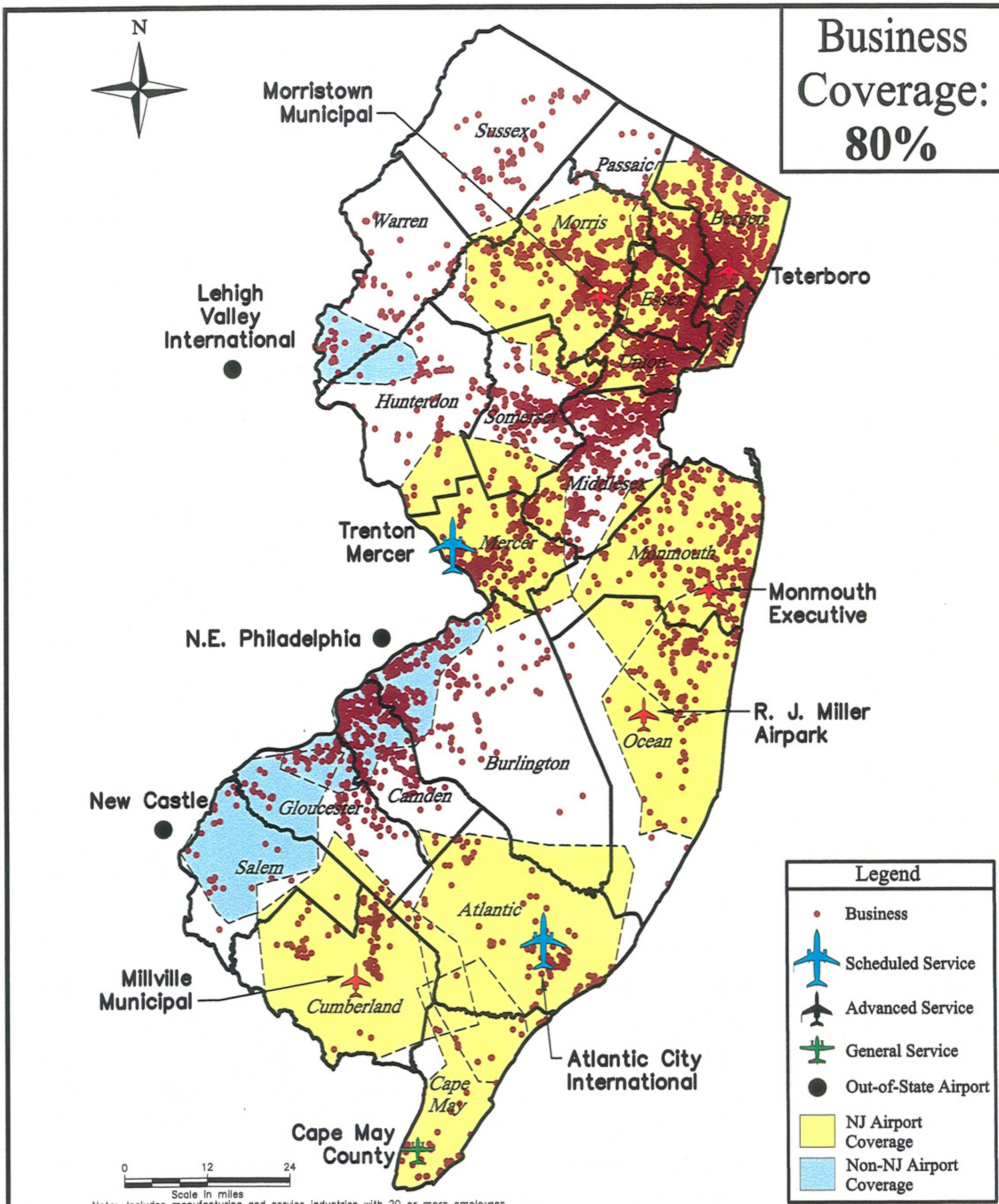
Exhibit 5-12

3. Runway Length Coverage

Adequate runway facilities are one of the most important components of an aviation system. Measuring runway adequacy is more complicated than simply counting the number of airports and/or runways in the system. In many instances, runway adequacy is determined by the ability of individual runways to accommodate use by a specific type of operator or class of aircraft. This section of the benchmark analysis examines the performance of existing runways in the New Jersey system of public use airports relative to businesses that have been identified in this analysis.

Many of the nation's leading employers that use general aviation as a business tool are members of the National Business Aircraft Association (NBAA). The NBAA's *Business Aviation Fact Book 2000* indicates that approximately 70 percent of all businesses included in the *Fortune 500* operate general aviation aircraft. In addition, 90 of the *Fortune 100* companies operate general aviation aircraft. A detailed analysis conducted for NBAA in 1998 also indicated that among the *Fortune 500* there were more than twice as many companies operating general aviation aircraft as non-operators. NBAA data indicate that, of its total membership fleet, approximately 78 percent is comprised of corporate jet aircraft, including light and medium jets (under 29,999 pounds) and heavy jets. In addition, recent trends related to business and corporate aviation use indicate that those businesses that own or frequently charter aircraft for company travel purposes continue to prefer larger and more demanding corporate aircraft.

A planning "rule of thumb" indicates that corporate jet aircraft typically require approximately 5,000 feet of paved runway to regularly support their operations at an airport. The 5,000-foot runway length represents a composite runway length requirement that results from a number of different factors being examined, including operational characteristics of specific aircraft, aircraft operator preferences, and standard corporate aircraft insurance policies. In the following analysis, those New Jersey airports with a paved runway measuring at least 5,000 feet in length were identified and their 30-minute drive time coverage areas were compared to the location of the New Jersey businesses included in this analysis. **Exhibit 5-13** graphically depicts the outcome of this analysis.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

≥ 5,000 Ft. Runways - Business Coverage

Exhibit 5-13

As shown in Exhibit 5-13, approximately 80 percent of the New Jersey businesses considered in this analysis are located within a 30-minute drive time of an airport with a paved runway measuring at least 5,000 feet in length. Because of their proximity to New Jersey, Lehigh Valley International Airport, Northeast Philadelphia Airport, and New Castle County Airport, all airports with at least one runway over 5,000 feet were included in this analysis. Portions of the following counties are located beyond the current coverage areas: Sussex, Warren, Passaic, Hunterdon, Somerset, Middlesex, Ocean, Burlington, Camden, and Gloucester.

This coverage analysis of runway length and New Jersey businesses can be summarized as follows:

- **Current Outcome** - Approximately **80 percent** of the State's businesses (those considered in this analysis) are within a 30-minute drive time of a paved runway at least 5,000 feet in length.

- **System Goal – 100 percent** of the State's businesses should be within a 30-minute drive time of a paved runway at least 5,000 feet in length. It should be noted that this system goal corresponds with the overall goal for advanced service airport coverage since one of the facility objectives for this category is a 5,000 foot primary runway.

C. Aviation Activity

The ability of an aviation system to adequately accommodate aviation activity is an important factor in determining system adequacy. The adequacy of New Jersey's airport system, as it relates to activity, was evaluated based on the relationship between operational capacity and annual operational demand. The general goal for New Jersey's system of public use airports can be summarized as follows:

AVIATION ACTIVITY GOAL: New Jersey's system of public use airports should adequately process aviation activity and meet anticipated aviation demand.

1. Existing Airfield Capacity

The benchmark used in this study to review existing airfield capacity was the relationship between each airport's annual service volume (ASV), which measures an airport's ability to process activity, and each airport's current operational levels. This benchmark analysis identified the percentage of airports in each functional level that fall within the following three demand/capacity ranges:

- Less than 60 percent demand/capacity ratio
- Between 60 and 80 percent demand/capacity ratio
- Greater than 80 percent demand/capacity ratio

The three demand/capacity ratio ranges presented above were developed based on FAA planning guidelines. These guidelines indicate that when an airport reaches a demand/capacity ratio of 60 percent, or an airport is operating at 60 percent of capacity, the level of delay experienced at that airport justifies the initiation of planning for capacity enhancement projects. A demand/ capacity ratio of 80 percent generally indicates that the construction of capacity enhancement projects should be initiated based on anticipated delay.

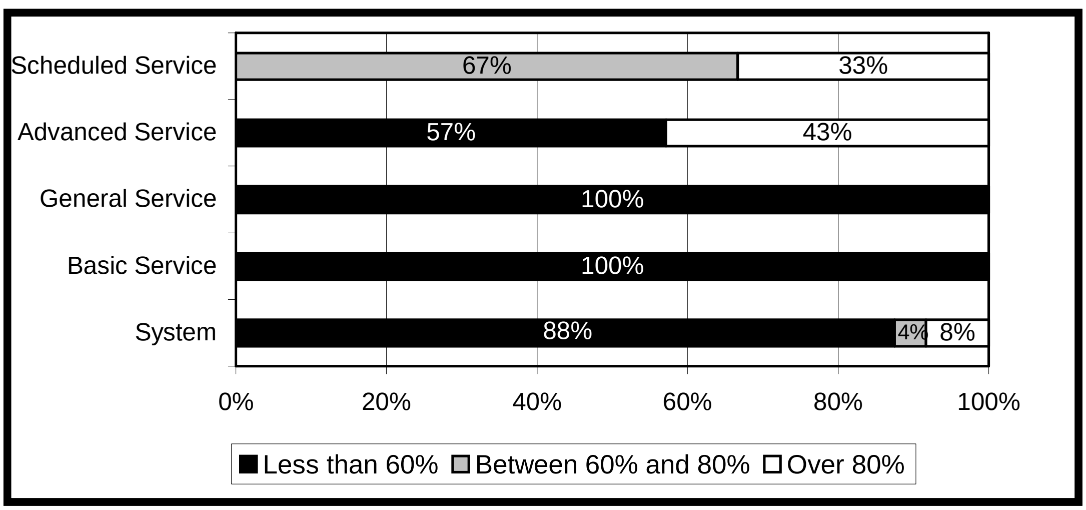
In general, operational delays are undesirable within an airport system for several reasons. Air travel is chosen as a transportation mode because of the timesavings that it offers. When aircraft encounter operational delays that are based on insufficient operating capacity, efficiencies gained through air transportation can be significantly diminished. Further, when aircraft are forced to idle on the ground or to circle in the air as a result of insufficient operational capacity, the aircraft operating cost and potential for environmental impacts are increased.

The methodology used to examine capacity issues in this system plan identifies planning estimates for each individual airport's ASV and compares this ASV to current levels of activity occurring at those facilities. This comparison establishes demand/capacity ratios for each system airport. Estimates of gross ASV were developed for each New Jersey airport based on an approved FAA methodology; then deductions to gross ASV were estimated using actual facility considerations at each airport.

For this benchmark, each airport's ASV was compared to its most recent estimate of total annual operations. The objective was to identify the percentage of system airports within each functional level, and for the system as a whole, whose current demand/capacity ratio indicates that delay could be occurring. At these facilities, planning or construction of capacity enhancement projects may be justified.

The results of the capacity benchmark analysis are presented in **Exhibit 5-14**.

Exhibit 5-14
CAPACITY ANALYSIS



Source: Wilbur Smith Associates

As shown, approximately 88 percent of the State's airports currently operate at a demand/capacity ratio of less than 60 percent, while an additional 4 percent of system airports have a demand/capacity ratio in the range of 60 to 80 percent. Only 8 percent of system airports (Newark Liberty, Essex, Morristown, and Teterboro) operate at demand/capacity ratios of 80 percent or greater. Each airport in the General Service and Basic Service functional level currently operates with a demand/capacity ratio under 60 percent. While the system as a whole appears to be performing well, capacity concerns do exist in the Scheduled Service and Advanced Service functional levels. Approximately 33 percent of Scheduled Service and 43 percent of Advanced Service airports in currently operate with a demand/capacity ratio greater than 80 percent. The remaining Scheduled Service airports in the system operate at demand/capacity ratios ranging from 60 percent to 80 percent. The specific capacity findings for each system airport are presented in **Table 5-1**.

Table 5-1
EXISTING OPERATIONAL CAPACITY SUMMARY

	Capacity		
	Under 60%	60% - 80%	Above 80%
Scheduled Service			
Atlantic City International		X	
Newark Liberty International			X
Trenton Mercer		X	
Advanced Service			
Essex County			X
Millville Municipal	X		
Monmouth Executive	X		
Morristown Municipal			X
Robert J. Miller	X		
South Jersey Regional	X		
Teterboro			X
General Service			
Alexandria Field	X		
Blairstown	X		
Cape May County	X		
Central Jersey Regional	X		
Cross Keys	X		
Flying W	X		
Greenwood Lake	X		
Hammonton Municipal	X		
Lakewood	X		
Lincoln Park	X		
Linden	X		
Marlboro	X		
Old Bridge	X		
Princeton	X		
Red Lion	X		

Table 5-1
EXISTING OPERATIONAL CAPACITY SUMMARY, Continued

	Capacity		
	Under 60%	60% - 80%	Above 80%
Sky Manor	X		
Solberg-Hunterdon	X		
Somerset	X		
Sussex	X		
Trenton-Robbinsville	X		
Woodbine Municipal	X		
Basic Service			
Aeroflex-Andover Field	X		
Bader Field	X		
Bucks	X		
Camden County	X		
Eagles Nest	X		
Hackettstown	X		
Kroelinger	X		
Li Calzi Airpark	X		
Newton	X		
Ocean City Municipal	X		
Red Wing	X		
Rudy's	X		
Southern Cross	X		
Spitfire Aerodrome	X		
Trinca	X		
Twin Pine	X		
Vineland Downstown	X		
System Total	**42**	**2**	**4**

Source: Wilbur Smith Associates

D. Development Potential

As demand at system airports grows and as FAA design criteria and development standards are modified over time, having a system of airports that can respond to changing needs and demands is important. Human, environmental, topographical, and other natural constraints can often combine to make airport growth and development difficult or, in some cases, impossible. There are some steps, however, that airports can take to help insure that they are in the best position to respond if future expansion is warranted.

Most airports that are part of the Federal airport system (Airports included in the National Plan of Integrated Airport Systems (NPIAS)) are eligible to receive Federal funding for many types of capital improvement projects. NPIAS and non-NPIAS airports are also eligible to receive funding from the State for various capital improvement projects. One of the prerequisites for receiving State or FAA funding for eligible development items is an approved airport planning document, such as an airport master plan or an airport layout plan. By having plans that are current (developed within the past five years), New Jersey airports can anticipate projects that may be required to accommodate new aircraft types, to serve higher volumes of activity, or to comply with new FAA design standards and guidelines. Regular review and update of airport planning documents helps to ensure that individual airports, and the airport system as a whole, can evolve to meet changing types and levels of demand.

Airport ownership is another factor that can impact the development potential of New Jersey airports and the airport system as a whole. The type of ownership, usually classified as public or private, can impact the airport's ability to obtain matching funds to leverage federal or State grants. The type of airport ownership in place can also impact the overall stability of the airport. In many instances, a privately owned, public-use airport is not obligated to keep the airport open for public use. Instead, the property could be sold to a developer and used for residential or commercial development.

The general system goal as it relates to development potential at New Jersey public use airports can be summarized as follows:

DEVELOPMENT POTENTIAL GOAL: Facilities at New Jersey's system of public use airports should be optimized in consideration of the demands of system users, as well as the human and natural environment.

1. Planning Documents

As previously noted, current planning documents for New Jersey system airports can be important to development at individual airports and for the system as a whole. For this analysis, information was collected regarding the most recently completed planning document at each New Jersey airport. Planning documents at New Jersey's airports were then categorized in the following three areas:

- Airports that have an approved airport planning document that was completed since 1995
- Airports that have an approved airport planning document that was completed prior to 1995
- Airports that have never completed an approved airport planning document

Table 5-2 summarizes current airport planning documents at each of the airports in the New Jersey system. Also listed is the year that the FAA or State accepted the last planning document. Where planning projects are currently underway, the anticipated completion date is noted.

Table 5-2
AIRPORT PLANNING DOCUMENT SUMMARY

	Planning Documents		
	Since 1995	Prior to 1995	None
Scheduled Service			
Atlantic City International	X		
Newark Liberty International	X		
Trenton Mercer	X		
Advanced Service			
Essex County	X		
Millville Municipal	X		
Monmouth Executive	X		
Morristown Municipal	X		
Robert J. Miller		X	
South Jersey Regional	X		
Teterboro		X	
General Service			
Alexandria Field	X		
Blairstown	X		
Cape May County	X		
Central Jersey Regional	X		
Cross Keys	X		
Flying W	X		
Greenwood Lake	X		
Hammonton Municipal	X		
Lakewood	X		
Lincoln Park		X	
Linden	X		
Marlboro			X
Old Bridge	X		
Princeton	X		
Red Lion	X		
Sky Manor	X		
Solberg-Hunterdon	X		
Somerset	X		
Sussex	X		
Trenton-Robbinsville	X		
Woodbine Municipal	X		
Basic Service			
Aeroflex-Andover Field	X		
Bader Field		X	
Bucks			X
Camden County	X		
Eagles Nest	X		
Hackettstown			X

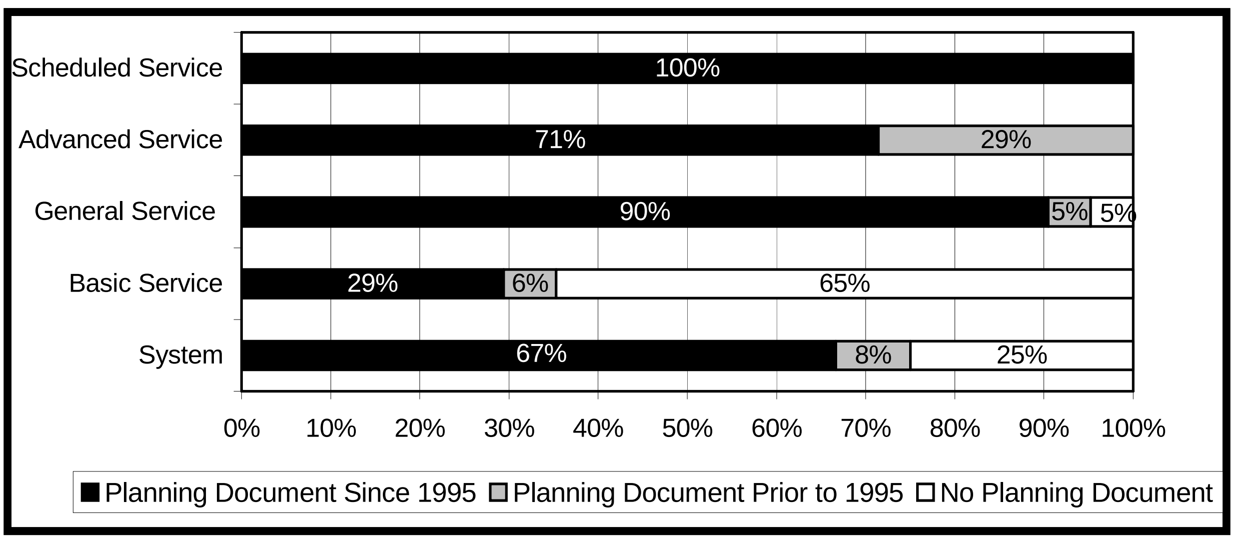
Table 5-2
AIRPORT PLANNING DOCUMENT SUMMARY, Continued

	Planning Documents		
	Since 1995	Prior to 1995	None
Kroelinger			X
Li Calzi Airpark			X
Newton			X
Ocean City Municipal	X		
Red Wing			X
Rudy's			X
Southern Cross			X
Spitfire Aerodrome			X
Trinca	X		
Twin Pine			X
Vineland Downstown			X
System Total	**26**	**7**	**15**

Source: NJDOT

Exhibit 5-15 summarizes the status of planning for the system.

Exhibit 5-15
PLANNING DOCUMENTS



Source: NJDOT

Airports are grouped as either having current or in-progress plans, outdated plans, or no plans at all. As shown above, 100 percent of Scheduled Service airports have approved planning documents, with each of those planning documents having been completed since 1995. All Advanced Airports and approximately 95 percent of General Service airports have approved planning documents. Approximately 35 percent of Basic Service airports have an accepted planning document.

- **Current Outcome** – As shown in the graph above, 67 percent of the system airports have completed a planning document since 1995, while an additional 8 percent of system airports have completed a planning document prior to 1995. The remaining 25 percent of the airports have not completed a planning document. Similar data is also presented for each functional level of airport.

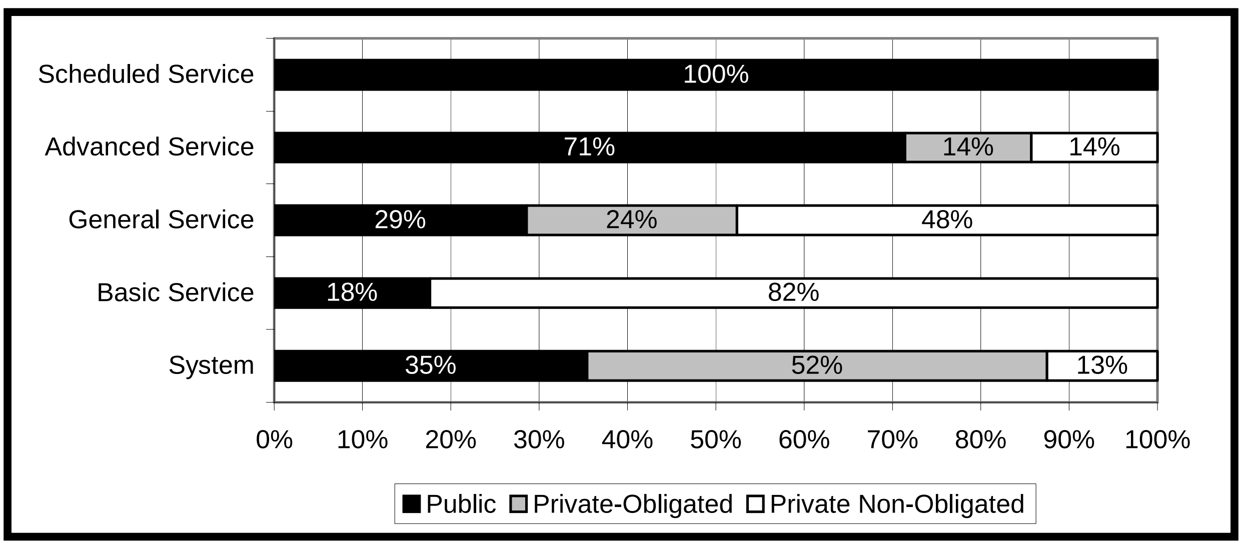
- **System Goal** – 100 percent of the airports included in the Scheduled Service and Advanced Service functional levels should have a planning document that has been updated within the last five years. 100 percent of the airports included in the General Service functional level should have a planning document that has been completed within the last 10 years, or as needed. Basic Service airports should prepare planning documents as needed.

2. Ownership

The benchmark analysis of airport ownership examined the type of ownership under which each airport in the system currently operates. This benchmark analysis is primarily informational in nature and is included to provide an overall illustration of the long-term development potential and stability of the existing system.

Exhibit 5-16 summarizes the outcome of this benchmark analysis.

Exhibit 5-16
AIRPORT OWNERSHIP



Source: NJDOT

While 100 percent of Scheduled Service airports are publicly owned, public ownership in the other functional levels of airports ranges from 71 percent for Advanced Service airports to approximately 18 percent for Basic Service airports. Approximately 14 percent of Advanced Service airports are privately owned, but federally obligated, while 24 percent of General Service airports can be classified in such a way. As shown, approximately 82 percent of the

Basic Service airports included in the New Jersey system are privately owned and are not federally-obligated. **Table 5-3** presents a description of ownership at each system airport.

- **Current Outcome** – As shown in the graph above, 35 percent of the system's airports are publicly owned, while 52 percent of system airports are privately-owned, but obligated under federal grant assurances. The remaining 13 percent of the system airports are privately owned and not federally-obligated. This data is presented in Exhibit 5-16 for each functional level of airport.

- **System Goal** – Due to the informational nature of this benchmark and the factors outside the State's control that influence this benchmark, no system goal was established. However, it is important for the State to ensure that those airports that are vital to the system pursue public ownership or become obligated to protect their long-term viability.

Table 5-3
AIRPORT OWNERSHIP SUMMARY

	Ownership		
	Public	Private	Private-Obligated
Scheduled Service			
Atlantic City International	X		
Newark Liberty International	X		
Trenton Mercer	X		
Advanced Service			
Essex County	X		
Millville Municipal	X		
Monmouth Executive		X	
Morristown Municipal	X		
Robert J. Miller	X		
South Jersey Regional			X
Teterboro	X		
General Service			
Alexandria Field		X	
Blairstown		X	
Cape May County	X		
Central Jersey Regional		X	
Cross Keys		X	
Flying W		X	
Greenwood Lake	X		
Hammonton Municipal	X		
Lakewood	X		
Lincoln Park			X
Linden	X		
Marlboro		X	
Old Bridge		X	
Princeton			X

Table 5-3
AIRPORT OWNERSHIP SUMMARY, Continued

	Ownership		
	Public	Private	Private-Obligated
Red Lion		X	
Sky Manor		X	
Solberg-Hunterdon		X	
Somerset			X
Sussex			X
Trenton-Robbinsville			X
Woodbine Municipal	X		
Basic Service			
Aeroflex-Andover Field	X		
Bader Field	X		
Bucks		X	
Camden County		X	
Eagles Nest		X	
Hackettstown		X	
Kroelinger		X	
Li Calzi Airpark		X	
Newton		X	
Ocean City Municipal	X		
Red Wing		X	
Rudy's		X	
Southern Cross		X	
Spitfire Aerodrome		X	
Trinca		X	
Twin Pine		X	
Vineland Downstown		X	
System Total	**17**	**25**	**6**

Source: NJDOT

E. Existing Infrastructure

New Jersey's system of public use airports contains a wealth of existing aviation infrastructure. The existing infrastructure has been funded through the use of airport development funds that have come from local, private, State, and Federal sources. Much of the existing infrastructure at system airports still has considerable useful life and should be considered when system development recommendations are made. Recognizing the contributions of existing infrastructure to the system, as well as balancing the need for the creation of new facilities, is often a key component in the long-term success of an airport system. Benchmarks used to measure the performance of existing system infrastructure have been developed for this analysis to identify how well existing facilities and services at system airports are meeting user needs.

In a previous task of the SASP, facility and service objectives were developed for each of the airport functional levels. Facility and service objectives for each functional level are presented in **Table 5-4**. The facility and service objectives measure the performance of each system airport as it relates to specific factors. These include runway and taxiway characteristics (lighting, approach, and weather aids), as well as ancillary facilities and services provided at each airport. It should be noted that the ARC benchmark denotes an airport having the proper designation on record. Actual compliance with ARC requirements is considered in separate benchmarks.

Table 5-4
FACILITY AND SERVICE OBJECTIVES

Scheduled Service Airports:	
ARC:	C-III or greater
Primary RWY Length:	Minimum of 6,000 feet
Primary RWY Width:	At least 150 feet
Primary RWY Strength:	60,000 Pounds
Taxiway:	Full Parallel
Navigational Aids:	CAT-II Precision Approach
Visual Aids:	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI
Lighting:	HIRL, CLTDZ Lights
Weather:	ASOS/AWOS or Tower
Services:	Phone, Restrooms, FBO, Maintenance, Jet Fuel, AvGas, Ground Transportation
Facilities:	Local and Itinerant Aircraft Parking Apron, Local and Itinerant Aircraft Storage, Air Carrier and General Aviation Terminal, Air Carrier and General Aviation Auto Parking
Advanced Service Airports:	
ARC:	C-II or greater
Primary RWY Length:	Minimum of 5,000 feet
Primary RWY Width:	At least 100 feet
Primary RWY Strength:	30,000 Pounds (accommodates all large B-II aircraft)
Taxiway:	Full Parallel for Primary Runway
Navigational Aids:	Precision Approach
Visual Aids:	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI
Lighting:	HIRL, MITL
Weather:	ASOS/AWOS
Services:	Phone, Restrooms, FBO, Maintenance, Jet Fuel, AvGas, Ground Transportation
Facilities:	General Aviation Terminal, General Aviation Auto Parking
General Service Airports:	
ARC:	B-I or greater
Primary RWY Length:	Minimum of 3,500 feet
Primary RWY Width:	To Meet ARC
Primary RWY Strength:	12,500 Pounds
Taxiway:	Full parallel, Partial Parallel, Connectors, or Turnarounds
Navigational Aids:	Non-Precision Approach
Visual Aids:	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI
Lighting:	MIRL, Taxiway Lighting/Reflectors
Weather:	Not Required
Services:	Phone, Restrooms, Fuel (Avgas)
Facilities:	Auto Parking

Table 5-4
FACILITY AND SERVICE OBJECTIVES, Continued

Basic Service Airports:	
ARC:	B-I or less
Primary RWY Length:	2,200 feet or greater
Primary RWY Width:	At least 60 feet
Primary RWY Strength:	Up to 12,500 Pounds
Taxiway:	Stub and Turnaround
Navigational Aids:	Not Required
Visual Aids:	Wind Cone
Lighting:	Not Required
Weather:	Not Required
Services:	Phone, Restrooms
Facilities:	Paved or Unpaved Aircraft Parking Apron, Auto Parking

Source: Wilbur Smith Associates

As previously stated, separate facility and service objectives were established for each functional level of airport identified in the SASP. It is important to note that the facility and service objectives adopted for this study are just that, objectives. In some cases, airports within the functional levels may not be capable of meeting one or more of the established objectives, or the development required to meet objectives may be cost-prohibitive. In many cases, however, directed investment at specific airports may significantly improve the system's overall performance related to the facility and service objectives identified in the SASP. The current goal of the SASP is that each airport in each functional level should be in 100 percent compliance with the facility and service objectives identified for its level. As the SASP progresses, the feasibility of implementing such a goal will be examined and, if it is determined that the goal is cost-prohibitive, the system goal related to facility and service objective compliances may be re-examined or individual airports re-categorized based on their existing facilities.

New Jersey's goal related to existing airport infrastructure can be summarized as follows:

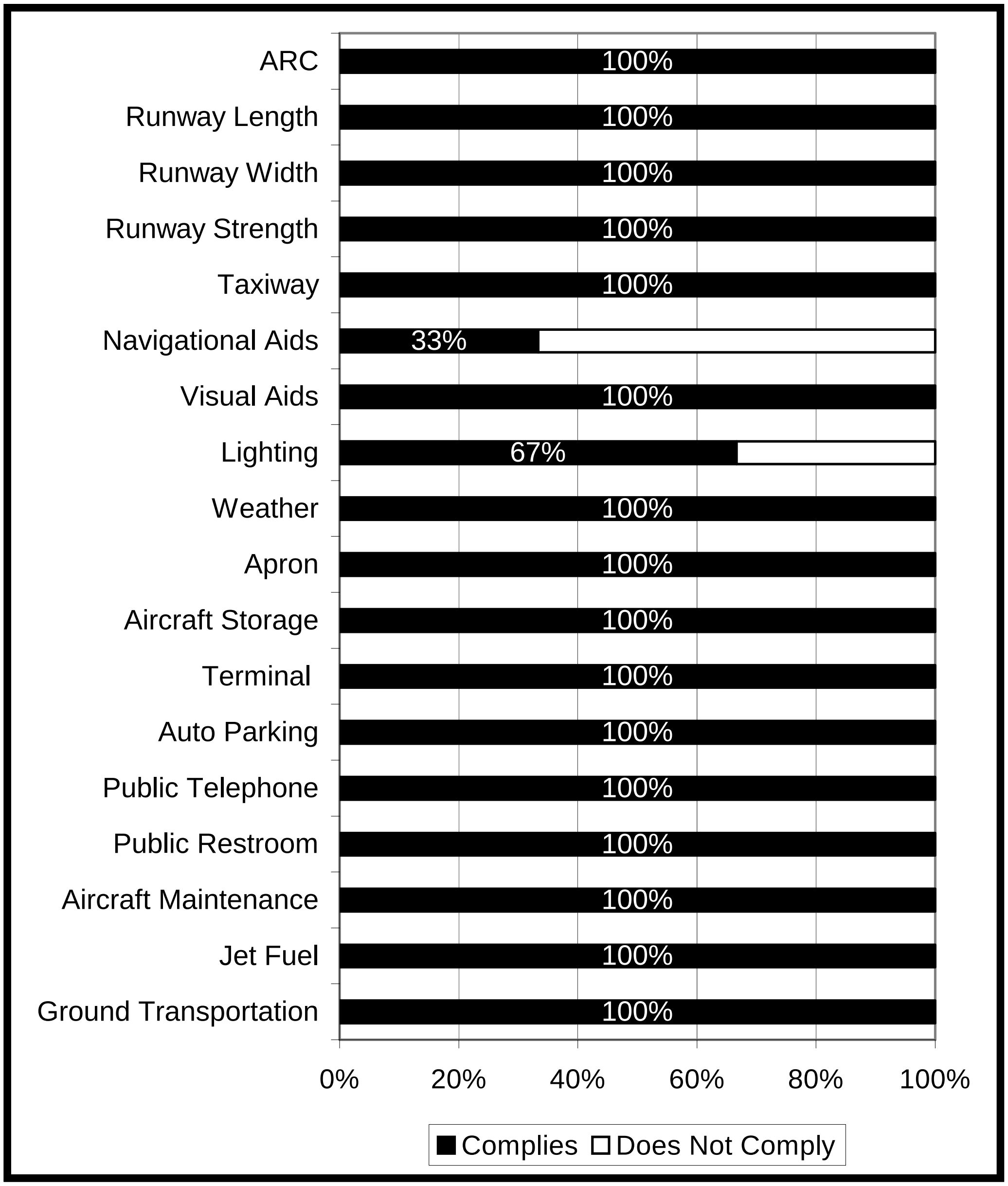
EXISTING INFRASTRUCTURE GOAL: New Jersey's system of public use airports should provide adequate facilities to safely meet the various needs of the airport users, depending on each airport's functional role in the system.

The following sections summarize the benchmark analysis and present the percentage of airports in each functional level that meet each facility and service objective, for their functional current level.

1. Scheduled Service

A summary of facility and service objectives, including the percentage of Scheduled Service airports that currently meet each specific objective, is presented in **Exhibit 5-17**.

Exhibit 5-17
SCHEDULED SERVICE FACILITY AND SERVICE OBJECTIVES



Source: NJDOT, Wilbur Smith Associates

It should be noted that Navigational Aids is only at 33 percent because only one airport, Newark Liberty International, has a CAT II approach. Background data regarding compliance with facility and service objectives for Scheduled Service airports is presented in **Table 5-5**.

Table 5-5
FACILITY AND SERVICE COMPLIANCE - SCHEDULE SERVICE AIRPORTS

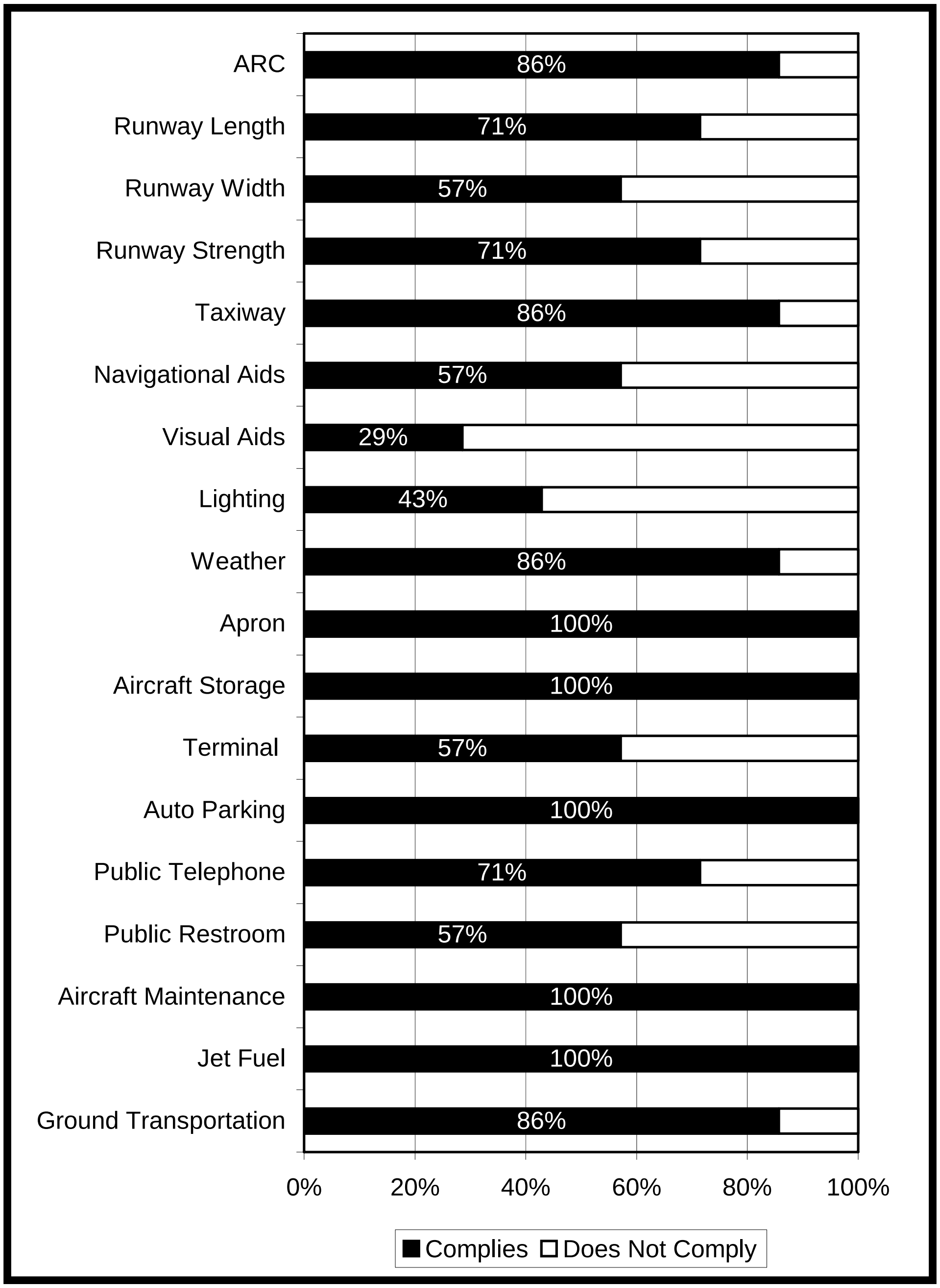
							Visual Aids				Lighting		Weather		Facilities				Services				
SCHEDULED SERVICE AIRPORTS	ARC Objective (C-III)	Runway Length Objective (6000)	Runway Width Objective (150)	Runway Strength Objective (60,000)	Taxiway Objective (Full Parallel)	Navigational Aid Objective (Cat. II ILS)	Rotating Beacon	Lighted Wind Indicator	REIL	VGSI	HIRL	CLTDZ	ASOS/AWOS	Tower	Apron Objective	Aircraft Storage Objective	Terminal Objective	Auto Parking Objective	Public Telephone	Public Restroom	Aircraft Maintenance	Jet Fuel	On-site rental car, Limo, Courtesy car
Atlantic City International	X	X	X	X	X	ILS	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Newark Liberty International	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Trenton Mercer	X	X	X	X	X	ILS	X	X	X	X	X		X		X	X	X	X	X	X	X	X	X

Note: X represents compliance with facility or service objective
Source: NJDOT, Wilbur Smith Associates

2. Advanced Service

A summary of facility and service objectives, including the percentage of Advanced Service airports that currently meet each specific objective, is presented in **Exhibit 5-18**.

Exhibit 5-18
ADVANCED SERVICE FACILITY AND SERVICE OBJECTIVES



Source: NJDOT, Wilbur Smith Associates

Supplemental information regarding compliance with facility and service objectives at Advanced Service airports is presented in **Table 5-6**.

Table 5-6
FACILITY AND SERVICE COMPLIANCE - ADVANCED SERVICE AIRPORTS

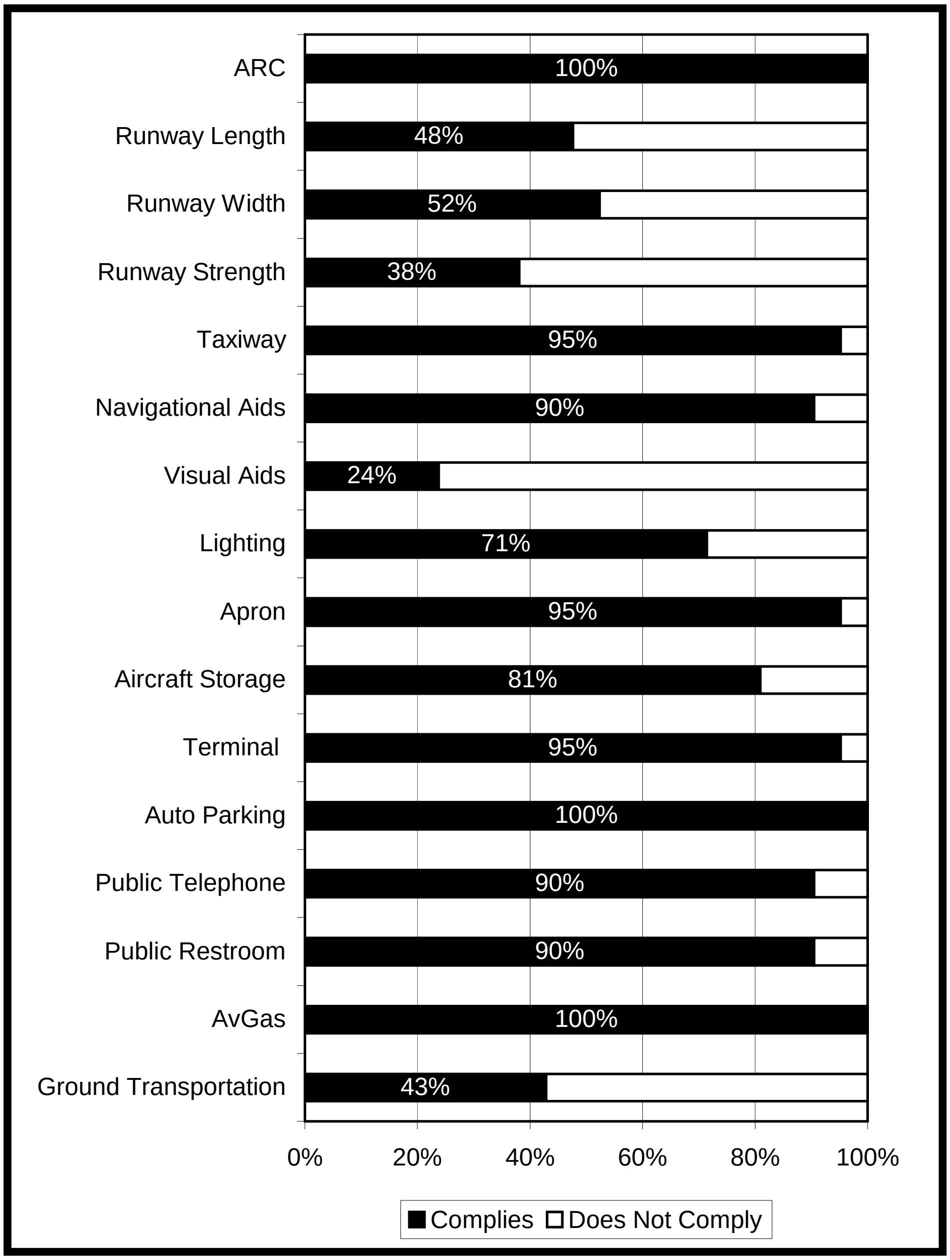
							Visual Aids					Weather		Facilities				Services				
Advanced Service	ARC Objective (C-II)	Runway Length Objective (5,000)	Runway Width Objective (100)	Runway Strength Objective (30,000)	Taxiway Objective (Full Parallel For Primary)	Navigational Aid Objective (Precision Approach)	Rotating Beacon	Lighted Wind Indicator	REIL	PAPI or VASI	HIRL	ASOS/AWOS	Tower	Apron Objective	Aircraft Storage Objective	Terminal Objective	Auto Parking Objective	Public Telephone	Public Restroom	Aircraft Maintenance	Jet Fuel	On-site rental car, Limo, Courtesy car
Essex County	X	4,553	80	X	X	Non-Precision	X	X			MIRL	X		X	X	X	X	X	X	X	X	X
Millville Municipal	X	X	X	X	X	X	X	X		X	MIRL	X		X	X	X	X	X		X	X	X
Monmouth Executive	X	X	80	n/a	X	Non-Precision	X	X			MIRL	X		X	X	X	X	X	X	X	X	
Morristown Municipal	X	X	X	X	X	X	X	X	X	X	X	LAWRS		X	X	X	X	X	X	X	X	X
Robert J. Miller	X	X	X	12,000	X	X	X	X	X	X	X	X		X	X	X	X			X	X	X
South Jersey Regional	B-I	3,911	50	X	Partial	Non-Precision	X	X		X	MIRL	X		X	X	X	X			X	X	X
Teterboro	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X

Note: X represents compliance with facility or service objective
Source: NJDOT, Wilbur Smith Associates

3. General Service

A summary of facility and service objectives, including the percentage of General Service airports that currently meet each specific objective, is presented in **Exhibit 5-19**.

Exhibit 5-19
GENERAL SERVICE FACILITY AND SERVICE OBJECTIVES



Source: NJDOT, Wilbur Smith Associates

Table 5-7 presents specific data for facility and service compliance at General Service airports.

Table 5-7
FACILITY AND SERVICE COMPLIANCE - GENERAL SERVICE AIRPORTS

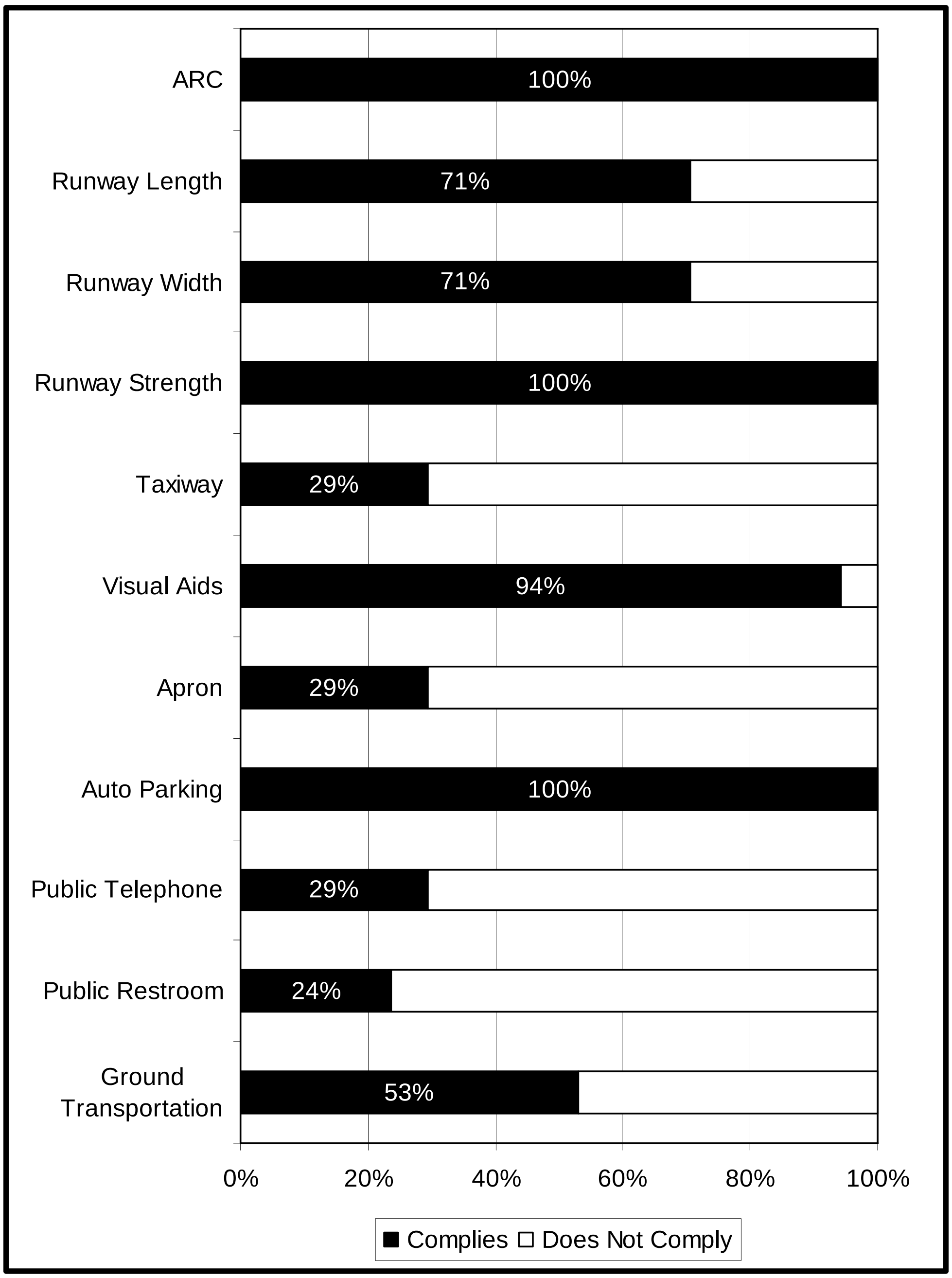
							Visual Aids					Facilities				Services			
General Service Airports	ARC Objective (B-I)	Runway Length Objective (3,500)	Runway Width Objective (ARC)	Runway Strength Objective (12,500)	Taxiway Objective (Connectors or Turnarounds)	Navigational Aid Objective (Non-Precision)	Rotating Beacon	Lighted Wind Indicator	PAPI, or VASI	REIL	MIRL	Apron Objective	Aircraft Storage Objective	Terminal Objective	Auto Parking Objective	Public Telephone	Public Restroom	AvGas	Taxi, Limo, Shuttle
Alexandria Field	X	2550	50	n/a	X	X	X	X			X	X	X	X	X	X	X	X	
Blairstown	X	3100	X	n/a	X	X	X	X			X	X	X	X	X	X	X	X	X
Cape May County	X	X	X	X	X	X	X	X	X		X	X	X		X			X	X
Central Jersey Regional	X	X	50	X	X	X	X	X			X	X	X	X	X	X	X	X	
Cross Keys	X	X	50	X	X	X		X			LIRL	X	X	X	X	X	X	X	
Flying W	X	3496	X	n/a	X	X	X	X	X		X	X	X	X	X	X	X	X	X
Greenwood Lake	X	X	X	n/a	X	X	X	X	X	X	LIRL	X	X	X	X	X	X	X	
Hammonton Municipal	X	X	X	1200	X	X	X	X	X		LIRL	X	None	X	X			X	X
Lakewood	X	3457	50	X	X	X	X	X			LIRL	X	X	X	X	X	X	X	X
Lincoln Park	X	2942	40	n/a	X	X	X	X	X		X	X	X	X	X	X	X	X	
Linden	X	X	X	X	X	Circling	X	X	X	X	X	X	None	X	X	X	X	X	
Marlboro	X	2156	50	n/a	X	X	X	X	X	X	LIRL		X	X	X	X	X	X	
Old Bridge	X	X	50	n/a	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Princeton	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	
Red Lion	X	2940	50	n/a	X	Circling		X			X	X	X	X	X	X	X	X	X
Sky Manor	X	2439	50	n/a	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Solberg-Hunterdon	X	X	50	n/a	X	X		X			X	X	None	X	X	X	X	X	
Somerset	X	2735	X	n/a	X	X	X	X			X	X	None	X	X	X	X	X	
Sussex	X	3499	X	n/a	X	X	X	X			LIRL	X	X	X	X	X	X	X	
Trenton-Robbinsville	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
Woodbine Municipal	X	3304	X	X	None	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Note: X represents compliance with facility or service objective
Source: NJDOT, Wilbur Smith Associates

4. Basic Service

A summary of facility and service objectives, including the percentage of Basic Service airports that currently meet each specific objective, is presented in **Exhibit 5-20**.

Exhibit 5-20
BASIC SERVICE FACILITY AND SERVICE OBJECTIVES



Source: NJDOT, Wilbur Smith Associates

Supplemental information regarding facility and service objectives at Basic Service airports is presented in **Table 5-8**.

Table 5-8
FACILITY AND SERVICE COMPLIANCE - BASIC SERVICE AIRPORTS

							Facilities		Services		
Basic Service Airports	ARC Objective (B-I or Less)	Runway Length Objective (2,200)	Runway Width Objective (60)	Runway Strength Objective (Up to 12,500)	Taxiway Objective (Stub and Turnaround)	Wind Cone	Apron Objective	Auto Parking Objective	Public Telephone	Public Restroom	Taxi, Shuttle
Aeroflex-Andover Field	X	1981	50	X	X	X	X	X	X	X	
Bader Field	X	X	X	X	X	X	X	X			X
Bucks	X	1900	X	X	None	X		X			X
Camden County	X	X	45	X	X	X	X	X	X		X
Eagles Nest	X	X	X	X	None			X			
Hackettstown	X	X	50	X	None	X		X	X	X	
Kroelinger	X	2188	X	X	None	X		X			
Li Calzi Airpark	X	X	X	X	None	X		X			X
Newton	X	X	45	X	None	X		X			
Ocean City Municipal	X	X	X	X	X	X	X	X			X
Red Wing	X	2040	X	X	None	X		X			X
Rudy's	X	X	X	X	None	X		X			X
Southern Cross	X	X	X	X	None	X		X			
Spitfire Aerodrome	X	X	50	X	X	X	X	X	X	X	X
Trinca	X	1924	X	X	None	X		X			
Twin Pine	X	X	X	X	None	X		X			
Vineland Downstown	X	X	X	X	None	X		X	X	X	X

Note: X represents compliance with facility or service objective
Source: NJDOT, Wilbur Smith Associates

It is important to note that the ground transportation service objective varied by airport functional level. The following objectives were used for the functional levels identified in this analysis:

- Scheduled Service and Advanced Service airports should have on-site rental car, limo/taxi and/or courtesy car.

- General Service and Basic Service airports should at least have off-site, on-call access to taxi/limo or other shuttle service ground transportation.

F. Design Standards

The Federal Aviation Administration (FAA), through its Advisory Circulars, develops guidance related to the planning and design of airport facilities. These Advisory Circulars summarize airport development guidelines that focus on airport safety and, secondarily, promote economy, efficiency, and longevity of airport facilities. FAA standards related to airport safety are generally referred to as "design standards." Design standards typically refer to runway and runway area dimensional criteria that are required to safely support the operation of a class of aircraft at an airport. Design standards can also refer to requirements related to specific airport facilities such as runway condition. The goal of New Jersey's system of public use airports as it relates to FAA design standards is summarized below:

DESIGN STANDARDS GOAL: New Jersey's system of public use airports should meet all current, applicable design standards.

A benchmark analysis was conducted for the following airport design standards:

- Runway/Taxiway Separation
- Width of Primary Runway
- Runway Safety Area Compliance
- Pavement Condition Index

The runway/taxiway separation, width of the primary runway, and Runway Safety Area (RSA) compliance design standards that are examined in this analysis are airfield dimensional requirements that are based on the FAA's Airport Reference Code (ARC) system. The ARC is a coding system that relates airport design criteria to the operational and physical characteristics of aircraft or aircraft groups that are intended to operate at an airport. The "airport design aircraft," or the most demanding aircraft or aircraft group that uses an airport on a regular basis (at least 500 annual operations) is represented by the ARC.

The ARC has two components related to an airport's design aircraft. The first component of the ARC is depicted by a letter that represents the aircraft approach category, as defined by approach speed. The second component of the ARC is depicted by a Roman numeral; this is the airplane design group determined by aircraft wingspans. Generally, aircraft approach speeds impact the design of runway and runway related facilities, while aircraft wing spans primarily impact separation criteria involving taxiways, runways, taxilanes, and runway width. Both components of the ARC impact the design of RSAs.

1. Runway/Taxiway Separation

Runway and taxiway separation design standards represent guidelines for the required distance between runway centerlines and taxiway centerlines on all runways served by a full or partial parallel taxiway. These standards are developed based on the airplane design group component of the ARC and represent the distance required (based on the wingspan of the design aircraft) for two aircraft to pass, while one is on the runway and one on the taxiway, with a margin of safety to eliminate the potential for wingtip-to-wingtip collision. Runway/taxiway separation design standards are presented in the following table:

RUNWAY/TAXIWAY SEPARATION (ft)

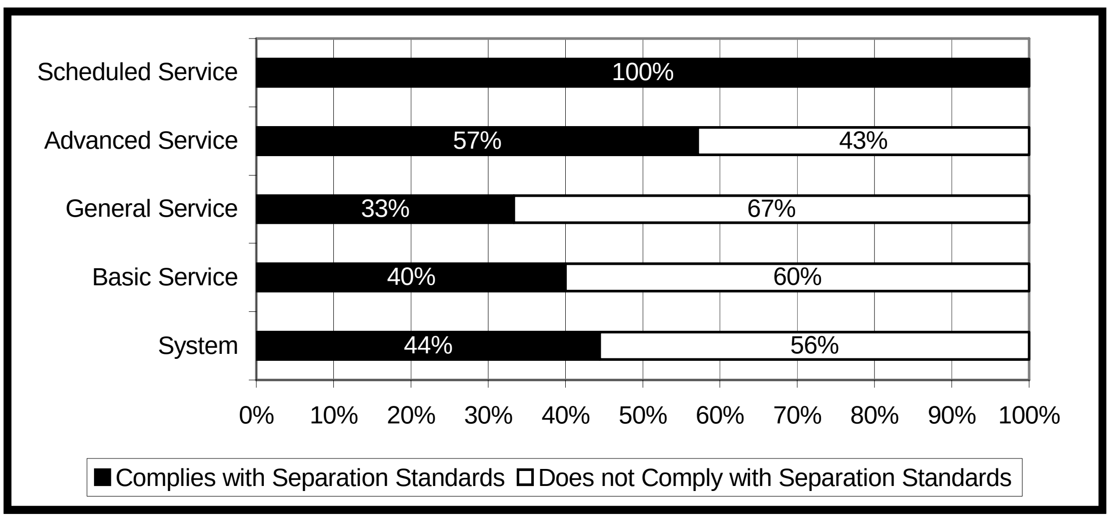
	Airplane Design Group					
Aircraft Approach Category	I	II	III	IV	V	VI
A/B	225	240	300	400		
C/D	300	300	400	400	400 1/	600

Source: FAA

Note 1/ Separation listed is for airports at an elevation of less than 1,345 ft. Greater elevations require increased separation.

Each system airport with a primary runway that served a full or partial parallel taxiway system was examined relative to runway/taxiway separation standards. The existing runway/taxiway separation at each airport was compared to the required separation based on current design standards, and the findings are summarized in **Exhibit 5-21**.

Exhibit 5-21
RUNWAY/TAXIWAY SEPARATION DESIGN STANDARD COMPLIANCE



As shown, system compliance relative to runway/taxiway separation design standards is approximately 44 percent. As shown, Scheduled Service airports have a compliance rate of 100 percent. Advanced Service airports have compliance rate of approximately 57 percent, General Service airports have a compliance rate of 33 percent, and Basic Service airports have a compliance rate of approximately 40 percent. It is important to note that in each functional level, only those airports that have a full or partial parallel taxiway were included in this analysis.

2. Width of Primary Runway

Runway width design standards generally dictate that as the wingspan of the design aircraft at an airport increases, so should the width of the runway. Current FAA design standards related to runway width are summarized in the following table:

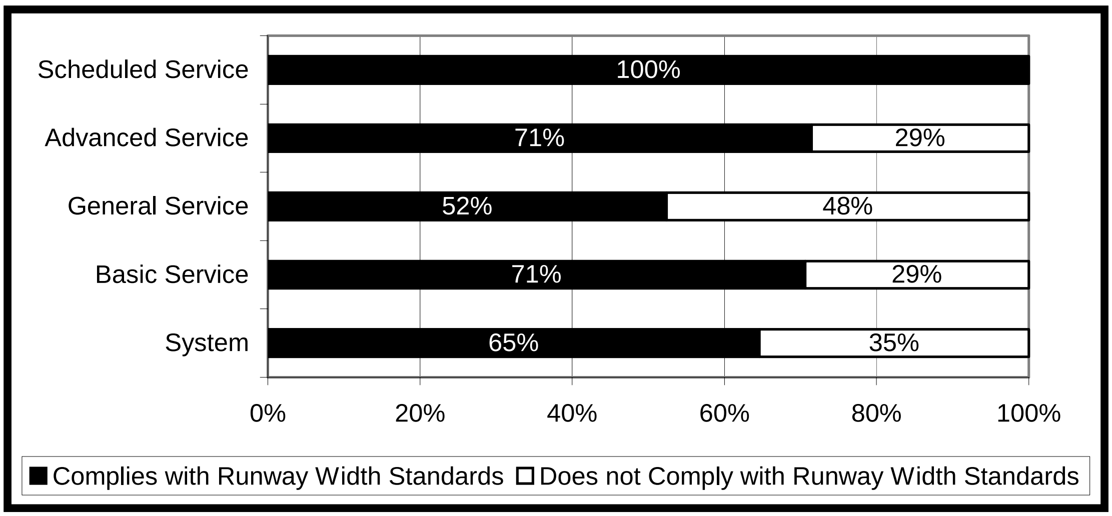
RUNWAY WIDTH STANDARDS (ft)

	Airplane Design Group					
Aircraft Approach Category	I	II	III	IV	V	VI
A/B	60	75	100	150		
C/D	100	100	100	150	150	200

Source: FAA

The primary runway of each system airport was examined and compared to the runway width standards presented in the table above. **Exhibit 5-22** summarizes the results of the runway width analysis.

Exhibit 5-22
RUNWAY WIDTH DESIGN STANDARD COMPLIANCE



As shown, New Jersey's system currently has a compliance rate of approximately 65 percent as it relates to primary runway width design standards. Scheduled Service airports currently have a 100 percent compliance rate. Advanced Service and Basic Service airports currently have a compliance rate of 71 percent while only 52 percent of the primary runways at General Service airports are in compliance with the current runway width design standard.

3. Runway Safety Area Compliance

The Runway Safety Area (RSA) is a critical two-dimensional area surrounding the runway. The role of the RSA is to accommodate aircraft, while minimizing the risk of aircraft damage, in the event of an undershoot, overshoot, or excursion from the runway. The FAA has set standards for both the length and width of an RSA based on the ARC system. Specific RSA design standards are presented below:

RSA LENGTH STANDARDS (ft)

Aircraft Approach Category	Airplane Design Group I	II	III	IV	V	VI
A/B	240	300	600	1000		
C/D	1000	1000	1000	1000	1000	1000

RSA WIDTH STANDARDS (ft)

Aircraft Approach Category	Airplane Design Group I	II	III	IV	V	VI
A/B	120	150	300	500		
C/D	500	500	500	500	500	500

Source: FAA

Each airport in the New Jersey system was evaluated to see if existing RSA lengths and widths meet the current ARC standards. **Table 5-9** lists each airport, identifies the primary runway at the airport, and indicates whether standards of length and width are met for the primary runway at the airport. At the same time this system plan is being updated, a detailed examination of RSAs is underway at New Jersey airports. However, the final data from this effort was not available at the time of this analysis. The data used in this analysis is based on the best available data and may require updating following the completion the RSA Study.

TABLE 5-9
RSA Benchmark Analysis

AIRPORT NAME	ARC	PRIMARY RUNWAY	RUNWAY END	REQUIRED RSA WIDTH	REQUIRED RSA LENGTH	MEETS RSA OBJECTIVE	COMMENTS
COMMERCIAL SERVICE AIRPORTS							
Atlantic City International	D-V	13/31	13	500'	1000'	Yes	
	D-V	13/31	31	500'	1000'	Yes	
Newark Liberty International	D-V	4R-22L	4R	500'	1000'	Yes	
	D-V	4R-22L	22L	500'	1000'	Yes	
Trenton Mercer	C-III	6-24	6	500'	1000'	Yes	Road beyond Rwy end
	C-III	6-24	24	500'	1000'	Yes	
ADVANCED SERVICE AIRPORTS							
Essex County	B-II	4-22	4	150'	300'	Yes	
	B-II	4-22	22	150'	300'	No	
Millville Municipal	C-III	10-28	10	500'	1000'	No	
	C-III	10-28	28	500'	1000'	Yes	
Monmouth Executive	C-III	14-32	14	500'	1000'	No	
	C-III	14-32	32	500'	1000'	No	
Morristown Municipal	C-III	5-23	5	500'	1000'	Yes	

TABLE 5-9
RSA Benchmark Analysis, Continued

AIRPORT NAME	ARC	PRIMARY RUNWAY	RUNWAY END	REQUIRED RSA WIDTH	REQUIRED RSA LENGTH	MEETS RSA OBJECTIVE	COMMENTS
	C-III	5-23	23	500'	1000'	Yes	
Robert J. Miller	C-III	6-24	6	500'	1000'	Yes	
	C-III	6-24	24	500'	1000'	Yes	
South Jersey Regional	B-I	8-26	8	120'	240'	Yes	
	B-I	8-26	26	120'	240'	No	
Teterboro	C-III	6-24	6	500'	1000'	No	
	C-III	6-24	24	500'	1000'	No	
GENERAL SERVICE AIRPORTS							
Alexandria Field	B-I	8-26	8	120'	240'	Yes	
	B-I	8-26	26	120'	240'	No	
Blairstown	B-I	7-25	7	120'	240'	No	
	B-I	7-25	25	120'	240'	No	
Cape May County - Wildwood	B-II	1-19	1	150'	300'	Yes	
	B-II	1-19	19	150'	300'	No	
Central Jersey Regional - Manville	B-II	7-25	7	150'	300'	No	
	B-II	7-25	25	150'	300'	Yes	
Cross Keys	B-I	9-27	9	120'	240'	No	
	B-I	9-27	27	120'	240'	No	
Flying W	B-I	1-19	1	120'	240'	No	terrain beyond Rwy 1 drops off
	B-I	1-19	19	120'	240'	No	terrain beyond Rwy 19 rises
Greenwood Lake - West Milford	B-I	6-24	6	120'	240'	No	
	B-I	6-24	24	120'	240'	No	
Hammonton Municipal	B-I	3-21	3	120'	240'	Yes	
	B-I	3-21	21	120'	240'	Yes	
Lakewood	B-I	6-24	6	120'	240'	Yes	
	B-I	6-24	24	120'	240'	Yes	
Lincoln Park	B-I	1-19	1	120'	240'	No	
	B-I	1-19	19	120'	240'	No	Road beyond Rwy 19
Linden	B-II	9-27	9	150'	300'	No	
	B-II	9-27	27	150'	300'	No	
Marlboro - Matawan	B-I	9-27	9	120'	240'	Yes	
	B-I	9-27	27	120'	240'	No	Train beyond rwy end
Old Bridge	B-I	6-24	6	120'	240'	No	
	B-I	6-24	24	120'	240'	No	
Princeton	B-II	10-28	10	150'	300'	No	Road beyond both rwy ends
	B-II	10-28	28	150'	300'	No	
Red Lion	B-I	5-23	5	120'	240'	Yes	
	B-I	5-23	23	120'	240'	Yes	
Sky Manor	B-I	7-25	7	120'	240'	No	Driveway and terrian drops
	B-I	7-25	25	120'	240'	Yes	
Solberg-Hunterdon - Readington	B-II	4-22	4	150'	300'	Yes	
	B-II	4-22	22	150'	300'	Yes	

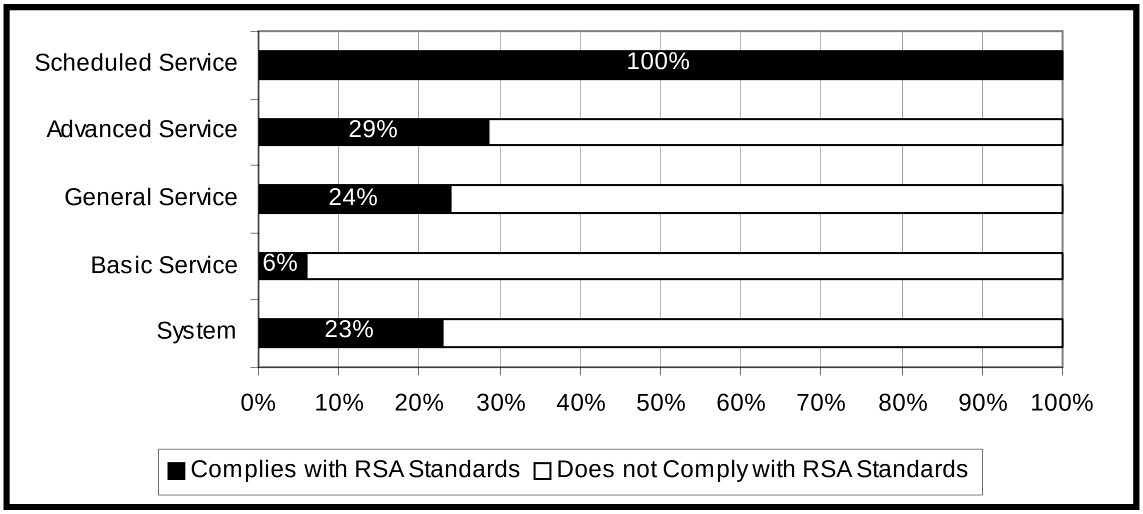
TABLE 5-9
RSA Benchmark Analysis, Continued

AIRPORT NAME	ARC	PRIMARY RUNWAY	RUNWAY END	REQUIRED RSA WIDTH	REQUIRED RSA LENGTH	MEETS RSA OBJECTIVE	COMMENTS
Somerset - Somerville	B-I	12-30	12	120'	240'	Yes	
	B-I	12-30	30	120'	240'	No	
Sussex	B-I	3-21	3	120'	240'	No	
	B-I	3-21	21	120'	240'	Yes	
Trenton-Robbinsville	B-I	11-29	11	120'	240'	No	Golf Course & terrain rises
	B-I	11-29	29	120'	240'	No	Road beyond Rwy 29
Woodbine Municipal	B-II	1-19	1	150'	300'	Yes	
	B-II	1-19	19	150'	300'	Yes	
BASIC SERVICE AIRPORTS							
Aeroflex-Andover Field	B-I	3-21	3	120'	240'	No	
	B-I	3-21	21	120'	240'	No	
Bader Field	B-I	11-29	11	120'	240'	No	
	B-I	11-29	29	120'	240'	No	
Bucks	A-I	18-36	18	120'	240'	No	Turf Rwy
	A-I	18-36	36	120'	240'	No	
Camden County	B-I	5-23	5	120'	240'	No	
	B-I	5-23	23	120'	240'	No	Road beyond rwy end
Eagles Nest	B-I	14-32	14	120'	240'	No	
	B-I	14-32	32	120'	240'	No	
Hackettstown	B-I	5-23	5	120'	240'	Yes	
	B-I	5-23	23	120'	240'	Yes	
Kroelinger	A-I	10-28	10	120'	240'	Yes	Turf Rwy
	A-I	10-28	28	120'	240'	No	
Li Calzi Airpark	A-I	12-30	12	120'	240'	No	Turf Rwy
	A-I	12-30	30	120'	240'	Yes	
Newton	B-I	6-24	6	120'	240'	Yes	
	B-I	6-24	24	120'	240'	No	
Ocean City Municipal	B-I	6-24	6	120'	240'	No	
	B-I	6-24	24	120'	240'	Yes	
Red Wing	A-I	11-29	11	120'	240'	Yes	Turf Rwy
	A-I	11-29	29	120'	240'	No	
Rudy's	A-I	8-26	8	120'	240'	Yes	Turf Rwy
	A-I	8-26	26	120'	240'	No	
Southern Cross	A-I	9-27	9	120'	240'	No	Turf Rwy
	A-I	9-27	27	120'	240'	Yes	
Spitfire Aerodrome	B-I	7-25	7	120'	240'	No	
	B-I	7-25	25	120'	240'	No	
Trinca	A-I	6-24	6	120'	240'	No	Turf Rwy
	A-I	6-24	24	120'	240'	No	
Twin Pine	A-I	12-30	12	120'	240'	Yes	Turf Rwy
	A-I	12-30	30	120'	240'	No	
Vineland Downstown	A-I	2-20	2	120'	240'	No	Turf Rwy
	A-I	2-20	20	120'	240'	No	

Source: NJDOT; Wilbur Smith Associates; Clough, Harbor & Associates; DY Consultants

Exhibit 5-23 summarizes compliance with RSA standards by functional level of airport used in the New Jersey SASP.

Exhibit 5-23
RSA DESIGN STANDARD COMPLIANCE



Source: NJDOT; Wilbur Smith Associates; Clough, Harbor & Associates; DY Consultants

To be considered compliant, both ends of the primary runway at the airport must meet RSA length and width standards for the airport's current ARC. As shown in Exhibit 5-23, approximately 23 percent of system airports are in compliance with current RSA design standards. Scheduled Service airports have a 100 percent compliance rate, while the compliance rate at the other functional levels of airports ranges from 6 percent at Basic Service airports to 29 percent at Advanced Service airports.

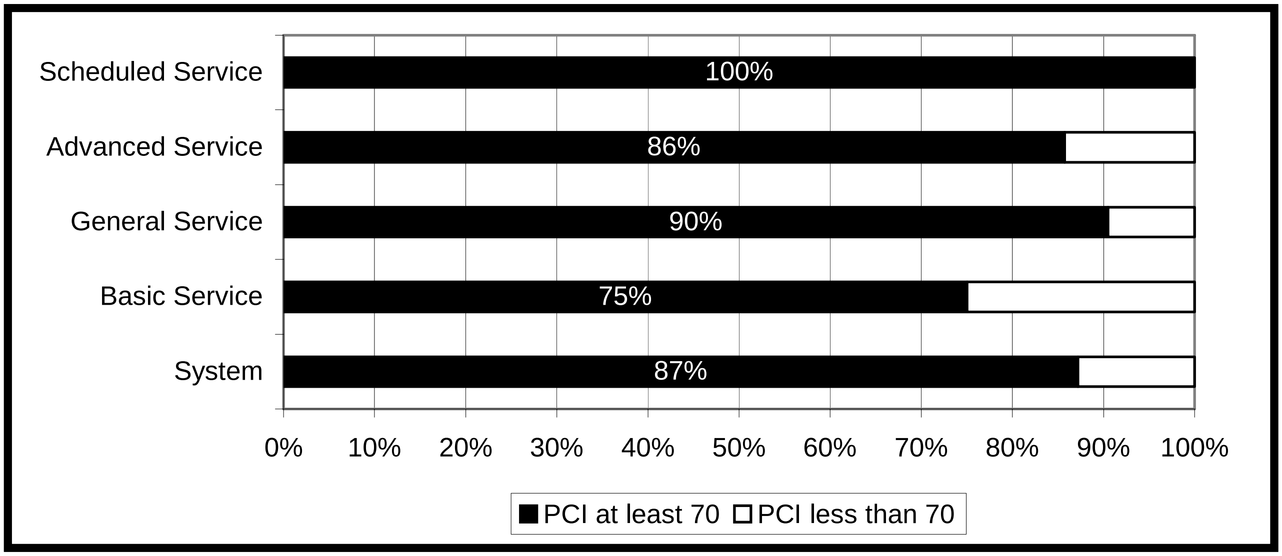
4. Pavement Condition Index

The pavement condition index (PCI) is a system that assigns a numeric value to a hard-surfaced area, based on the general condition of that surface. Numeric values in the PCI index system range from 0 to 100, with 100 being the best. Pavement with an average PCI value of 70 or better is generally considered to be in good to excellent condition. Generally speaking, pavement areas with an average PCI of 70 or greater would benefit from preventative maintenance actions, such as crack and joint sealing and surface treatments. Pavements with a PCI of 40 to 70 may require major rehabilitation such as overlays. A PCI of less than 40 indicates that reconstruction is the only viable alternative due to substantial damage to the pavement structure.

In 1999, a Pavement Management Study was conducted for the New Jersey Division of Aeronautics. The pavement evaluation procedure used in that study is accepted by the FAA and was used to visually assess the condition of New Jersey airport pavements. The PCI data from that study provides information on the type, severity, and quantity of pavement deterioration, as well as an indication of the cause of the pavement deterioration at each airport.

For this benchmark , the PCI of each paved primary runway in the New Jersey airport system was identified. **Exhibit 5-24** summarizes the PCI analysis by airport functional level as well as for the system as a whole.

Exhibit 5-24
PAVEMENT CONDITION INDEX



Source: NJDOT

As shown, approximately 87 percent of the State's airports with paved primary runways have a PCI of 70 or greater, indicating that the pavement is in good condition. While 100 percent of the Scheduled Service airports have an average PCI of 70 or greater on their primary runway, only approximately 75 percent of the paved primary runways at Basic Service airports meet this benchmark.

- **System Goal –** 100 percent of all airports in the system should have a PCI of at least 70 on their primary runway, if paved.

5. Primary Surface

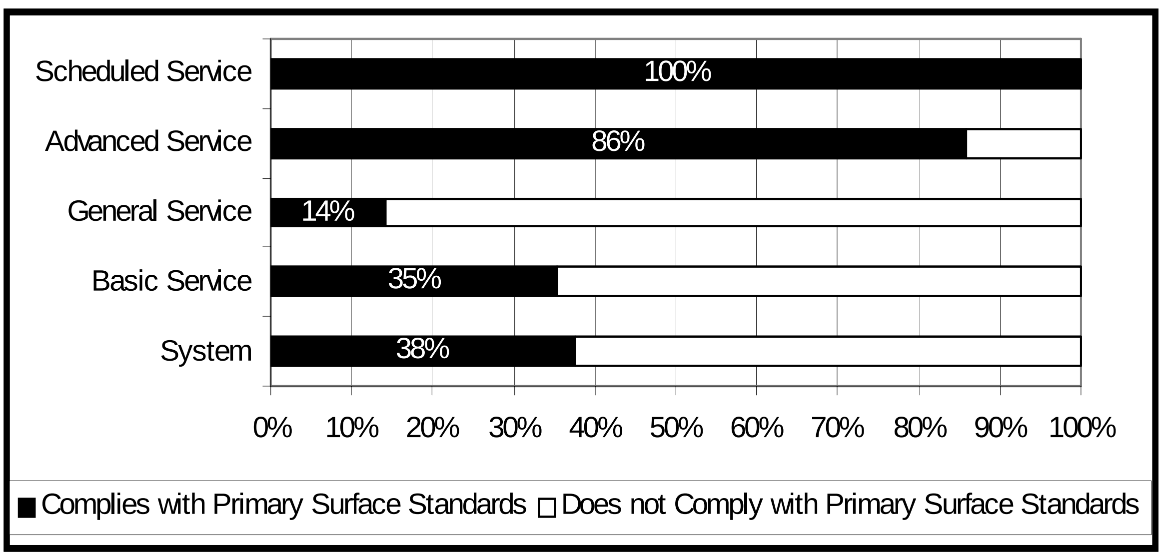
Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*, establishes standards for determining if structures on an airport or in an airport's environs pose potential obstructions to air navigation. This is accomplished by defining specific airspace areas in the environs of an airport that cannot contain any protruding objects. These airspace areas are referred to as "imaginary surfaces." The dimensions of the imaginary surfaces identified by FAR Part 77 vary depending on the type of runway approach. Objects that could impact these imaginary surfaces include existing or proposed objects of natural growth, terrain, or permanent or temporary construction, including equipment which is permanent or temporary in nature. One of the most important imaginary surfaces outlined in FAR Part 77 is the primary surface.

The primary surface is an area that is longitudinally centered on the runway. All runways have a primary surface. When the runway has a hard surface, the primary surface extends 200 feet beyond each end of that runway. The width of a runway's primary surface ranges from 250 to 1,000 feet, depending on the existing or planned approach and runway type. Primary surface width requirements are summarized as follows:

- 250 feet for utility runways having only visual approaches
- 500 feet for utility runways having non-precision instrument approaches
- 500 feet for visual runways having only visual approaches
- 500 feet for non-precision instrument runways having visibility minimums greater than ¾ of a statute mile
- 1,000 feet for a non-precision instrument runway having a non-precision instrument approach with visibility minimums as low as ¾ of a statute mile
- 1,000 feet for precision instrument runways

Primary surfaces at New Jersey's public use airports were evaluated based on the standards identified in FAR Part 77 and presented above. **Exhibit 5-25** summarizes the outcome of this analysis.

Exhibit 5-25
PRIMARY SURFACE DESIGN STANDARD COMPLIANCE



Source: NJDOT

As shown, compliance with primary surface design standards at New Jersey airports ranges from 100 percent at Scheduled Service airports to approximately 14 percent at General Service airports. The overall compliance rate throughout the system is approximately 38 percent.

III. CONCLUSIONS

The benchmark analysis presented in this chapter provides a detailed look at how the State airport system is performing related to several general performance measures. The following section summarizes the overall report performance for each measure.

- Air Accessibility – Consideration should be given to increasing the availability of precision approaches and on-site weather reporting throughout New Jersey. Slight improvements to the system of non-precision approaches may also be required.
- Surface Accessibility – While the State’s population and businesses are provided excellent coverage with regard to Scheduled Service airports, there are small coverage voids in the State system with regard to Advanced Service, Basic Service and General Service airport coverage. Improvements may be needed with regard to coverage provided by runways of 5,000 feet or greater.
- Aviation Activity – While 88 percent of the system airports are operating at less than 60 percent of operational capacity, four vital airports are operating in excess of 80 percent capacity. Capacity issues will require continued monitoring, especially in the highly developed Philadelphia and New York City areas.
- Development Potential – While most of the system airports have completed some type of airport plan, several Scheduled Service, Advanced Service, and General Service facilities should consider preparing or updating plans. Only 38 percent of the system airports are publicly owned, 50 percent are privately owned but are grant obligated, while the remaining 12 percent are privately owned without grant obligations.
- Existing Infrastructure – The airport system represents billions of dollars of infrastructure. Many of the system airports provide all the recommended facilities to fulfill their role. There are airports in each category, however, that require specific improvements.

Now that the system of airports has been scored with regard to various critical performance measures and benchmarks, the next step will be to identify alternatives to meet the stated goals for the system. The system’s strengths and weaknesses will be identified and potential improvements to individual airports will be considered. Possible changes in airport role and/or new facilities will be considered. Potential options for improving the performance of the system will be identified in the next chapter. Land use, environmental issues and other “real world” factors associated with airport improvements will be considered in the analysis of alternatives and the ultimate identification of a recommended system.

CHAPTER SIX
SYSTEM ADEQUACY ANALYSIS

I. INTRODUCTION

The previous chapter of the New Jersey State Airport System Plan (SASP) examined a series of system performance measures and benchmarks. Benchmarks were used to measure the current performance of New Jersey's existing airports relative to performance goals established as part of this study. In addition, this chapter identifies options available for making warranted system improvements. It is possible that for some benchmarks the current level of performance, even if it is less than the recommended goal, is sufficient to meet the needs of the aviation system's users. In other words, a 100 percent performance rating for each of the benchmarks may not be feasible and, furthermore, may not be required in order for New Jersey to have an adequate airport system. However, for those benchmarks that are determined to require higher levels of compliance, options for expanding or enhancing the system to improve its performance will be identified. Options examined in this chapter and those options that show the most promise for meeting New Jersey's vision for its airport system are included in the recommended development plan. It is important to note that the benchmark compliance ratings presented in Chapter Five and examined in this chapter measure the performance of the State's **existing** airport system relative to the benchmarks.

For purposes of this options analysis, the order in which the benchmarks and options are discussed is as follows:

- Aviation Activity
    - Existing Airfield Capacity
- Development Potential
    - Planning Documents
    - Airport Ownership
- Existing Infrastructure
    - Facility and Service Objectives
- Design Standards
    - Runway/Taxiway Separation
    - Width of Primary Runway
    - Runway Safety Area Compliance
    - Pavement Condition Index

Although, in previous sections of the SASP, the Air Accessibility and Surface Access performance measures were not examined separately from the other performance measures, the level of detail required to examine options for improving overall system coverage requires that they be examined in a separate chapter. Overall airport system coverage relates to the ability of New Jersey system airports to serve the people and businesses of the State, within a reasonable drive time, with various types of aviation facilities and services. Options for improving overall airport system coverage will be examined in Chapter Seven.

II. AVIATION ACTIVITY

A. System Adequacy Analysis

The benchmark used in this study to review existing airfield operational capacity was the relationship between each airport's annual service volume (ASV), which measures an airport's ability to process activity on an annual level, and each airport's current annual operational levels. In more general terms, airfield operational capacity is a measure of an airport's ability to accommodate aircraft operations without congestion and delay. The ability of an airport system to accommodate aircraft operational demand is one important indication of a system's overall performance.

The benchmark analysis, presented in Chapter Five, identified the percentage of airports in each functional level that fall within the following three demand/capacity ranges:

- Less than 60 percent demand/capacity ratio
- Between 60 and 80 percent demand/capacity ratio
- Greater than 80 percent demand/capacity ratio

The three demand/capacity ranges presented above were developed based on FAA planning guidelines which indicate that when an airport is operating at 60 percent of its annual capacity, the level of delay experienced at that airport justifies the initiation of planning for capacity enhancement projects. A demand/capacity ratio of 80 percent generally indicates that the construction of capacity enhancement projects should be initiated, based on delay experienced at that airport.

While it is possible for airports to operate in excess of 100 percent of their identified capacity, from a system planning standpoint, it is undesirable. As airports reach key trigger points in terms of demand/capacity ratios, delay and congestion increase exponentially. Facility and capacity enhancement projects become necessary or at least desirable at capacity constrained airports. Capacity enhancement projects typically include runway improvements, taxiway improvements, NAVAID improvements, or other facility improvements. Where capacity enhancing projects are not feasible, demand management should be implemented. At the system planning level, capacity considerations are important to understanding how the state system, as a whole, and regional/metropolitan systems within the state can accommodate current and projected future levels of activity.

In general, operational delays are undesirable within an airport system for several reasons. Air travel is chosen as a transportation mode because of the time-savings that it offers. When aircraft encounter operational delays that are based on insufficient operating capacity, efficiencies gained through air transportation can be significantly diminished. Further, when aircraft are forced to idle on the ground or to circle in the air as a result of insufficient operational capacity, the aircraft operating cost and potential for environmental impacts are increased.

By identifying specific airports, and/or regions of the State, that are currently experiencing capacity constraints, the SASP identifies the impacts that these constrained airports may have on current and future system performance, as they relate to study benchmarks. In some instances, operational capacity constraints at the airports examined in the SASP may negatively impact system performance to such a degree that options for augmenting system operating capacity may be required.

The methodology used to examine capacity issues in this SASP is further explained in Chapter Five and Appendix A (Capacity Analysis). Based on the analysis conducted in the SASP, those New Jersey airports estimated to be operating at 60 percent or more of their ASV include the following:

- Atlantic City International
- Essex County (over 80 percent of ASV)
- Morristown Municipal (over 80 percent of ASV)
- Newark Liberty International (over 80 percent of ASV)
- Teterboro (over 80 percent of ASV)
- Trenton Mercer

More detailed, airport-specific operational capacity analyses typically rely on computerized modeling that estimates the average delay per aircraft. The FAA uses average delay per aircraft estimates to identify airport facilities that have major capacity concerns that should be the focus of capacity-enhancing measures. Conducting more detailed capacity analyses at the airports identified above may be beneficial as part of their master planning efforts to assess the actual level of delay.

According to the FAA, Newark Liberty International Airport currently experiences one of the highest rates of average delay per aircraft operation in the U.S. As a result, Newark Liberty International Airport is the focus of major FAA efforts to improve operational capacity and/or manage demand. One study, the airport's Capacity Enhancement Plan completed in May 2000, examined existing conditions at the airport. This study was prepared jointly by the FAA, the Port Authority of New York and New Jersey, and users and airlines operating at Newark Liberty International Airport and Teterboro Airport. Based on future activity levels, this analysis recommended facility improvements to increase operational capacity. Several near-term alternatives for increasing Newark Liberty International's operational capacity were recommended in the Capacity Enhancement Plan, including the construction of a new runway with the capability for independent arrivals in all weather conditions.

In addition to its Capacity Enhancement Plan, the FAA also included Newark Liberty International Airport in its Airport Capacity Benchmark Report which was published in 2001. Planned improvements to increase operational capacity at Newark Liberty International summarized in this analysis include the following:

- Improved arrival and departure procedures
- Use of land and hold short operations (LAHSO)

- Airspace redesign
- Avionics improvements
- Potential for airline examination of their scheduling practices to reduce peaking

Since the events of September 11, 2001, Newark Liberty International Airport's general aviation traffic has been diverted to surrounding airports. This reduction in traffic (approximately 19,400 annual operations) has temporarily alleviated some delay at Newark. No additional options or recommendations, beyond those previously identified by the FAA, regarding capacity enhancement at Newark Liberty International Airport will be examined as part of the SASP.

Five other New Jersey airports, in addition to Newark Liberty International Airport, were estimated to currently operate at 60 percent or more of their respective ASVs. These potentially capacity-constrained airports have been determined through the SASP stratification process to make a significant contribution to the State's overall system. The important role that these airports play in the system and the potential for operational delay that exists at these facilities indicates that operational capacity at these specific facilities may need to be enhanced. Options for addressing the operational capacity deficiencies at system airports are identified in the following sections.

B. Options Identification

Based on the SASP analysis, those airports estimated to be experience significant levels of delay based on demand/capacity analysis have been identified. Options available for addressing capacity constraints at the airports include the following:

- Do Nothing Alternative
- Capacity Enhancement Projects

1. Do Nothing Alternative

Although this analysis identified those airports that currently or potentially could operate at levels approaching 60 or 80 percent of their estimated ASVs, the FAA has identified that only one New Jersey airport, Newark Liberty International, represents a significant capacity/delay issue. Newark Liberty International Airport is currently the focus of major capacity analyses and significant efforts are being made to enhance capacity, reduce delay, and/or manage demand at the airport. Because such extreme capacity concerns do not currently exist at the other New Jersey airports identified in this analysis, major efforts to study capacity and delay at these airports and develop means for improving operations at these airports may not be necessary. If the do nothing approach is followed, however, increases in airport activity at New Jersey airports could lead to increased congestion and delay at one or more of the airports listed above and impact the efficiency of the State's overall airport system.

2. Operational Capacity Enhancement Projects

For the airports identified in this analysis as operating at over 60 percent of their ASV, specific operational capacity-enhancing projects could be implemented to address and/or mitigate capacity shortfalls. Capacity-enhancing projects are typically identified in detailed airport-specific planning efforts. Examples of capacity enhancing projects that could be implemented include construction of additional taxiways, construction of high-speed taxiway exits, and/or construction of a parallel runway.

The SASP analysis identified several airports that could experience operational capacity issues over the study period. The study's findings were based on general planning guidelines appropriate for system planning purposes. It was determined, based on discussions with FAA officials, that more detailed analysis of operational capacity is warranted to determine airport-specific capacity deficiencies. The SASP findings will be used by the Division of Aeronautics to identify New Jersey airports that have a justified need to conduct more detailed, airport-specific capacity analyses.

To address capacity constraints identified in the SASP, it is important that follow-on airport specific-studies conducted at airports with potential capacity shortfalls include detailed capacity analysis. These individual studies, when conducted, will more thoroughly examine capacity deficiencies and will identify means for addressing demonstrated capacity shortfalls.

The SASP analysis indicates that a vast majority of New Jersey airports currently operate within acceptable ranges of delay, based on demand/capacity ratios. Operational capacity analysis and capacity enhancing projects should, therefore, not be the focus of near-term planning and development efforts at those system airports currently operating within acceptable ranges of delay.

C. Options Analysis Summary and Recommendation

Options are summarized in **Table 6-1**. Each option and its pros, cons, and potential costs are presented.

Table 6-1
SUMMARY OF AIRFIELD CAPACITY OPTIONS

Option	Pros	Cons	Cost
Do-Nothing Alternative	No system resources required	Potential congestion and delays could impact existing and future system	Low
Operational Capacity Enhancement Projects	Requires airport-specific studies to identify true capacity shortfalls, addresses capacity concerns where they exist	Feasible projects may not exist for all capacity-constrained facilities	Medium

Source: Wilbur Smith Associates

Providing sufficient airfield operating capacity is one of the most important goals of an aviation system. Existing capacity issues at several New Jersey airports, and the impacts these issues have on the overall system, illustrate the important role that sufficient airfield operating capacity plays in airport system performance. As a result, the do-nothing option cannot be considered a viable option given existing and anticipated capacity shortfalls in New Jersey's aviation system. Operational capacity-enhancement projects are recommended to address capacity issues for the New Jersey aviation system. Implementing capacity-enhancement projects at those airports that have documented capacity shortfalls (where such projects are environmentally and financially feasible) will enable New Jersey's airport system to accommodate current and projected levels of demand.

III. DEVELOPMENT POTENTIAL

Specific benchmarks were examined in Chapter Five to measure system performance relative to the development potential performance measure. This performance measure examined factors that determined the ability of system airports to be further developed to meet the changing needs of the system. The specific benchmarks examined in Chapter Five included the availability of up-to-date airport planning documents and airport ownership. The findings from the previous analysis, as well as options for improving performance, are summarized in the following sections.

A. Airport Planning Documents

1. System Adequacy Analysis

Planning documents provide a means for individual airports to address future needs, and these documents are critical to the ultimate development of the New Jersey airport system. The SASP analysis examined the status of airport master plans, airport layout plans, and other plans conducted for the airports. Approximately 75 percent of the system's airports have planning documents and approximately 67 percent of the system's planning documents are less than five years old. The airports with the highest percentage of current planning documents are in the Scheduled Service category, followed by the General Service and Advanced Service categories. The status of planning documents at each New Jersey airport is summarized in **Table 6-2.**

System performance relative to the airport planning documents benchmark is currently inadequate. Analysis conducted in Chapter Five indicates that approximately 25 percent of system airports currently have no planning documents. An additional 8 percent of system airports have planning documents that were completed prior to 1995. Options for improving system performance relative to the airport planning documents benchmark are identified in the following sections.

Table 6-2
AIRPORT PLAN INFORMATION

Airport Name	Master Plan	Airport Layout Plan	Economic Impact Study
Aeroflex-Andover Field	2002	2002	1996
Alexandria Field	1997	1997	1996
Atlantic City International	1992	1999	---
Bader Field	None	1992	None
Blairstown	2000	2000	1996
Bucks	None	None	None
Camden County	2002	2002	1996
Cape May County	2002	2002	1996
Central Jersey Regional	2001	2001	1996
Cross Keys	2002	2002	1996
Eagles Nest	2002	2002	None
Essex County	1990	1995	1996
Flying W	1997	1997	1996
Greenwood Lake	1997	1997	1996
Hackettstown	None	None	None
Hammonton Municipal	1994	1994, Pen & Ink Change 2000	1996
Kroelinger	None	None	None
Lakewood	1997	2000	1996
Li Calzi Airpark	None	None	None
Lincoln Park	1988	1988	1996
Linden	1992	2000	1996
Little Ferry Seaplane Base	None	None	None
Marlboro	None	None	1996
Millville Municipal	1997	2002	1996
Monmouth Executive	None	2001	1996
Morristown Municipal	1985	2001	1996
Newark Liberty International	None	1997, Pen & Ink Change 2000	---
Newton	None	None	None
Ocean City Municipal	2000	2000	1996
Old Bridge	2002	2002	1996
Princeton	1996	1997	1996
Red Lion	2000	2001	1996
Red Wing	None	None	None
Robert J. Miller Airpark	1992	1992	1996
Rudy's	None	None	None
Sky Manor	1998	1998	1996
Solberg-Hunterdon	1997	1998	1996
Somerset	1996	1996	1996

Table 6-2
AIRPORT PLAN INFORMATION, Continued

Southern Cross	None	None	None
South Jersey Regional	1997	1997	1996
Spitfire Aerodrome	None	None	1996
Sussex	1997	1997	1996
Teterboro	1990	1991	1996
Trenton-Mercer	1997	1997	1996
Trenton-Robbinsville	2000	2001	1996
Trinca	1996	1996	1996
Twin Pine	None	None	1996
Vineland Downstown	None	None	1996
Woodbine Municipal	1983	2002	1996

Sources: NJDOT; Economic Impact of New Jersey's General Aviation Airports, 1996

2. Options Identification

Because of the importance that airport planning documents play in maintaining and expanding airport facilities, it is vital that those airports that are most important to the New Jersey aviation system have plans in place to promote and protect their future development. Options for improving system performance relative to the airport planning documents benchmark include one or more of the following:

- Develop planning documents for all system airports
- Develop planning documents for the airports that contribute most to the system
- Identify minimum data requirements for lower level airports

a. <u>Develop Planning Documents for all System Airports</u>

In this option, planning documents would be required for each system airport. Activity levels, economic resources, and owner/sponsor intentions, however, may not make it necessary for all airports to have frequent planning studies. Developing planning documents for all airports, therefore, could be financially burdensome to the Division of Aeronautics and airport owners/sponsors. In addition, due to the characteristics of certain facilities, these studies may be unwarranted.

b. <u>Develop Planning Documents for the Airports that Contribute Most to the System</u>

Understanding that some airports owners/sponsors may not have the financial resources to conduct planning studies on a regular basis, and that the Division of Aeronautics may not have the resources to fund such studies at all airports, an option could be to ensure that key system airports have the necessary plans in place to promote airport stability, maintenance, and expansion where necessary.

c. Identify Minimum Data Requirement for Lower Level Airports

For those airports that do not accommodate significant levels of activity, or those that may not be an instrumental part of the overall aviation system in New Jersey, a less detailed source, such as a standard airport layout plan (ALP), may provide sufficient data regarding the airport when detailed airport planning studies are not feasible. For example, state or regional plans may provide adequate levels of information for Basic Service airports that have not developed individual plans.

3. Options Analysis Summary and Recommendation

Three potential options were developed for improving system performance relative to airport planning documents. These options were described above and are summarized in **Table 6-3** relative to their pros, cons, and potential costs.

Table 6-3
SUMMARY OF AIRPORT PLANNING DOCUMENTS OPTIONS

Option	Pros	Cons	Cost
Develop Planning Documents for all System Airports	Promotes the importance of systematic planning for future system needs	Requires significant Division of Aeronautics time and resources, not all airports may need plans	High
Develop Planning Documents for the Airports that Contribute Most to the System	Promotes logical development of limited developable properties at most important system airports	Overlooks importance of planning at lower level airports	Medium
Identify Minimum Data Requirements for Lower Level Airports	All airports have plans in place, lower level airports don't need plans updated as frequently, update if changes occur	Standards must be developed and implemented	Low

Source: Wilbur Smith Associates

A hybrid of the options presented above is the recommended approach for improving system performance relative to the airport planning document benchmark. The following guidelines for meeting the airport planning documents benchmark are recommended:

- Scheduled Service and Advanced Service Airports – Airport planning document updated every five years.
- General Service Airports – Airport planning document current within the last 10 years and updated as needed.
- Basic Service Airports – Planning documents completed as needed.

Airports contribute differently to the system and the recommended approach recognizes that by applying different planning objectives to the SASP's different functional levels. The Scheduled Service and Advanced Service airports, those airports that contribute the most to the system, are important components to the system; it is essential that these airports have current plans presenting their long-range development goals. General Service and Basic

Service airports tend to have limited financial resources. Less stringent planning guidelines should, therefore, be applied to these airports unless major are experienced or anticipated.

B. Airport Ownership

1. System Adequacy Analysis

To support the long-term viability of airports that have been determined to contribute most to the system, it is important that certain ownership and grant obligation characteristics exist at New Jersey airports. These characteristics promote stability, efficiency, development, and service. By promoting public ownership, as well as grant obligation, the Division of Aeronautics can aid in ensuring that New Jersey's airports that contribute most to the system remain open to the public. Airport ownership and grant obligation characteristics were examined and explained in greater detail in Chapter Five and specifics related to the current characteristics of system airports were also presented in that chapter.

Chapter Five presents a point-in-time view of the existing airport system relative to airport ownership and grant obligation. As identified in Chapter Five, approximately 13 percent of system airports are currently privately owned and non-obligated. Within specific functional levels, approximately 14 percent of Advanced Service and 48 percent of General Service airports are privately owned and non-obligated. Current system performance relative to the airport ownership benchmark should be considered deficient because of the significant number of Advanced Service and General Service airports, airports identified as being part of the core system, that are currently privately owned and non-obligated.

While airport ownership may not fall under the direct control of the Division of Aeronautics, it is a factor that is very important to overall system performance. The Division of Aeronautics does have the ability to influence grant obligation at airports within the system by pursuing grants at specific, eligible airports through the Block Grant Program and other State funding programs. Most privately owned airports are not eligible for federal funds, and therefore, cannot be made federally-obligated. The Division of Aeronautics could work to obligate these privately owned airport through non-federal programs. Options for addressing the system's deficiency relative to the airport ownership benchmark are presented in the following sections.

2. Options Identification

Options exist related to how this information can be used by the Division of Aeronautics to promote the stability and long-term viability of New Jersey airports. These options include the following:

- Periodic Update/Do Nothing Option
- Continuous Monitoring of System
- Development of System Goals for Airport Ownership and Grant Obligation Characteristics

a. <u>Periodic Update/Do Nothing Option</u>

Data presented in the SASP relative to the airport ownership performance measure could be used by the Division of Aeronautics as a source of information on current conditions and characteristics at New Jersey airports. This information provides a better understanding of the airport system's characteristics, at the present time. This information could be updated at some point in the future, possibly as part of the next SASP. This update would be undertaken to identify trends related to ownership and grant obligation at system airports. Ownership and grant obligation characteristics at system airports are important because they reflect the stability and viability of the airports. Privately owned airports that are not grant obligated can be closed, sold, or redeveloped at the owner's discretion. Should this happen at a number of New Jersey airports, or at very active system airports, the overall system could be greatly impacted.

b. <u>Continuous Monitoring of System</u>

By continuously monitoring changes in airport ownership and grant obligation characteristics at New Jersey airports, the Division of Aeronautics can ensure that any changes in these characteristics, especially at the system airports that contribute most to the system, are known. In an instance where closure or re-development of an airport may be an option for the airport owner, it is important for the Division of Aeronautics to anticipate this and work with owners, sponsors, and potential public sponsors to ensure that such actions do not have a significant negative impact on the overall airport system. Although the Division of Aeronautics currently does monitor these factors for most system airports, the development of a more formal process for doing so may be beneficial.

c. <u>Development of System Goals for Airport Ownership and Grant Obligation Characteristics</u>

A more proactive use for the information developed in the SASP may be to develop goals for system airports related to the specific ownership and grant obligation characteristics examined. By identifying specific goals individually for the different functional levels of airports identified in the SASP, the Division of Aeronautics could take a more active role in ensuring that New Jersey's airports remain open to public use and continue to support the State's aviation needs. An example of this option would be a goal of public ownership and federal grant obligation at all airports in the Advanced Service functional level.

3. Options Analysis Summary and Recommendation

The system's current outcome relative to the airport ownership benchmark was presented in Chapter Five. That analysis identified that some airports that contribute significantly to the system are currently privately-owned and non-obligated. Three options were identified as potential means to improve system performance relative to this benchmark. Each of these options has been described in greater detail above, the pros, cons, and relative cost levels of each option are summarized in **Table 6-4**.

Table 6-4
SUMMARY OF AIRPORT OWNERSHIP AND GRANT OBLIGATION OPTIONS

Option	Pros	Cons	Cost
Periodic Update/Do-Nothing	No additional Division of Aeronautics resources required	Potential change of ownership could negatively impact system	Low
Continuous Monitoring of System	Division of Aeronautics knowledge of existing conditions at all facilities, can protect those that are most essential	Requires Division of Aeronautics resources	Low/Medium
Development of System Goals for Airport Ownership and Grant Obligation Characteristics	Identifies system goals, framework to address issue	Division of Aeronautics has limited control over meeting goals	Medium

Source: Wilbur Smith Associates

Because airport ownership and grant obligation characteristics can significantly impact the airport system, it is important that Division of Aeronautics monitor these factors to ensure that the system and those airports that contribute most to the system remain stable and viable over the long-term. Where possible, the Division of Aeronautics should consider proactive steps to secure airports by working with airports, sponsors, and their surrounding municipalities to ensure that those airports that contribute significantly to the overall system remain in operation. The Division of Aeronautics should accomplish this through interaction and discussions with local airport, municipal, or regional representatives. One important step in this process would be to work with the sponsors of privately owned airports to ensure that the Division of Aeronautics or local municipalities have an option to buy any private airport before it is sold for non-aviation use. This process would allow public acquisition of private airports that are important to New Jersey's aviation system.

IV. EXISTING INFRASTRUCTURE

New Jersey's system of public use airports is comprised of a wealth of existing aviation infrastructure. The existing infrastructure has been funded through the use of airport development funds that have come from local, private, State, and Federal sources. Much of the existing infrastructure at system airports still has considerable useful life that should be considered when system development recommendations are made. Maintaining existing airport infrastructure while developing new facilities to meet growing/changing aviation demand is often a key component in the long-term success of an airport system. Benchmarks used to measure the performance of existing system infrastructure were developed and analyzed in Chapter Five. The findings of these analyses are re-examined in the following sections and options for improving system performance relative to facility benchmarks are identified.

A. Facility and Service Objectives

1. System Adequacy Analysis

System performance relative to facility and service objectives for each functional level of airport was presented in Chapter Five. Graphs presented in that chapter depicted the percentage of airports in each functional level that currently meet objectives developed for each specific facility or service identified in the SASP. To complement that information, matrices were also developed to show in detail which airports meet the identified facility and service objectives for each of the four airport functional levels. In the matrices, airports that meet the specific objective were depicted with an "x." For those airports that do not currently meet their objectives, the existing facilities or services at the airport are identified. It is important to note that airports in the special use category were not addressed because of the unique nature of their facilities. In the SASP process, facility and service objectives were identified and analyzed for the following:

- Airport Reference Code (ARC)
- Runway length
- Taxiway width
- Runway strength
- Taxiway type
- Navigational aids
- Visual aids
- Lighting
- Weather
- Facilities
- Services

Specifics related to facility and service objective performance, by airport and by functional level, are presented in the following tables:

Table 6-5: Scheduled Service Airport Summary
Table 6-6: Advanced Service Airport Summary
Table 6-7: General Service Airport Summary
Table 6-8: Basic Service Airport Summary

As shown, each system airport is currently deficient in one or more facility or service objective based on its existing functional role in the system. In addition, there are individual facility or service objectives in each of the functional levels in which most airports included in that functional level are not in compliance. Options for improving system compliance with these facility and service objectives are presented in the following sections.

Table 6-5
FACILITY AND SERVICE OBJECTIVES - SCHEDULED SERVICE AIRPORTS SUMMARY

							Visual Aids				Lighting		Weather		Facilities				Services				
Scheduled Service Airports	**ARC Objective (C-III)**	**Runway Length Objective (6000)**	**Runway Width Objective (150)**	**Runway Strength Objective (60,000)**	**Taxiway Objective (Full Parallel)**	**Navigational Aid Objective (Cat. II ILS)**	**Rotating Beacon**	**Lighted Wind Indicator**	**REIL**	**VGSI**	**HIRL**	**CLTDZ**	**ASOS/AWOS**	**Tower**	**Apron Objective**	**Aircraft Storage Objective**	**Terminal Objective**	**Auto Parking Objective**	**Public Telephone**	**Public Restroom**	**Aircraft Maintenance**	**Jet Fuel**	**On-site rental car, Limo, Courtesy car**
Atlantic City International	X	X	X	X	X	ILS	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Newark Liberty International	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
Trenton-Mercer	X	X	X	X	X	ILS	X	X	X	X	X		X		X	X	X	X	X	X	X	X	X

Note: X represents compliance with facility or service objective
Source: NJDOT, Wilbur Smith Associates

Table 6-6
FACILITY AND SERVICE OBJECTIVES - ADVANCED SERVICE AIRPORTS SUMMARY

							Visual Aids					Weather		Facilities				Services				
Advanced Service	**ARC Objective (C-II)**	**Runway Length Objective (5,000)**	**Runway Width Objective (100)**	**Runway Strength Objective (30,000)**	**Taxiway Objective (Full Parallel For Primary)**	**Navigational Aid Objective (Precision Approach)**	**Rotating Beacon**	**Lighted Wind Indicator**	**REIL**	**PAPI or VASI**	**HIRL**	**ASOS/AWOS**	**Tower**	**Apron Objective**	**Aircraft Storage Objective**	**Terminal Objective**	**Auto Parking Objective**	**Public Telephone**	**Public Restroom**	**Aircraft Maintenance**	**Jet Fuel**	**On-site rental car, Limo, Courtesy car**
Essex County	X	4,553	80	X	X	Non-Precision	X	X			MIRL	X		X	X	X	X	X	X	X	X	X
Millville Municipal	X	X	X	X	X	X	X	X		X	MIRL	X		X	X	X	X	X		X	X	X
Monmouth Executive	X	X	80	n/a	X	Non-Precision	X	X			MIRL	X		X	X	X	X	X	X	X	X	
Morristown Municipal	X	X	X	X	X	X	X	X	X	X	X	LAWRS		X	X	X	X	X	X	X	X	X
Robert J. Miller	X	X	X	12,000	X	X	X	X	X	X	X	X		X	X	X	X			X	X	X
South Jersey Regional	B-II	3,911	50	X	Partial	Non-Precision	X	X		X	MIRL	X		X	X	X	X			X	X	X
Teterboro	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X

Note: X represents compliance with facility or service objective
Source: NJDOT, Wilbur Smith Associates

Table 6-7
FACILITY AND SERVICE OBJECTIVES - GENERAL SERVICE AIRPORTS SUMMARY

							Visual Aids					Facilities				Services			
General Service Airports	**ARC Objective (B-I)**	**Runway Length Objective (3,500)**	**Runway Width Objective (ARC)**	**Runway Strength Objective (12,500)**	**Taxiway Objective (Connectors or Turnarounds)**	**Navigational Aid Objective (Non-Precision)**	**Rotating Beacon**	**Lighted Wind Indicator**	**PAPI, or VASI**	**REIL**	**MIRL**	**Apron Objective**	**Aircraft Storage Objective**	**Terminal Objective**	**Auto Parking Objective**	**Public Telephone**	**Public Restroom**	**AvGas**	**Taxi, Limo, Shuttle**
Alexandria Field	X	2550	50	n/a	X	X	X	X			X	X	X	X	X	X	X	X	
Blairstown	X	3100	X	n/a	X	X	X	X			X	X	X	X	X	X	X	X	X
Cape May County	X	X	X	X	X	X	X	X	X		X	X	X		X			X	X
Central Jersey Regional	X	X	50	X	X	X	X	X			X	X	X	X	X	X	X	X	
Cross Keys	X	X	50	X	X	X		X			LIRL	X	X	X	X	X	X	X	
Flying W	X	3496	X	n/a	X	X	X	X	X		X	X	X	X	X	X	X	X	X
Greenwood Lake	X	X	X	n/a	X	X	X	X	X	X	LIRL	X	X	X	X	X	X	X	
Hammonton Municipal	X	X	X	1200	X	X	X	X	X		LIRL	X	None	X	X			X	X
Lakewood	X	3457	50	X	X	X	X	X			LIRL	X	X	X	X	X	X	X	X
Lincoln Park	X	2942	40	n/a	X	X	X	X	X		X	X	X	X	X	X	X	X	
Linden	X	X	X	X	X	Circling	X	X	X	X	X	X	None	X	X	X	X	X	
Marlboro	X	2156	50	n/a	X	X	X	X	X	X	LIRL		X	X	X	X	X	X	
Old Bridge	X	X	50	n/a	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Princeton	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	
Red Lion	X	2940	50	n/a	X	Circling		X			X	X	X	X	X	X	X	X	X
Sky Manor	X	2439	50	n/a	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Solberg-Hunterdon	X	X	50	n/a	X	X		X			X	X	None	X	X	X	X	X	
Somerset	X	2735	X	n/a	X	X	X	X			X	X	None	X	X	X	X	X	
Sussex	X	3499	X	n/a	X	X	X	X			LIRL	X	X	X	X	X	X	X	
Trenton-Robbinsville	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
Woodbine Municipal	X	3304	X	X	None	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Note: X represents compliance with facility or service objective
Source: NJDOT, Wilbur Smith Associates

Table 6-8
FACILITY AND SERVICE OBJECTIVES - BASIC SERVICE AIRPORTS SUMMARY

							Facilities		Services		
Basic Service Airports	**ARC Objective (B-I or Less)**	**Runway Length Objective (2,200)**	**Runway Width Objective (60)**	**Runway Strength Objective (Up to 12,500)**	**Taxiway Objective (Stub and Turnaround)**	**Wind Cone**	**Apron Objective**	**Auto Parking Objective**	**Public Telephone**	**Public Restroom**	**Taxi, Shuttle**
Aeroflex-Andover Field	X	1981	50	X	X	X	X	X	X	X	
Bader Field	X	X	X	X	X	X	X	X			X
Bucks	X	1900	X	X	None	X		X			X
Camden County	X	X	45	X	X	X	X	X	X		X
Eagles Nest	X	X	X	X	None			X			
Hackettstown	X	X	50	X	None	X		X	X	X	
Kroelinger	X	2188	X	X	None	X		X			
Li Calzi Airpark	X	X	X	X	None	X		X			X
Newton	X	X	45	X	None	X		X			
Ocean City Municipal	X	X	X	X	X	X	X	X			X
Red Wing	X	2040	X	X	None	X		X			X
Rudy's	X	X	X	X	None	X		X			X
Southern Cross	X	X	X	X	None	X		X			
Spitfire Aerodrome	X	X	50	X	X	X	X	X	X	X	X
Trinca	X	1924	X	X	None	X		X			
Twin Pine	X	X	X	X	None	X		X			
Vineland Downstown	X	X	X	X	None	X		X	X	X	X

Note: X represents compliance with facility or service objective
Source: NJDOT, Wilbur Smith Associates

2. Options Identification

The specific facility and service objective deficiencies identified at New Jersey airports could be addressed through the following options:

- Complete System Improvements
- Focus Improvements on Specific Facilities/Services
- Focus Improvement on Specific Functional Levels
- Prioritize Improvements

a. Complete System Improvements

This option for improving system performance relative to facility and service objectives would include improvements that would bring each airport into complete compliance with all SASP objectives. Facility and service objectives used in the SASP were developed for each functional level to show the types of facilities and services that would allow each system airport to meet its role in the system. It is important to note that all airport development implemented with federal funding would have to be properly justified based on FAA criteria. These FAA criteria generally stipulate that the use of federal funding is limited to those development projects that are justified to meet aviation demand. Each airport development project that uses federal funds is subject to eligibility and justification requirements included in the normal AIP funding process. For example, if a runway extension is recommended for an Advanced Service airport to meet the 5,000-foot long runway length objective, the airport would need to justify that runway length to the FAA. In addition, any runway extension project would need to be identified on an approved airport layout plan and meet all environmental requirements.

While this option would bring all but the most constrained airports into compliance with their respective facility and service objectives, the financial implications could be overwhelming. This option would require the diversion of all or most of the Division of Aeronautics' airport grant resources over a multi-year period to go to this specific objective. Should this be the case, vital rehabilitation and/or expansion projects may need to be postponed or ignored which could negatively impact the overall airport system.

Another important consideration in this option is that, although Division of Aeronautics funds could be used to develop facilities at airports to bring them into compliance with facility and service objectives, the airports themselves would be responsible for funding the maintenance and operation of these facilities once they were developed. In many instances, the airports may not be able to support the increased operational budgets associated with these improvements and the initial investment in infrastructure could deteriorate as a result of insufficient maintenance funds. It is also important to note that the Division of Aeronautics can promote the development of aviation facilities through the grant process, however, the provision of aviation services at airports is up to the airports and their respective tenants. In addition, the decision to attempt to meet SASP facility and service objectives is ultimately up to the airport sponsor. If local support does not exist, or development/improvement is not feasible, it is unlikely that all SASP recommended development will occur.

b. Focused Improvements for Specific Facilities/Services

Another means for quickly addressing deficiencies related to facility and service objectives at system airports would be to focus improvements on those objectives determined to be most important to the system. Improvement to these most important objectives would then be implemented in each functional level, if applicable. For instance, if runway length was determined to be the most important objective, all New Jersey airports could be brought into compliance with that specific objective before other objectives are pursued. While the financial impact of this option would not be as great as in the previous option, this scenario could still require significant amounts of investment. One shortfall of this process is that it may ignore the synergy that exists between specific facilities and services. For example, the development of a 5,000-foot long runway at an airport may not enable the airport to fulfill its system role unless other ancillary facility objectives, such as lighting, NAVAIDS, and runway strength, are also met. As with the previous option, the airport sponsor ultimately is responsible for implementing specific projects.

c. <u>Focused Improvements for Functional Levels</u>

Another option for addressing deficiencies related to facility and service objectives would be to focus improvements on those airports that contribute most to the airport system. Improvements focused on individual functional levels could bring all Scheduled Service and Advanced Service airports into compliance with objectives before moving to General Service and Basic Service airports. This process would substantially improve airport performance relative to facility and service objectives, functional level by functional level. One shortfall of this process is that it could delay and/or ignore improvements that may be required at airports in supporting functional levels. In addition, while Advanced Service airports may contribute most to the system, meeting the facility and service objectives for this level may require the highest level of investment. Meeting the facility and service objectives at Basic Service airports may not be as costly and their overall performance relative to their facility and service objectives could potentially be greatly improved with more minimal investment.

d. <u>Prioritized Improvements</u>

System performance relative to facility and service objectives is impacted by many factors and promoting improved performance is a complicated process. While other options identified in this analysis include a systematic approach to making improvements, they lack the flexibility that may be required to ensure that improvements made at specific facilities have their desired impact. Other options may also limit quick fixes that can be implemented, where available, to efficiently and inexpensively improve system performance. A more flexible approach to implementing necessary improvements at system airports could rely on the existing or a revised version of the Division of Aeronautics' Project Priority Rating System. In the funding process, those projects that improve an airport's compliance relative its specific facility and service objectives would be of a higher priority than other projects that may not address SASP objectives.

3. Options Analysis Summary and Recommendation

In the SASP planning process, facility and service objectives were developed for each airport functional level. These facility and service objectives represent goals for each functional level that would allow them to accommodate the types and levels of aviation demand they are intended to serve. System performance relative to the facility and service objectives identified in the SASP was measured in Chapter Five. Options for improving system performance were identified above and are summarized in **Table 6-9**.

Table 6-9
SUMMARY OF FACILITY AND SERVICE OBJECTIVE OPTIONS

Option	Pros	Cons	Cost
Complete System Improvements	Total compliance	High cost would divert resources from other important uses	High
Focused Improvements for Specific Facilities/ Services	Total compliance objective-by-objective	Limited flexibility, loss of synergistic benefits	Medium
Focused Improvements for Functional Levels	Total compliance functional level – by – functional level	Limited flexibility	Medium
Prioritized Improvements	Flexibility, address most important concerns first, implement improvements in a logical fashion	Systematic process will require time	Medium

Source: Wilbur Smith Associates

Four different approaches for improving system performance relative to SASP facility and service objectives are presented above. For each of these approaches, it is important to note that although facility and service objectives have been identified in the SASP, the funding and development of new or improved facilities will require proper justification through the airport-specific planning processes.

The "complete system improvements" option would promote total compliance at all functional levels with all facility and service objectives. Although this approach would drastically improve system performance, it would require an enormous amount of investment and could divert funds from other important projects. Again, projects cannot be initiated without support and justification from the airport sponsor. The focused improvements options continue to promote total system compliance with facility and service objectives. In these approaches, however, improvements would be focused on specific facilities/services or on specific airport functional levels. The focused improvement options would require significant amounts of investment and could limit the Division of Aeronautics' flexibility in promoting improved system performance. Focusing on improving system performance relative to a single facility objective may ignore synergies that exist between certain airport facilities. For example, promoting the development of precision approaches at all Advanced Airports may not provide the system maximum benefit unless the runway facilities at all Advance Airports are able to meet the appropriate design standards. Similarly, focusing on individual functional levels of airports may postpone improvements at other airports that may provide significant benefits to system performance.

Based on the existing system performance relative to facility and service objectives and the characteristics of the options presented above, the prioritized improvement approach is recommended. This approach will allow the Division of Aeronautics to pursue system improvements based on facility and service objectives developed in the SASP with the flexibility that may be required to maximize system performance. This approach allows the Division of Aeronautics to work with available funds and in conjunction with system airports to promote improved system performance relative to facility and service objectives in a flexible manner.

V. DESIGN STANDARDS

A. System Adequacy Analysis

In Chapter Five, each airport in the New Jersey system was evaluated to determine if its existing facilities comply with FAA standards related to airport safety, generally referred to in this analysis as "design standards." Design standards typically refer to runway area dimensional criteria that are recommended to safely support the operation of a specific class of aircraft at an airport. Design standards can also refer to recommendations related to specific airport facilities such as runway condition. The specific design standards examined in the SASP and current system performance relative to those standards are as follows:

- **Runway/Taxiway Separation** – Analysis conducted in Chapter Five identified that approximately 51 percent of system airports currently comply with runway/taxiway separation design standards based on their current Airport Reference Codes (ARCs). Among the airport functional levels, Scheduled Service airports have the highest compliance rating (100 percent of Scheduled Service airports comply with runway/taxiway separation design standards) and Basic Service airports have the lowest compliance rating at approximately 38 percent.

- **Width of Primary Runway –** Compliance of system airports to runway width design standards, based on each airport's ARC, ranged from 100 percent in the Scheduled Service functional level to approximately 48 percent in the General Service functional level. For the system as a whole, approximately 63 percent of system airports were in compliance with runway width design standards, based on their ARC.

- **Runway Safety Area Compliance** – Results of the benchmark analysis conducted in Chapter Five for the Runway Safety Area (RSA) design standard indicated that approximately 23 percent of system airports are in compliance with current design standards, based on their ARC. Based on the analysis conducted in the SASP, 100 percent of Scheduled Service airports currently comply with their respective runway safety area design standards. Current compliance in other functional levels ranges from approximately 29 percent at Advanced Service airports, approximately 24 percent at General Service airports, to approximately 6 percent at Basic Service airports. A more detailed evaluation of RSAs at system airports is currently underway. However, the findings of that separate analysis are not yet complete.

- **Pavement Condition Index** – In the benchmark analysis process, airports were examined to determine the Pavement Condition Index (PCI) of their primary runway, based on data collected during New Jersey's 1999 Pavement Condition Study. Data were examined to determine the percentage of system airports and percentage of airports in each functional level that have a PCI rating of 70 or greater. This rating is generally considered to represent good pavement condition for a primary runway. Analysis indicated that 100 percent of Scheduled Service airports had PCI ratings of 70 or better for their primary runway. Performance relative to this benchmark in the other airport functional levels is as follows; 86 percent for Advanced Service airports, 90 percent for General Service airports, and 75 percent for Basic Service airports.

In Chapter Five, a system goal of 100 percent compliance to applicable design standards was established for all public use airports in New Jersey. As the data presented above indicates, system compliance to design standards is currently deficient relative to that goal. The following sections describe approaches for improving system compliance relative to the design standards benchmarks.

B. Options Identification

Options available to increase the system performance relative to the design standards performance measure include the following:

- Do Nothing Option
- Implement System Performance Improvements

1. Do Nothing Option

The design standards analysis conducted in the SASP examined the current performance of system airports relative to their airport design standards. As shown in the analysis, a number of the airports examined do not comply with all of the standards that were analyzed. FAA design standards are used to promote the highest degree of safety in airport operations. In some instances, however, these design standards are impossible to meet, based on conditions at specific airports. Bringing all airports into total compliance with the design standards benchmark would be a very costly endeavor and the actual incremental improvement to system safety would be hard to quantify and not necessarily proportionate to the amount of investment that is required.

2. Implement System Performance Improvements

Promoting and maintaining the safety of aircraft operations should continue to be one of the top priorities of New Jersey's airport system. Working to bring impacted airports into compliance with design standards is important to maintaining the safety of system airports. Specific modifications can be made to airport facilities, often in conjunction with other projects, that can bring airports into compliance with the design standards examined in this analysis.

The Division of Aeronautics is currently conducting RSA inspections for all paved runways at grant obligated general aviation airports in the State. This study includes on-site inspection of the current condition of RSAs for those runways included in the analysis. Non-standard RSA conditions at system airports are being identified and alternatives to address RSA deficiencies developed. The feasibility of implementing RSA projects that provide full conformity with standards will be examined. Additional alternatives will be examined when design standards cannot be fully met. This on-going companion analysis will provide the Division of Aeronautics with a tool that identifies non-conformities with RSA design standards and provides alternatives to bringing deficient RSAs into compliance at many system airports.

Knowing where facilities are currently not in compliance with these standards can help the airports and the Division of Aeronautics to start planning for projects that are needed to improve compliance. The process of implementing projects to improve system performance relative to design standards could be conducted in such a way that projects that improve compliance are planned and implemented in an orderly process in conjunction with other projects.

C. Options Analysis Summary and Recommendation

Chapter Five presented an analysis of system compliance to FAA design standards. Design standards provide guidance related to the planning and design of airport facilities and primarily focus on the development of safe airport facilities. FAA standards also promote economy, efficiency, and longevity of airport facilities. New Jersey airports were examined for compliance relative to four FAA design standards. Based on the outcome of the analysis in Chapter Five and the summaries presented in this chapter, options for improving system performance relative to the FAA design standards benchmarks were developed. These options are summarized in **Table 6-10**.

Table 6-10
DESIGN STANDARDS OPTIONS

Option	Pros	Cons	Cost
Do-Nothing Option	No Division of Aeronautics resources required	Potential impacts to safety, ignores existing standards	Low
Implement System Performance Improvements	Promotes improved system safety, proactive	Requires system resources	Medium/ High

Source: Wilbur Smith Associates

FAA design standards are recommendations related to the design of airport facilities, however, they become requirements and regulations at those airports that accept federal funds for airport development. Once federal airport improvement program (AIP) moneys are accepted, an airport agrees to grant assurances that require compliance to FAA design standards. In New Jersey, FAA standards should also be followed by those airports that are not eligible for federal funding. Promoting design standards compliance at all airports promotes increased levels of safety and should continue to be a system goal. Because safety is an overriding goal of the aviation system, the do-nothing option is an unacceptable alternative. Instead, the Division of Aeronautics should work in cooperation with airports and the FAA to bring all system airports that have or will accept AIP moneys into compliance with design standards when opportunities arise to do so. In addition, although FAA design standards are not required to be applied to non-NPIAS airports or those airports that have not accepted federal moneys, the Division of Aeronautics should continue to use these design standards as guidelines for development at those airports, where possible.

VI. SUMMARY

Options for improving system performance relative to SASP performance measures and benchmarks have been identified in this chapter. In many cases, options ranged from a "do-nothing" approach to implementing full-scale improvements at all system airports. Through a matrix-based analysis of each option's pros and cons, as well as overall feasibility, recommended options for each SASP benchmark have been identified. Some recommended options for improving system performance relative SASP benchmarks are a hybrid of one or more of the options identified in this chapter. The system recommendations presented in this chapter will be summarized in Chapter Eight in conjunction with system recommendations for improving overall airport coverage that will be developed in the following chapter.

Chapter Seven examines overall airport coverage throughout New Jersey and, based on geographic and population coverage, makes recommendations for airport and system improvements that will make the airport system more accessible to its users. Options for improving system geographic coverage are identified in Chapter Seven, and recommendations for specific airport and system improvements are made in Chapter Eight. In addition, Chapter Eight will also present recommendations for the performance measures and benchmarks examined in this chapter. These recommendations will represent the best/most feasible approach for improving system performance.

CHAPTER SEVEN
GEOGRAPHIC COVERAGE ANALYSIS

Airport system coverage relates to the ability of the existing New Jersey system of public use airports to support aviation demand throughout the State by providing access, within a reasonable drive time, to a variety of aviation facilities and services. In previous sections of the SASP, airport coverage was generally discussed in the context of the air accessibility and surface access performance measures. This chapter combines those two performance measures into a single measure, referred to as overall airport coverage. This chapter also analyzes the overall level of potential demand for aviation services, independent of the existing airport system. The "clean-slate" approach, as well as options for improving the overall airport coverage of the existing system, are both discussed in the following sections. Specific recommendations for improving geographic coverage are made based on geographic coverage voids.

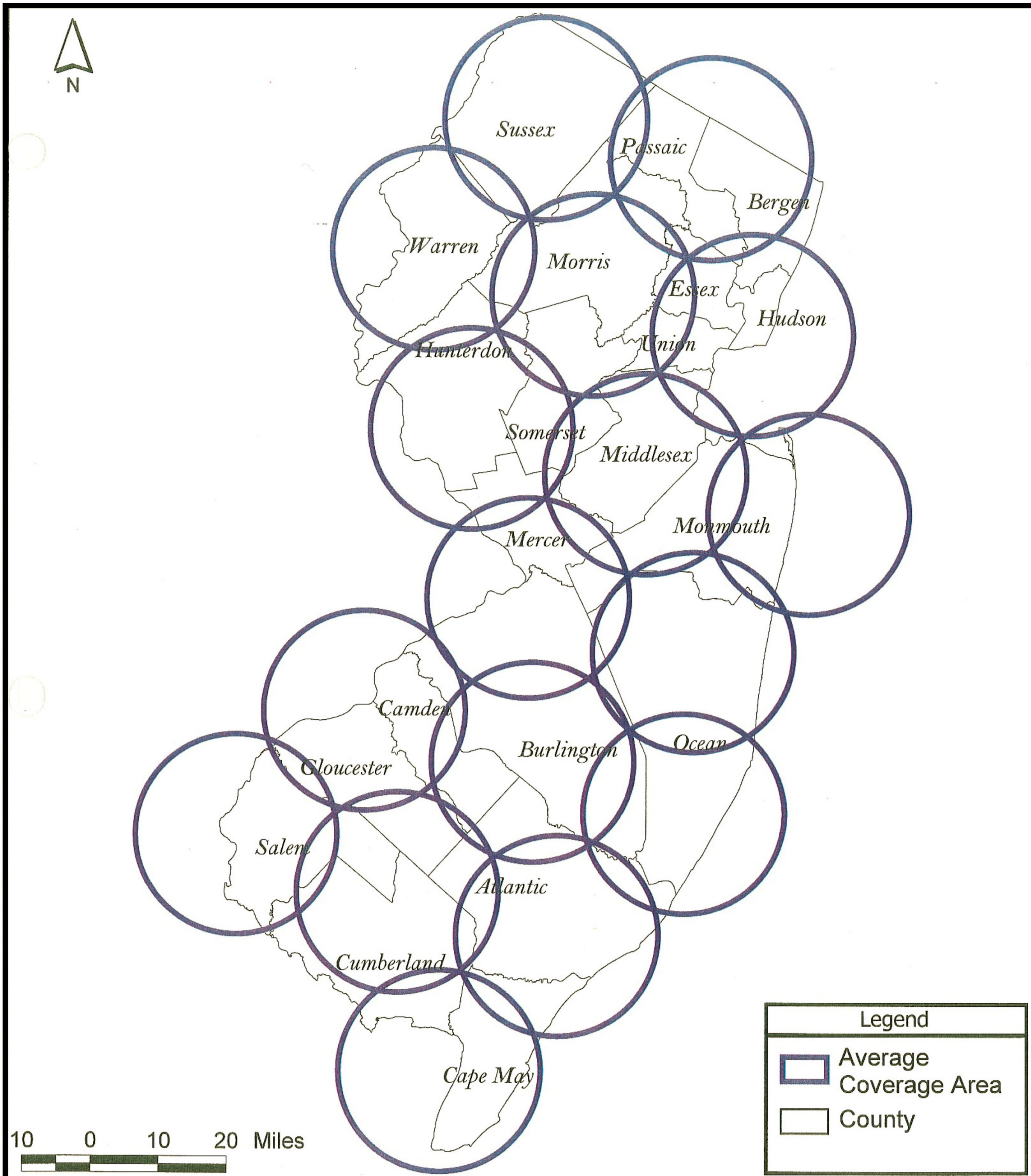
I. CLEAN-SLATE ANALYSES OF SYSTEM COVERAGE

An important consideration in developing options for improving system performance relative to airport coverage in New Jersey is to understand unconstrained demand for airport facilities in the State. To identify this demand for airport facilities, two different "clean-slate" analyses of system coverage were conducted. The first methodology that was used identified an average coverage area for an airport and then determined the number of airport facilities that would be required, based on the size of New Jersey and the size of an average market area, to provide total coverage to the State of New Jersey. This methodology is graphically depicted in **Exhibit 7-1**.

Exhibit 7-1 illustrates that approximately 17 airports would be required to provide total geographic coverage to the State of New Jersey assuming coverage with a radius of 15 miles centered on the airport. When examining eligibility for inclusion in the National Plan of Integrated Airport Systems (NPIAS), the FAA assumes an airport's 30-minute drive time coverage area is comprised of a circle with a 20-mile radius centered on the airport. The underlying assumption in this FAA approach is that a distance of 20 miles would typically take 30 minutes to drive, assuming a reasonable speed and normal driving conditions. Usually, for an airport to be included in the NPIAS, it must be at least 20 minutes from the nearest NPIAS airport. For this clean-slate analysis in New Jersey, due to the State's relatively high population density and congested driving conditions, the estimated radius of an average airport's market or coverage area is reduced from 20 miles to approximately 15 miles.

As this approach illustrates, assuming an average airport coverage area with a 15-mile radius, approximately 17 airports could provide coverage to the entire State of New Jersey with little overlap. Population density and aviation demand in some areas of the State could theoretically require additional airports in some areas of New Jersey. However, the outcome of this analysis indicates that the current system of 49 public-use airports is significantly greater than is estimated to be required, given the assumptions used in this analysis.

The second clean-slate analysis used a statistics-based approach. This clean-slate analysis looked at existing conditions in New Jersey and determined, based on planning estimates, the



STATE AIRPORT SYSTEM PLAN

Clean Slate Analysis Geographic Coverage

Exhibit 7-1

number of airports that would be required to sufficiently accommodate the needs of State businesses and residents, regardless of the number and location of existing airport facilities in the State. This analysis provides an estimate of the total number of airports that New Jersey's demand for general aviation warrants, and then identifies the potential demand at the county level. It is important to understand that this analysis estimates the number of airports needed in the State, not necessarily the types of facilities needed in each county.

The process used in this analysis applied standard planning ratios to New Jersey population statistics to estimate the gross operational demand for general aviation aircraft. In previous analyses conducted in states throughout the country it has been determined that there is a statistically significant correlation between population and general aviation aircraft operational demand (typically an R^2 of .80). By applying an average estimate of the number of general aviation aircraft operations per capita, a gross level of general aviation aircraft operations was determined for the State and for each New Jersey county. This gross demand was then translated into an estimate of the number of airport facilities required to accommodate the estimated level of demand for each county and for the State as a whole.

The specific data used in this analysis of system coverage includes the following:

- U.S. Census Bureau data (2000) were used to identify current State and county population levels

- An average ratio of 0.32 operations per person was applied to the population of each New Jersey county to estimate total general aviation aircraft operations in each county. The ratio that was used in this analysis represents the population-weighted average of the operations per person ratio from other states for which data were available (Alabama, Colorado, Florida, Louisiana, Maine, Mississippi, Nebraska, New York, and Pennsylvania). The states included in this analysis accommodate a wide variety of general aviation activity, ranging from Florida which experiences high levels of training and is relatively densely-populated, to Nebraska, with a relatively low population density and where aviation activity tends to be more seasonal.

- When the general aviation operations per-person ratio is applied to each New Jersey county's population, an estimate of total general aviation operational demand can be developed for each county. The estimate of total general aviation operational demand in New Jersey counties ranged from almost 280,000 annual general aviation operations in Bergen County to just over 20,000 annual general aviation operations in Salem County.

- County estimates of total general aviation operational demand were then allocated to airport facilities by assuming that a typical general aviation airport could accommodate approximately 90,000 annual general aviation operations. This assumption is based on an estimated annual service volume (ASV) for a single-runway airport with a parallel taxiway and a non-precision approach. The ASV for this type of airport is approximately 180,000 annual operations. In the clean-slate approach, airports are assumed to operate at approximately 50 percent of their operational capacity. At this activity level, the airports would accommodate a significant amount of activity, yet would not experience unacceptable levels of congestion or delay. The majority of New Jersey's system airports currently accommodate annual general aviation activity levels much lower than the 90,000 annual general aviation operations estimate used in the clean-slate approach.

Table 7-1 summarizes the outcome of this analysis.

Table 7-1
CLEAN-SLATE ANALYSIS OF SYSTEM COVERAGE

	2000 Pop.	Estimated Demand (OPS)	Existing Airports	Required Airports	Difference
New Jersey	8,414,350	2,647,600	49	29	20

Source: Wilbur Smith Associates

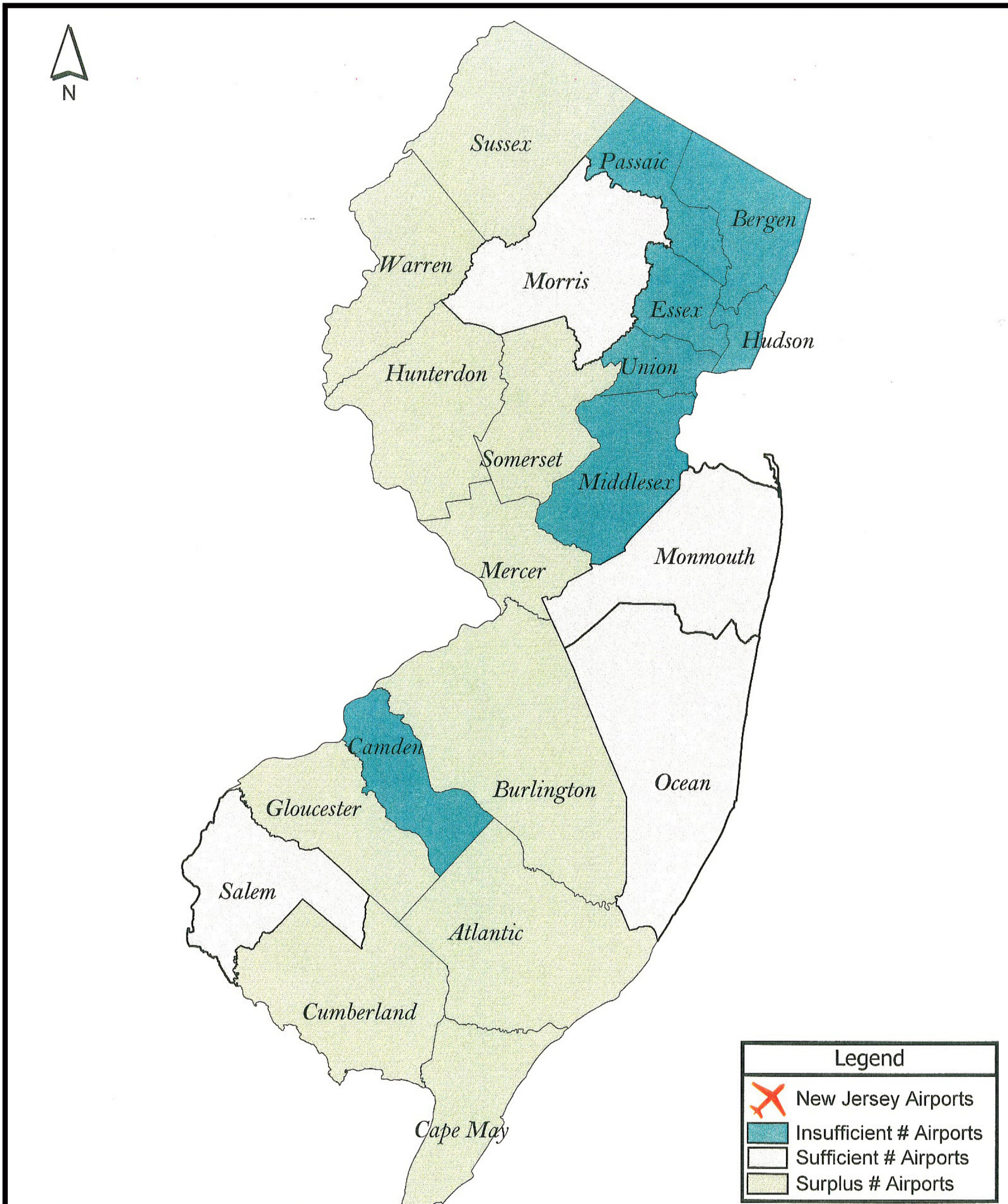
As shown in the table, based on the clean-slate approach, approximately 29 airports would be required to meet the demand for general aviation operations throughout New Jersey based on the State's current population and the process used for this analysis. New Jersey's existing system of public-use airports is currently comprised of 49 facilities, significantly more than the number of airports identified in this analysis. It is important to note, however, that many of the existing system airports do not have the level of facilities and services that were assumed in this analysis.

The analysis summarized in Table 7-1, however, did indicate that some of the State's most populated areas appear to have an insufficient number of airport facilities to accommodate their estimated demand for general aviation operations.

Those counties where an insufficient number of airport facilities were identified are listed below:

- Bergen
- Essex
- Hudson
- Union
- Passaic
- Middlesex
- Camden

Exhibit 7-2 illustrates the location of the New Jersey counties identified above. Based on the outcome of the clean-slate analysis, augmentation of the airport system may be required in these areas of the State to allow the system to sufficiently accommodate estimated general aviation demand.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Clean Slate Analysis Total Airport Demand

Exhibit 7-2

The clean-slate analysis also identified areas of New Jersey where excess airport facilities exist, based on the general aviation demand estimated in the analysis. Those counties appearing to have excess facilities include:

- Sussex
- Gloucester
- Warren
- Mercer
- Hunterdon
- Atlantic
- Somerset
- Cape May
- Burlington
- Cumberland

Exhibit 7-2 also identifies those New Jersey counties that appear to have an excess of aviation facilities based on the general aviation operational demand estimated in the clean-slate analysis. In some areas, circumstances may exist that require more facilities to exist than have been identified in this analysis. Therefore, in some counties identified as having excess facilities, there may or may not actually be excess facilities. However, in some of the areas identified above, a true duplication of facilities may exist.

Data generated by the clean-slate analysis regarding counties with excess or duplicative airport facilities will be used in Chapter Eight as one of several factors examined to identify the recommended options for improving airport system coverage. It is important to understand that this data resulted from an analysis that used demographic characteristics of New Jersey counties to estimate the number, not necessarily the type, of airports that could accommodate each county's theoretical demand for general aviation operations. In addition, there are areas that have been identified as having an excess number of airports; but this does not imply that those airports are excess to the system.

II. INTRODUCTION TO SYSTEM COVERAGE

The overall airport coverage performance measure has been developed to simplify this chapter's discussion of options for improving system performance relative to accessibility from both the air and the land. In a previous chapter of the SASP, the market area coverage provided to New Jersey by each functional level of airport was determined. This market area coverage was measured relative to current New Jersey population by identifying the percent of the State's total population that is within a specified drive time of each functional level of airport. In addition, a similar process was used to measure the coverage provided to businesses located throughout the State. Previous analysis has indicated that market area coverage provided to population and businesses, although not precisely the same, are very similar. For the purposes of simplifying the presentation of options for system improvement with regards to market area coverage, all discussion related to market area coverage in this analysis will focus on population.

In the Benchmark Analysis chapter, a goal of 100 percent coverage of New Jersey population and businesses was established for each functional level of airport. For Scheduled Service airports, coverage was determined based on a 60-minute drive time. Coverage of Advanced, General, and Basic Service airports was determined based on a 30-minute drive. The adequacy of the existing system will be examined in the following sections and options for improving system performance will be identified. In addition, because certain facility and service objectives are tied to airport functional levels, some system benchmarks related to specific airport facilities are also discussed in the context of this market area coverage analysis.
Air accessibility and surface access performance measures were examined independently in previous sections of the SASP. Because of the correlation of some of the factors examined in these two performance measures, as well as their interaction with facility and service objectives developed for system airports, combining them into a single performance measure simplifies the options identification process. The specific factors that are examined in the overall airport coverage analysis are listed below:

- **Scheduled Service Airport Coverage –** In this analysis, the coverage provided to New Jersey's population by Scheduled Service airports is examined. Scheduled Service airport market area coverage is determined by using a 60-minute drive time at all airports with service by scheduled air carriers. Drive time coverage areas were prepared for New Jersey airports and airports in neighboring states whose coverage areas extend into New Jersey. The current adequacy of Scheduled Service airport market area coverage will be determined in this analysis.

- **Advanced Service Airport Coverage –** Coverage provided to New Jersey's population by Advanced Service airports is examined, and options for improving system coverage are identified, where applicable. In addition, because a number of other benchmark factors that were examined in previous sections of the SASP are included in the facility and service objectives for Advanced Service airports, they will be examined in conjunction with the Advanced Service airport coverage factor. The specific benchmark factors that will be examined in conjunction with Advanced Service airport coverage include:

    - Precision Approach Coverage
    - On-Site Weather Coverage
    - Air Traffic Control Tower Coverage
    - 5,000 Foot Runway Coverage

    The correlation between facility and service objectives and airport coverage can be explained as follows:

    - The percentage of New Jersey businesses located within a 30-minute drive time of an airport with a 5,000 foot-long runway is a benchmark identified for the SASP; current system performance was measured in Chapter Five. Because a minimum runway length of 5,000 feet is a facility and service objective for Scheduled Service and Advanced Service airports, when options for improving the overall coverage of those functional levels are examined, runway length coverage is included by default. For instance, if an airport is recommended to be upgraded to the Advanced Service functional level, a 5,000 foot long runway would be an objective for that airport. Improving the runway at that facility to 5,000 feet, to meet the Advanced Service airport facility and service objective, would also improve the coverage provided to New Jersey businesses by airports with runways at least 5,000 feet in length.

- **General Service Airport Coverage –** Coverage provided to New Jersey's population by General Service airports, and options for improving this coverage, if applicable, are examined. Non-precision approaches are a facility and service objective for General Service airports and will also be examined in conjunction with General Service airport coverage.

- **Basic Service Airport Coverage** - Coverage provided to New Jersey's population by Basic Service airports is examined. In addition, geographic duplication of services by these facilities is also examined.

III. FACTORS INFLUENCING CURRENT SYSTEM COVERAGE

Chapter Five presented the findings of the benchmark analysis based on New Jersey's existing system of public use airports. New Jersey's airport system, however, is dynamic. There are a number of potential changes that could occur at system airports that could impact airport coverage as measured in Chapter Five. This section of the analysis examines several factors that will be considered when making coverage recommendations.

The factors examined include the following:

- Out-of-State Airports
- Existing and Future Airport Constraints
- Airport Ownership
- Inability to Meet Facility and Service Objectives for Current Role

The impacts that these factors may have on airport coverage vary, however, they are important to understand. For instance, coverage identified for each functional level of airport in Chapter Five was determined based on the market area coverage of both New Jersey and out-of-state airports whose coverage areas extend into New Jersey. While the coverage provided by out-of-state airports does benefit the performance of New Jersey's overall system, these airports are beyond the influence of the NJDOT and the Division of Aeronautics. Therefore, in areas of New Jersey where airport coverage is provided solely by out-of-state airports, it may be important to consider improving coverage in that area through development of a New Jersey airport. This would help to ensure that the needs of New Jersey citizens and businesses are met by an airport included in the New Jersey system of public-use airports.

A. Out-of-State Airports

As part of the New Jersey SASP, an analysis was conducted to determine which airports in neighboring states impact the New Jersey system. The goal of this analysis was to identify airports and areas in neighboring states that currently have the potential to serve the aviation needs of New Jersey. The results of this analysis will be considered when determining the adequacy of New Jersey's existing aviation system as well as in examining options for improving overall system performance.

The initial step in this analysis was to identify those airports in surrounding states that could have the potential to serve New Jersey aviation demand. For this analysis, all airports in neighboring states located within 20 miles driving distance, on existing roads, of the New Jersey border were identified.

Airports in the neighboring states of Delaware, New York, and Pennsylvania that meet the 20-mile criterion are listed below:

- New Castle County Airport (Wilmington, DE)
- Randall Airport (Middletown, NY)
- Warwick Municipal Airport (Warwick, NY)
- Brandywine Airport (West Chester, PA)
- Doylestown Airport (Doylestown, PA)
- Braden Airpark (Easton, PA)
- Lehigh Valley International Airport (Allentown, PA)
- New Garden Airport (Toughkenamon, PA)
- Northeast Philadelphia Airport (Philadelphia, PA)
- Philadelphia International Airport (Philadelphia, PA)
- Allentown Queen City Municipal Airport (Allentown, PA)
- Stroudsburg-Pocono Airport (East Stroudsburg, PA)

Following the identification of the out-of-state airports that have the potential to serve New Jersey aviation demand, it was important to determine the role that these airports play and where they would be stratified in the functional level classifications that have been developed for the SASP.

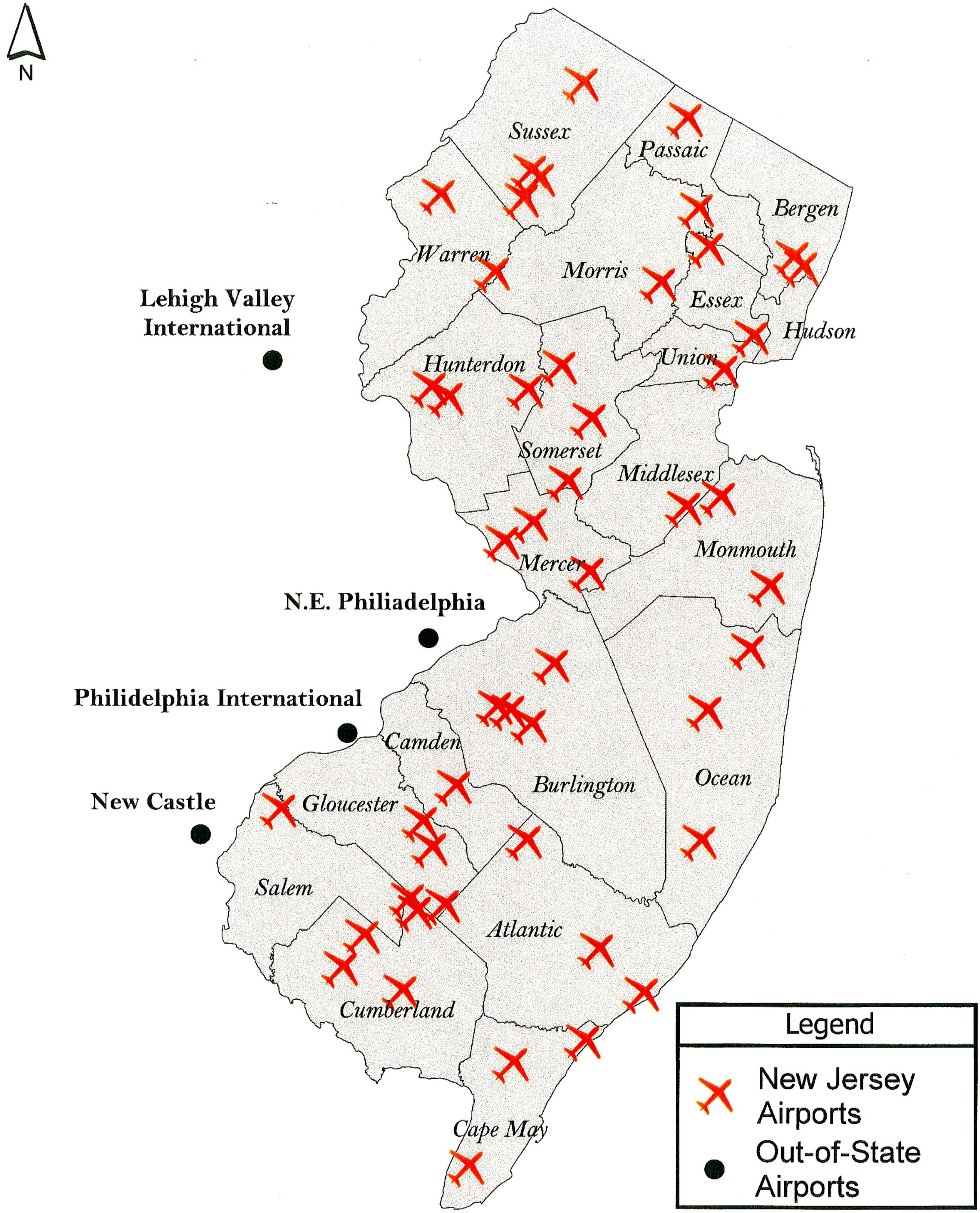
Specific factors that were examined for each of the airports listed above include:

- Drive time from airport to New Jersey
- Demographic factors in airport area
- Runway facilities
- Available approaches
- Based aircraft
- Aircraft operations

Based on the factors listed above, out-of-state airports that were determined to provide coverage to areas of New Jersey were classified into the Scheduled Service, Advanced Service, General Service, or Basic Service functional levels. As presented in Chapter Five, these out-of-state airports were then included in the coverage analysis. Those out-of-state airports that were determined to play a significant role in serving New Jersey's aviation demand include the following:

- New Castle County Airport (Wilmington, DE)
- Lehigh Valley International Airport (Allentown, PA)
- Northeast Philadelphia Airport (Philadelphia, PA)
- Philadelphia International Airport (Philadelphia, PA)

Exhibit 7-3 identifies the location of these out-of-state airports relative to New Jersey.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Out-of-State Airports

Exhibit 7-3

B. Existing and Future Airport Constraints

Previous discussions in the SASP related to constrained airports focused on airfield operational constraints. Other factors, such as limited aircraft parking or storage facilities, or limited developable property, can also impact an airport to the point where its ability to accommodate current and future users becomes constrained. The benchmark analysis presented in Chapter Five identified the percentage of airports in each functional level that currently experience operational demand/capacity ratios that place them within generally accepted target zones that indicate a potential for congestion and delay.

Through the demand/capacity analysis that was conducted, the following airports were identified as system airports that have the potential to experience operational delays, based on their current demand/capacity ratios:

- Essex County
- Morristown Municipal
- Newark International
- Teterboro

In addition, as was discussed in the previous section of this chapter, airports in neighboring states also impact the performance of New Jersey's existing airport system. Airports in neighboring states were also examined relative to their operational capacity and the following airports were identified as having the potential to experience operational delays based on current demand/capacity ratios:

- Philadelphia International
- Northeast Philadelphia

More detailed analysis would be required to determine the degree to which current operational demand levels at these airports truly impact their operational efficiency. Significant impacts to operational efficiency could lead to congestion and delays. However, if it is determined that a system airport is currently constrained based on its operational activity levels, the ability of that facility to accommodate additional activity in the future may be questionable. If this is the case, options for augmenting coverage in that area will be considered for improving system performance.

When considering existing airport facilities and their ability to continue to accommodate the needs of current and future users, the following are some examples of other factors that have the potential to represent constraints:

- Limited aircraft parking areas can impact an airport's ability to accommodate the necessary number and/or types of aircraft desiring to use a facility.
- Limited indoor aircraft hangar storage facilities can impact an airport's ability to accommodate existing and/or future demand.

- Airspace considerations, such as an airport's location relative to congested flight paths, or its inability to accommodate specific types of approach aids and systems can impact an airport's ability to adequately serve its existing or future role within the system.
- Where an airport is currently developed to its maximum build-out, and additional opportunities for expansion are not probable, that facility's ability to accommodate current and future users may be limited.

These types of constraints, as well as others that may exist at system airports, will be considered in the SASP analysis to the extent possible. While airports that may currently be constrained, or have the potential to be constrained in the future, were included in the geographic coverage analysis, the ability of these airports to accommodate higher levels of future activity may be finite. Therefore, as the system adequacies and options analysis proceeds, the impacts that constrained airports have on system compliance and coverage will be examined, and where necessary, recommendations will be made to augment the compliance or coverage provided by these potentially constrained airports.

C. Airport Ownership

Airport ownership is an important consideration when examining the long-term viability and development potential of system airports. The type of ownership, usually classified as public or private, under which airports operate can impact the funding that those airports receive for improvement projects and can also impact the overall stability of the facilities.

New Jersey is somewhat exceptional in the national aviation system because of its high percentage of privately owned, public use airports. Privately owned airports fall into two categories; privately owned airports that are not obligated to remain open and privately owned airports that have accepted public money for their development. Under such an agreement, the airport is obligated to remain a public use airport facility or repay the public funds that they have accepted by agreeing to grant assurances. In the context of the SASP, it is assumed that privately owned airports that are not obligated are generally considered more "at risk" for closure. Privately owned airports under grant assurances are assumed to be relatively more likely to remain open as a public use facility; however, since they are still under private ownership, their long-term stability should still be a consideration in this analysis. **Table 7-2** summarizes airport ownership by airport functional level in New Jersey.

Table 7-2
AIRPORT OWNERSHIP SUMMARY

	Ownership		
	Public	**Private**	**Private-Obligated**
Scheduled Service			
Atlantic City International	X		
Newark Liberty International	X		
Trenton-Mercer	X		
Advanced Service			
Essex County	X		
Millville Municipal	X		
Monmouth Executive		X	
Morristown Municipal	X		
Robert J. Miller	X		
South Jersey Regional			X
Teterboro	X		
General Service			
Alexandria Field		X	
Blairstown		X	
Cape May County	X		
Central Jersey Regional		X	
Cross Keys		X	
Flying W		X	
Greenwood Lake	X		
Hammonton Municipal	X		
Lakewood	X		
Lincoln Park			X
Linden	X		
Marlboro		X	
Old Bridge		X	
Princeton			X
Red Lion		X	
Sky Manor		X	
Solberg-Hunterdon		X	
Somerset			X
Sussex			X
Trenton-Robbinsville			X
Woodbine Municipal	X		
Basic Service			
Aeroflex-Andover Field	X		
Bader Field	X		
Bucks		X	
Camden County		X	
Eagles Nest		X	

Table 7-2
AIRPORT OWNERSHIP SUMMARY, Continued

	Ownership		
	Public	Private	Private-Obligated
Hackettstown		X	
Kroelinger		X	
Li Calzi Airpark		X	
Newton		X	
Ocean City Municipal	X		
Red Wing		X	
Rudy's		X	
Southern Cross		X	
Spitfire Aerodrome		X	
Trinca		X	
Twin Pine		X	
Vineland Downstown		X	

Source: NJDOT

As presented in Table 7-2, the number of privately owned, non-obligated airports in each SASP functional level are as follows:

- Scheduled Service Airports – No Scheduled Service airports are privately owned and non-obligated.
- Advanced Service Airports – Two Advanced Service airports, South Jersey Regional and Monmouth Executive (approximately 29 percent of this functional level) are privately owned. South Jersey Regional, however, is obligated.
- General Service Airports – Ten of the 21 General Service airports (48 percent of this functional level) are privately owned and non-obligated. Another General Service airport is privately owned, but is currently obligated.
- Basic Service Airports – 14 of the 17 Basic Service airports (82 percent of this functional level) are privately owned and non-obligated.

Much of the system coverage and compliance that was identified in Chapter Five related to the SASP's coverage performance measures is provided by privately owned airports. The number of privately owned airports included in the system alludes to the amount of aviation activity that is supported by these private facilities. The fact that privately owned airports are important to the current system's performance is not necessarily a positive or negative characteristic. However, the impact that private ownership has on the long-term development potential and long-term viability of airports will be a consideration in the options identification and options analyses tasks. System performance could be impacted by closures of private airports and, where possible, the SASP should identify development options and recommendations that augment the coverage and/or compliance provided by private airports so that negative impacts of future airport closures are minimized. The closure of specific airports can not be predicted and the impacts of such closures on system coverage will not be quantified.

D. Inability to Meet Facility and Service Objectives for Current Role

Included in previous sections of the SASP was a stratification of the existing airport system and recommended facility and service objectives for system airports based on the functional roles. These facility and service objectives represent the types of facilities and services that are generally desirable at system airports based on the types and levels of activity that are anticipated to occur at each functional level of airport. While these objectives are not intended as requirements, if an airport is unable to meet the identified objectives, the performance of the overall airport system could be negatively impacted.

For instance, if an airport is currently identified as an Advanced Service facility but constraints make it impossible for that facility to have a runway approaching 5,000 feet in length, then that facility may never be able to completely meet its functional role. Where facility constraints exist that limit an airport's ability to comply with facility and service objectives, alternatives must be examined in order to provide the coverage required. Options for improving system performance in areas where constrained airports exist will be examined to ensure that system performance and system coverage is truly adequate given existing conditions and long-term development potential at system airports.

IV. SYSTEM COVERAGE ANALYSIS

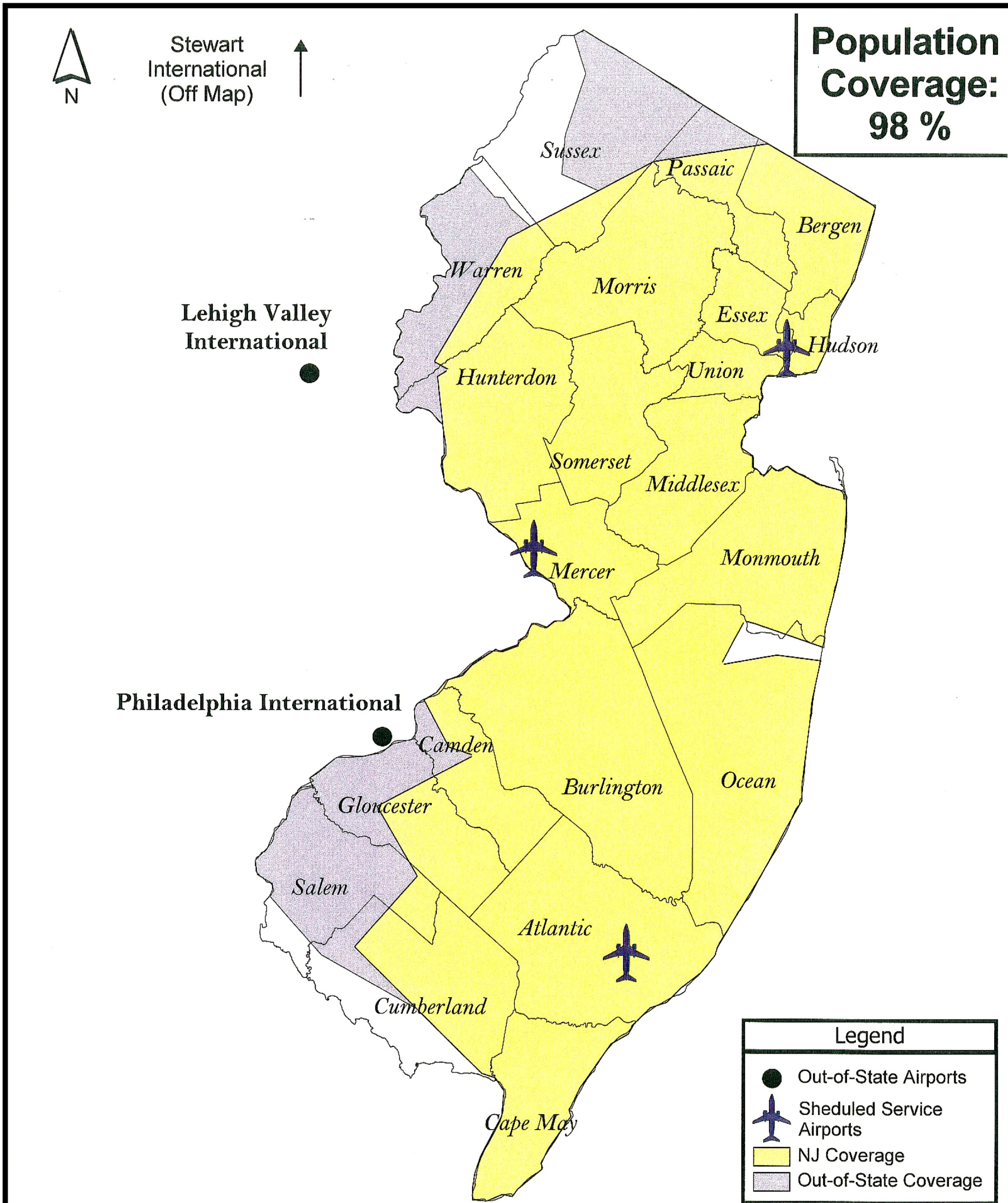
Airport system coverage relates to the ability of existing New Jersey airports to support existing and future aviation demand throughout the State. The evaluation of system coverage is determined based on the percentage of population that is within a specified drive time of a functional level of airport. Airport system coverage will be discussed for the following functional levels of airports identified in the SASP:

- Scheduled Service Airports
- Advanced Service Airports
- General Service Airports
- Basic Service Airports

The following sections summarize existing coverage by functional level. Factors that have a potential to impact coverage are also discussed. Options for improving or augmenting coverage, as well as limiting duplicative coverage, in each functional level will be identified. When considering options for improving airport coverage, one of the first considerations will be upgrading existing facilities, where possible. Existing environmental limitations, as well as facility development constraints, will be considered to ensure that the recommendations have the potential to be implemented.

A. Scheduled Service Airports

Exhibit 7-4 illustrates areas of the State that are beyond a 60-minute drive time from a Scheduled Service airport. As shown in Exhibit 7-4, approximately 98 percent of the State's population is within a 60-minute drive time of an airport that currently provides access to scheduled airline service. Existing coverage provided by Scheduled Service airports comes from New Jersey airports and airports located outside the State. GIS analysis indicates that although 98 percent of the State's total population is currently covered, based on a 60-minute drive time, approximately 28 percent of the State's population is covered exclusively by out-of-state airports. Philadelphia International Airport is the sole Scheduled Service airport providing coverage to 22 percent of the State's population, while Lehigh Valley International and Stewart International exclusively serve 5 percent and 1 percent of the State's total population, respectively.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Scheduled Service Coverage

Exhibit 7-4

Several points are noteworthy related to the State's goal for 100 percent population coverage for Scheduled Service airports; these points are as follows:

- In the deregulated commercial airline operating environment, the New Jersey Department of Transportation, as a state agency, has little influence over where commercial airlines either provide or do not provide service.

- While some of the State's population is currently "covered" by the scheduled airline service that is available at the Trenton Mercer Airport, the percentage that is covered exclusively by this commercial airport is small, approximately 2 or 3 percent of the State's total population. Most of the 60-minute service area for the Trenton Mercer Airport overlaps with either the service area for Newark International and/or the service area for Philadelphia International.

- Scheduled commercial airline service provided to Atlantic City International Airport is limited. Spirit Airlines is the only carrier flying major/national jet equipment to this market on a scheduled basis. The remainder of this market's service is on commuter carriers. The majority of the commercial activity at this airport can generally be categorized as scheduled charter activity that supports tourism to the area's casinos and other attractions.

Based on the findings of the geographic coverage analysis and the factors listed above, the current coverage provided by Scheduled Service airports to New Jersey's populace is considered adequate.

B. Advanced Service Airports

The coverage provided to New Jersey residents by the existing system's seven Advanced Service airports will be examined in the following sections:

- Summary of Current Coverage/Coverage Area Gaps
- Factors Influencing Current Advanced Service Coverage
- Identification of Options for Improving Advanced Service Coverage
- Summary of Options for Improving Advanced Service Coverage
- Advanced Service Airport Recommendations

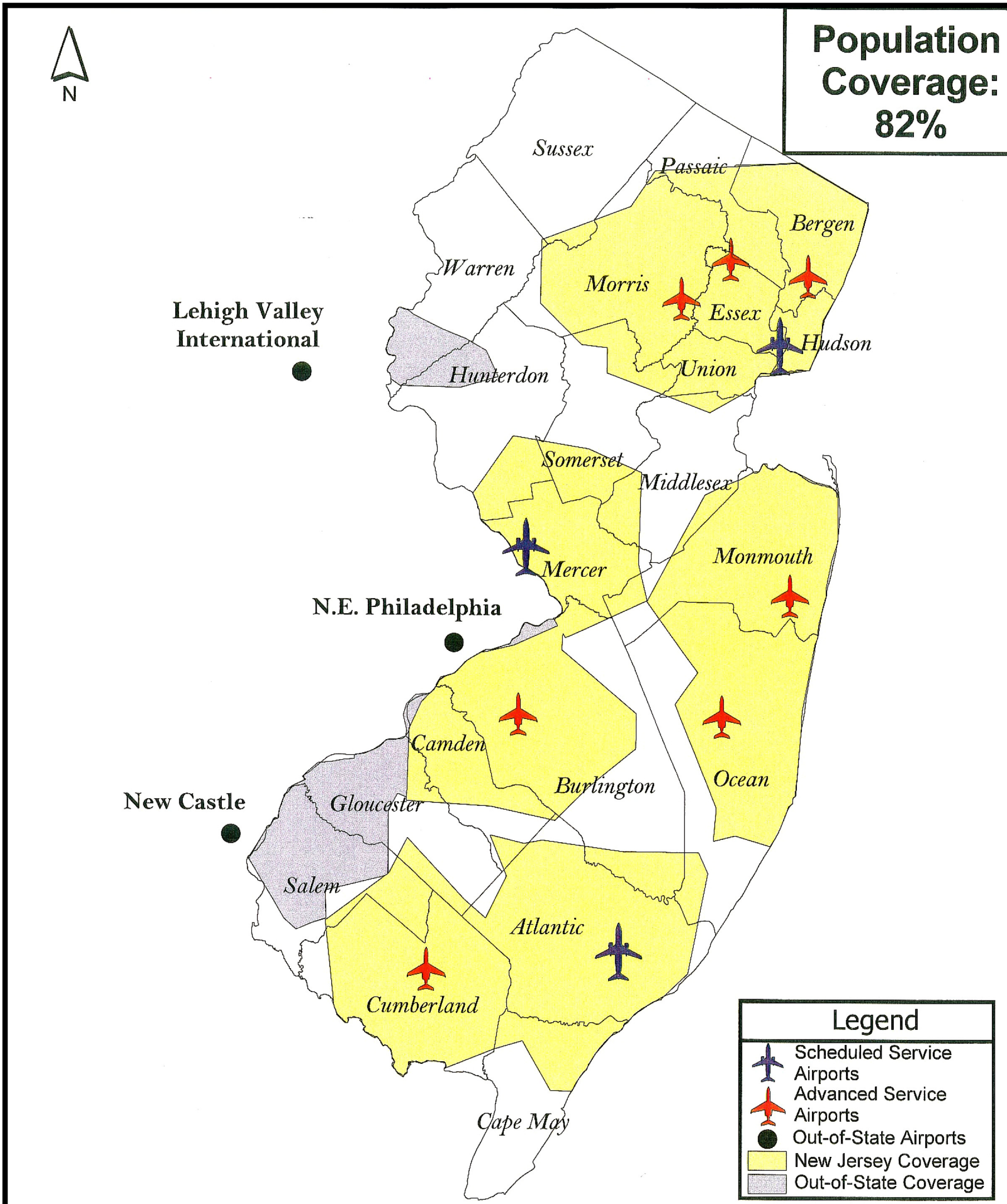
Through the analysis conducted in these sections, options for improving system coverage relative to Advanced Service airports will be identified. These options will be examined in the following chapter and recommendations will be made that identify the most viable option for improving coverage in each identified area of deficiency.

1. Summary of Current Coverage/Coverage Area Gaps

Those areas of the State whose population is beyond a 30-minute drive time of an Advanced Service airport or a Scheduled Service airport, such as Atlantic City, Trenton Mercer, and Lehigh Valley, that is capable of meeting the needs of aircraft that would typically operate at an Advanced Service airport, were identified in Chapter Five. Current Advanced Service airport coverage is illustrated in **Exhibit 7-5**. As shown in Exhibit 7-5, approximately 82 percent of the State's population is currently within a 30-minute drive time of an Advanced Service airport. The goal for Advanced Service airport coverage is 100 percent. While current coverage is 82 percent of the State's total population, it is important to note that there are large areas of the State, approximately 35 percent of the State's land area, that currently are not covered.

Exhibit 7-6 compares New Jersey's current Advanced Service airport coverage to the location of those counties identified in the clean-slate analysis as having insufficient or excess aviation facilities. Exhibit 7-6 shows that portions of Passaic, Bergen, Middlesex, and Camden counties, counties identified as having insufficient facilities, are located outside of the coverage areas of existing Advanced Service airports. The remaining areas of New Jersey that are located beyond the 30-minute drive time coverage areas of the State's existing Advanced Service airports are located in counties with sufficient or excess aviation facilities, as determined by the clean-slate analysis.

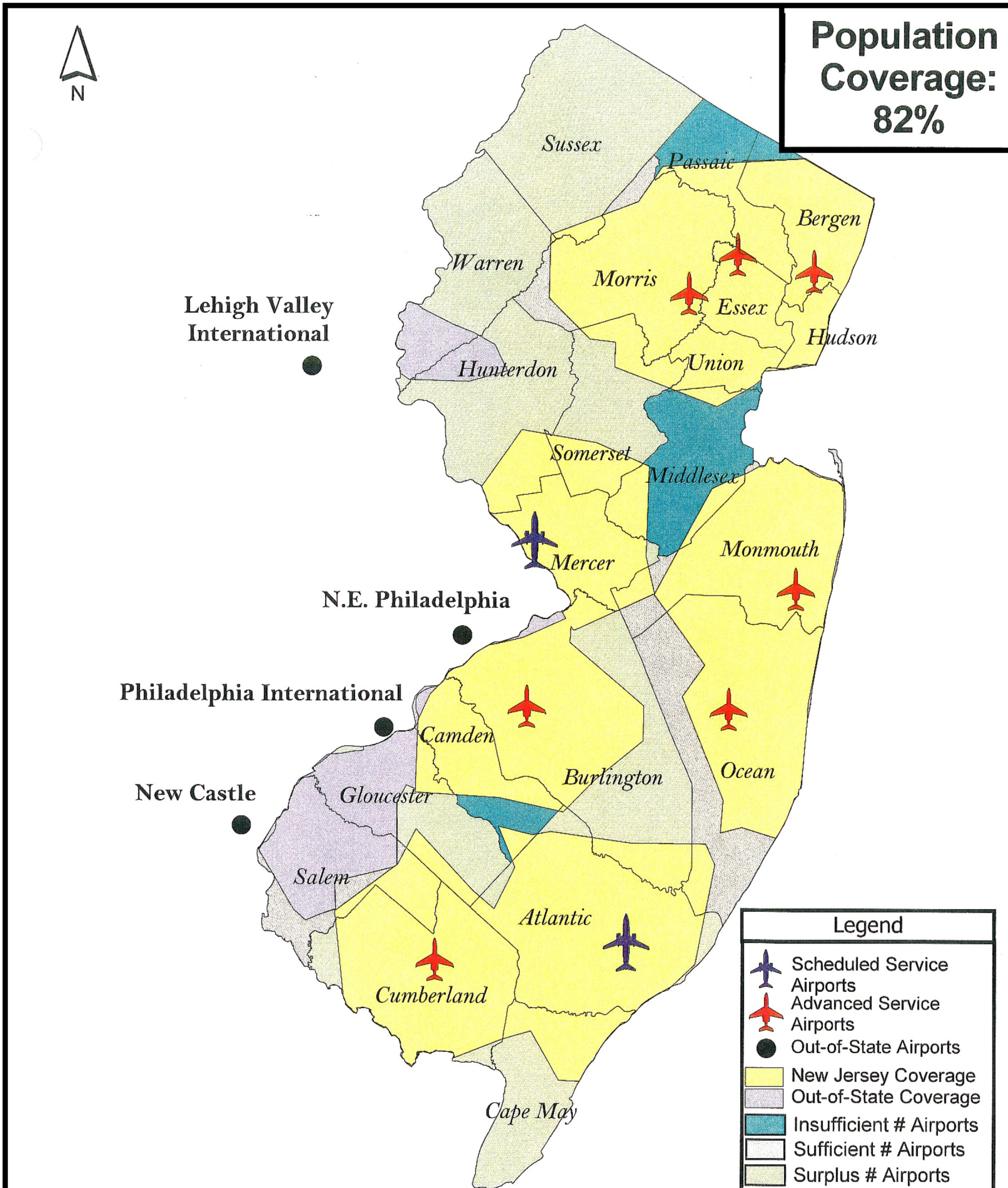
Those areas that are currently excluded from the 30-minute drive time coverage areas of Advanced Service airports have been identified as coverage area voids on **Exhibit 7-7**. As shown in Exhibit 7-6, 11 areas of the State have been identified as current Advanced Service coverage area voids.



STATE AIRPORT SYSTEM PLAN

Current Advanced Service Coverage

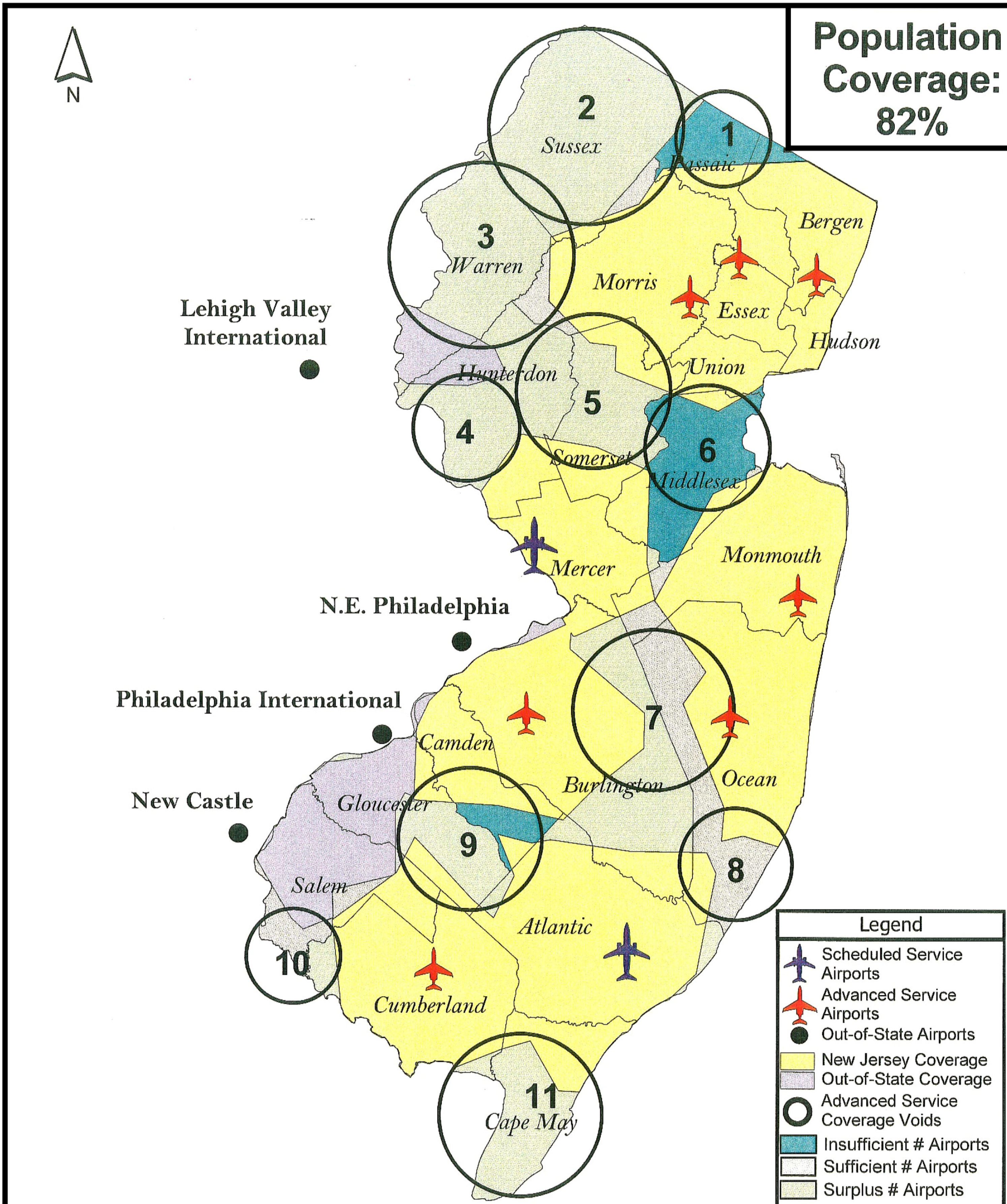
Exhibit 7-5



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Advanced Service Coverage and Clean Slate Analysis

Exhibit 7-6



STATE AIRPORT SYSTEM PLAN

Advanced Service Coverage Area Voids

Exhibit 7-7

2. Factors Influencing Current Advanced Service Airport Coverage

GIS analysis indicated that approximately 82 percent of the State's population is covered by an existing Advanced Service airport. Factors such as airport location, development constraints, airport ownership, and existing facilities, however, may impact the ability of some of the system's Advanced Service airport to continue to provide coverage in the future.

Out-of-state airports including Lehigh Valley International and Northeast Philadelphia in Pennsylvania, and New Castle County in Delaware, provide exclusive Advanced Service airport coverage to areas of Warren, Hunterdon, Burlington, Camden, Gloucester, and Salem counties in New Jersey. Because these Advanced Service airports are located outside of New Jersey, the Division of Aeronautics has no control over the operation, maintenance, and development of these facilities. While it can generally be assumed that these facilities will continue to be operated in a fashion similar to existing conditions, it is important to understand that any changes that may occur at these facilities could impact Advanced Service airport coverage in areas of New Jersey in the future.

Developmental constraints, including limits to operational capacity and facility development, have the potential to impact coverage provided by several existing Advanced Service airports. The three airports that provide Advanced Service airport coverage to northern New Jersey, Teterboro, Essex County, and Morristown Municipal airports, each currently accommodate a high level of aircraft operations and/or have limited available property for additional facility development. As these airports may approach operational and/or development capacity in the future and their ability to accommodate an increase in operations may be limited.

The process used in the initial functional level stratification in the SASP focused on the contribution of existing system airports to the overall system. A total of 14 different factors were examined for each system airport to determine its current contribution. Once the stratification process was complete, airports were placed into functional levels based on their contribution to the system. Advanced Service airports are identified as those general aviation airports that contribute most to the system. Once airports were stratified into functional levels, facility and service objectives were identified for each functional level. Important facility and service objectives for Advanced Service airports include a minimum runway length of 5,000 feet and a precision approach. It was possible, based on the methodology used in the stratification process, for an airport that was stratified as an Advanced Service airport to not be in compliance with the facility and service objectives identified for this functional level. As a result, some Advanced Service airports that are included in the coverage analysis, do not meet all facility and service objectives for their functional level.

Where development is possible, the SASP will recommend that Advanced Service airports be developed in such a way as to comply with the SASP's facility and service objectives. Some Advanced Service airports, however, may be limited in their ability to comply with facility and service objectives. As a result, Advanced Service airport coverage provided by these facilities may be somewhat compromised. South Jersey Regional and Essex County airports do not currently have runways of at least 5,000 feet or precision approaches. Monmouth Executive Airport (formerly Allaire) currently meets the runway length objective, but does not have a precision approach. If any of these facilities are incapable of being developed to meet both the runway length and approach objective, their inability to provide adequate Advanced Service airport coverage could impact system performance.

South Jersey Regional Airport and Monmouth County Airport are the only existing Advanced Service airports that are privately owned. While private airports are important components of New Jersey's aviation system, funding considerations associated with private airports and their long-term stability are important considerations in examining existing and future Advanced Service airport coverage. Because South Jersey Regional Airport and Monmouth County Airport both provide exclusive Advanced Service airport coverage to a significant area of New Jersey it is important to ensure that these facilities, or another airport in the area, be able to provide Advanced Service airport coverage in the future.

3. Identification of Options for Improving Advanced Service Airport Coverage

Specific coverage voids and options for improving Advanced Service airport coverage in these voids are discussed in the following sections. Options for improving Advanced Service airport coverage in these areas include upgrading an existing facility to meet facility and service objectives for an Advanced Service airport or the construction of a new Advanced Service airport in that area. Each option that is identified in the following sections will be examined in this chapter and recommendations for improving system coverage will be presented.

Advanced Service airport coverage area voids that have been identified in this analysis include the following:

- **Coverage Area Void 1** – As shown in Exhibit 7-7, the northern portion of Passaic County is currently not within a 30-minute drive time of an Advanced Service airport. In addition, the airports that provide coverage to the southern portion of the county, as well as areas of Bergen and Morris County in northern New Jersey, are currently constrained in such a manner as to limit their ability to accommodate significant amounts of additional activity. Those airports that could be considered as option airports for upgrade to the Advanced Service functional level in this coverage area void are presented in **Table 7-3**.

Table 7-3
ADVANCED SERVICE OPTION AIRPORTS – Coverage Area Void 1

Airport Name	County	Current Functional Level
Greenwood Lake	Passaic	General Service
Lincoln Park	Morris	General Service

Source: Wilbur Smith Associates

The construction of a new Advanced Service airport in this area should also be considered as an option for improving Advanced Service airport coverage.

- **Coverage Area Void 2 –** Only a small portion of Sussex County is currently located within a 30-minute drive time of an Advanced Service airport. The area of Sussex County that is currently covered, the southeastern-most corner, is served by Morristown Municipal. The ability of this airport to support a significant amount of additional Advanced Service operations may be limited because of operational capacity and development constraints. Those airports that should be considered as options for improving Advanced Service airport coverage in the northern portion of Sussex County are presented in **Table 7-4**

Table 7-4
ADVANCED SERVICE OPTION AIRPORTS – Coverage Area Void 2

Airport Name	County	Current Functional Level
Sussex	Sussex	General Service

Source: Wilbur Smith Associates

The construction of a new Advanced Service airport in this portion of Sussex County should also be considered as an option for improving coverage in this area of the State.

- **Coverage Area Void 3 –** This coverage area void includes portions of southern Sussex County and northern Warren County. Airports located within this area that should be considered as options to be upgraded to improve Advanced Service airport coverage are presented in **Table 7-5**.

Table 7-5
ADVANCED SERVICE OPTION AIRPORTS – Coverage Area Void 3

Airport Name	County	Current Functional Level
Newton	Sussex	Basic Service
Trinca	Sussex	Basic Service
Aeroflex-Andover	Sussex	Basic Service
Blairstown	Warren	General Service
Hackettstown	Warren	Basic Service

Source: Wilbur Smith Associates

The construction of a new Advanced Service airport in this area should also be considered as an option for improving Advanced Service airport coverage.

- **Coverage Area Void 4 –** The majority of Hunterdon County is currently located beyond the 30-minute drive time coverage area of an Advanced Service airport. In addition, the limited coverage provided to Hunterdon County is provided by Lehigh Valley International Airport in Pennsylvania. Airports located in this area that should be considered as options for improving Advanced Service airport coverage are identified in **Table 7-6**.

Table 7-6
ADVANCED SERVICE OPTION AIRPORTS – Coverage Area Void 4

Airport Name	County	Current Functional Level
Alexandria Field	Hunterdon	General Service
Sky Manor	Hunterdon	General Service

Source: Wilbur Smith Associates

The construction of a new Advanced Service airport in this area should also be considered as an option for improving Advanced Service airport coverage.

- **Coverage Area Void 5** – Much of Somerset County, a densely populated area with several large business centers, is currently not covered by the 30-minute drive time coverage of an Advanced Service airport. Airports located in Coverage Area Void 5 that should be considered as options for upgrading to meet Advanced Service airport facility and service recommendations are presented in **Table 7-7**.

Table 7-7
ADVANCED SERVICE OPTION AIRPORTS – Coverage Area Void 5

Airport Name	County	Current Functional Level
Solberg-Hunterdon	Hunterdon	General Service
Somerset	Somerset	General Service
Central Jersey Regional	Somerset	General Service
Princeton	Somerset	General Service

Source: Wilbur Smith Associates

The construction of a new Advanced Service airport in this area should also be considered as an option for improving Advanced Service airport coverage.

- **Coverage Area Void 6** – Coverage Area Void 6 is primarily comprised of Middlesex County. Middlesex County is relatively densely populated area of New Jersey that includes major business centers. The central portion of the county is currently not covered by an Advanced Service airport. Airports that should be considered as options for development to improve Advanced Service airport coverage in portions of Middlesex County are presented in **Table 7-8**.

Table 7-8
ADVANCED SERVICE OPTION AIRPORTS – Coverage Area Void 6

Airport Name	County	Current Functional Level
Linden	Union	General Service
Marlboro	Monmouth	General Service
Old Bridge	Middlesex	General Service

Source: Wilbur Smith Associates

The construction of a new Advanced Service airport in this area should also be considered as an option for improving coverage.

- **Coverage Area Void 7 –** Coverage Area Void 7 is in central New Jersey and covers almost the entire border between Burlington and Ocean counties. While some areas of each of these counties are within the 30-minute drive time coverage areas of Advanced Service airports, a large area along their common border is currently not covered. Airports located in this area that should be examined for their ability to be improved to meet Advanced Service airport facility and service objectives are presented in **Table 7-9**.

Table 7-9
ADVANCED SERVICE OPTION AIRPORTS – Coverage Area Void 7

Airport Name	County	Current Functional Level
Red Wing	Burlington	Basic Service
Flying W	Burlington	General Service
Red Lion	Burlington	General Service

Source: Wilbur Smith Associates

Constructing a new Advanced Service facility in this area should also be considered an option for improving system coverage.

- **Coverage Area Void 8 –** This coverage area void is comprised of relatively small areas in southern Ocean County and eastern Atlantic County. Airports that should be considered for upgrade in and around this area to provide Advanced Service airport coverage are presented in **Table 7-10**.

Table 7-10
ADVANCED SERVICE OPTION AIRPORTS – Coverage Area Void 8

Airport Name	County	Current Functional Level
Eagles Nest	Ocean	Basic Service
Bader Field	Atlantic	Basic Service

Source: Wilbur Smith Associates

The construction of a new Advanced Service airport in Coverage Area Void 8 should also be considered as an option for improving coverage in this area.

- **Coverage Area Void 9 –** The southeastern corners of both Camden and Gloucester Counties are located beyond the 30-minute drive time coverage areas of existing Advanced Service airports. New Castle County Airport in Delaware currently provides Advanced Service airport coverage to the western portion of Gloucester County. Options for improving Advanced Service airport coverage in this area include constructing a new Advanced Service facility or upgrading the airports identified in **Table 7-11** to meet Advanced Service airport facility and service objectives.

Table 7-11
ADVANCED SERVICE OPTION AIRPORTS – Coverage Area Void 9

Airport Name	County	Current Functional Level
Camden County	Camden	Basic Service
Cross Keys	Gloucester	General Service
Southern Cross	Gloucester	Basic Service
Hammonton Municipal	Atlantic	General Service
Vineland-Downstown	Gloucester	Basic Service
Rudy's	Cumberland	Basic Service
Kroelinger	Cumberland	Basic Service

Source: Wilbur Smith Associates

- **Coverage Area Void 10 –** This coverage area void includes the southern portion of Salem County and the western-most portion of Cumberland County. A large portion of Salem County is currently covered by New Castle County Airport in Delaware. Airports located near this coverage area void that should be considered as options for upgrading to improve Advanced Service airport coverage are presented in **Table 7-12**.

Table 7-12
ADVANCED SERVICE OPTION AIRPORTS – Coverage Area Void 10

Airport Name	County	Current Functional Level
Spitfire Aerodrome	Salem	Basic Service
Bucks	Cumberland	Basic Service
Li Calzi Airpark	Cumberland	Basic Service

Source: Wilbur Smith Associates

The construction of a new Advanced Service airport in this area should also be considered an option for improving Advanced Service coverage in Coverage Area Void 10.

- **Coverage Area Void 11 –** As shown in Exhibit 7-7, Coverage Area Void 11 is located in the southern portion of Cape May County. Those airports located in this area that should be considered as options for upgrade to meet Advanced Service facility and service objectives are presented in **Table 7-13**.

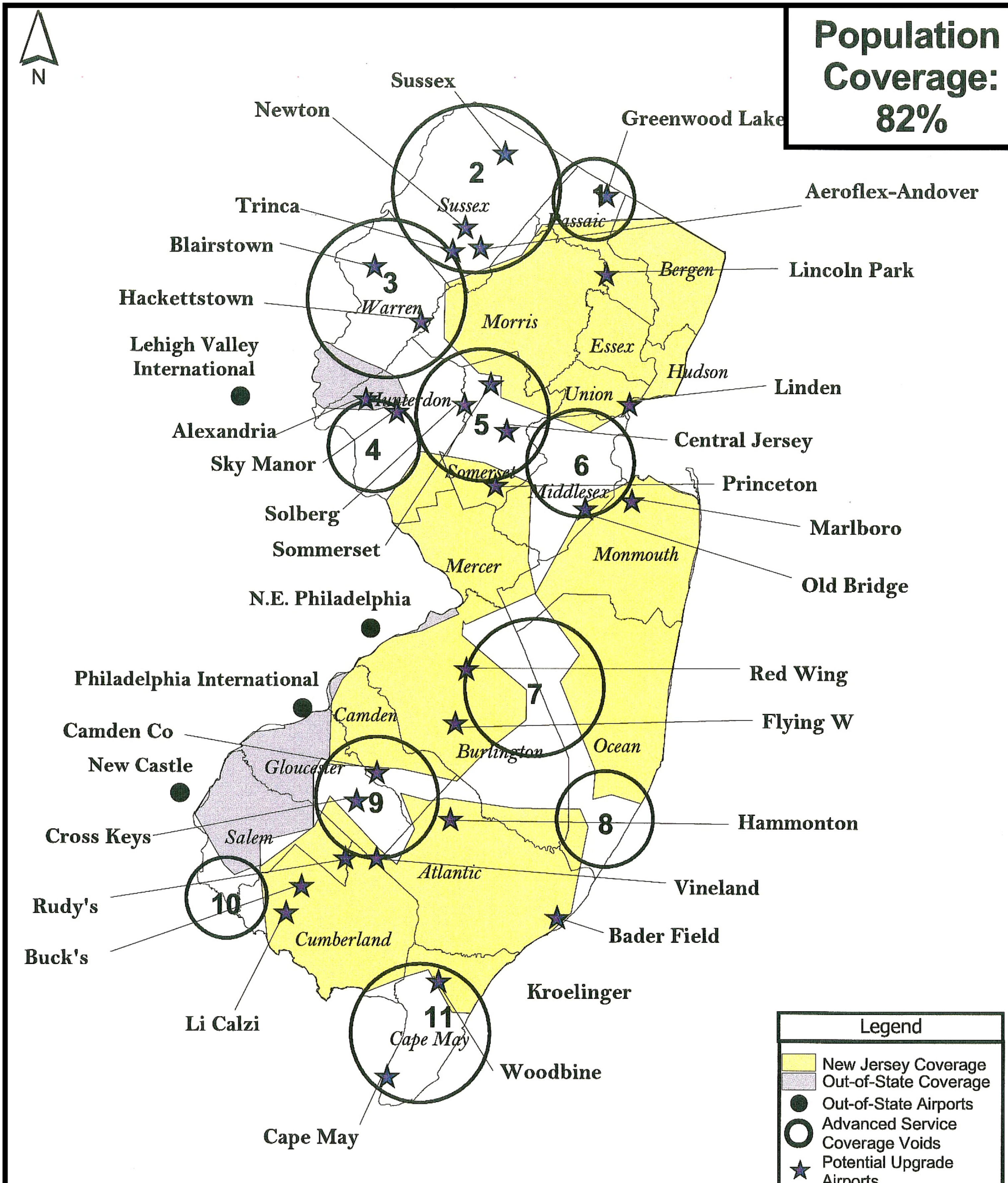
Table 7-13
ADVANCED SERVICE OPTION AIRPORTS – Coverage Area Void 11

Airport Name	County	Current Functional Level
Woodbine Municipal	Cape May	General Service
Cape May County	Cape May	General Service

Source: Wilbur Smith Associates

The construction of a new Advanced Service facility in this area should also be considered as an option for providing additional coverage in this area of New Jersey.

Exhibit 7-8 presents the location of each of these airports in relation to the coverage area voids presented in this section.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Options Analysis - Advanced Service

Exhibit 7-8

4. Advanced Service Airport Coverage Options Analysis

Those options that were identified for improving Advanced Service airport coverage will be examined to determine the most feasible means for improving Advanced Service airport coverage in each of the coverage area voids identified in this analysis. The specific factors that will be used to examine each option include, but are not limited to, the following:

- Airport ownership
- New Jersey State Development and Redevelopment planning areas
- Expansion potential
- Other considerations

These factors will be described in the following sections and then the characteristics of those airports that are identified as options for improving Advanced Service airport coverage will be examined to determine the most feasible option. Where some or all of the factors listed above may preclude expansion at option airports and the development of new airport facilities is unfeasible, the SASP may recommend that existing airports be reclassified to a new functional level and designated as Priority General Service airports. The Priority General Service airport functional level will be described in more detail in a following section.

a. Airport Ownership

As airports are examined to determine their potential for upgrade to the Advanced Service functional level, it is important to understand if the type of ownership that exists at the airports impacts their ability to improve Advanced Service system coverage. The public-use airport facilities included in the New Jersey SASP operate under either private or public ownership. Owners of private airports operate the facilities "at-will" as a business, and retain the right to close the airports or sell the property for other uses. Some private airports have grant obligations, however, private airports are generally considered to be less stable over the long-run than publicly owned facilities. Many privately-owned airports are not eligible to receive federal funding for airport projects. Therefore the burden of development rests on the owner to fund project costs.

Goals in recommending system improvements to augment Advanced Service airport coverage in New Jersey look to promote the long-term viability of system airports and their facilities and to leverage funding sources to the greatest extent possible. For airport development projects that may be required to upgrade airports to the Advanced Service functional levels, these goals point towards focusing improvements at publicly owned airports and privately owned NPIAS (federally-obligated) airports because they are relatively more stable. As options are examined for the potential to improve Advanced Service airport coverage, airport ownership will be considered and recommendations will be put forth that focus airport development at publicly owned airports, where possible.

b. New Jersey State Development and Redevelopment Planning Areas

The New Jersey State Development and Redevelopment Plan (SDRP) was adopted by the State Planning Commission on March 1, 2001. It serves as a policy guide, rather than a regulation, for public and private sector investment in New Jersey. The SDRP is intended for State, regional and local agencies, to guide their functional plans and investment decisions. State agency plans should be reviewed and modified to reflect the provisions of the SDRP. The SDRP's Statewide Policies guide when and where State funds should be expended to achieve the goals of the State Planning Act. While the SDRP is voluntary for local communities, any updated county and municipal master plans should be modified to reflect the provisions of the SDRP.

The SDRP contains both broad "Goals" and specific "Policies" to guide future development in New Jersey. The Statewide Policies are grouped into 18 different categories. Two of the categories contain specific policies regarding Public Use Airports. These include:

- Economic Development
- Transportation

Both policy categories identify preservation and enhancement of airport facilities as an objective. Specifically, the policy in the Economic Development category states:

> "Preserve and enhance the capability of NJ's public use airports to support regional economic development and act as a conduit for goods movement and trade development as a recognized part of interstate commerce".

Additionally, in the Transportation category, the policy related to aviation facilities states:

> "Preserve and protect NJ's public use aeronautical facilities to maintain access to the global air transportation network. Enhance those facilities for goods and people to maintain the viability of the airport to meet its role in the transportation system and where appropriate to act as a stimulus for the regional economy. Provide adequate land use management for those areas immediately surrounding public use airports through air safety zones, master plans, capital plans, official maps and development regulations."

The primary planning tool of the SDRP is the State Plan Policy Map, which categorizes areas of the state into one of five "Planning Areas" and two subareas. These include:

- PA1 – Metropolitan Planning Area
- PA2 – Suburban Planning Area
- PA3 – Fringe Planning Area
- PA4 – Rural Planning Area
- PA5 – Environmentally Sensitive Planning Area

- PA4B – Rural/Environmentally Sensitive Planning Area
- PA5B – Coastal Environmentally Sensitive Planning Area

There are also several special planning areas. These include:

- SP – State Parks
- MB – Military Bases
- HM – Hackensack Meadowlands
- PMA – Pinelands Management Area (which contains its own management area categories)

For each of the Planning Areas, the SDRP establishes "Policy Objectives". Within PA1, PA2, and PA3, the policy objectives with regards to public-use airports include maintenance, improvements, and implied expansion (where appropriate). Within PA4, only preservation is listed as an objective. Within PA5 airports are not discussed. The airport-related objectives are listed below:

- PA1: Preserve and stabilize general aviation airports and, where appropriate, encourage community economic development and promote complementary uses for airport property such as business centers.

- PA2: Preserve and stabilize general aviation airports and, where appropriate, encourage community economic development, transportation intermodal hubs, and complementary uses for airport property such as business centers.

- PA3: Preserve and stabilize general aviation airports and, where appropriate, encourage community economic development and promote complementary uses for airport property such as business centers.

- PA4: Support the preservation of general aviation airports as integral parts of the State's transportation system.

- PA5: No stated policy objective.

Table 7-14 identifies the State Planning Area for each of New Jersey's 49 public-use airports.

Table 7-14
NEW JERSEY AIRPORTS AND PLANNING AREAS

#	Airport/Heliport Name	State Planning Area	Functional Level
1	Aeroflex-Andover Field	SP – Parks	Basic
2	Alexandria Field	PA4 - Rural	General
3	Monmouth Executive	PA2 - Suburban	Advanced
4	Atlantic City International	PMA – Pinelands (Regional Growth)	Scheduled
5	Bader Field	PA1 – Metropolitan	Basic
6	Blairstown	PA4B - Rural/Env. Sensitive	General
7	Bucks	PA4 – Rural	Basic
8	Camden County	PA1 – Metropolitan	Basic
9	Cape May County	PA3 – Fringe	General
10	Central Jersey Regional	PA3 – Fringe	General
11	Cross Keys	PA2 – Suburban	General
12	Eagles Nest	PA4 – Rural	Basic
13	Essex County	PA1 – Metropolitan	Advanced
14	Flying W	PA4 – Rural	General
15	Greenwood Lake	PA5 – Env. Sensitive	General
16	Hackettstown	PA5 – Env. Sensitive	Basic
17	Hammonton Municipal	PMA - Pinelands (Agri. Production)	General
18	Kroelinger	PA2 – Suburban	Basic
19	Lakewood	PA2 – Suburban	General
20	Li Calzi Airpark	PA4 – Rural	Basic
21	Lincoln Park	PA1 – Metropolitan	General
22	Linden	PA1 – Metropolitan	General
24	Marlboro	PA2 – Suburban	General
25	Millville Municipal	PA2 – Suburban	Advanced
26	Morristown Municipal	PA1 – Metropolitan	Advanced
27	Newark Liberty International	PA1 – Metropolitan	Scheduled
28	Newton	PA4B - Rural/Env. Sensitive	Basic
29	Ocean City Municipal	PA5 - Env. Sensitive	Basic
30	Old Bridge	PA2 – Suburban	General
31	Princeton	PA2 – Suburban	General
32	Red Lion	PA4 – Rural	General
33	Red Wing	PA4 – Rural	Basic
34	Robert J. Miller Airpark	PMA - Pinelands (Preservation Area)	Advanced
35	Rudy's	PA2 – Suburban	Basic
36	Sky Manor	PA4 – Rural	General
37	Solberg-Hunterdon	PA4 – Rural	General
38	Somerset	PA5 - Env. Sensitive	General
39	Southern Cross	PMA - Pinelands (Agri. Production)	Basic
40	South Jersey Regional	PA4 - Rural	Advanced
41	Spitfire Aerodrome	PA2 - Suburban	Basic
42	Sussex	PA4 - Rural	General
43	Teterboro	HM - Hackensack Meadowlands	Advanced

Table 7-14 NEW JESEY AIRPORTS AND PLANNING AREAS, Continued			
#	**Airport/Heliport Name**	**State Planning Area**	**Functional Level**
44	Trenton-Mercer	PA1 - Metropolitan	Scheduled
45	Trenton-Robbinsville	PA4 - Rural	General
46	Trinca	PA4B - Rural/Env. Sensitive	Basic
47	Twin Pine	PA4 – Rural	Basic
48	Vineland-Downstown	PA4B – Rural/Env. Sensitive	Basic
49	Woodbine Municipal Airport	PMA – Pinelands (Town)	General

Source: New Jersey State Planning Commission, Wilbur Smith Associates

For PA1, PA2, and PA3, airport preservation and development are supported by the SDRP. However, in PA4, only airport preservation is identified as an objective. Thus, it could be concluded that any expansion of airport facilities within this area may be inconsistent with the SDRP. **Table 7-15** identifies the 12 airports that are located within PA4.

Table 7-15 NEW JERSEY AIRPORTS WITHIN PA4		
Map #	**Airport**	**Functional Level**
2	Alexandria Field	General
7	Bucks	Basic
12	Eagles Nest	Basic
14	Flying W	General
20	Li Calzi Airpark	Basic
32	Red Lion	General
33	Red Wing	Basic
36	Sky Manor	General
37	Solberg-Hunterdon	General
40	South Jersey Regional	Advanced
42	Sussex	General
45	Trenton-Robbinsville	General
47	Twin Pine	Basic

Source: New Jersey State Planning Commission, Wilbur Smith Associates

The SDRP does not identify any airport-related objectives within the Rural/Environmentally Sensitive (PA4B), Environmentally Sensitive (PA5), and State Park (SP) Planning Areas. However, it can be concluded that any expansion of airport facilities within these areas may be inconsistent with the SDRP. **Table 7-16** presents those airports that are located in these areas.

Table 7-16
NEW JERSEY AIRPORTS WITHIN PA4B, PA5, & SP

Map #	Airport	Functional Level
1	Aeroflex-Andover Field	Basic
6	Blairstown	General
15	Greenwood Lake	General
16	Hackettstown	Basic
28	Newton	Basic
29	Ocean City Municipal	Basic
38	Somerset	General
46	Trinca	Basic
48	Vineland-Downstown	Basic

Source: New Jersey State Planning Commission, Wilbur Smith Associates

As described above, the SPRP serves as a policy guide rather than a regulation. In addition, the specific policies related to airport development in some of the planning areas may be open to interpretation. Therefore, those airports that are considered as options for improving Advanced Service coverage that are located in more restrictive planning areas will not be eliminated from consideration. It is important to understand, however, that upgrading an airport to the Advanced Service functional level may require facility expansion, and where possible, the SASP should promote airport expansion in those SDRP planning areas in which additional economic development is encouraged by other State planning guidelines.

c. Expansion Potential

Expansion potential is an important consideration when developing system recommendations for improved Advanced Service airport coverage. The facility and service objectives of the Advanced Service functional level indicate that most of the airports that are considered options for improving Advanced Service airport coverage would require some level of facility expansion to meet the facility and service objectives of that functional level. The ability of option airports to accommodate facility expansion should be examined and used to evaluate options to ensure that the airports recommended for upgrade to the Advanced Service functional level can accommodate the necessary development in a manner that is financially, environmentally, and physically feasible.

There are a number of factors that can potentially impact an airport's expansion potential. General categories of constraints to airport expansion potential that were reviewed in the SASP include, but are not necessarily limited to, the following:

- Developable land
- Environmental constraints
- Fiscal constraints

Airport ownership of sufficient developable land often limits the development of landside and/or airside facilities. Environmental constraints such as wetlands and other environmentally sensitive areas can also limit further development of some airport facilities. A number of fiscal constraints exist that can also negatively impact airport expansion potential. Federal and State funds for airport development are scarce and there are often more airports projects competing for funding than can be funded given budget constraints. In addition, if federal or State funds are earmarked for projects at a specific airport, that airport's sponsor must work to secure its share of local matching funds. If an airport sponsor cannot secure the necessary funding to meet the matching requirements, the proposed project cannot be implemented.

As the SASP examines options for improving Advanced Service airport coverage in New Jersey, the ability of option airports to accommodate expansion is an important factor in developing recommendations. SASP recommendations should promote the development of airport facilities that meet the facility and service objectives of the Advanced Service functional level at those option airports where developable land exists and where land acquisition costs, environmental constraints, and fiscal constraints do not make such development impossible or unfeasible.

Through the SASP inventory and data collection process information was gathered related to expansion potential at each system airport. The information collected in the inventory process was augmented with the local knowledge of Division of Aeronautics' staff and with the knowledge of consultant and engineering staff that have completed projects at the airports. The expansion potential data that was gathered is intended to be used to provide a "planning level" understanding of expansion potential at system airports. This planning level of knowledge is sufficient for examining options and developing recommendations for changes in airport functional level classification to. Before any specific expansion projects are undertaken, project-specific analyses would be conducted at the airports at which facility development is recommended to ensure that the project is viable.

d. <u>Other Considerations</u>

Special circumstances were examined at some of the airports that were identified as options for upgrade to the Advanced Service functional level to improve system coverage. The factors included in these "other" considerations are ones that would negatively impact an airport's ability to be upgraded to the Advanced Service level. In general, these are factors that would make it impossible to expand airport facilities to meet Advanced Service facility and service objectives or would not allow an upgraded airport to significantly improve overall system coverage. Specific examples of other considerations that were examined in this process include the following:

- Topography of the airport itself or of airport environs
- Airspace considerations, limitations, and conflicts
- Duplication of existing coverage

As options for improving Advanced Service coverage in the coverage area voids identified in the SASP analysis were examined, those option airports that may be impacted by these other considerations were identified.

e. <u>Priority General Service Airport Functional Level</u>

One additional alternative considered as an option for improving system coverage is the development of an additional category of system airport: Priority General Service airports. In areas of New Jersey where some of the factors listed above may preclude expansion at option airports and the development of new airport facilities was considered unfeasible, the SASP may recommend that some existing airports be classified as Priority General Service airports. No airports were categorized in the Priority General Service functional level in the initial system stratification.

The Priority General Service airport functional level is being added to the SASP to identify those airports that contribute significantly to the system and those that should ideally be upgraded to the Advanced Service functional level. However, existing constraints at airports in the Priority General Service functional level may make expansion at these airports, specifically related to a 5,000 long runway and/or precision approach, extremely unlikely or unfeasible. For those airports included in the Priority General Service functional level, minimum facility and service objectives have been identified. The SASP recommends that any airport included in the Priority General Service functional level be developed to the fullest extent possible in efforts to comply with the Advanced Service functional level objectives. Where meeting the Advanced Service facility and service objectives is impossible or unfeasible, the minimum facility and service objectives of the Priority General Service airport functional level should be applied.

Facility and service objectives for the Priority General Service functional level are presented in **Table 7-17**.

Table 7-17
PRIORITY GENERAL SERVICE AIRPORT
MINIMUM FACILITY AND SERVICE OBJECTIVES 1/

Facility/Service	Objective
ARC	B-II or greater
Primary Runway Length	Minimum of 4,000 ft.
Primary Runway Width	Minimum of 75 ft.
Primary Runway Strength	Minimum of 12,500 lbs.
Taxiway	Full Parallel for Primary RWY
Navigational Aids	Non-Precision Approach
Visual Aids	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI
Lighting	MIRL, MITL
Weather	ASOS/AWOS
Services	Phone, Restrooms, FBO, Maintenance, Jet Fuel, AvGas, Ground Transportation
Facilities	Local and Itinerant Aircraft Parking Apron, Local and Itinerant Aircraft Storage, General Aviation Terminal, General Aviation Auto Parking

1/ Whenever possible Advanced Service facility and service objectives should be sought.
Source: Wilbur Smith Associates

Priority General Service airport facility and service objectives are intended to illustrate the need to provide a maximum level of facilities and services at airports in this functional level given their contribution to the system. This category of airports recognizes that existing constraints may prevent these airports from fully achieving an ultimate Advanced Service role.

5. Advanced Service Airport Recommendations

Each of the option airports identified in this chapter was examined to determine the general feasibility and desirability of implementing the necessary facility and service improvements to bring them into compliance with Advanced Service objectives. Where improving an existing airport was not considered to be a feasible option, the construction of a new Advanced Service airport in the area not currently covered was also considered as an option for improving system performance.

a. <u>Coverage Recommendations</u>

Following analysis of the options for improving Advanced Service airport coverage in each of the coverage area voids, the following recommendations emerged:

- **Coverage Area Void 1 –** The construction of a new Advanced Service airport in Bergen County is the recommendation for improving Advanced Service coverage in this area of the State. This recommendation was developed based on number of factors including, but not limited to, the following:

- This Advanced Service coverage area void is a densely-populated area in which the clean-slate analysis indicated a system need for additional airport facilities.
- Upgrading an existing airport in this coverage area to meet the facility and service objectives of the Advanced Service functional level was determined to be unlikely based on constraints at those facilities.
- A new airport facility in this coverage area void would augment the Advanced Service airport coverage provided in this area of the State by Essex County Airport, Teterboro Airport, and Morristown Municipal Airport, each of which is currently or potentially constrained in accommodating a significant amount of additional future development and activity.

Identifying a suitable location for the new airport in Bergen County will need to be the focus of a separate site selection analysis. The new airport facility, however, should be developed with facilities that are, at a minimum, comparable to the facility and service objectives of the SASP's Advanced Service functional level.

- **Coverage Area Void 2 –** No action is recommended in this coverage area void. The clean-slate analysis indicated that excess airport facilities exist in this area of the State. Existing and projected future population trends in this area also indicate that existing airports in this Advanced Service airport coverage area void are sufficient to accommodate existing and future levels and types of aviation demand.

- **Coverage Area Void 3 –** For reasons similar to those presented for Coverage Area Void 2, no action is recommended in this coverage area void. Existing airport facilities in this area of the State are sufficient to accommodate the projected levels and types of aviation demand.

- **Coverage Area Void 4 –** No action is recommended for Coverage Area Void 4 due to the relatively small size of the void, its proximity to the Advanced Service airport coverage areas of Lehigh Valley International Airport and Trenton Mercer Airport, the limited development potential of the option airports identified in this area, and results of the clean-slate analysis indicate that Hunterdon County currently has a sufficient number of existing airport facilities.

- **Coverage Area Void 5 –** Each of the airports identified as options for improving Advanced Service coverage in this area are constrained by factors that would impact their ability to be expanded to meet the facility and service objectives of the Advanced Service functional level. The other option for improving Advanced Service coverage is this area is the construction of a new airport; however, the clean-slate analysis does not indicate that additional airport facilities are needed in this area of the State. Given these two factors, the SASP recommends that Solberg-Hunterdon Airport and Central Jersey Regional Airport be classified as Priority General Service airports and developed accordingly.

- **Coverage Area Void 6 –** Coverage Area Void 6 is comprised of a large, relatively densely populated area of Middlesex County. The options identified for improving Advanced Service coverage in this area of the State included upgrading one of the three existing General Service airports located in the coverage void or constructing a new Advanced Service airport. Two of the General Service airports identified as options have limited expansion potential and other constraints that may limit them from meeting the Advanced Service airport facility and service objectives. Additional analysis is required to determine the feasibility of upgrading Old Bridge Airport to the Advanced Service functional level. Upgrading Old Bridge Airport, if determined to be feasible, is the recommended action for improving Advanced Service coverage in this area of New Jersey. However, if upgrading Old Bridge is determined to not be feasible, the construction of a new Advanced Service airport in Middlesex County should be pursued. The clean-slate analysis indicates that sufficient demand exists in this portion of the State to support additional/expanded airport facilities. In addition, Middlesex County's dense population and location relative to other constrained Advanced Service airports in northern New Jersey, as well as the area identified as Coverage Area Void 5 in this analysis, warrants improvements to Advanced Service coverage in the area.

- **Coverage Area Void 7 –** No action is recommended in this coverage area void. Option airports identified for improving Advanced Service coverage are located in New Jersey SDRP Planning Areas that may limit their potential for expansion. Other on-airport constraints may also limit the expansion potential of these option airports. The clean-slate analysis indicates that a sufficient number of airport facilities are located in this area of the State, and the area's population density indicates that existing facilities may be sufficient to accommodate existing and projected aviation demand. In addition, the coverage areas of several airports that can accommodate Advanced Service activity are proximate to this coverage void.

- **Coverage Area Void 8 –** For reasons similar to those presented for Coverage Area Void 7, no action is recommended for providing new Advanced Service coverage to this area of the State. Atlantic City International Airport and Robert J. Miller Airpark, both Advanced Service airports, provide reasonable access to Advanced Service facilities for this relatively small area of the State.

- **Coverage Area Void 9 –** Upgrading Hammonton Municipal Airport to the Advanced Service functional level is the recommendation for improving Advanced Service coverage in Coverage Area Void 9. Of the option airports examined for the potential for upgrade to the Advanced Service functional level, Hammonton Municipal Airport's expansion potential and existing infrastructure made it the most feasible option. Improving Advanced Service coverage in this area is important because existing coverage provided in Salem County and Gloucester County is provided by an out-of-state airport, New Castle County

Airport in Delaware. In addition, Advanced Service coverage provided to Camden and Burlington Counties is provided by South Jersey Regional Airport, an airport initially stratified as an Advanced Service airport. It is unlikely, however, that this particular airport can meet the facility and service objectives of that functional level. As a result, South Jersey Regional Airport has been classified as a Priority General Service airport. These two factors support the importance of pursuing the recommended upgrade to Hammonton Municipal Airport.

- **Coverage Area Void 10** - Coverage Area Void 10 is small area for which no action is recommended to improve Advanced Service airport coverage.

- **Coverage Area Void 11 –** Upgrading Cape May County Airport is the recommendation for improving Advanced Service coverage in Coverage Area Void 11. The airport is located in a SDRP Planning Area that can accommodate additional development and existing facilities at the airport would require minimal improvements to comply with the facility and service objectives of the Advanced Service functional level.

b. Facility and Service Objectives Recommendations

In addition to identifying recommended options for improving Advanced Service airport coverage, the SASP also examined those airports that were initially stratified in the Advanced Service functional level to determine their long-term ability to meet their intended role in the system. Of the seven airports that were initially stratified in the Advanced Service airport functional level, South Jersey Regional Airport was the only one determined to be unable to serve its intended role in the system. The two major considerations in this determination are the following:

- Inability to extend the existing 3,911 foot runway to meet the 5,000 foot runway length facility and service objective for Advanced Service airports
- Inability to develop a precision approach at the airport to meet the navigational aid facility and service objective for Advanced Service airports

As a result of the factors listed above, South Jersey Regional Airport is recommended to be reclassified as a Priority General Service airport. The Priority General Service airport classification includes those system airports whose contribution to the system warrants them being in the Advanced Service functional level, but because of development constraints, it is considered unlikely that they will be able to comply with Advanced Service facility and service objectives. The importance of these airports to the system dictates that they be developed to comply with as many Advanced Service airport facility and service objectives as possible, given local constraints. Minimum facility and service objectives for the Priority General Service airport functional level were presented in Table 7-17.

The impacts that these recommendations have on system coverage presented in previous chapters of the SASP are quantified in Chapter Eight. In this process, revised estimates of coverage will be developed for the following benchmarks:

- Precision Approach Coverage
- 5,000 Foot Runway Coverage

These revised estimates of coverage for the benchmarks listed above will assume that airports included in the Advanced Service functional level are developed in compliance with their recommended facility and service objectives.

C. General Service Airports

The coverage provided to New Jersey residents by the existing system's 21 General Service airports will be examined in the following sections:

- Summary of Current Coverage/Coverage Area Gaps
- Factors Influencing Current General Service Airport Coverage
- Identification of Options for Improving General Service Airport Coverage
- Summary of Options for Improving General Service Airport Coverage

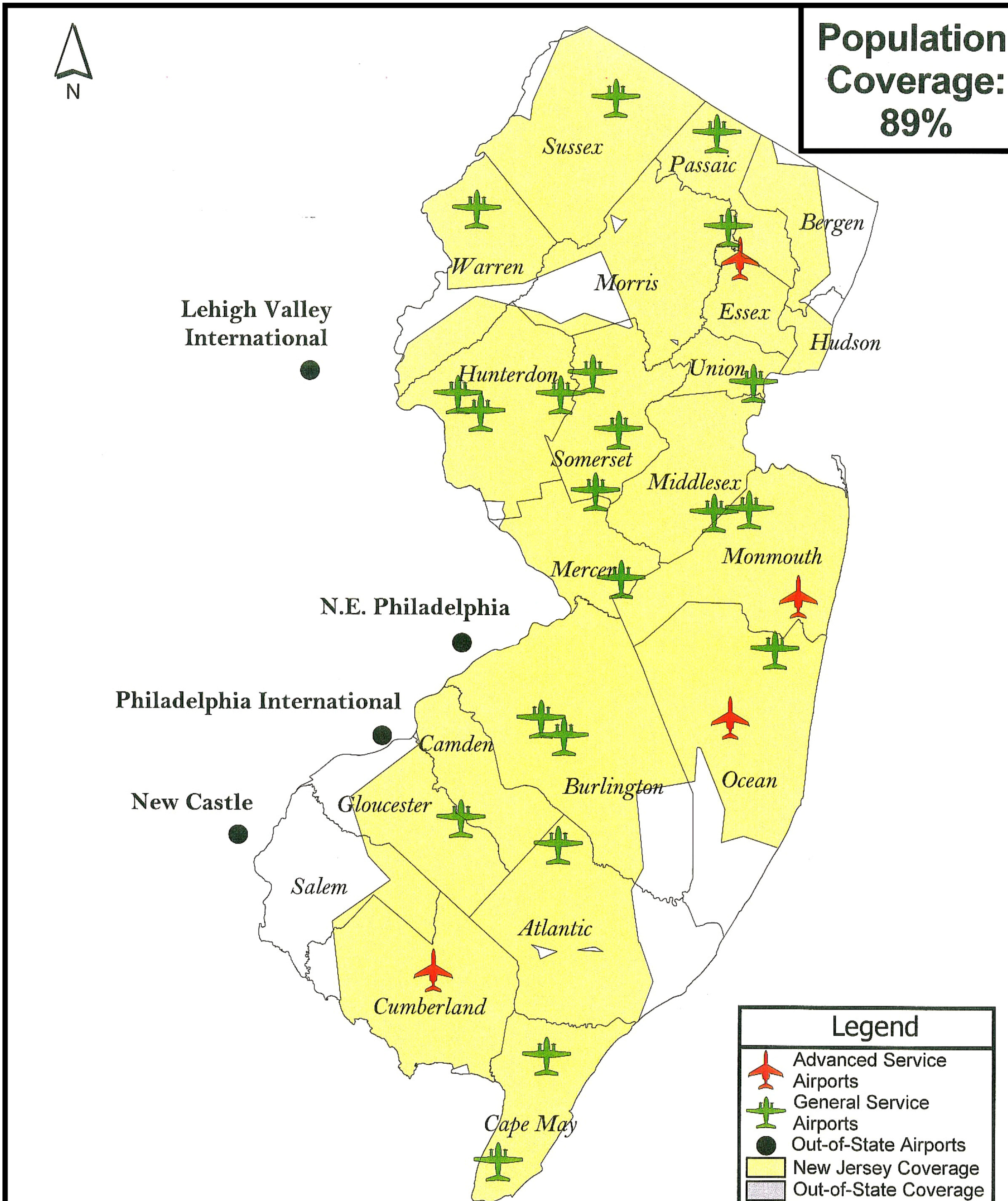
Through the analysis conducted in these sections, options for improving system coverage, relative to General Service airports, will be identified. These options will be examined in the following chapter and recommendations will be made that identify the most viable option for improving coverage in each identified area of deficiency.

1. Summary of Current Coverage/Coverage Area Gaps

Current coverage provided to New Jersey by existing General Service airports is illustrated in **Exhibit 7-9**. As shown in Exhibit 7-9, approximately 89 percent of the State's population is located within a 30-minute drive time of a General Service airport facility (or an Advanced Service facility that can accommodate General Service activity). In addition, existing General Service facilities provide geographic coverage to approximately to approximately 89 percent of the State's land area.

Exhibit 7-10 compares New Jersey's current General Service airport coverage to the findings of the clean-slate analysis. As shown, the only county that was identified as having insufficient airport facilities in the clean-slate analysis that is not provided complete coverage by General Service airports is Bergen County. However, the area of Bergen County that is located beyond the 30-minute drive time of a General Service airport is very small. Portions of Warren, Burlington, Atlantic, and Cumberland counties (counties with excess airport facilities based on the clean-slate analysis) are also beyond the 30-minute drive time coverage areas of General Service airports.

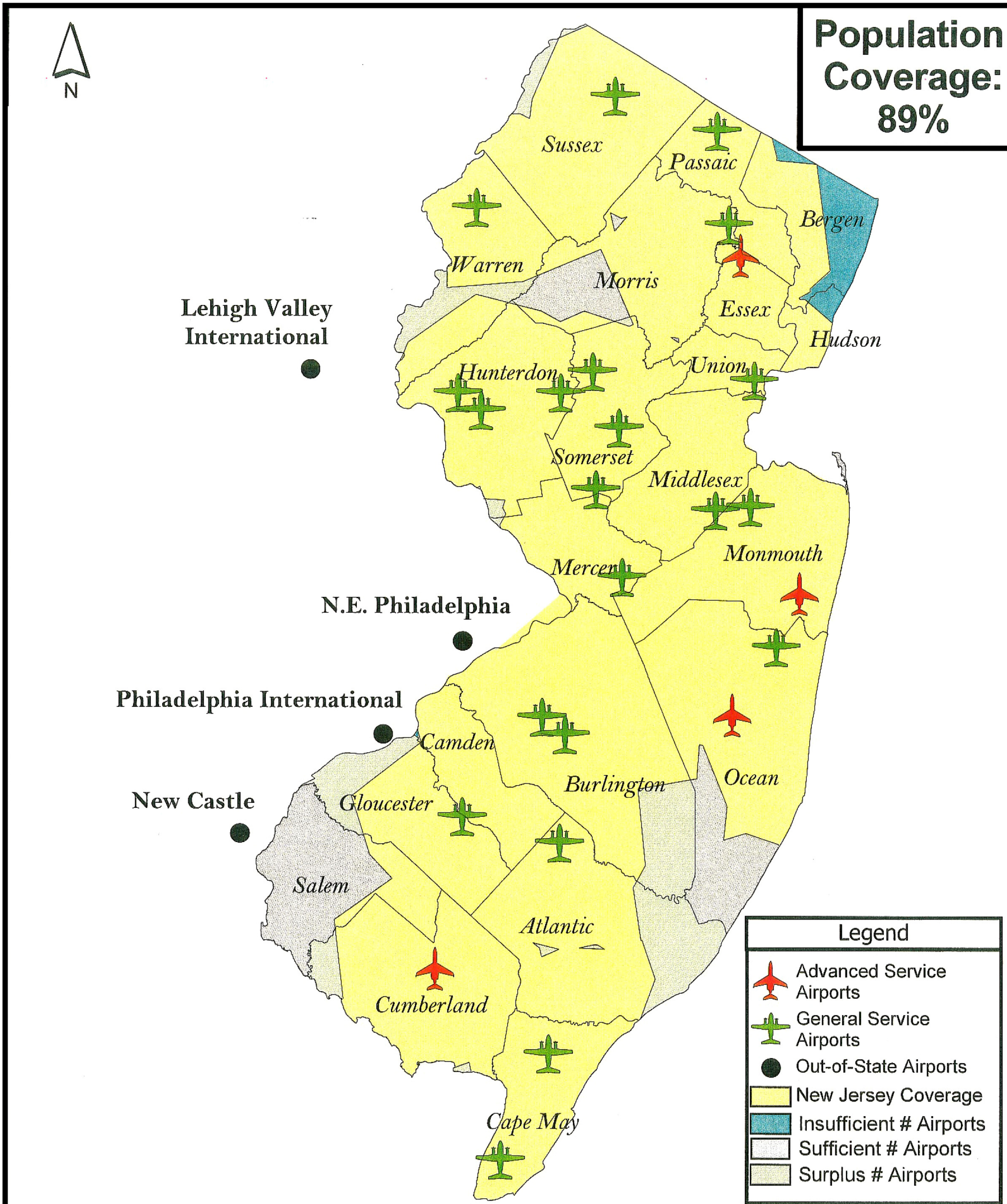
Those areas of the State that are beyond the 30-minute drive time coverage area of a General Service airport are shown in **Exhibit 7-11**. Four coverage area voids have been identified in Exhibit 7-11. Coverage area voids are depicted in the exhibit by circles that represent an estimated drive time of a General Service airport facility located in each void in a way that provides the most additional coverage.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

General Service Coverage

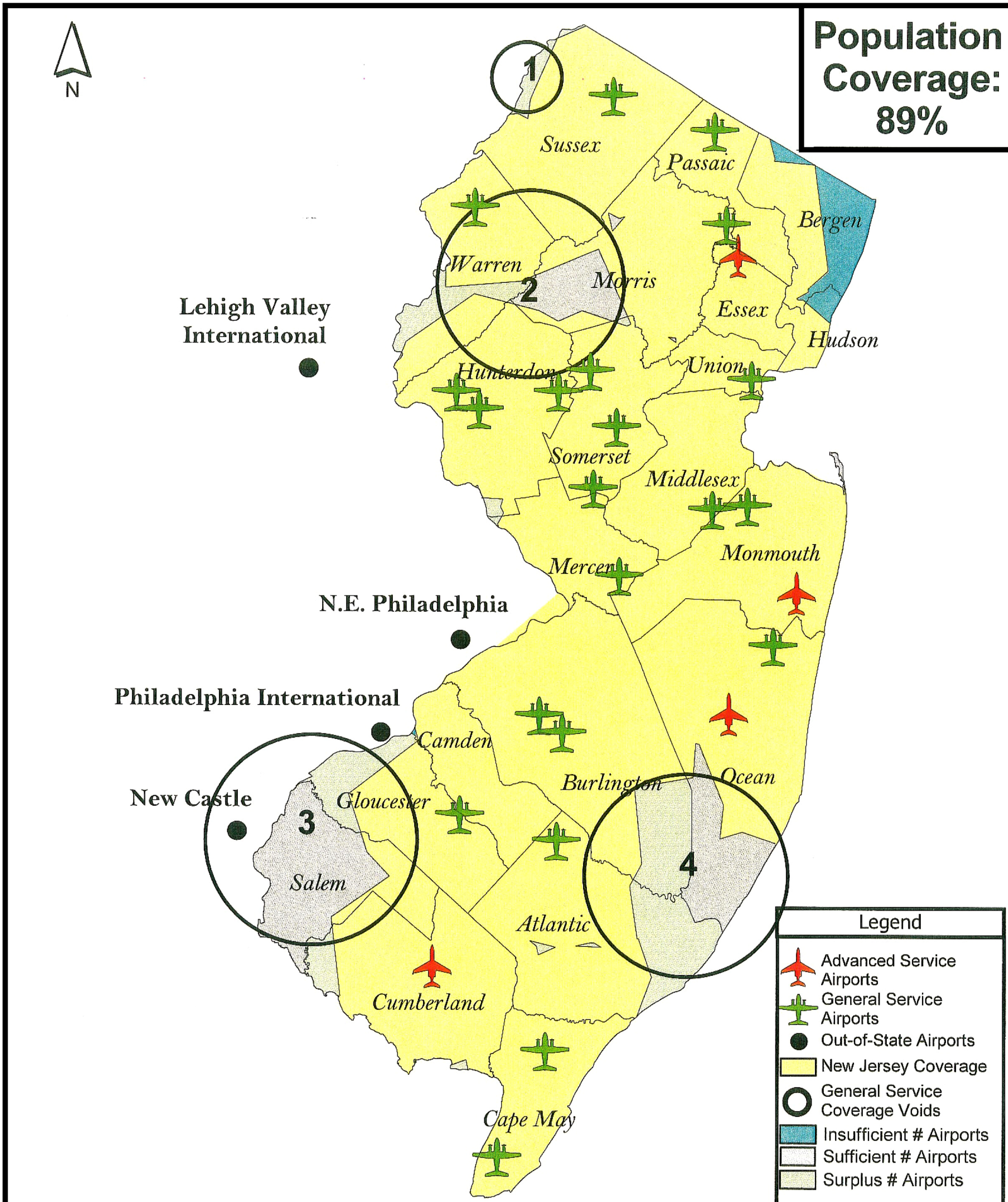
Exhibit 7-9



NEW JERSEY STATE AIRPORT SYSTEM PLAN

General Service Coverage and Clean Slate Analysis

Exhibit 7-10



NEW JERSEY STATE AIRPORT SYSTEM PLAN

General Service Coverage Area Voids

Exhibit 7-11

2. Factors Influencing General Service Airport Coverage

Coverage provided to New Jersey residents by General Service airports may be influenced by factors that could negatively impact the current and future coverage of this functional level of airport. GIS analysis indicated that approximately 89 percent of the State's population is provided coverage by an existing General Service airport. The high proportion of private airports included in this functional level, as well as the ability of these airports to comply with the facility and service objectives for this functional level, could lower the percentage of population that is sufficiently covered.

Airports were stratified into the General Service functional level based on their contribution to the overall airport system. General Service airports are those general aviation airports that are important to the New Jersey system to support small business aircraft and a majority of private business and recreational users. Once stratified, facility and service objectives were developed for system airports based on their current functional role. Important facility and service objectives for General Service airports included a minimum runway length of 3,500 feet and a non-precision approach. The following airports are currently included in the General Service airport functional level, but they do not currently meet runway length and/or approach objectives:

- Alexandria – runway length
- Red Lion – runway length and approach type
- Blairstown – runway length
- Sky Manor – runway length
- Lincoln Park – runway length
- Somerset – runway length
- Linden – approach type
- Woodbine – runway length
- Marlboro – runway length

These airports are included in the General Service airport coverage calculation even though they do not currently comply with stated facility and service objectives. If these airports are unable to be developed in such a way as to maximize their compliance to the facility and service objectives of the General Service functional level, system performance relative to General Service airport coverage will be negatively impacted.

Another important consideration in examining General Service airport coverage is the coverage provided by privately owned airports. Of the 21 airports that were stratified into the General Service functional level, only the following six airports are publicly owned:

- Cape May County
- Lakewood
- Greenwood Lake
- Linden

- Hammonton Municipal
- Woodbine

Due to funding considerations that may impact development potential, as well as the long-term stability of privately owned General Service airports, it is important to understand that the General Service airport coverage identified in the GIS analysis to this point could be reduced if private airports are sold and/or developed for non-aviation purposes.

3. Identification of Options for Improving General Service Airport Coverage

Options for improving General Service airport coverage in each of the coverage area voids will be presented in the following sections. Options for improving coverage could include upgrading existing facilities to meet General Service airport facility and service objectives or constructing new General Service airports. Options are examined in the following sections and recommendations for improving system coverage are developed.

General Service airport coverage voids that have been identified in this analysis include the following:

- **Coverage Area Void 1 –** Coverage Area Void 1 is located in northwestern Sussex County. General Service coverage is currently provided to the vast majority of Sussex County by Sussex Airport in Sussex County and Blairstown Airport located in Warren County. There are no airports located in the coverage area void. The only option available for improving General Service coverage in this area would be the construction of a new General Service airport. The small size of the coverage area void and the significant coverage that currently exists in Sussex County, as well as the low population density of the area, may not justify the development of a new airport.

- **Coverage Area Void 2 –** As shown in Exhibit 7-11, Coverage Area Void 2 encompasses portions of central Warren County and southeastern Morris County. Hackettstown Airport, a Basic Service facility, is located in the coverage void area. Upgrading Hackettstown Airport to meet the facility and service objectives of a General Service airport would provide coverage to a significant portion of this area. The construction of a new General Service airport could also be considered as an option for improving coverage in this area of the State.

- **Coverage Area Void 3 –** Coverage Area Void 3 includes portions of Gloucester, Salem, and Cumberland Counties in southwestern New Jersey. Most of Gloucester and Cumberland Counties are covered by South Jersey Regional Airport and Millville Municipal Airport. Only a portion of Salem County is currently provided coverage by these airports. Spitfire Aerodrome, a Basic Service airport, is located in this coverage void area. Upgrading Spitfire Aerodrome to meet the General Service facility and service objectives would provide additional General Service airport coverage in this area of the State. In addition, the construction of a new General

Service facility in this area of the State could also be an option for improving general service coverage.

- **Coverage Area Void 4 –** Portions of Ocean, Burlington, and Atlantic counties that are located beyond the 30-minute drive time coverage area of a General Service airport make up Coverage Area Void 4. Two Basic Service airports, Eagles Nest and Bader Field, are located in this coverage area void. Improving these airports to meet the facility and service objectives for General Service airports should be considered options for improving General Service coverage in this area. Constructing a new General Service airport in the area should also be considered as an option for improving coverage.

Table 7-18 presents a summary of the options that have been identified for improving General Service airport coverage in the coverage area voids.

Table 7-18
GENERAL SERVICE OPTIONS

Airport Name	General Service Coverage Area Void	County	Current Functional Level
New airport	Coverage Area Void 1	Sussex County	Not applicable
Hackettstown Airport	Coverage Area Void 2	Warren County	Basic Service
New airport	Coverage Area Void 2	Warren or Morris County	Not applicable
Spitfire Aerodrome	Coverage Area Void 3	Salem	Basic Service
New airport	Coverage Area Void 3	Gloucester, Salem, or Cumberland County	Not applicable
Eagles Nest	Coverage Area Void 4	Ocean County	Basic Service
Bader Field	Coverage Area Void 4	Atlantic County	Basic Service
New Airport	Coverage Area Void 4	Ocean, Burlington, or Atlantic County	Not applicable

Source: Wilbur Smith Associates

Each of the options presented in Table 7-18 will be examined and recommendations for improving General Service coverage in the coverage area voids will be identified in the following section.

4. General Service Airport Coverage Options Recommendations

The SASP analysis has identified four coverage area voids for the General Service airport functional level. Based on an analysis of the options for improving General Service coverage in each of the coverage area voids identified in the SASP, the following recommendations have been developed:

- **Coverage Area Void 1 –** Coverage Area Void 1 is a small area with relatively sparse population density that is located proximate to the coverage areas of two existing General Service airports, Sussex County Airport and Blairstown Airport. No action is recommended for improving General Service airport coverage in this area of New Jersey.

- **Coverage Area Void 2 –** For reasons similar to those presented for Coverage Area Void 1, no action is recommended for improving General Service coverage in this coverage area void. This area is located proximate to the coverage areas of numerous existing General Service airports that should be able to sufficiently accommodate aviation demand in this area of the State throughout the study period.

- **Coverage Area Void 3 –** Upgrading Spitfire Aerodrome from Basic Service to the General Service functional level is the recommended alternative for improving General Service coverage in this area of the State.

- **Coverage Area Void 4 –** Upgrading Eagles Nest Airport from Basic Service is the recommended approach for improving General Service airport coverage in Coverage Area Void 4. Because of limited development potential the other option, upgrading Bader Field Airport, was determined to not be a feasible alternative.

Because of local constraints, two airports that were initially stratified in the General Service functional level were identified as being unlikely to be able to comply with the airport runway length objective of 3,500 feet for that functional level. The airports and the existing length of their primary runway are as follows:

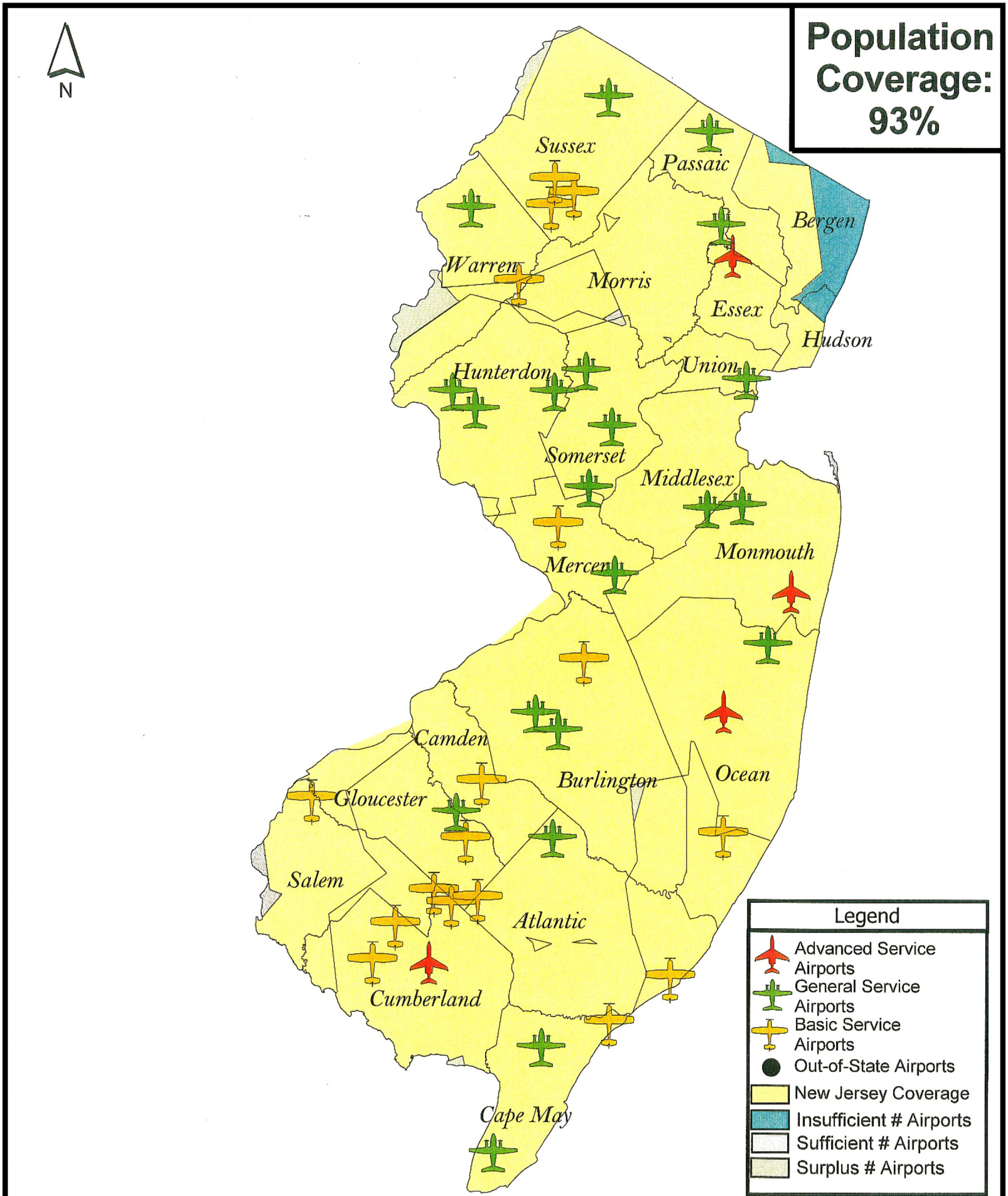
- Marlboro – Existing primary runway length 2,156
- Red Lion – Existing primary runway length 2,940

Because of their inability to be expanded to comply with the runway length facility objective of the General Service functional level, Marlboro and Red Lion are both recommended to be reclassified into the Basic Service functional level.

The impact that the recommended improvements have on other benchmarks will be quantified. In this process, revised estimates of non-precision approach coverage will be developed. These revised estimates of non-precision approach coverage will take into account recommendations for facility improvements as well as any known development constraints at facilities for which development recommendations have been made.

D. Basic Service Airports

As shown in **Exhibit 7-12**, with the exception of a notable gap in Bergen County, almost all of New Jersey's population is within a 30-minute drive time of a Basic Service airport. Given the aviation needs identified throughout the benchmarking process for northeastern New Jersey, if new/supplemental airport facilities were provided in this part of the State, it would be most reasonable for them to be, at the minimum, in the General Service category. Therefore, there is no recommendation to provide additional Basic Service coverage in the State.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Basic Service Coverage

Exhibit 7-12

It is important to note, however, that many of the Basic Service airports have overlapping 30-minute drive time coverage areas. The system of Basic Service airports was reviewed for its potential duplication of services. System overlaps related to Basic Service airports were identified in the following areas:

- Cumberland County – Rudy's, Vineland Downstown, and Kroelinger all have overlapping 30-minute drive times. All three of these airports are privately owned. Only Kroelinger is noted in the SASP inventory as not being constrained for future airside development. None of these airports appear to be essential to addressing system gaps as identified by the benchmarking analysis.

- Cumberland County – In addition to the three Basic Service airports noted above, this county is also home to Bucks and Li Calzi Airpark; both of these Basic Service airports are privately owned. While Li Calzi Airpark may have airside expansion constraints, Bucks was not noted in the SASP inventory as having such constraints. This part of the State was identified as being a potential candidate for an additional General Service airport. The ability of these two airports to be upgraded/expanded to meet system needs should be investigated.

- Camden/Gloucester County – In this part of the State, there is a small overlap in the service areas of Camden County and Southern Cross airports. The SASP inventory has identified Southern Cross as being a privately owned airport with airside expansion constraints. Camden County Airport is a privately owned airport in this area of the State that currently accommodates a significant amount of aviation activity. Due to its existing level of activity and recent sponsor initiative to improve existing facilities and participate in the State aviation system, Camden County should be included in the recommended Basic Service functional level.

- Warren/Sussex County – This part of the State contains the remainder of the Basic Service airports with overlapping 30-minute drive times. The most pronounced overlap occurs among Newton, Aeroflex-Andover, and Trinca. There is a smaller overlap between the 30-minute drive times for Hackettstown and Trinca. Aeroflex-Andover is the only one of these four airports that is not privately owned, while Newton is the only one of the four Basic Service airports in this part of the State that was not identified as having airside development constraints. The potential need to upgrade at least one of these airports to fill a higher role in the New Jersey system has been identified during the benchmarking analysis. These airports should be reviewed to determine their ability to be expanded. Given the shortage of facilities in this part of the State, it may be desirable to maintain all of these airports, even at their current facility levels.

In addition to the duplicative coverage areas identified above, some Basic Service airports are located proximate to airports in other functional levels and provide duplicative coverage to those larger facilities. Red Wing Airport is located proximate to South Jersey Regional Airport, Flying W Airport, and Red Lion Airport each of which contributes more to the existing airport system and has a higher level of facility and services than Red Wing. The same description applies to

Twin Pine Airport with its location proximate to Trenton Mercer Airport, Princeton Airport, and Trenton-Robbinsville Airport.

Through its analysis of Basic Service airport coverage, the SASP has identified Basic Service airports that provide duplicative coverage to other system airports. A recommendation of the SASP is to establish an additional airport functional level category in the system for these types of airports. Basic Service airports that have facilities and services that duplicate those of other nearby airports that offer a higher level of service and facilities should be reclassified into the Duplicative Basic Service functional level. System airports recommended to be included in the Duplicative Basic Service functional level include the following:

- Kroelinger
- Rudy's
- Li Calzi
- Southern Cross
- Newton
- Trinca
- Red Wing
- Twin Pine

In addition to providing duplicative coverage to other system airports, the airports included in the Duplicative Basic Service functional level generally accommodate low levels of activity. The activity supported by these Duplicative Basic Service airports could easily be accommodated by other system airports.

V. SUMMARY

The various geographic coverage analyses that were conducted in this chapter examined, at a planning level, the number of airport facilities that may be needed to meet coverage goals established for the State of New Jersey. In general, the clean-slate analyses identified that the number of existing airport facilities in New Jersey is greater than the number that was estimated to be needed. It is important to understand that the clean-slate analyses made no distinction between the various functional levels of airport. In general, the findings could be interpreted that even though the system as a whole may have more facilities than estimated to be required, many of the system's existing facilities were initially stratified in the Basic Service functional level and are not considered part of the core system. The findings of the clean-slate analyses are more applicable to New Jersey's core airport system and illustrate the importance of having a sufficient number of airports in the Scheduled Service, Advanced Service, and General Service functional levels throughout the State.

The analysis of airport coverage that was conducted in this chapter of the SASP examined existing airport coverage by each of the following airport functional levels:

- Scheduled Service Airports
- Advanced Service Airports

- General Service Airports
- Basic Service Airports

Existing system coverage was presented and then factors that could impact that coverage were identified. Specific factors that were examined in the analysis of airport functional level coverage included:

- Out-of-State Airports
- Existing and Future Airport Constraints
- Airport Ownership
- Inability to Meet Facility and Service Objectives for Current Role

Based on existing system coverage and the impacts that the factors listed above may have on that coverage, options for improving coverage in each of the SASP functional levels were identified and analyzed. In most cases, options for improving coverage in each of the functional levels included upgrading an existing airport in another functional level or constructing a new facility. Following the analysis of options, recommendations were presented for system coverage.

The recommended final stratification of the New Jersey airport system summarizes the recommendations that were made for each airport functional level. The recommended final stratification of system airports is presented in **Table 7-19**. Major changes between the initial stratification of system airports, conducted in Chapter Three, and the recommended final stratification include the addition of two new functional levels, the Priority General Service functional level and the Duplicative Basic Service functional level. Recommended changes to New Jersey airport stratification are summarized below:

Airports to be added/upgraded to the Advanced Service functional level:

- Bergen County Airport – new airport
- Cape May County Airport – upgrade from General Service
- Hammonton Municipal Airport – upgrade from General Service
- New airport **or** Old Bridge (upgrade from General Service)

Airports to be included in the Priority General Service functional level:

- Central Jersey Regional Airport – upgrade from General Service
- Cross Keys Airport – upgrade from General Service
- Lincoln Park Airport – upgrade from General Service
- Linden Airport – upgrade from General Service
- Solberg-Hunterdon Airport – upgrade from General Service
- South Jersey Regional Airport – reclassify from Advanced Service

Airports to be upgraded to the General Service functional level:

- Eagles Nest Airport – upgrade from Basic Service
- Spitfire Aerodrome – upgrade from Basic Service

Airports to be reclassified to the Basic Service functional level:

- Marlboro Airport – reclassify from General Service
- Red Lion Airport – reclassify from General Service

Airports to be included in the Duplicative Basic Service functional level:

- Kroelinger Airport – reclassify from Basic Service
- Li Calzi Airpark – reclassify from Basic Service
- Newton Airport – reclassify from Basic Service
- Red Wing Airport – reclassify from Basic Service
- Rudy's Airport - reclassify from Basic Service
- Southern Cross Airport - reclassify from Basic Service
- Trinca Airport – reclassify from Basic Service
- Twin Pine Airport - reclassify from Basic Service

The impacts that these recommendations have on airport coverage are quantified in Chapter Eight.

Table 7-19
RECOMMENDED AIRPORT SYSTEM

Airport Name	Associated City	Current Functional Level
SCHEDULED SERVICE AIRPORTS		
Atlantic City International	Atlantic City	Scheduled Service
Newark Liberty International	Newark	Scheduled Service
Trenton-Mercer	Trenton	Scheduled Service
ADVANCED SERVICE AIRPORTS		
Bergen County		New Airport
Cape May County	Wildwood	General Service
Essex County	Caldwell	Advanced Service
Hammonton Municipal	Hammonton	General Service
Middlesex County		New Airport
Millville Municipal	Millville	Advanced Service
Monmouth Executive	Belmar/Farmington	Advanced Service (Allaire)
Morristown Municipal	Morristown	Advanced Service
Robert J. Miller	Toms River	Advanced Service
Teterboro	Teterboro	Advanced Service
PRIORITY GENERAL SERVICE AIRPORTS		
Central Jersey Regional	Manville	General Service
Cross Keys	Cross Keys	General Service
Lincoln Park	Lincoln	General Service
Linden	Linden	General Service
Solberg-Hunterdon	Readington	General Service
South Jersey Regional	Mount Holly	Advanced Service
GENERAL SERVICE AIRPORTS		
Alexandria Field	Pittstown	General Service
Blairstown	Blairstown	General Service
Eagles Nest	West Creek	Basic Service
Flying W	Lumberton	General Service
Greenwood Lake	West Milford	General Service
Lakewood	Lakewood	General Service
Old Bridge	Old Bridge	General Service
Princeton	Princeton	General Service
Sky Manor	Pittstown	General Service
Spitfire Aerodrome	Pedricktown	Basic Service
Somerset	Somerville	General Service
Sussex	Sussex	General Service
Trenton-Robbinsville	Robbinsville	General Service
Woodbine Municipal	Woodbine	General Service
BASIC SERVICE AIRPORTS		
Aeroflex-Andover Field	Andover	Basic Service
Bader Field	Atlantic City	Basic Service
Bucks	Bridgeton	Basic Service

Table 7-19
RECOMMENDED AIRPORT SYSTEM, Continued

Airport Name	Associated City	Current Functional Level
Camden County	Berlin	Basic Service
Hackettstown	Hackettstown	Basic Service
Marlboro	Matawan	General Service
Ocean City Municipal	Ocean City	Basic Service
Red Lion	Vincentown	General Service
Vineland Downstown	Vineland	Basic Service
DUPLICATIVE BASIC SERVICE AIRPORTS		
Kroelinger	Vineland	Basic Service
Li Calzi Airpark	Bridgeton	Basic Service
Newton	Newton	Basic Service
Red Wing	Jobstown	Basic Service
Rudy's	Vineland	Basic Service
Southern Cross	Williamstown	Basic Service
Trinca	Andover	Basic Service
Twin Pine	Pennington	Basic Service
SPECIALTY FACILITIES		
Coach-N-Paddock Heliport	Hampton	Specialty Facility
Little Ferry Seaplane Base	Little Ferry	Specialty Facility
Holly City Heliport	Millville	Specialty Facility
Newark Heliport	Newark	Specialty Facility
Ryland Heliport/Balloonport	Whitehouse	Specialty Facility

Source: Wilbur Smith Associates

CHAPTER EIGHT
SYSTEM RECOMMENDATIONS

I. INTRODUCTION

The previous chapters of the New Jersey State Airport System Plan (SASP) followed a strategic process that was established to improve overall airport system performance relative to the benchmarks that were identified at the initiation of the SASP. These benchmarks were used to measure the current performance of New Jersey's existing airports relative to goals established for each benchmark. Options for improving system performance relative to these benchmarks were then identified. Based on analysis conducted and described in Chapter Six and Chapter Seven, recommendations for improving system performance relative to the benchmarks are presented.

The analysis of SASP benchmarks and the development of recommendations for improving system performance have been grouped into the two following categories to facilitate their discussion:

- SASP Performance Measures
- Overall Airport Coverage

Recommendations for improving system performance relative to benchmarks in the two categories listed above are discussed in detail in Chapter Six and Chapter Seven. These recommendations are summarized in the following sections.

II. SASP PERFORMANCE MEASURES SUMMARY RECOMMENDATIONS

SASP recommendations for the performance measures and benchmarks examined in the study are summarized in the following sections. These recommendations provide the Division of Aeronautics with a framework in which to improve the performance of the airports system relative to the SASP benchmarks. The SASP identified recommendations for the following:

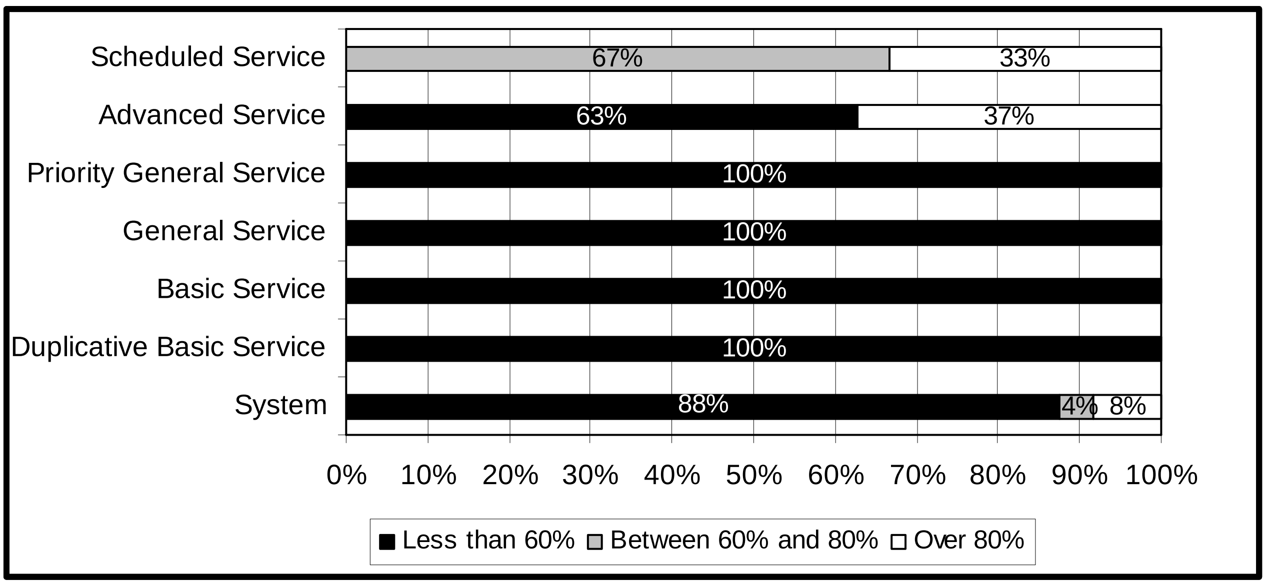
- Aviation Activity
- Development Potential
- Existing Infrastructure
- Design Standards

It should be noted that the adequacy analyses presented in previous chapters of the SASP were based on the initial stratification of the system presented in *Chapter Three, Airport Roles*. Recommendations presented in Chapter Seven identified changes to airport functional level stratifications that would maximize system performance relative to accessibility and population coverage. Revised system performance measurements based on the recommended system stratification are presented in the following sections along with the recommended approach for improving system performance relative to each benchmark. It is important to note that any variations that occur between the system performance graphs presented in this chapter and those presented Chapter Five are the exclusive result of those changes to airport functional level classifications that were identified in the SASP's recommended final stratification of system airports. Priority General Service airports are included in the General Service category in the following graphs. System performance graphs presented in this chapter should be used as a baseline to measure the impact of the SASP's recommendations on overall system performance relative to the study's major performance measures listed above.

A. Aviation Activity

The aviation activity performance measure examined existing airfield operational capacity at system airports. SASP analysis used planning level estimates of airport capacity compared to existing activity levels to identify those airports that may be experiencing capacity shortfalls. Performance of the recommended system to the aviation activity benchmark is presented in **Exhibit 8-1**.

Exhibit 8-1
CAPACITY ANALYSIS – RECOMMENDED SYSTEM



Source: Wilbur Smith Associates

As shown in Exhibit 8-1, SASP analysis determined that the approximately 88 percent of system airports currently have sufficient operating capacity. Six system airports were identified as having potential capacity deficiencies. Of New Jersey's three Scheduled Service airports, Atlantic City International and Trenton Mercer airports currently operate at between 60 percent and 80 percent of their estimated ASV and Newark International is estimated to operate at over 80 percent of its ASV. Essex County, Morristown Municipal, and Teterboro airports, all in the recommended Advanced Service functional level, are estimated to operate at over 80 percent of their ASV.

As presented in Chapter Six, the importance of sufficient airfield operating capacity led to the SASP recommendation of implementing capacity-enhancement projects at those airports with documented capacity shortfalls. Implementing capacity-enhancement projects at those airports that have documented capacity shortfalls, where these projects are environmentally and financially feasible, will assist New Jersey's airport system to accommodate current and projected levels of demand.

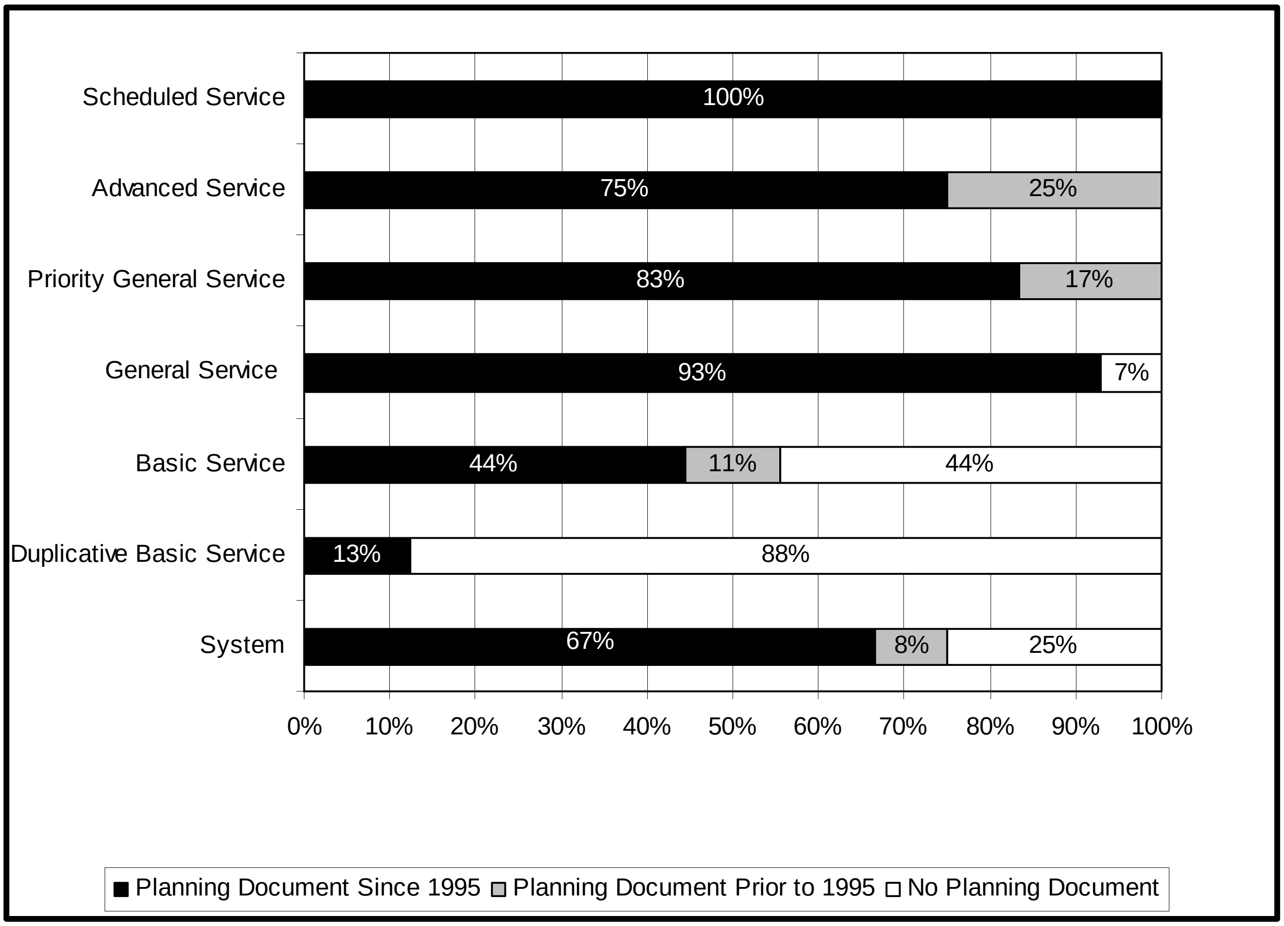
B. Development Potential

Benchmarks that were examined relative to development potential included existence and currency of airport planning documents, current ownership, and grant obligation characteristics at each system airport. Revised system performance relative to these benchmarks for the recommended system, as well as recommendations for improving system performance, are summarized in the following sections.

1. Airport Planning Documents

The analysis of airport planning documents indicated that the system was deficient due to the number of airports in the system that either had no planning documents or the documents were outdated. **Exhibit 8-2** summarizes the performance of the recommended system relative to the airport planning documents benchmark.

Exhibit 8-2
AIRPORT PLANNING DOCUMENTS – RECOMMENDED SYSTEM



Source: NJDOT, Wilbur Smith Associates

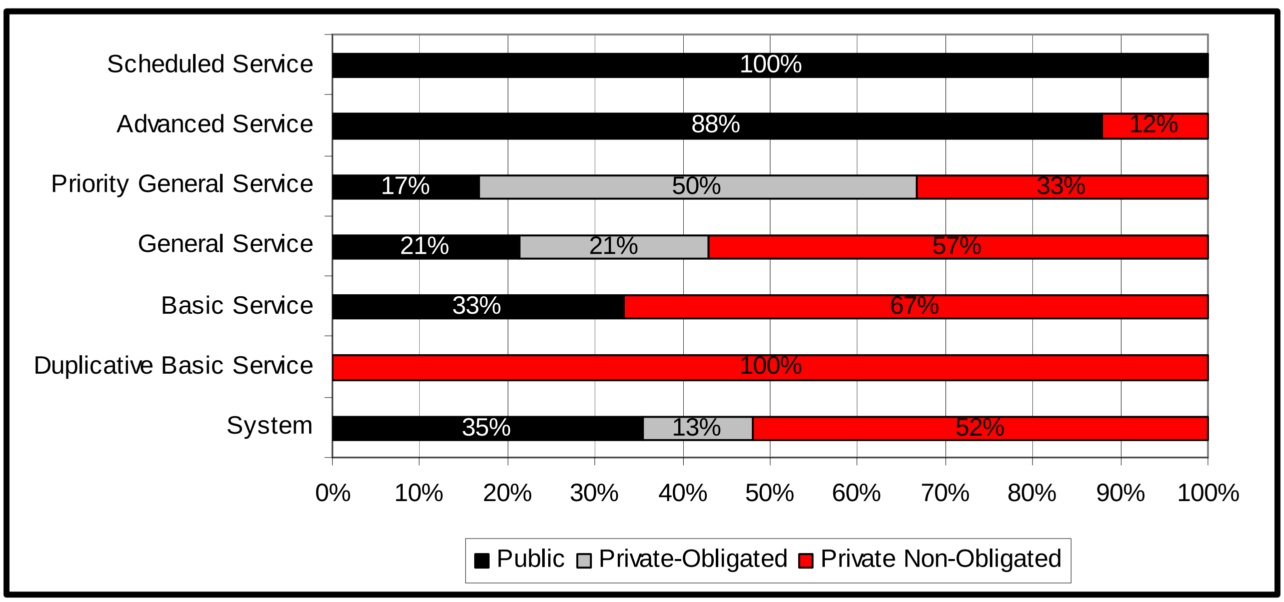
Recognizing the importance of airport planning documents to future system development, the SASP recommends the following guidelines be applied to system airports related to airport planning documents:

- Scheduled Service - Airport planning document updated every five years
- Advanced Service - Airport planning document updated every five years
- Priority General Service - Airport planning document updated every five years
- General Service - Airport planning document completed every 10 years or as needed
- Basic Service - Airport planning documents should be completed as needed
- Duplicative Basic Service - Airport planning documents should be completed as needed

2. Airport Ownership

Airport ownership and grant obligation characteristics can impact long-term viability and stability of system airports. The benchmark analysis identified that a number of airports that contribute significantly to the system are privately owned, and some are non-obligated. Airport ownership and grant obligation characteristics of the recommended system are summarized in **Exhibit 8-3**.

Exhibit 8-3
AIRPORT OWNERSHIP – RECOMMENDED SYSTEM



Source: NJDOT, Wilbur Smith Associates

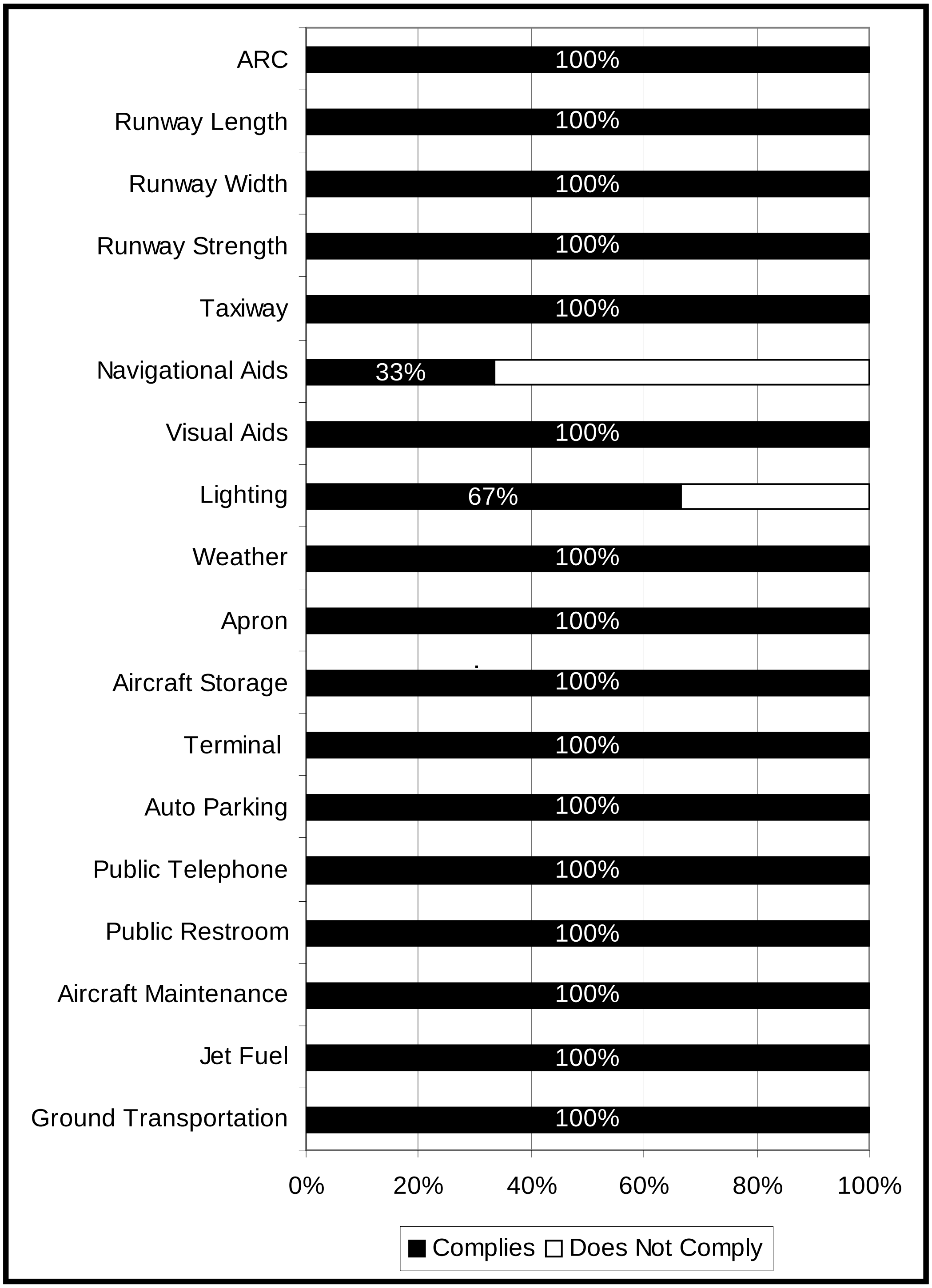
To promote the long-term viability of the system, the SASP recommends that the Division of Aeronautics continue to monitor ownership and obligation characteristics at system airports. Where possible, proactive steps should be taken to secure long-term airport viability by working with airports, sponsors, and their municipalities to ensure that those airports that contribute significantly to the system remain in operation. One goal in this process is to ensure that as privately owned airports come up for sale, potential public sponsors and/or the Division of Aeronautics can work to acquire the airport before it is sold into non-aviation use.

C. Existing Infrastructure

Airport compliance to the facility and service objectives that were identified for the SASP functional levels was quantified in Chapter Five. This analysis was conducted to compare airports, based on their initial stratification within the system, to facility and service objectives of the SASP functional levels that were developed given the intended role of each functional level of airport within the system. The same methodology was applied to the recommended system and the results of the analysis are summarized for airports recommended to be in each of the SASP's functional levels. Performance of the recommended system to facility and service objectives are summarized in the following exhibits:

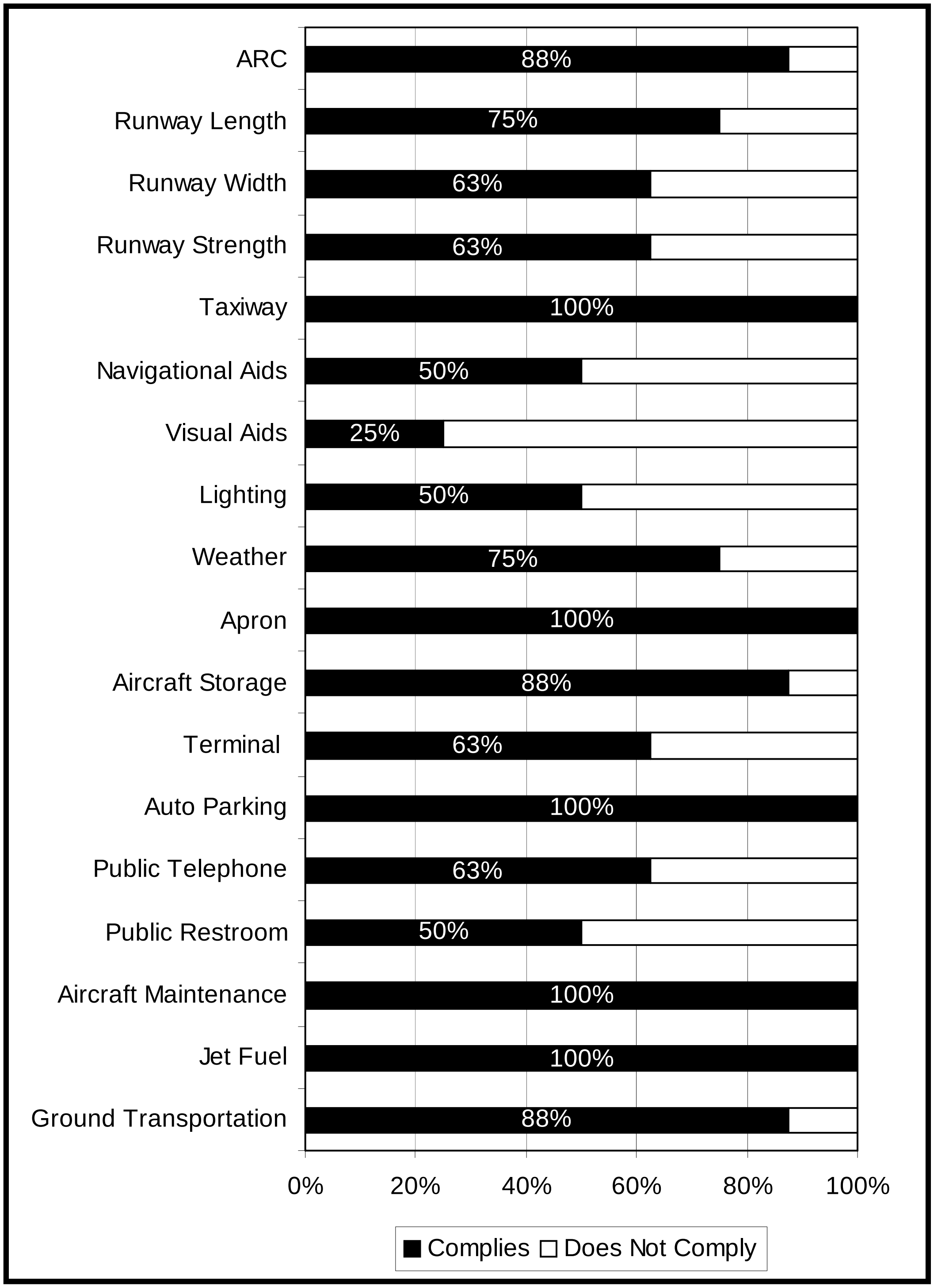
- **Exhibit 8-4**: Scheduled Service Airports
- **Exhibit 8-5**: Advanced Service Airports
- **Exhibit 8-6**: Priority General Service
- **Exhibit 8-7**: General Service Airports
- **Exhibit 8-8**: Basic Service Airports
- **Exhibit 8-9**: Duplicative Basic Service Airports

Exhibit 8-4
SCHEDULED SERVICE FACILITY AND SERVICE OBJECTIVES
RECOMMENDED SYSTEM



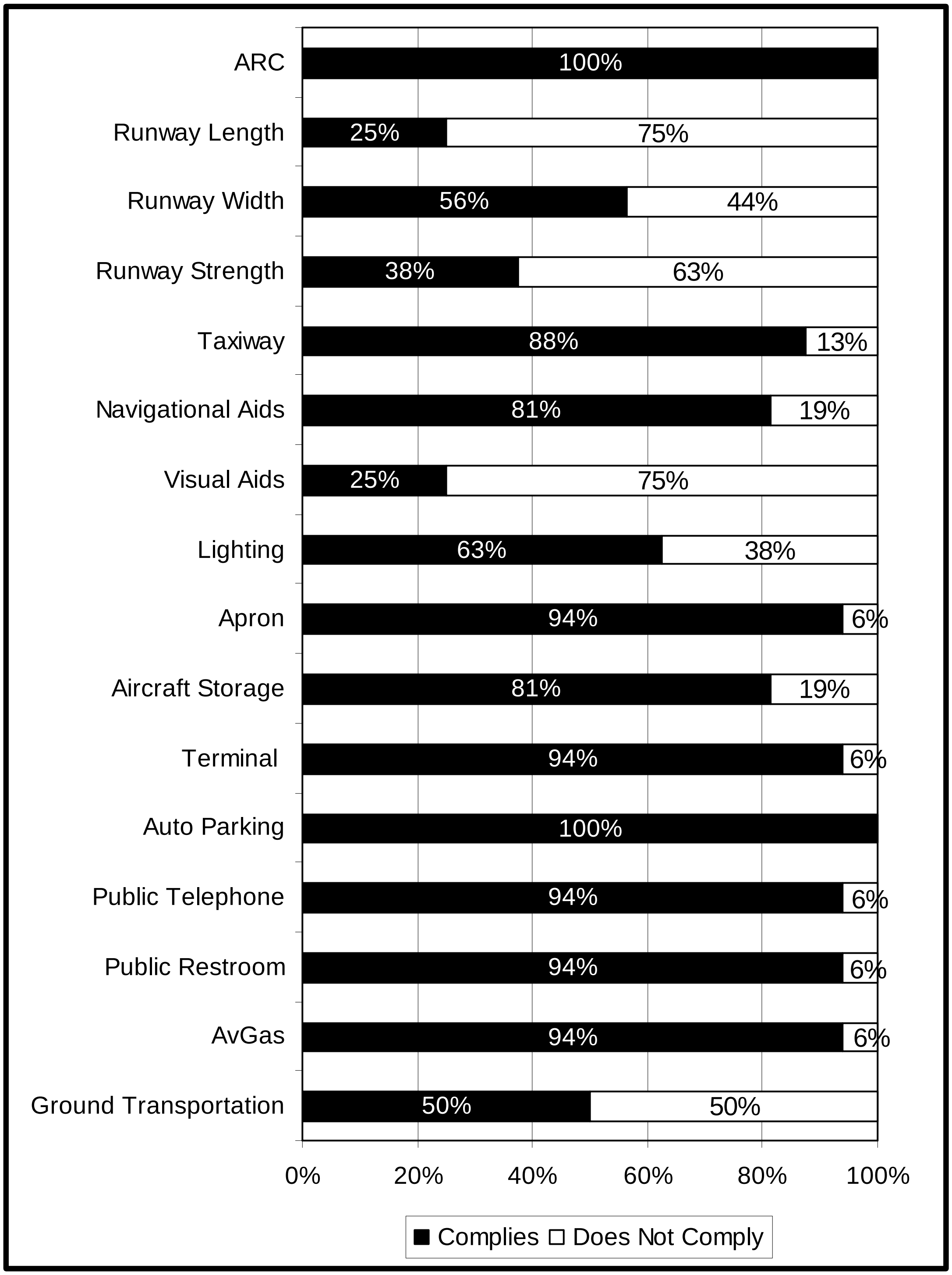
Source: Wilbur Smith Associates

Exhibit 8-5
ADVANCED SERVICE FACILITY AND SERVICE OBJECTIVES
RECOMMENDED SYSTEM



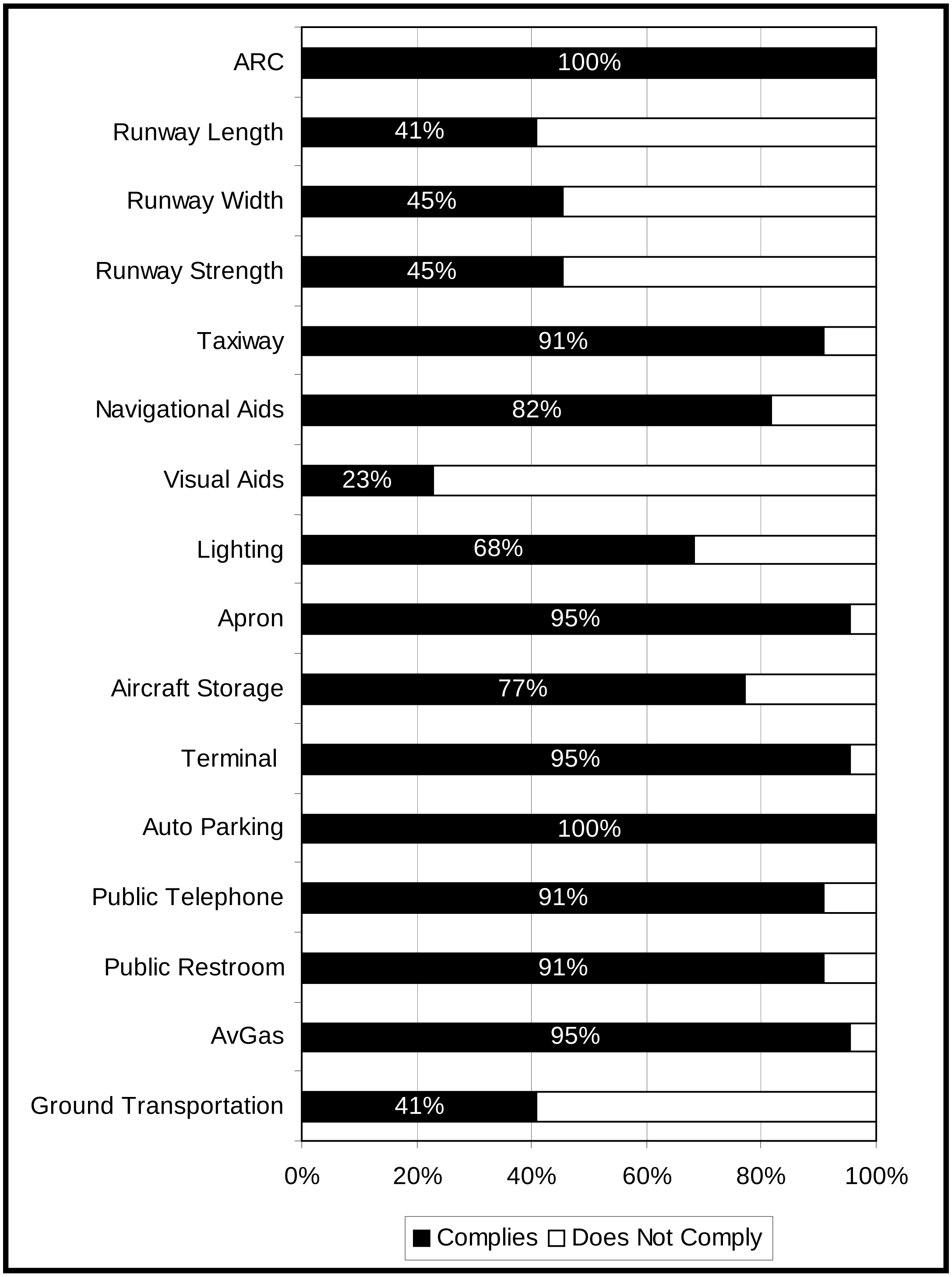
Source: Wilbur Smith Associates

Exhibit 8-6
PRIORITY GENERAL SERVICE FACILITY AND SERVICE OBJECTIVES
RECOMMENDED SYSTEM



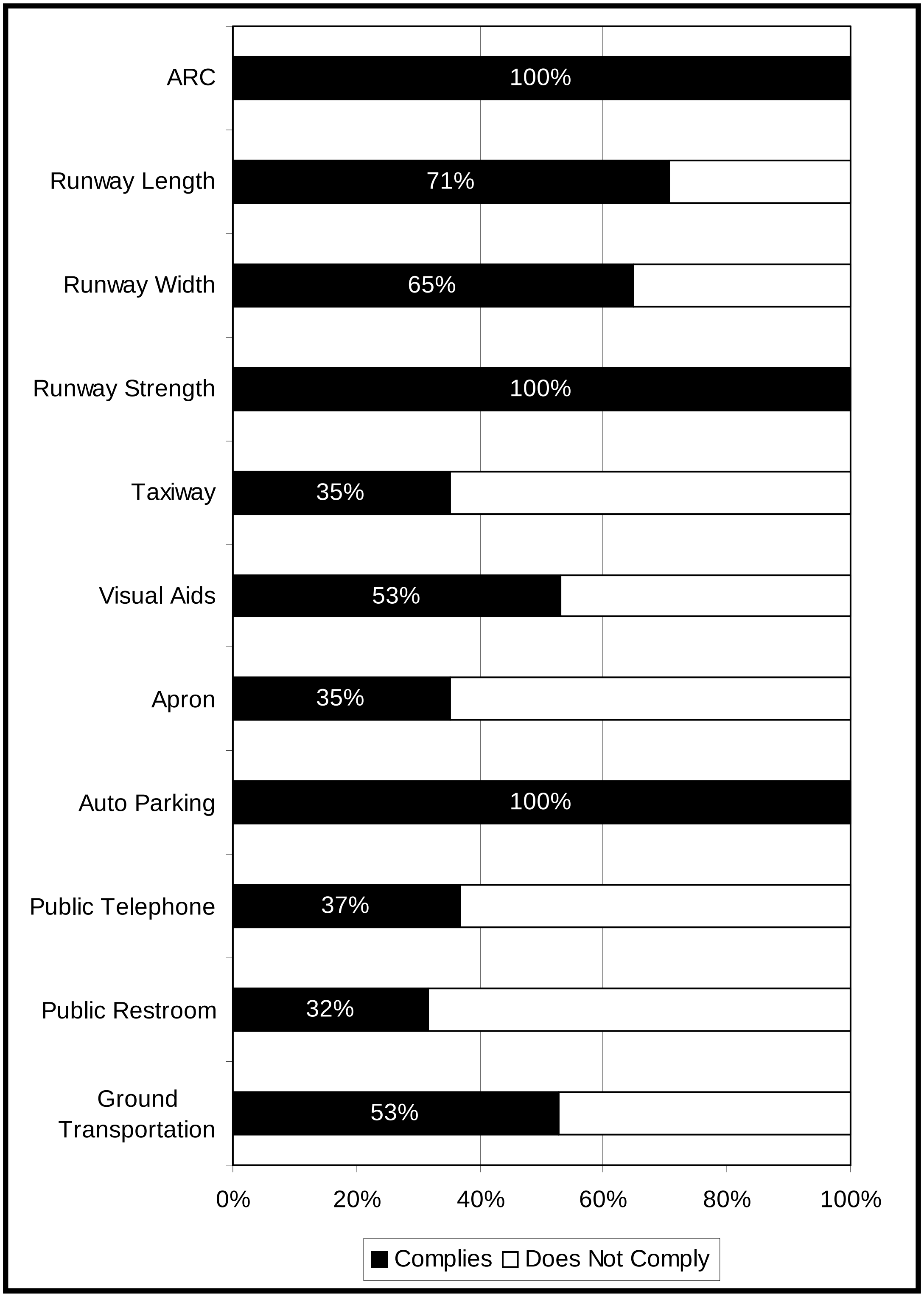
Source: Wilbur Smith Associates

Exhibit 8-7
GENERAL SERVICE FACILITY AND SERVICE OBJECTIVES
RECOMMENDED SYSTEM



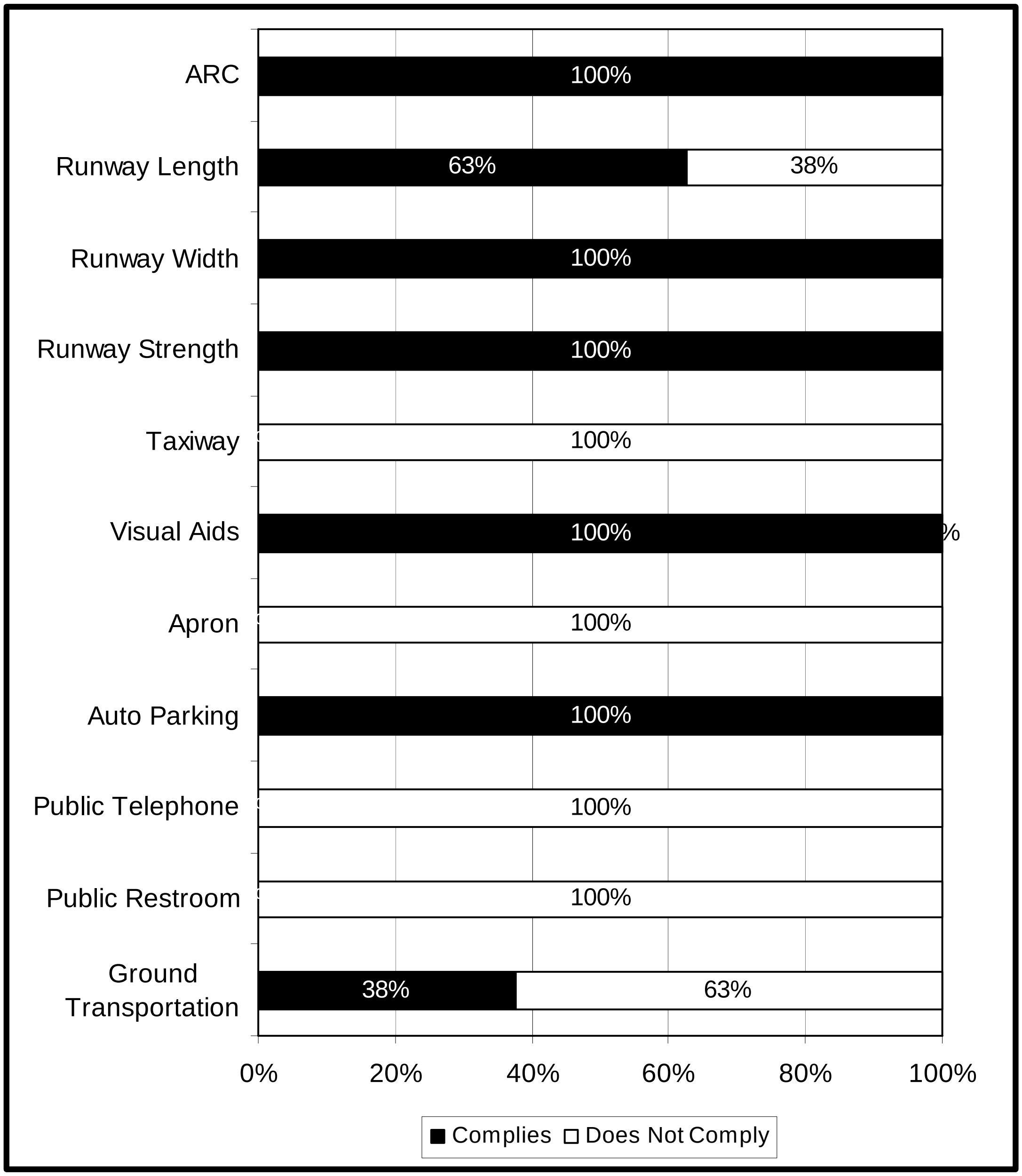
Source: Wilbur Smith Associates

Exhibit 8-8
BASIC SERVICE FACILITY AND SERVICE OBJECTIVES
RECOMMENDED SYSTEM



Source: Wilbur Smith Associates

Exhibit 8-9
DUPLICATIVE BASIC SERVICE FACILITY AND SERVICE OBJECTIVES
RECOMMENDED SYSTEM



Source: Wilbur Smith Associates

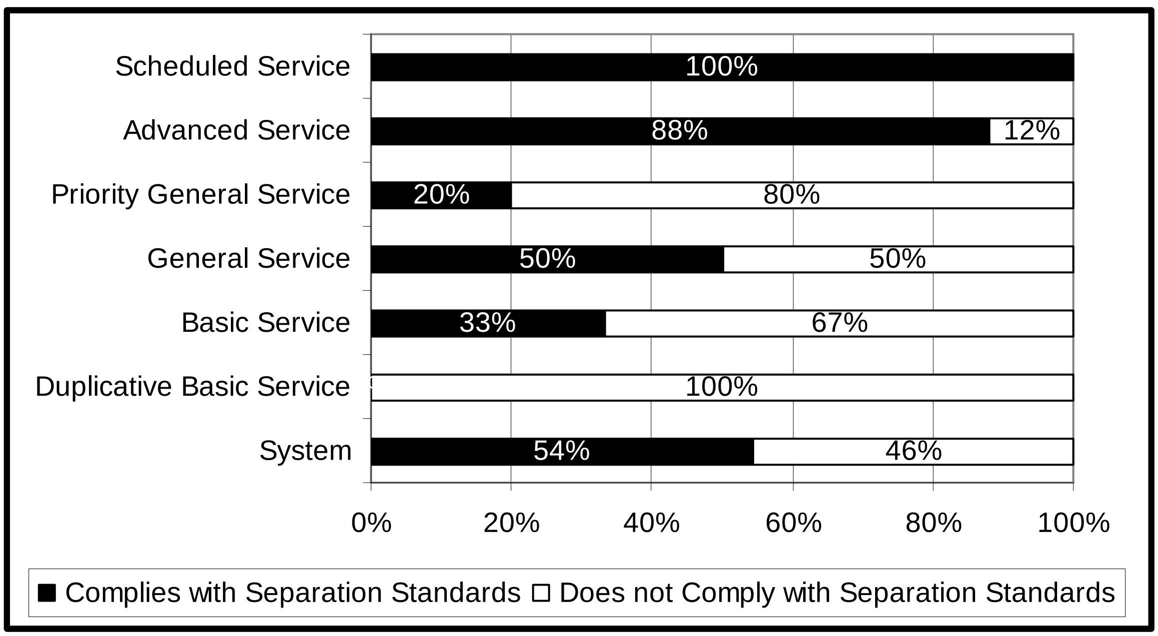
Based on the SASP's facility and service objectives, it was determined that the recommended system was deficient relative to this benchmark. A prioritized approach to improving system performance relative to all facility and service objectives is recommended by the SASP. The prioritized approach should work to bring airports into compliance with their facility and service objectives based on their recommended role in the system. The approach to implementing improvements should be flexible and follow a process similar to the Division of Aeronautics' existing grant allocation process. It should be noted that facility development recommendations that are presented in a following chapter identify all of those projects that are recommended to bring system airports into compliance the with facility and service objectives based on their recommended final role within the system.

D. Design Standards

Four specific design standards were examined in the SASP; runway/taxiway separation, width of primary runway, runway safety area compliance, and pavement condition index. System performance relative to these design standards, based on the recommended system stratification, is summarized in the following exhibits:

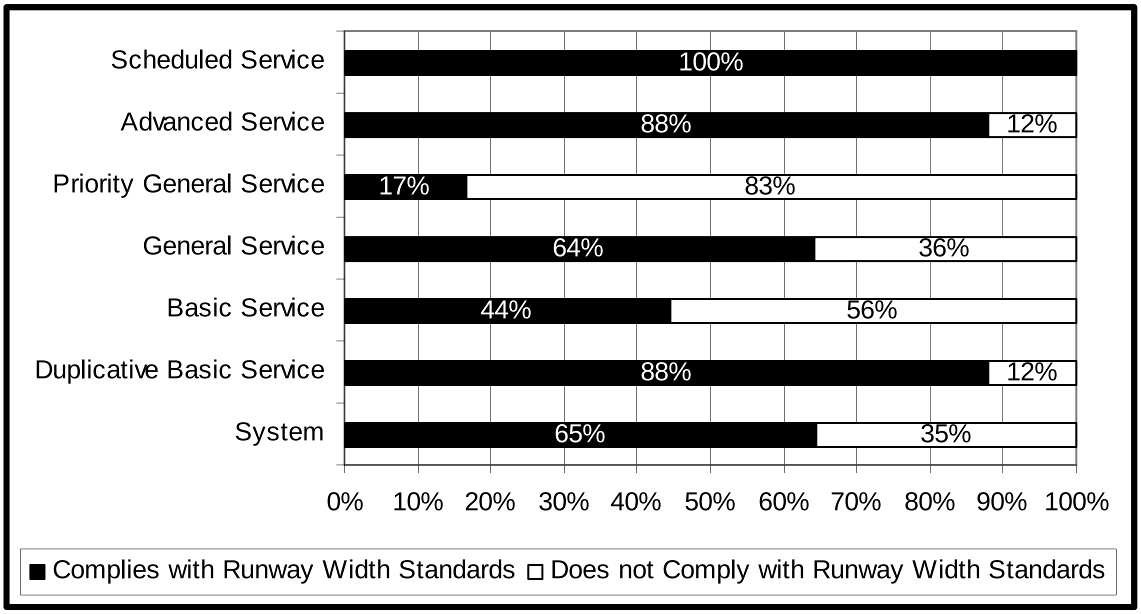
- **Exhibit 8-10**: Runway/Taxiway Separation (where applicable)
- **Exhibit 8-11**: Runway Width
- **Exhibit 8-12**: Runway Safety Area
- **Exhibit 8-13**: Pavement Condition Index

Exhibit 8-10
RUNWAY/TAXIWAY SEPARATION DESIGN STANDARD COMPLIANCE
RECOMMENDED SYSTEM



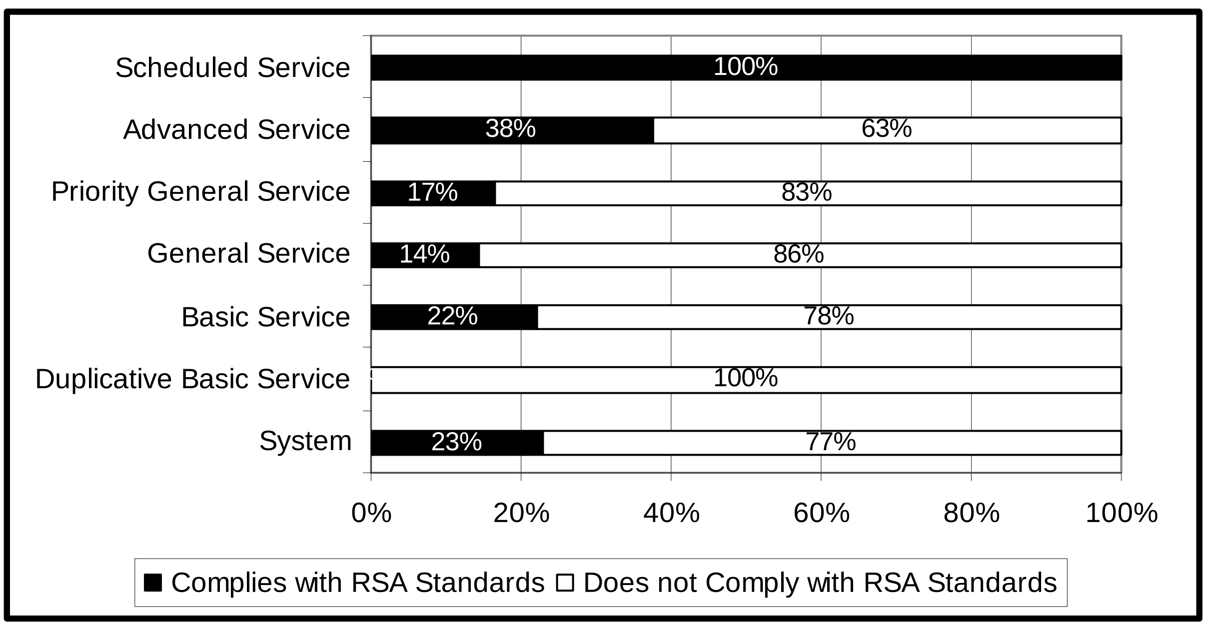
Source: NJDOT, Wilbur Smith Associates

Exhibit 8-11
RUNWAY WIDTH DESIGN STANDARD COMPLIANCE
RECOMMENDED SYSTEM



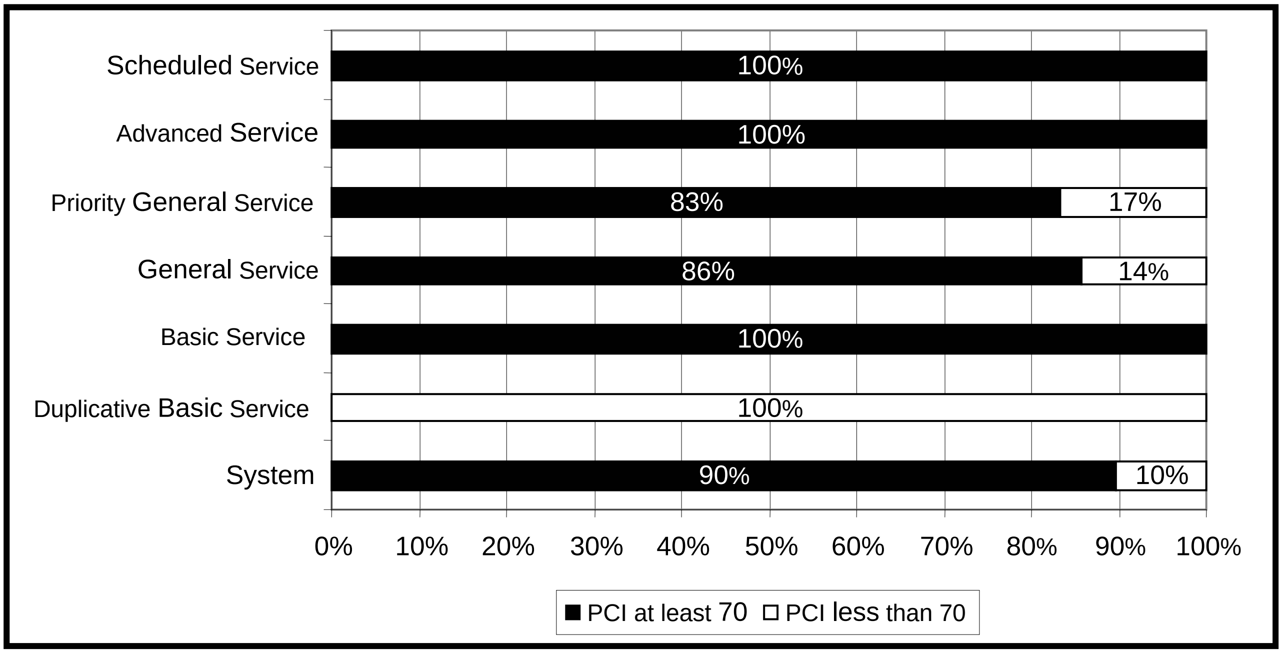
Source: NJDOT, Wilbur Smith Associates

Exhibit 8-12
RSA DESIGN STANDARD COMPLIANCE
RECOMMENDED SYSTEM



Source: NJDOT, Wilbur Smith Associates

Exhibit 8-13
PAVEMENT CONDITION INDEX
RECOMMENDED SYSTEM



Source: NJDOT, Wilbur Smith Associates

SASP analysis determined that system performance relative to each of these design standards was deficient. The Division of Aeronautics should work with those airports that are not in compliance with these design standards to implement projects at those airports to bring them into compliance with applicable design standards. Where possible, these improvement projects should be completed in conjunction with other projects being undertaken that are directly related to those facilities impacted by the design standards examined in the SASP.

E. Conclusion

The recommendations developed for improving the New Jersey airport system relative to SASP performance measures are policy-related. In general, these recommendations identify a framework and a general approach for improving system performance. Upon implementing the recommendations, it will be important for the Division of Aeronautics to periodically measure the impact that these recommendations have the system by comparing future system performance relative to the system performance quantified in the SASP.

III. OVERALL AIRPORT COVERAGE SUMMARY RECOMMENDATIONS

The SASP examined airport coverage in New Jersey as a measure of the system's accessibility. In general, airport coverage refers to having airports in different functional levels located throughout the State that provide reasonable access. In this analysis, reasonable access was determined to be within a 30-minute drive time of New Jersey's aviation users. The SASP initially stratified system airports based on their contribution to the overall system. In the initial stratification process, airports were categorized into the following functional levels:

- Scheduled Service
- Advanced Service
- General Service
- Basic Service

Following this initial stratification, GIS analysis was conducted to identify the percentage of the State's businesses and population that were located within a 30-minute drive time of airports in each of these functional levels. A 60-minute drive time area was used for Scheduled Service airports. Current system coverage was quantified in each of the functional levels of airports and coverage area voids were identified. These coverage area voids represent areas of New Jersey in which options for improving coverage by one or more of the functional levels of airports were evaluated. Based on analyses of these coverage voids and the options identified within each void for improving coverage, recommendations for changes to the initial airport stratification were made. Based on constraints at system airports and duplication of services provided by some airports in the system, the recommended stratification of system airports includes the following functional level categories:

- Scheduled Service
- Advanced Service
- Priority General Service
- General Service
- Basic Service
- Duplicative General Service

The analysis of system coverage is presented in detail in Chapter Seven, the major recommendations related to recommended functional level changes for system airports are summarized below:

Airports to be added/upgraded to the Advanced Service functional level:

- Bergen County Airport – new airport
- Cape May County Airport – upgrade from General Service
- Hammonton Municipal Airport – upgrade from General Service
- Old Bridge (upgrade from General Service) **or** new airport

Airports to be included in the Priority General Service functional level:

- Central Jersey Regional Airport – upgrade from General Service
- Cross Keys Airport – upgrade from General Service
- Lincoln Park Airport – upgrade from General Service
- Linden Airport – upgrade from General Service
- Solberg-Hunterdon Airport – upgrade from General Service
- South Jersey Regional Airport – reclassify from Advanced Service

Airports to be upgraded to the General Service functional level:

- Eagles Nest Airport – upgrade from Basic Service
- Spitfire Aerodrome – upgrade from Basic Service

Airports to be reclassified to the Basic Service functional level:

- Marlboro Airport – reclassify from General Service
- Red Lion Airport – reclassify from General Service

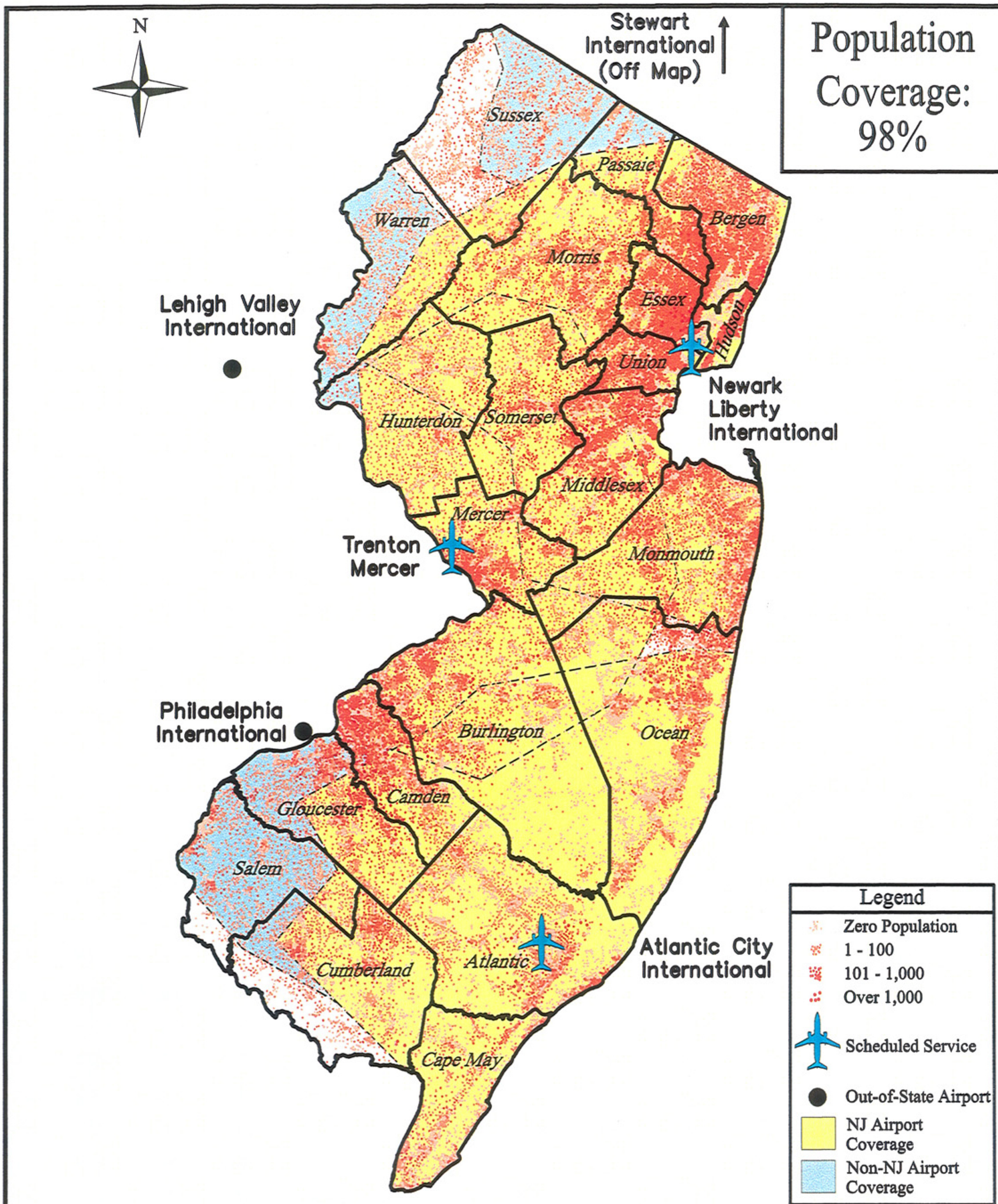
Airports to be included in the Duplicative Basic Service functional level:

- Kroelinger Airport – reclassify from Basic Service
- Li Calzi Airpark – reclassify from Basic Service
- Newton Airport – reclassify from Basic Service
- Red Wing Airport – reclassify from Basic Service
- Rudy's Airport - reclassify from Basic Service
- Southern Cross Airport - reclassify from Basic Service
- Trinca Airport – reclassify from Basic Service
- Twin Pine Airport - reclassify from Basic Service

The impacts that these recommendations would have on system coverage are summarized in the following sections.

A. Recommended Scheduled Service Airport Coverage

Exhibit 8-14 depicts the geographic coverage of Scheduled Service airports in New Jersey. New Jersey's Scheduled Service airports as well as airports in neighboring states with scheduled air carrier service, and their associated 60-minute drive time coverage areas, are included in Exhibit 8-14. No recommendations were included in the SASP for improving Scheduled Service airport coverage. As shown in Exhibit 8-14, approximately 98 percent of New Jersey's population is located within a 60-minute drive time of a Scheduled Service airport in the recommended system.



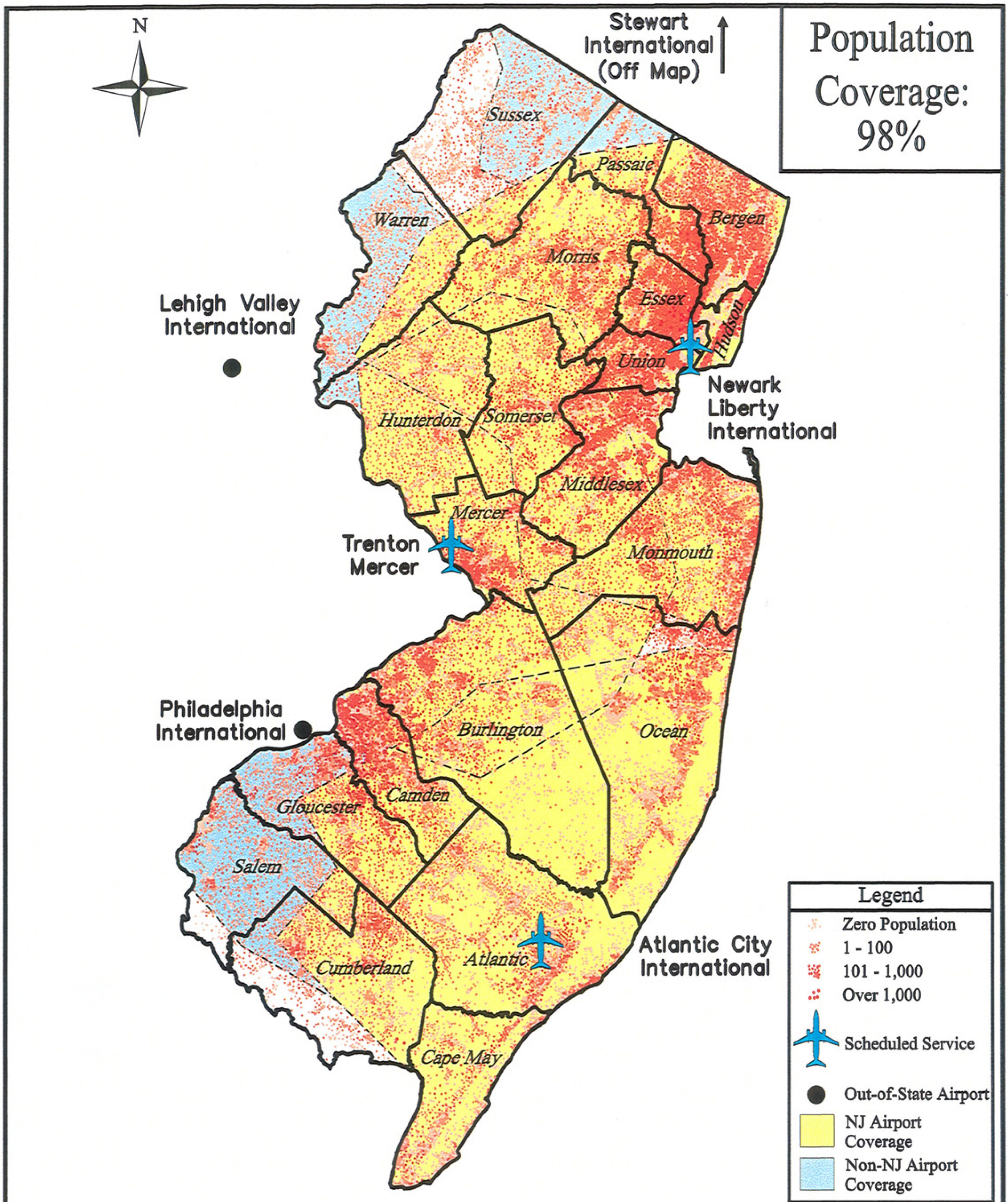
NEW JERSEY STATE AIRPORT SYSTEM PLAN

Recommended Scheduled Service Airport Coverage

Exhibit 8-14

B. Recommended Advanced Service Airport Coverage

Population coverage of the recommended Advanced Service functional level is presented in **Exhibit 8-15**. As shown in Exhibit 8-15, approximately 83 percent of New Jersey's population will be within a 30-minute drive time of an existing airport recommended to be in the Advanced Service functional level. Population coverage of the Advanced Service functional level in the initial stratification of system airports was estimated at approximately 82 percent. It is important to note that the coverage of the recommended Advanced Service airports depicted in Exhibit 8-15 does not include population coverage that would be added to the recommended system with the construction of the two new Advanced Service airports recommended in the SASP. The recommended construction of new Advanced Service airports in Bergen and Middlesex Counties would be anticipated to significantly increase population coverage by Advanced Service airports in the recommended system.



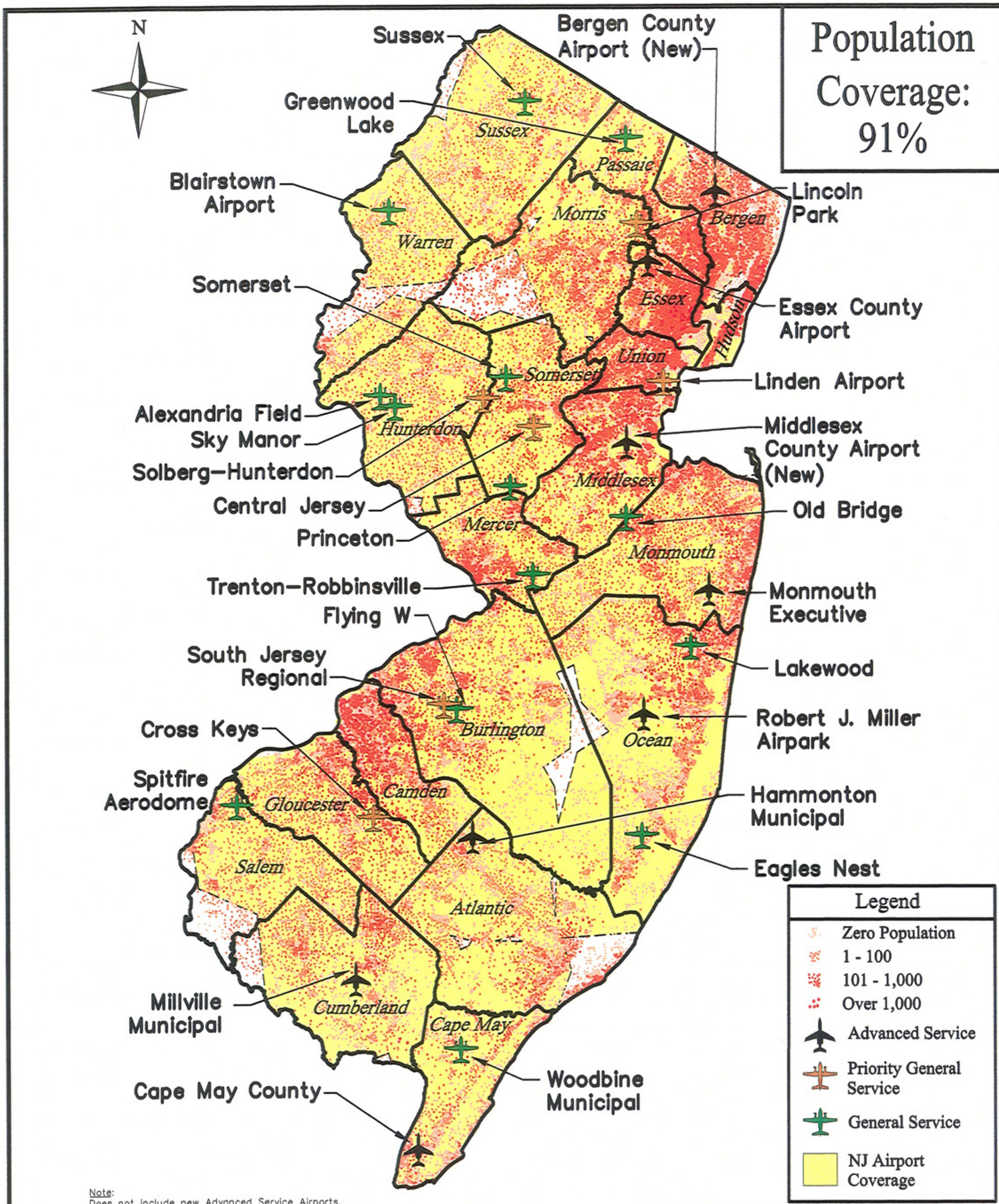
NEW JERSEY STATE AIRPORT SYSTEM PLAN

Recommended Scheduled Service Airport Coverage

Exhibit 8-14

C. Recommended General Service Airport Coverage (including Priority General Service)

In the recommended airport system, General Service airport coverage is estimated to increase from approximately 89 percent of the State's population to approximately 91 percent of the State's population. **Exhibit 8-16** summarizes General Service airport coverage in the recommended system. It is important to note that the construction of new Advanced Services airports, airports that would also meet the needs of the General Service functional level, would be anticipated to significantly increase coverage in the recommended system. As shown in Exhibit 8-16, the construction of a new Advanced Service airport in Bergen County would be anticipated to also provided General Service coverage to portions of Bergen County that are currently beyond the 30-minute drive time coverage area of an airport that can accommodate General Service activity.



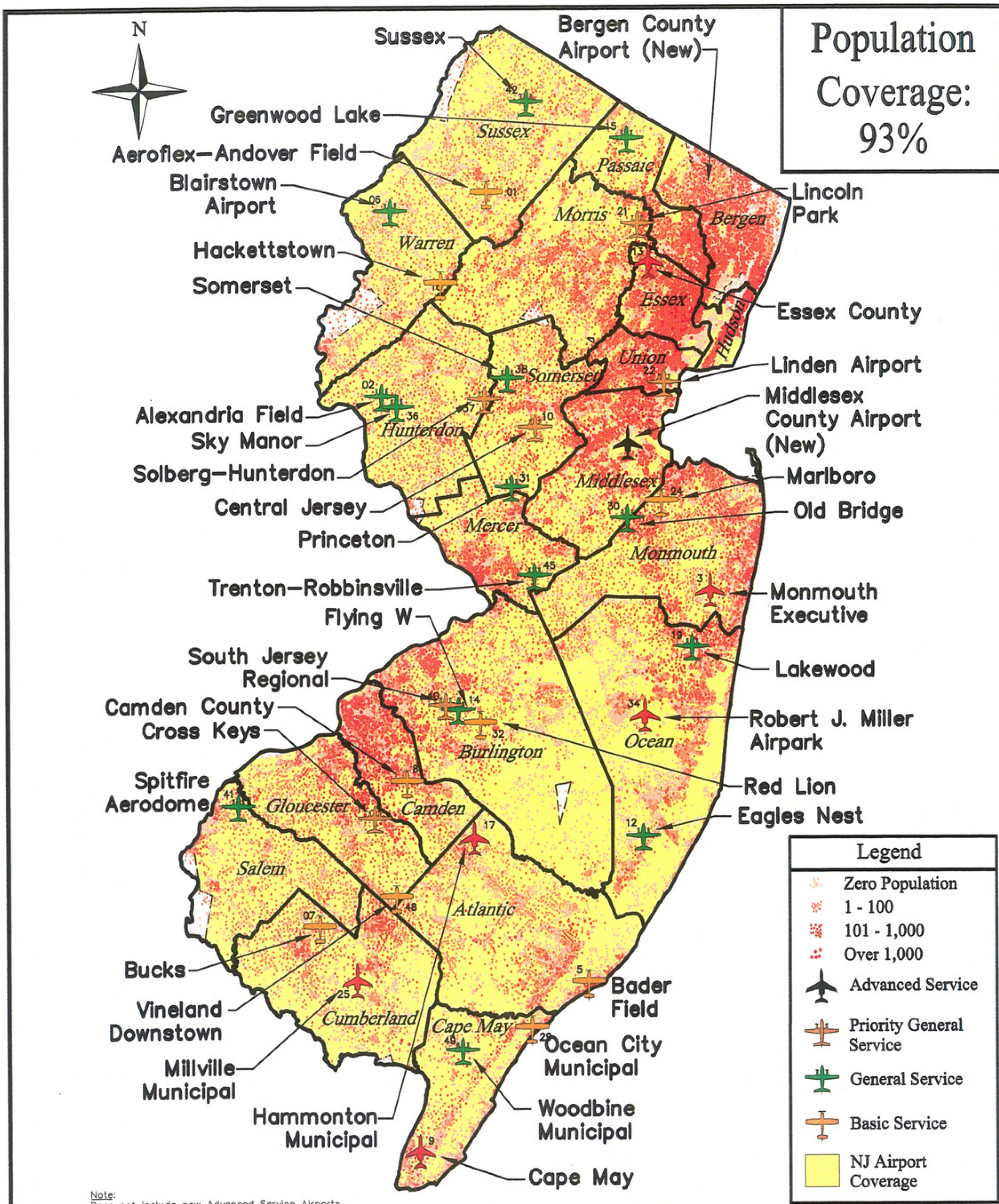
STATE AIRPORT SYSTEM PLAN

Recommended General Service Airport Coverage

Exhibit 8-16

D. Recommended Basic Service Airport Coverage (including Duplicative Basic Service)

Basic Service airport coverage in the recommended system is estimated to remain 93 percent of New Jersey's population until the construction of two new Advanced Service airports. It is assumed that new Advanced Service airports in Bergen and Middlesex Counties would also be able to support Basic Service airport needs in their respective counties, thereby providing additional Basic Service airport population coverage if they are constructed. **Exhibit 8-17** summarizes Basic Service airport coverage in the recommended system.



NEW JERSEY STATE AIRPORT SYSTEM PLAN

Recommended Basic Service Airport Coverage

Exhibit 8-17

IV. SYSTEM RECOMMENDATIONS SUMMARY

Table 8-1 presents a summary of the recommendations developed through the SASP planning process for improving the performance of New Jersey’s public-use airport system relative to the study’s performance measures. For the Aviation Activity, Development Potential, Existing Infrastructure, and Design Standards performance measures, recommended actions are identified for improving system performance. Improving system performance relative to the benchmarks used in the SASP is contingent upon the Division of Aeronautics’ ability to implement the recommendations, over time, and to continuously monitor the system’s progress relative to goals that were established in the system planning process.

Recommendations related to System Coverage identify airports that should be upgraded or reclassified to a different airport functional level in order to improve overall system performance. As airports are reclassified into the recommended functional levels, the Division of Aeronautics should work to bring them into compliance with the facility and service objectives for their respective SASP airport functional level. A following chapter will identify specific projects for system airports that are recommended based on the airport’s recommended functional level. Cost estimates for implementing the facility development projects resulting from the recommended functional level changes are also presented.

Table 8-1
SYSTEM RECOMMENDATIONS SUMMARY

PERFORMANCE MEASURE	RECOMMENDATION
Aviation Activity	
Existing Airfield Capacity	Operational capacity enhancement projects at constrained airports
Development Potential	
Planning Documents	Scheduled Service - Updated every 5 years Advanced Service - Updated every 5 years General Service - Completed every 10 years or as needed Basic Service - Completed as needed
Airport Ownership/Obligation	Continuously monitor airport ownership and grant obligation characteristics
Existing Infrastructure	
Facility and Service Objectives	Prioritized improvements
Design Standards	
Runway Taxiway Separation	Implement system performance improvements
Width of Primary Runway	Implement system performance improvements
Runway Safety Area Compliance	Implement system performance improvements
Pavement Condition Index	Implement system performance improvements
Airport System Coverage	
Upgrade to Advanced Service	Bergen County Airport (new) Cape May County Airport Hammonton Municipal Airport Old Bridge (or new airport)
Include in Priority General Service	Central Jersey Regional Airport Cross Keys Airport Lincoln Park Airport Linden Airport Solberg-Hunterdon Airport South Jersey Regional Airport
Upgrade to General Service	Eagles Nest Airport Spitfire Aerodrome
Reclassify to Basic Service	Marlboro Airport Red Lion Aiport
Include in Duplicative General Service	Kroelinger Airport Li Calzi Airport Newton Airport Red Wing Airport Rudy's Airport Southern Cross Airport Trinca Airport Twin Pine Airport

Source: Wilbur Smith Associates

CHAPTER NINE
PROJECTIONS OF AIRPORT AVIATION DEMAND

The development of aviation activity projections for the airports included in New Jersey's airport system is an essential step in assessing the need for and phasing of future development requirements. In Chapter Four, Projections of Statewide Aviation Demand, forecasts of regional and statewide based aircraft and general aviation operations were developed. Based on these projections and the recommended functional role determined in Chapter Eight, Recommendations, individual forecasts for each of the airports in the New Jersey system were developed. These activity projections are one factor used in planning future airside and landside facilities for the system.

Demand projections generally fall into three distinct categories: general aviation, commercial service, and military. Significant differences in these three sectors of the aviation industry often make it necessary to modify the general approach or methodology used in forecasting to reflect specific airport or industry conditions. Each New Jersey airport's projection of general aviation activity has been developed based on the regional projections presented in Chapter Four. Projections of commercial service activity for the three commercial service airports in New Jersey (Newark Liberty International, Atlantic City International, and Trenton-Mercer) were derived from data from the individual airports as well as the FAA's Terminal Area Forecasts. Military activity was kept constant throughout the forecast period. Each forecast is discussed in further detail in the sections to follow.

Projection methodologies used in the SASP were developed prior to the September 11, 2001 terrorist attacks. Both commercial service and general aviation were impacted by the events of September 11th. Commercial service airlines experienced a drop of up to 50 percent in the month immediately following the attacks and responded with employee layoffs and capacity cuts. As of February 2002, commercial service airlines still struggled with restoring passengers levels to that experienced prior to September 11th. General aviation felt the impacts of September 11th mainly through increased security measures. Emergency air service rules, which included VFR restrictions, were in effect at thirty metropolitan areas until December 19, 2001. The FAA has released other security recommendations to enhance security at flight schools and fixed base operators at general aviation airports. The following general aviation forecasts account for known changes in New Jersey's general aviation operating environment, however, future federal and State policies and guidelines and their impact to general aviation are still unknown.

As discussed in Chapter Four, complete, and often times, reliable historical data for each airport in the system is not readily available for various general aviation activity indicators, including operations. Airports with FAA air traffic control towers provide the most reliable operations data. However, at airports without an FAA air traffic control tower, historic aircraft operations data represents best guess estimates by airport managers/operators. In 1997, New Jersey initiated a statewide counting program for operational activity at system airports in the State. New Jersey operations data for 2000 represents the first verified record of annual general aviation operational activity for all airports. In addition, based aircraft data were collected in the SASP inventory process, which was conducted in throughout the summer of 2001. This effort represents the most recent and comprehensive accumulation of data on New Jersey's based aircraft.

I. GENERAL AVIATION ACTIVITY PROJECTIONS

In Chapter Four, projections of regional general aviation activity for New Jersey were developed. The State was divided into six regions or Mobility Strategy Areas (MSAs), used currently by the New Jersey Department of Transportation for transportation planning purposes. The New Jersey airports located in each region are presented in **Table 9-1**.

Table 9-1
MOBILITY STRATEGY AREAS IN NEW JERSEY

MSA 1 – Northeast	MSA 2 – Northwest	MSA 3 – Central
Essex County	Aeroflex-Andover Field	Alexandria Field
Linden	Blairstown	Central Jersey Regional
Little Ferry Seaplane Base	Greenwood Lake	Old Bridge
Newark Liberty International	Hackettstown	Princeton
Teterboro	Lincoln Park	Sky Manor
	Morristown Municipal	Solberg-Hunterdon
	Newton	Somerset
	Sussex	
	Trinca	

MSA 4 – Shore/E. Central	MSA 5 - Southwest	MSA 6 - South
Eagles Nest	Camden County	Atlantic City International
Lakewood	Cross Keys	Bader Field
Marlboro	Flying W	Bucks
Monmouth Executive	Red Lion	Cape May County
Robert J. Miller Airpark	Red Wing	Hammonton Municipal
	South Jersey Regional	Kroelinger
	Southern Cross	Li Calzi Airpark
	Trenton Mercer	Millville Municipal
	Trenton-Robbinsville	Ocean City Municipal
	Twin Pine	Rudy's
	Vineland Downstown	Spitfire Aerodrome
		Woodbine Municipal

Source: New Jersey Department of Transportation.

Three methodologies were used to determine preferred projections of regional based aircraft and general aviation operations for 2005, 2010, and 2020. Due to the lack of historical comparisons, the preferred methodology is based on regional socioeconomic growth projected by the New Jersey Department of Labor. Both population and civilian labor force are indicators of a region's viability and need for aviation services. **Table 9-2** presents the preferred projected based aircraft and general aviation operations for each of New Jersey's MSAs.

Statewide based aircraft are projected to grow from 4,203 based aircraft in 2000 to 4,830 aircraft in 2020. This represents an average annual growth rate of 0.7 percent over the period. General aviation operations in New Jersey are projected to grow 0.9 percent per year, on average, between 2000 and 2020, up from 1.98 million in 2000 to 2.38 million by 2020. The preferred general aviation forecast was developed using a bottom up methodology base on projected civilian labor force projections prepared by the New Jersey Department of Labor. These regional projections of general aviation activity provide a baseline for the individual airport projections.

Table 9-2
NEW JERSEY REGIONAL PROJECTIONS OF BASED AIRCRAFT AND GENERAL AVIATION OPERATIONS

Mobility Strategy Area	Historic 2000	Projected 2005	Projected 2010	Projected 2020	Avg. Annual Growth Rate 2000-2020
BASED AIRCRAFT					
MSA 1- Northeast	756	771	787	819	0.4%
MSA 2- Northwest	920	947	975	1,033	0.6%
MSA 3- Central	837	881	926	1,025	1.0%
MSA 4- Shore/ E. Central	508	534	562	622	1.0%
MSA 5- Southwest	731	752	773	817	0.6%
MSA 6- South	451	466	481	513	0.6%
Statewide Total	**4,203**	**4,351**	**4,504**	**4,830**	**0.7%**
GENERAL AVIATION OPERATIONS					
MSA 1- Northeast	537,489	556,600	576,300	618,000	0.7%
MSA 2- Northwest	482,220	503,600	525,900	573,400	0.9%
MSA 3- Central	247,176	263,300	280,400	318,100	1.3%
MSA 4- Shore/ E. Central	135,838	145,200	155,200	177,300	1.3%
MSA 5- Southwest	373,950	389,300	405,400	439,400	0.8%
MSA 6- South	205,577	216,200	227,300	251,300	1.0%
Statewide Total	**1,982,250**	**2,074,200**	**2,170,500**	**2,377,500**	**0.9%**

Source: Wilbur Smith Associates.

Once projections of general aviation demand were developed on a regional basis, the projections were then assigned back to the individual airport level. Based on the airport's current share of regional based aircraft, general aviation operations, and its recommended airport functional role developed in Chapter Eight, airport-specific projections were developed. Depending on its recommended role in the system, an airport was assigned a share of the growth projected for the region in which it is located. For example, if an airport currently classified as a "General Service" airport was recommended to be upgraded to an "Advanced Service" airport, that airport obtained a greater share of its region's growth. If an airport was recommended to be classified as a "Duplicative Basic Service" airport or lowered in classification from "General Service" to a "Basic Services," that airport's level of based aircraft and general aviation operations was held constant at its 2000 level throughout the forecast period.

II. BASED AIRCRAFT PROJECTIONS

Projections of each New Jersey airport's based aircraft in 2005, 2010, and 2020 are presented in **Table 9-3**. Due to restrictions placed on general aviation activity in the New York City area as a result of September 11, 2001, the aircraft based at Newark Liberty International Airport were relocated to other airports in the MSA 1-Northeast, namely, Essex County and Teterboro airports. The New Jersey SASP recommended that two new "Advanced Service" airports be built to accommodate current capacity constraints and projected aviation demand. It has been assumed that these airports, one located in MSA 1 and one located in MSA 3, will be operating by 2010. It was assumed that a new airport would attract a significant portion of that region's projected increase in based aircraft and operations between 2010 and 2020.

An airport's based aircraft fleet mix is an indication of its operational role and facility needs. In projecting the based aircraft fleet mix for the system airports, consideration was given to the continually changing national active general aviation aircraft fleet and the existing fleet mix at each system airport.

The FAA asserts in the *FAA Aerospace Forecasts FY 2001-2012* that there will be strong growth in active jet aircraft. This trend illustrates a movement in the general aviation community toward more sophisticated, higher performing, and more demanding aircraft. This trend will impact the types of activity occurring at general aviation airports and the types of facilities required at those airports. The FAA projects that the percentage increase in jet aircraft will significantly outpace growth in other components of the aircraft fleet. Turboprop, rotorcraft, and other aircraft are projected to experience an average annual growth rate of over one percent per year over the forecast period.

Table 9-3
BASED AIRCRAFT PROJECTIONS, BY NEW JERSEY SYSTEM AIRPORT

Airport Name	Current Role	Recommended Role	Annual Based Aircraft Historic 2000	Projected 2005	Projected 2010	Projected 2020
Aeroflex-Andover Field	Basic	Basic	54	55	56	58
Alexandria Field	General	General	97	101	104	108
Atlantic City International	Scheduled	Scheduled	29	30	31	33
Bader Field	Basic	Basic	13	13	14	15
Blairstown	General	General	159	163	168	177
Bucks	Basic	Basic	28	29	30	32
Camden County	Basic	Basic	52	53	54	56
Cape May County	**General**	**Advanced**	71	73	76	81
Central Jersey Regional	**General**	**Advanced**	111	123	130	145
Cross Keys	General	Priority General	62	66	70	80
Eagles Nest	**Basic**	**General**	2	5	9	19
Essex County	Advanced	Advanced	399	420	420	420
Flying W	General	General	82	85	87	93
Greenwood Lake	General	General	57	61	66	77
Hackettstown	Basic	Basic	54	55	56	58
Hammonton Municipal	**General**	**Advanced**	67	69	72	77
Kroelinger	Basic	Duplicative Basic	3	3	3	3
Lakewood	General	General	83	87	91	100
Li Calzi Airpark	Basic	Duplicative Basic	3	3	3	3
Lincoln Park	General	Priority General	104	112	120	139
Linden Municipal	General	Priority General	129	136	136	136
Little Ferry SPB	Specialty	Specialty	0	0	0	0
Marlboro	**General**	**Basic**	91	91	91	91
Millville Municipal	Advanced	Advanced	98	101	105	111
Monmouth Executive	Advanced	Advanced	219	231	244	271
Morristown Municipal	Advanced	Advanced	325	330	334	340
New Airport-MSA 1	**New**	**Advanced**	0	0	15	47
New Airport-MSA 3	**New**	**Advanced**	0	0	14	62
Newark Liberty International	Scheduled	Scheduled	12	0	0	0
Newton	Basic	Duplicative Basic	9	9	9	9
Ocean City Municipal	Basic	Basic	29	30	31	33
Old Bridge	General	General	94	100	105	113
Princeton	General	General	162	168	172	178
Red Lion	**General**	**Basic**	53	53	53	53
Red Wing	Basic	Duplicative Basic	11	11	11	11
Robert J. Miller Airpark	Advanced	Advanced	113	120	127	141
Rudy's	Basic	Duplicative Basic	1	1	1	1
Sky Manor	General	General	89	92	95	98

Table 9-3
BASED AIRCRAFT PROJECTIONS, BY NEW JERSEY SYSTEM AIRPORT, Continued

			Annual Based Aircraft			
Airport Name	**Current Role**	**Recommended Role**	**Historic 2000**	**Projected 2005**	**Projected 2010**	**Projected 2020**
Solberg-Hunterdon	General	Priority General	85	90	94	103
Somerset	General	General	199	207	212	218
South Jersey Regional	Advanced	Priority General	176	182	188	199
Southern Cross	Basic	Duplicative Basic	24	24	24	24
Spitfire Aerodrome	**Basic**	**General**	34	36	37	40
Sussex	General	General	143	147	151	160
Teterboro	Advanced	Advanced	216	216	216	216
Trenton-Mercer	Scheduled	Scheduled	150	155	160	170
Trenton-Robbinsville	General	General	66	68	70	75
Trinca	Basic	Duplicative Basic	15	15	15	15
Twin Pine	Basic	Duplicative Basic	30	30	30	30
Vineland Downstown	Basic	Basic	25	26	26	27
Woodbine Municipal	General	General	75	77	79	84
TOTAL—BASED AIRCRAFT			**4,203**	**4,351**	**4,504**	**4,829**

Sources: Airport Management Records; Wilbur Smith Associates.

Table 9-4 presents the existing general aviation fleet mix for New Jersey system airports. In 2000, single-engine aircraft accounted for 77.6 percent of the based aircraft fleet at all system airports combined. For this analysis, each airport's based aircraft fleet mix was projected for 2005, 2010, and 2020. **Tables 9-5 through 9-7** present the based aircraft fleet mix for each of New Jersey's system airports for these years. It is projected that, in 2020, single-engine aircraft will account for 76.7 percent of the total based aircraft. Jet aircraft will see the largest increase, comprising 6.8 percent of New Jersey's total based aircraft in 2020, compared to 5.1 percent in 2000.

Table 9-4
EXISTING BASED GENERAL AVIATION AIRCRAFT FLEET MIX 2000

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Military	Total Based Aircraft
Aeroflex-Andover Field	51	2	0	1	0	0	54
Alexandria Field	91	4	0	2	0	0	97
Atlantic City International	10	7	8	4	0	0	29
Bader Field	13	0	0	0	0	0	13
Blairstown	124	7	0	0	28	0	159
Bucks	27	1	0	0	0	0	28
Camden County	48	1	0	1	2	0	52
Cape May County	43	24	0	1	3	0	71
Central Jersey Regional	96	10	0	1	4	0	111
Cross Keys	60	2	0	0	0	0	62
Eagles Nest	2	0	0	0	0	0	2
Essex County	313	69	2	15	0	0	399
Flying W	75	6	0	1	0	0	82
Greenwood Lake	52	4	0	0	1	0	57
Hackettstown	54	0	0	0	0	0	54
Hammonton Municipal	55	3	0	1	8	0	67
Kroelinger	3	0	0	0	0	0	3
Lakewood	80	3	0	0	0	0	83
Li Calzi Airpark	3	0	0	0	0	0	3
Lincoln Park	98	6	0	0	0	0	104
Linden Municipal	95	16	0	18	0	0	129
Little Ferry SPB	0	0	0	0	0	0	0
Marlboro	80	2	0	1	8	0	91
Millville Municipal	62	31	5	0	0	0	98
Monmouth Executive	178	19	8	14	0	0	219
Morristown Municipal	205	45	53	22	0	0	325
New Airport-MSA 1	0	0	0	0	0	0	0
New Airport-MSA 3	0	0	0	0	0	0	0
Newark Liberty International	0	0	10	2	0	0	12
Newton	6	1	0	0	2	0	9
Ocean City Municipal	27	2	0	0	0	0	29
Old Bridge	82	10	0	2	0	0	94
Princeton	120	35	0	7	0	0	162
Red Lion	50	3	0	0	0	0	53
Red Wing	0	0	0	0	11	0	11
Robert J. Miller Airpark	91	17	4	1	0	0	113
Rudy's	1	0	0	0	0	0	1
Sky Manor	80	5	0	2	2	0	89
Solberg-Hunterdon	78	7	0	0	0	0	85
Somerset	161	24	0	2	12	0	199
South Jersey Regional	138	26	2	2	8	0	176
Southern Cross	24	0	0	0	0	0	24
Spitfire Aerodrome	30	1	0	3	0	0	34

Table 9-4
EXISTING BASED GENERAL AVIATION AIRCRAFT FLEET MIX 2000, Continued

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Military	Total Based Aircraft
Sussex	132	7	0	1	3	0	143
Teterboro	70	27	103	16	0	0	216
Trenton-Mercer	66	22	18	13	0	31	150
Trenton-Robbinsville	60	5	0	1	0	0	66
Trinca	15	0	0	0	0	0	15
Twin Pine	24	1	0	0	5	0	30
Vineland Downstown	22	3	0	0	0	0	25
Woodbine Municipal	67	2	0	1	5	0	75
TOTAL—BASED AIRCRAFT	**3,262**	**460**	**213**	**135**	**102**	**31**	**4,203**

Sources: Airport Management Records; Wilbur Smith Associates.

Table 9-5
PROJECTED BASED GENERAL AVIATION AIRCRAFT FLEET MIX 2005

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Military	Total Based Aircraft
Aeroflex-Andover Field	52	2	0	1	0	0	55
Alexandria Field	95	4	0	2	0	0	101
Atlantic City International	11	7	9	4	0	0	30
Bader Field	13	0	0	0	0	0	13
Blairstown	127	7	0	0	29	0	163
Bucks	28	1	0	0	0	0	29
Camden County	49	1	0	1	2	0	53
Cape May County	44	24	0	1	3	0	73
Central Jersey Regional	105	12	0	1	5	0	123
Cross Keys	64	3	0	0	0	0	66
Eagles Nest	4	1	0	0	0	0	5
Essex County	318	70	16	16	0	0	420
Flying W	78	6	0	1	0	0	85
Greenwood Lake	56	5	0	0	1	0	61
Hackettstown	55	0	0	0	0	0	55
Hammonton Municipal	56	3	0	2	8	0	69
Kroelinger	3	0	0	0	0	0	3
Lakewood	84	3	0	0	0	0	87
Li Calzi Airpark	3	0	0	0	0	0	3
Lincoln Park	104	7	0	0	0	0	112
Linden Municipal	100	17	0	19	0	0	136
Little Ferry SPB	0	0	0	0	0	0	0
Marlboro	80	2	0	1	8	0	91
Millville Municipal	63	32	7	0	0	0	101
Monmouth Executive	185	20	11	15	0	0	231
Morristown Municipal	207	45	55	23	0	0	330
New Airport-MSA 1	0	0	0	0	0	0	0
New Airport-MSA 3	0	0	0	0	0	0	0
Newark Liberty International	0	0	0	0	0	0	0
Newton	6	1	0	0	2	0	9
Ocean City Municipal	28	2	0	0	0	0	30
Old Bridge	87	11	0	2	0	0	100
Princeton	125	35	0	8	0	0	168
Red Lion	50	3	0	0	0	0	53
Red Wing	0	0	0	0	11	0	11
Robert J. Miller Airpark	97	17	4	2	0	0	120
Rudy's	1	0	0	0	0	0	1
Sky Manor	83	5	0	2	2	0	92
Solberg-Hunterdon	83	7	0	0	0	0	90
Somerset	168	24	0	2	13	0	207
South Jersey Regional	142	27	3	3	8	0	182
Southern Cross	24	0	0	0	0	0	24
Spitfire Aerodrome	32	1	0	3	0	0	36

Table 9-5
PROJECTED BASED GENERAL AVIATION AIRCRAFT FLEET MIX 2005, Continued

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Military	Total Based Aircraft
Sussex	135	7	0	1	4	0	147
Teterboro	68	27	106	16	0	0	216
Trenton-Mercer	69	22	20	14	0	31	155
Trenton-Robbinsville	62	5	0	1	0	0	68
Trinca	15	0	0	0	0	0	15
Twin Pine	24	1	0	0	5	0	30
Vineland Downstown	23	3	0	0	0	0	26
Woodbine Municipal	69	2	0	1	6	0	77
TOTAL—BASED AIRCRAFT	**3,371**	**471**	**229**	**141**	**106**	**31**	**4,351**

Sources: Airport Management Records; Wilbur Smith Associates.

Table 9-6
PROJECTED BASED GENERAL AVIATION AIRCRAFT FLEET MIX 2010

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Military	Total Based Aircraft
Aeroflex-Andover Field	53	3	0	1	0	0	56
Alexandria Field	97	4	0	3	0	0	104
Atlantic City International	11	7	9	4	0	0	31
Bader Field	14	0	0	0	0	0	14
Blairstown	129	8	0	0	30	0	168
Bucks	29	1	0	0	0	0	30
Camden County	50	1	0	1	3	0	54
Cape May County	47	25	0	2	3	0	76
Central Jersey Regional	110	14	0	2	5	0	130
Cross Keys	68	4	0	0	0	0	70
Eagles Nest	8	1	0	0	0	0	9
Essex County	318	70	16	16	0	0	420
Flying W	80	6	0	1	0	0	87
Greenwood Lake	55	4	0	0	2	0	66
Hackettstown	56	0	0	0	0	0	56
Hammonton Municipal	57	3	2	2	8	0	72
Kroelinger	3	0	0	0	0	0	3
Lakewood	88	3	0	0	0	0	91
Li Calzi Airpark	3	0	0	0	0	0	3
Lincoln Park	109	8	0	0	0	0	120
Linden Municipal	100	17	0	19	0	0	136
Little Ferry SPB	0	0	0	0	0	0	0
Marlboro	79	2	0	1	8	0	91
Millville Municipal	65	32	8	0	0	0	105
Monmouth Executive	194	20	14	16	0	0	244
Morristown Municipal	213	46	56	23	0	0	334
New Airport-MSA 1	10	1	3	1	0	0	15
New Airport-MSA 3	11	1	2	0	0	0	14
Newark Liberty International	0	0	0	0	0	0	0
Newton	6	1	0	0	2	0	9
Ocean City Municipal	29	2	0	0	0	0	31
Old Bridge	92	11	0	2	0	0	105
Princeton	128	36	0	8	0	0	172
Red Lion	50	3	0	0	0	0	53
Red Wing	0	0	0	0	11	0	11
Robert J. Miller Airpark	103	18	5	2	0	0	127
Rudy's	1	0	0	0	0	0	1
Sky Manor	86	5	0	2	2	0	95
Solberg-Hunterdon	87	7	0	0	0	0	94
Somerset	171	25	0	3	14	0	212
South Jersey Regional	145	28	3	3	9	0	188
Southern Cross	24	0	0	0	0	0	24
Spitfire Aerodrome	33	1	0	3	0	0	37

Table 9-6
PROJECTED BASED GENERAL AVIATION AIRCRAFT FLEET MIX 2010, Continued

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Military	Total Based Aircraft
Sussex	139	8	0	2	4	0	151
Teterboro	65	26	109	17	0	0	216
Trenton-Mercer	71	23	22	14	0	31	160
Trenton-Robbinsville	64	5	0	1	0	0	70
Trinca	15	0	0	0	0	0	15
Twin Pine	24	1	0	0	5	0	30
Vineland Downstown	23	3	0	0	0	0	26
Woodbine Municipal	70	2	0	1	6	0	79
TOTAL—BASED AIRCRAFT	**3,481**	**480**	**248**	**147**	**111**	**31**	**4,504**

Sources: Airport Management Records; Wilbur Smith Associates.

Table 9-7
PROJECTED BASED GENERAL AVIATION AIRCRAFT FLEET MIX 2020

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Military	Total Based Aircraft
Aeroflex-Andover Field	54	3	0	1	0	0	58
Alexandria Field	101	4	0	3	0	0	108
Atlantic City International	12	7	10	4	0	0	33
Bader Field	15	0	0	0	0	0	15
Blairstown	137	8	0	0	32	0	177
Bucks	31	1	0	0	0	0	32
Camden County	51	1	0	1	3	0	56
Cape May County	50	25	1	2	3	0	81
Central Jersey Regional	120	17	0	2	6	0	145
Cross Keys	75	5	0	0	0	0	80
Eagles Nest	17	2	0	0	0	0	19
Essex County	318	70	16	16	0	0	420
Flying W	86	6	0	1	0	0	93
Greenwood Lake	68	7	0	0	2	0	77
Hackettstown	58	0	0	0	0	0	58
Hammonton Municipal	59	3	4	3	8	0	77
Kroelinger	3	0	0	0	0	0	3
Lakewood	97	3	0	0	0	0	100
Li Calzi Airpark	3	0	0	0	0	0	3
Lincoln Park	130	9	0	0	0	0	139
Linden Municipal	100	17	0	19	0	0	136
Little Ferry SPB	0	0	0	0	0	0	0
Marlboro	80	2	0	1	8	0	91
Millville Municipal	66	33	11	0	0	0	111
Monmouth Executive	212	21	20	18	0	0	271
Morristown Municipal	211	46	59	24	0	0	340
New Airport-MSA 1	29	3	13	2	0	0	47
New Airport-MSA 3	34	5	22	1	0	0	62
Newark Liberty International	0	0	0	0	0	0	0
Newton	6	1	0	0	2	0	9
Ocean City Municipal	31	2	0	0	0	0	33
Old Bridge	98	12	0	3	0	0	113
Princeton	133	36	0	9	0	0	178
Red Lion	50	3	0	0	0	0	53
Red Wing	0	0	0	0	11	0	11
Robert J. Miller Airpark	115	18	5	3	0	0	141
Rudy's	1	0	0	0	0	0	1
Sky Manor	89	5	0	2	2	0	98
Solberg-Hunterdon	96	7	0	0	0	0	103
Somerset	175	25	0	3	15	0	218
South Jersey Regional	152	30	4	4	9	0	199
Southern Cross	24	0	0	0	0	0	24

Table 9-7
PROJECTED BASED GENERAL AVIATION AIRCRAFT FLEET MIX 2020, Continued

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Military	Total Based Aircraft
Spitfire Aerodrome	36	1	0	3	0	0	40
Sussex	145	8	0	2	5	0	160
Teterboro	60	25	114	17	0	0	216
Trenton-Mercer	76	23	25	15	0	31	170
Trenton-Robbinsville	69	5	0	1	0	0	75
Trinca	15	0	0	0	0	0	15
Twin Pine	24	1	0	0	5	0	30
Vineland Downstown	24	3	0	0	0	0	27
Woodbine Municipal	73	2	0	1	8	0	84
TOTAL—BASED AIRCRAFT	**3,709**	**505**	**304**	**161**	**119**	**31**	**4,829**

Sources: Airport Management Records; Wilbur Smith Associates.

III. GENERAL AVIATION OPERATIONS PROJECTIONS

Table 9-8 presents each airport's projected general aviation operations for the years 2005, 2010, and 2020. Due to constraints on general aviation at New York City's commercial service airports, Newark Liberty International's general aviation activity will be accommodated by other airports in the region (MSA 1- Northeast) throughout the forecast period. As was previously indicated, two new "Advanced Service" airports have been recommended, one located in MSA 1 and one located in MSA 3. These two new airports will accommodate much of the projected operational growth in these areas between 2010 and 2020. If it was recommended that an airport move from a Basic Service airport role to a Duplicative Basic Service role, the airport's 2000 operational count was held constant throughout the forecast period.

Table 9-8
GENERAL AVIATION OPERATIONS PROJECTIONS, BY NEW JERSEY SYSTEM AIRPORT

Airport Name	Current Role	Recommended Role	Historic 2000	Projected 2005	Projected 2010	Projected 2020
Aeroflex-Andover Field	Basic	Basic	24,826	25,900	26,800	29,000
Alexandria Field	General	General	29,863	31,300	32,400	33,900
Atlantic City International	Scheduled	Scheduled	60,635	63,800	67,100	74,100
Bader Field	Basic	Basic	10,683	11,200	11,800	13,100
Blairstown	General	General	23,228	25,700	28,400	33,800
Bucks	Basic	Basic	900	900	900	1,000
Camden County	Basic	Basic	16,143	16,500	17,000	18,200
Cape May County	General	Advanced	20,192	21,200	22,300	24,600
Central Jersey Regional	General	Advanced	37,486	42,500	45,100	51,300
Cross Keys	General	Priority General	37,540	40,200	43,100	49,400
Eagles Nest	Basic	General	50	1,400	3,000	6,400
Essex County	Advanced	Advanced	198,905	220,900	226,900	238,500
Flying W	General	General	39,361	41,100	43,000	46,800
Greenwood Lake	General	General	29,523	32,200	35,200	42,400
Hackettstown	Basic	Basic	19,000	19,600	20,200	21,800
Hammonton Municipal	General	Advanced	15,080	16,000	17,100	19,100
Kroelinger	Basic	Duplicative Basic	2,400	2,400	2,400	2,400
Lakewood	General	General	15,765	17,100	18,500	21,400
Li Calzi Airpark	Basic	Duplicative Basic	4,000	4,000	4,000	4,000
Lincoln Park	General	Priority General	58,453	64,800	71,200	88,300
Linden Municipal	General	Priority General	36,502	46,100	47,200	49,300
Little Ferry SPB	Specialty	Specialty	40	0	0	0
Marlboro	General	Basic	27,527	27,500	27,500	27,500
Millville Municipal	Advanced	Advanced	43,760	46,000	48,400	53,500
Monmouth Executive	Advanced	Advanced	57,229	61,300	65,600	75,300
Morristown Municipal	Advanced	Advanced	271,074	276,000	280,300	287,900
New Airport-MSA 1	New	Advanced	0	0	11,000	36,000
New Airport-MSA 3	New	Advanced	0	0	4,700	21,300
Newark Liberty International	Scheduled	Scheduled	19,750	0	0	0
Newton	Basic	Duplicative Basic	10,695	10,700	10,700	10,700
Ocean City Municipal	Basic	Basic	20,164	21,200	22,300	24,700
Old Bridge	General	General	24,787	26,100	26,900	28,300
Princeton	General	General	50,622	53,100	55,800	59,000
Red Lion	General	Basic	15,373	15,400	15,400	15,400
Red Wing	Basic	Duplicative Basic	12,500	12,500	12,500	12,500
Robert J. Miller Airpark	Advanced	Advanced	35,267	37,800	40,600	46,500
Rudy's	Basic	Duplicative Basic	150	200	200	200
Sky Manor	General	General	26,372	27,600	28,800	30,300
Solberg-Hunterdon	General	Priority General	37,282	39,800	41,800	46,500
Somerset	General	General	40,764	42,900	45,000	47,500
South Jersey Regional	Advanced	Priority General	59,466	62,300	65,100	71,000
Southern Cross	Basic	Duplicative Basic	3,200	3,200	3,200	3,200

Table 9-8
GENERAL AVIATION OPERATIONS PROJECTIONS, BY NEW JERSEY SYSTEM AIRPORT, Continued

Airport Name	Current Role	Recommended Role	Historic 2000	Projected 2005	Projected 2010	Projected 2020
Spitfire Aerodrome	**Basic**	**General**	8,363	9,000	9,500	11,100
Sussex	General	General	34,026	37,300	41,500	48,200
Teterboro	Advanced	Advanced	282,292	289,500	291,200	294,100
Trenton-Mercer	Scheduled	Scheduled	133,255	139,400	145,500	158,200
Trenton-Robbinsville	General	General	29,762	31,000	32,400	35,400
Trinca	Basic	Duplicative Basic	11,395	11,400	11,400	11,400
Twin Pine	Basic	Duplicative Basic	12,000	12,000	12,000	12,000
Vineland Downstown	Basic	Basic	15,350	15,800	16,200	17,400
Woodbine Municipal	General	General	19,250	20,300	21,400	23,600
TOTAL—GENERAL AVIATION OPERATIONS			**1,982,250**	**2,074,100**	**2,170,500**	**2,377,500**

Sources: New Jersey ASCP; Airport Management Records; FAA; Wilbur Smith Associates.

Note: Tables may not sum to totals due to rounding.

A. General Aviation Local/Itinerant Split

The split between local and itinerant general aviation operations was projected for each of the New Jersey system airports. The FAA defines local operations as operations performed by aircraft that:

- Operate in the local traffic pattern or within sight of an airport
- Are known to be departing for or arriving from flight in local practice areas located within a 20-miles radius of the airport, or
- Are expecting simulated instrument approaches in low pass at an airport.

Itinerant operations are all other operations. **Table 9-9** presents the 2000 local/itinerant splits for the system airports. **Tables 9-10 through 9-12** reflect how each airport's split between local/itinerant general aviation operations is expected to either increase or remain constant in 2005, 2010, and 2020. If it was recommended that an airport's functional role be upgraded, that airport's percentage of itinerant operations was anticipated to increase by the end of the forecast period. If it was recommended that an airport remain in the same functional role throughout the forecast period, that airport's local/itinerant split of operations was projected to remain constant.

B. Operational Fleet Mix

Each New Jersey airport's estimated historical operational fleet mix is depicted in **Table 9-13**. The existing fleet mix data were collected from each airport during the SASP. The future fleet mix was derived from the existing fleet mix, as well as projected fleet mix trends as presented in the *FAA Aerospace Forecasts FY 2001-2012*. **Tables 9-14 through 9-16** present the projected general aviation operational fleet mix for 2005, 2010, and 2020 for system airports. While operations by single-engine aircraft are projected to remain the largest segment of operational activity in New Jersey, their share of total operations is expected to slightly decline by 2020. Jet aircraft operations by general aviation aircraft are projected experience the largest gain in market share. By the end of the planning period jets will account for 15.4 percent of statewide general aviation operations

Table 9-9
LOCAL AND ITINERANT GENERAL AVIATION OPERATIONS 2000

			2000 Annual General Aviation Operations				
Airport Name	**Current Role**	**Recommended Role**	**Local Operations**	**Percent Local**	**Itinerant Operations**	**Percent Itinerant**	**Total Operations**
Aeroflex-Andover Field	Basic	Basic	14,896	60.0%	9,930	40.0%	24,826
Alexandria Field	General	General	17,918	60.0%	11,945	40.0%	29,863
Atlantic City International	Scheduled	Scheduled	30,754	50.7%	29,881	49.3%	60,635
Bader Field	Basic	Basic	3,205	30.0%	7,478	70.0%	10,683
Blairstown	General	General	13,937	60.0%	9,291	40.0%	23,228
Bucks	Basic	Basic	900	100.0%	0	0.0%	900
Camden County	Basic	Basic	10,493	65.0%	5,650	35.0%	16,143
Cape May County	**General**	**Advanced**	8,017	39.7%	12,175	60.3%	20,192
Central Jersey Regional	**General**	**Advanced**	22,492	60.0%	14,994	40.0%	37,486
Cross Keys	General	Priority General	24,401	65.0%	13,139	35.0%	37,540
Eagles Nest	**Basic**	**General**	0	0.0%	50	100.0%	50
Essex County	Advanced	Advanced	93,146	46.8%	105,759	53.2%	198,905
Flying W	General	General	25,585	65.0%	13,776	35.0%	39,361
Greenwood Lake	General	General	17,714	60.0%	11,809	40.0%	29,523
Hackettstown	Basic	Basic	15,000	78.9%	4,000	21.1%	19,000
Hammonton Municipal	**General**	**Advanced**	7,540	50.0%	7,540	50.0%	15,080
Kroelinger	Basic	Duplicative Basic	1,500	62.5%	900	37.5%	2,400
Lakewood	General	General	10,248	65.0%	5,517	35.0%	15,765
Li Calzi Airpark	Basic	Duplicative Basic	2,500	62.5%	1,500	37.5%	4,000
Lincoln Park	General	Priority General	35,072	60.0%	23,381	40.0%	58,453
Linden Municipal	General	Priority General	20,076	55.0%	16,426	45.0%	36,502
Little Ferry SPB	Specialty	Specialty	40	100.0%	0	0.0%	40
Marlboro	**General**	**Basic**	17,893	65.0%	9,634	35.0%	27,527
Millville Municipal	Advanced	Advanced	28,444	65.0%	15,316	35.0%	43,760
Monmouth Executive	Advanced	Advanced	40,060	70.0%	17,169	30.0%	57,229
Morristown Municipal	Advanced	Advanced	93,025	34.3%	178,049	65.7%	271,074
New Airport-MSA 1	**New**	**Advanced**	-	-	-	-	-
New Airport-MSA 3	**New**	**Advanced**	-	-	-	-	-
Newark Liberty International	Scheduled	Scheduled	0	0.0%	19,750	100.0%	19,750
Newton	Basic	Duplicative Basic	7,487	70.0%	3,208	30.0%	10,695
Ocean City Municipal	Basic	Basic	8,066	40.0%	12,098	60.0%	20,164
Old Bridge	General	General	16,112	65.0%	8,675	35.0%	24,787
Princeton	General	General	30,373	60.0%	20,249	40.0%	50,622
Red Lion	**General**	**Basic**	9,224	60.0%	6,149	40.0%	15,373
Red Wing	Basic	Duplicative Basic	11,000	88.0%	1,500	12.0%	12,500
Robert J. Miller Airpark	Advanced	Advanced	18,000	51.0%	17,267	49.0%	35,267
Rudy's	Basic	Duplicative Basic	100	66.7%	50	33.3%	150
Sky Manor	General	General	15,823	60.0%	10,549	40.0%	26,372
Solberg-Hunterdon	General	Priority General	22,369	60.0%	14,913	40.0%	37,282
Somerset	General	General	24,458	60.0%	16,306	40.0%	40,764
South Jersey Regional	Advanced	Priority General	37,324	62.8%	22,142	37.2%	59,466
Southern Cross	Basic	Duplicative Basic	2,000	62.5%	1,200	37.5%	3,200

Table 9-9
LOCAL AND ITINERANT GENERAL AVIATION OPERATIONS 2000, Continued

Airport Name	Current Role	Recommended Role	2000 Annual General Aviation Operations Local Operations	Percent Local	Itinerant Operations	Percent Itinerant	Total Operations
Spitfire Aerodrome	**Basic**	**General**	7,527	90.0%	836	10.0%	8,363
Sussex	General	General	20,412	60.0%	13,614	40.0%	34,026
Teterboro	Advanced	Advanced	7,497	2.7%	274,795	97.3%	282,292
Trenton-Mercer	Scheduled	Scheduled	66,384	49.8%	66,871	50.2%	133,255
Trenton-Robbinsville	General	General	22,842	76.7%	6,920	23.3%	29,762
Trinca	Basic	Duplicative Basic	9,686	85.0%	1,709	15.0%	11,395
Twin Pine	Basic	Duplicative Basic	8,000	66.7%	4,000	33.3%	12,000
Vineland Downstown	Basic	Basic	14,500	94.5%	850	5.5%	15,350
Woodbine Municipal	General	General	12,513	65.0%	6,738	35.0%	19,250
TOTAL—GENERAL AVIATION OPERATIONS			**926,552**	**46.7%**	**1,055,698**	**53.3%**	**1,982,250**

Sources: New Jersey ASCP; Wilbur Smith Associates.

Note: Tables may not sum to totals due to rounding.

Table 9-10
LOCAL AND ITINERANT GENERAL AVIATION OPERATIONS 2005

			2005 Annual General Aviation Operations				
Airport Name	**Current Role**	**Recommended Role**	**Local Operations**	**Percent Local**	**Itinerant Operations**	**Percent Itinerant**	**Total Operations**
Aeroflex-Andover Field	Basic	Basic	15,540	60.0%	10,360	40.0%	25,900
Alexandria Field	General	General	18,780	60.0%	12,520	40.0%	31,300
Atlantic City International	Scheduled	Scheduled	32,359	50.7%	31,441	49.3%	63,800
Bader Field	Basic	Basic	3,360	30.0%	7,840	70.0%	11,200
Blairstown	General	General	15,420	60.0%	10,280	40.0%	25,700
Bucks	Basic	Basic	900	100.0%	0	0.0%	900
Camden County	Basic	Basic	10,725	65.0%	5,775	35.0%	16,500
Cape May County	**General**	**Advanced**	8,417	39.7%	12,783	60.3%	21,200
Central Jersey Regional	**General**	**Advanced**	25,500	60.0%	17,000	40.0%	42,500
Cross Keys	General	Priority General	26,130	65.0%	14,070	35.0%	40,200
Eagles Nest	**Basic**	**General**	840	60.0%	560	40.0%	1,400
Essex County	Advanced	Advanced	103,446	46.8%	117,454	53.2%	220,900
Flying W	General	General	26,715	65.0%	14,385	35.0%	41,100
Greenwood Lake	General	General	19,320	60.0%	12,880	40.0%	32,200
Hackettstown	Basic	Basic	15,474	78.9%	4,126	21.1%	19,600
Hammonton Municipal	**General**	**Advanced**	8,000	50.0%	8,000	50.0%	16,000
Kroelinger	Basic	Duplicative Basic	1,500	62.5%	900	37.5%	2,400
Lakewood	General	General	11,116	65.0%	5,984	35.0%	17,100
Li Calzi Airpark	Basic	Duplicative Basic	2,500	62.5%	1,500	37.5%	4,000
Lincoln Park	General	Priority General	38,880	60.0%	25,920	40.0%	64,800
Linden Municipal	General	Priority General	25,355	55.0%	20,745	45.0%	46,100
Little Ferry SPB	Specialty	Specialty	0	100.0%	0	0.0%	0
Marlboro	**General**	**Basic**	17,875	65.0%	9,625	35.0%	27,500
Millville Municipal	Advanced	Advanced	29,900	65.0%	16,100	35.0%	46,000
Monmouth Executive	Advanced	Advanced	42,910	70.0%	18,390	30.0%	61,300
Morristown Municipal	Advanced	Advanced	94,715	34.3%	181,285	65.7%	276,000
New Airport-MSA 1	**New**	**Advanced**	0	0.0%	0	0.0%	0
New Airport-MSA 3	**New**	**Advanced**	0	0.0%	0	0.0%	0
Newark Liberty International	Scheduled	Scheduled	0	0.0%	0	0.0%	0
Newton	Basic	Duplicative Basic	7,491	70.0%	3,209	30.0%	10,700
Ocean City Municipal	Basic	Basic	8,480	40.0%	12,720	60.0%	21,200
Old Bridge	General	General	16,965	65.0%	9,135	35.0%	26,100
Princeton	General	General	31,860	60.0%	21,240	40.0%	53,100
Red Lion	**General**	**Basic**	9,240	60.0%	6,160	40.0%	15,400
Red Wing	Basic	Duplicative Basic	11,000	88.0%	1,500	12.0%	12,500
Robert J. Miller Airpark	Advanced	Advanced	19,293	51.0%	18,507	49.0%	37,800
Rudy's	Basic	Duplicative Basic	133	66.7%	67	33.3%	200
Sky Manor	General	General	16,560	60.0%	11,040	40.0%	27,600
Solberg-Hunterdon	General	Priority General	23,880	60.0%	15,920	40.0%	39,800
Somerset	General	General	25,740	60.0%	17,160	40.0%	42,900
South Jersey Regional	Advanced	Priority General	39,103	62.8%	23,197	37.2%	62,300
Southern Cross	Basic	Duplicative Basic	2,000	62.5%	1,200	37.5%	3,200

Table 9-10
LOCAL AND ITINERANT GENERAL AVIATION OPERATIONS 2005, Continued

Airport Name	Current Role	Recommended Role	2005 Annual General Aviation Operations				
			Local Operations	Percent Local	Itinerant Operations	Percent Itinerant	Total Operations
Spitfire Aerodrome	**Basic**	**General**	8,100	90.0%	900	10.0%	9,000
Sussex	General	General	22,376	60.0%	14,924	40.0%	37,300
Teterboro	Advanced	Advanced	7,688	2.7%	281,812	97.3%	289,500
Trenton-Mercer	Scheduled	Scheduled	69,445	49.8%	69,955	50.2%	139,400
Trenton-Robbinsville	General	General	23,792	76.7%	7,208	23.3%	31,000
Trinca	Basic	Duplicative Basic	9,690	85.0%	1,710	15.0%	11,400
Twin Pine	Basic	Duplicative Basic	8,000	66.7%	4,000	33.3%	12,000
Vineland Downstown	Basic	Basic	14,925	94.5%	875	5.5%	15,800
Woodbine Municipal	General	General	13,195	65.0%	7,105	35.0%	20,300
TOTAL—GENERAL AVIATION OPERATIONS			**984,636**	**47.5%**	**1,089,464**	**52.5%**	**2,074,100**

Sources: New Jersey ASCP, Wilbur Smith Associates.

Note: Tables may not sum to totals due to rounding.

Table 9-11
LOCAL AND ITINERANT GENERAL AVIATION OPERATIONS 2010

			2010 Annual General Aviation Operations				
Airport Name	**Current Role**	**Recommended Role**	**Local Operations**	**Percent Local**	**Itinerant Operations**	**Percent Itinerant**	**Total Operations**
Aeroflex-Andover Field	Basic	Basic	16,080	60.0%	10,720	40.0%	26,800
Alexandria Field	General	General	19,440	60.0%	12,960	40.0%	32,400
Atlantic City International	Scheduled	Scheduled	34,033	50.7%	33,067	49.3%	67,100
Bader Field	Basic	Basic	3,540	30.0%	8,260	70.0%	11,800
Blairstown	General	General	17,040	60.0%	11,360	40.0%	28,400
Bucks	Basic	Basic	900	100.0%	0	0.0%	900
Camden County	Basic	Basic	11,050	65.0%	5,950	35.0%	17,000
Cape May County	**General**	**Advanced**	8,854	39.7%	13,446	60.3%	22,300
Central Jersey Regional	**General**	**Advanced**	27,060	60.0%	18,040	40.0%	45,100
Cross Keys	General	Priority General	28,015	65.0%	15,085	35.0%	43,100
Eagles Nest	**Basic**	**General**	1,800	60.0%	1,200	40.0%	3,000
Essex County	Advanced	Advanced	106,256	46.8%	120,644	53.2%	226,900
Flying W	General	General	27,950	65.0%	15,050	35.0%	43,000
Greenwood Lake	General	General	21,120	60.0%	14,080	40.0%	35,200
Hackettstown	Basic	Basic	15,947	78.9%	4,253	21.1%	20,200
Hammonton Municipal	**General**	**Advanced**	8,550	50.0%	8,550	50.0%	17,100
Kroelinger	Basic	Duplicative Basic	1,500	62.5%	900	37.5%	2,400
Lakewood	General	General	12,026	65.0%	6,474	35.0%	18,500
Li Calzi Airpark	Basic	Duplicative Basic	2,500	62.5%	1,500	37.5%	4,000
Lincoln Park	General	Priority General	42,720	60.0%	28,480	40.0%	71,200
Linden Municipal	General	Priority General	25,960	55.0%	21,240	45.0%	47,200
Little Ferry SPB	Specialty	Specialty	0	100.0%	0	0.0%	0
Marlboro	**General**	**Basic**	17,875	65.0%	9,625	35.0%	27,500
Millville Municipal	Advanced	Advanced	31,460	65.0%	16,940	35.0%	48,400
Monmouth Executive	Advanced	Advanced	45,920	70.0%	19,680	30.0%	65,600
Morristown Municipal	Advanced	Advanced	96,191	34.3%	184,109	65.7%	280,300
New Airport-MSA 1	**New**	**Advanced**	3,850	35.0%	7,150	65.0%	11,000
New Airport-MSA 3	**New**	**Advanced**	1,880	40.0%	2,820	60.0%	4,700
Newark Liberty International	Scheduled	Scheduled	0	0.0%	0	100.0%	0
Newton	Basic	Duplicative Basic	7,491	70.0%	3,209	30.0%	10,700
Ocean City Municipal	Basic	Basic	8,920	40.0%	13,380	60.0%	22,300
Old Bridge	General	General	17,485	65.0%	9,415	35.0%	26,900
Princeton	General	General	33,480	60.0%	22,320	40.0%	55,800
Red Lion	**General**	**Basic**	9,240	60.0%	6,160	40.0%	15,400
Red Wing	Basic	Duplicative Basic	11,000	88.0%	1,500	12.0%	12,500
Robert J. Miller Airpark	Advanced	Advanced	20,722	51.0%	19,878	49.0%	40,600
Rudy's	Basic	Duplicative Basic	133	66.7%	67	33.3%	200
Sky Manor	General	General	17,280	60.0%	11,520	40.0%	28,800
Solberg-Hunterdon	General	Priority General	25,080	60.0%	16,720	40.0%	41,800
Somerset	General	General	27,000	60.0%	18,000	40.0%	45,000
South Jersey Regional	Advanced	Priority General	40,860	62.8%	24,240	37.2%	65,100
Southern Cross	Basic	Duplicative Basic	2,000	62.5%	1,200	37.5%	3,200

Table 9-11
LOCAL AND ITINERANT GENERAL AVIATION OPERATIONS 2010, Continued

			2010 Annual General Aviation Operations				
Airport Name	**Current Role**	**Recommended Role**	**Local Operations**	**Percent Local**	**Itinerant Operations**	**Percent Itinerant**	**Total Operations**
Spitfire Aerodrome	**Basic**	**General**	8,550	90.0%	950	10.0%	9,500
Sussex	General	General	24,896	60.0%	16,604	40.0%	41,500
Teterboro	Advanced	Advanced	7,734	2.7%	283,466	97.3%	291,200
Trenton-Mercer	Scheduled	Scheduled	72,484	49.8%	73,016	50.2%	145,500
Trenton-Robbinsville	General	General	24,867	76.7%	7,533	23.3%	32,400
Trinca	Basic	Duplicative Basic	9,690	85.0%	1,710	15.0%	11,400
Twin Pine	Basic	Duplicative Basic	8,000	66.7%	4,000	33.3%	12,000
Vineland Downstown	Basic	Basic	15,303	94.5%	897	5.5%	16,200
Woodbine Municipal	General	General	13,910	65.0%	7,490	35.0%	21,400
TOTAL—GENERAL AVIATION OPERATIONS			**1,035,643**	**47.7%**	**1,134,857**	**52.3%**	**2,170,500**

Sources: New Jersey ASCP, Wilbur Smith Associates.

Note: Tables may not sum to totals due to rounding.

Table 9-12
LOCAL AND ITINERANT GENERAL AVIATION OPERATIONS 2020

Airport Name	Current Role	Recommended Role	2020 Annual General Aviation Operations: Local Operations	Percent Local	Itinerant Operations	Percent Itinerant	Total Operations
Aeroflex-Andover Field	Basic	Basic	17,400	60.0%	11,600	40.0%	29,000
Alexandria Field	General	General	20,340	60.0%	13,560	40.0%	33,900
Atlantic City International	Scheduled	Scheduled	37,583	50.7%	36,517	49.3%	74,100
Bader Field	Basic	Basic	3,930	30.0%	9,170	70.0%	13,100
Blairstown	General	General	20,280	60.0%	13,520	40.0%	33,800
Bucks	Basic	Basic	1,000	100.0%	0	0.0%	1,000
Camden County	Basic	Basic	11,830	65.0%	6,370	35.0%	18,200
Cape May County	**General**	**Advanced**	9,767	39.7%	14,833	60.3%	24,600
Central Jersey Regional	**General**	**Advanced**	30,781	60.0%	20,519	40.0%	51,300
Cross Keys	General	Priority General	32,110	65.0%	17,290	35.0%	49,400
Eagles Nest	**Basic**	**General**	3,840	60.0%	2,560	40.0%	6,400
Essex County	Advanced	Advanced	111,688	46.8%	126,812	53.2%	238,500
Flying W	General	General	30,420	65.0%	16,380	35.0%	46,800
Greenwood Lake	General	General	25,440	60.0%	16,960	40.0%	42,400
Hackettstown	Basic	Basic	17,211	78.9%	4,589	21.1%	21,800
Hammonton Municipal	**General**	**Advanced**	9,550	50.0%	9,550	50.0%	19,100
Kroelinger	Basic	Duplicative Basic	1,500	62.5%	900	37.5%	2,400
Lakewood	General	General	13,911	65.0%	7,489	35.0%	21,400
Li Calzi Airpark	Basic	Duplicative Basic	2,500	62.5%	1,500	37.5%	4,000
Lincoln Park	General	Priority General	52,980	60.0%	35,320	40.0%	88,300
Linden Municipal	General	Priority General	27,115	55.0%	22,185	45.0%	49,300
Little Ferry SPB	Specialty	Specialty	0	100.0%	0	0.0%	0
Marlboro	**General**	**Basic**	17,875	65.0%	9,625	35.0%	27,500
Millville Municipal	Advanced	Advanced	34,775	65.0%	18,725	35.0%	53,500
Monmouth Executive	Advanced	Advanced	52,710	70.0%	22,590	30.0%	75,300
Morristown Municipal	Advanced	Advanced	98,799	34.3%	189,101	65.7%	287,900
New Airport-MSA 1	**New**	**Advanced**	12,600	35.0%	23,400	65.0%	36,000
New Airport-MSA 3	**New**	**Advanced**	8,520	40.0%	12,780	60.0%	21,300
Newark Liberty International	Scheduled	Scheduled	0	0.0%	0	100.0%	0
Newton	Basic	Duplicative Basic	7,491	70.0%	3,209	30.0%	10,700
Ocean City Municipal	Basic	Basic	9,880	40.0%	14,820	60.0%	24,700
Old Bridge	General	General	18,396	65.0%	9,904	35.0%	28,300
Princeton	General	General	35,400	60.0%	23,600	40.0%	59,000
Red Lion	**General**	**Basic**	9,240	60.0%	6,160	40.0%	15,400
Red Wing	Basic	Duplicative Basic	11,000	88.0%	1,500	12.0%	12,500
Robert J. Miller Airpark	Advanced	Advanced	23,733	51.0%	22,767	49.0%	46,500
Rudy's	Basic	Duplicative Basic	133	66.7%	67	33.3%	200
Sky Manor	General	General	18,180	60.0%	12,120	40.0%	30,300
Solberg-Hunterdon	General	Priority General	27,900	60.0%	18,600	40.0%	46,500
Somerset	General	General	28,500	60.0%	19,000	40.0%	47,500
South Jersey Regional	Advanced	Priority General	44,563	62.8%	26,437	37.2%	71,000
Southern Cross	Basic	Duplicative Basic	2,000	62.5%	1,200	37.5%	3,200

Table 9-12
LOCAL AND ITINERANT GENERAL AVIATION OPERATIONS 2020, Continued

Airport Name	Current Role	Recommended Role	2020 Annual General Aviation Operations				
			Local Operations	Percent Local	Itinerant Operations	Percent Itinerant	Total Operations
Spitfire Aerodrome	**Basic**	**General**	9,990	90.0%	1,110	10.0%	11,100
Sussex	General	General	28,915	60.0%	19,285	40.0%	48,200
Teterboro	Advanced	Advanced	7,811	2.7%	286,289	97.3%	294,100
Trenton-Mercer	Scheduled	Scheduled	78,811	49.8%	79,389	50.2%	158,200
Trenton-Robbinsville	General	General	27,169	76.7%	8,231	23.3%	35,400
Trinca	Basic	Duplicative Basic	9,690	85.0%	1,710	15.0%	11,400
Twin Pine	Basic	Duplicative Basic	8,000	66.7%	4,000	33.3%	12,000
Vineland Downstown	Basic	Basic	16,436	94.5%	964	5.5%	17,400
Woodbine Municipal	General	General	15,340	65.0%	8,260	35.0%	23,600
TOTAL—GENERAL AVIATION OPERATIONS			**1,145,034**	**48.2%**	**1,232,466**	**51.8%**	**2,377,500**

Sources: New Jersey ASCP, Wilbur Smith Associates.

Note: Tables may not sum to totals due to rounding.

Table 9-13
EXISTING GENERAL AVIATION OPERATIONS BY EQUIPMENT TYPE

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Total Operations
Aeroflex-Andover Field	22,343	1,241	0	1,241	0	24,826
Alexandria Field	26,877	1,493	0	1,493	0	29,863
Atlantic City International	18,191	18,191	12,127	12,127	0	60,635
Bader Field	7,478	320	0	2,884	0	10,683
Blairstown	19,905	1,394	0	929	1,000	23,228
Bucks	864	36	0	0	0	900
Camden County	12,107	2,260	161	1,614	0	16,143
Cape May County	6,865	6,058	6,058	202	1,010	20,192
Central Jersey Regional	22,492	11,246	1,874	1,874	0	37,486
Cross Keys	33,786	1,877	0	1,877	0	37,540
Eagles Nest	50	0	0	0	0	50
Essex County	149,179	29,836	1,989	17,901	0	198,905
Flying W	33,850	3,542	0	1,968	0	39,361
Greenwood Lake	25,095	2,952	0	738	738	29,523
Hackettstown	19,000	0	0	0	0	19,000
Hammonton Municipal	10,405	3,016	0	1,508	151	15,080
Kroelinger	2,400	0	0	0	0	2,400
Lakewood	14,661	631	158	158	158	15,765
Li Calzi Airpark	4,000	0	0	0	0	4,000
Lincoln Park	52,608	4,676	0	1,169	0	58,453
Linden Municipal	18,251	5,475	3,650	9,126	0	36,502
Little Ferry SPB	40	0	0	0	0	40
Marlboro	26,426	275	0	826	0	27,527
Millville Municipal	24,068	13,128	4,376	2,188	0	43,760
Monmouth Executive	34,337	13,735	8,012	1,145	0	57,229
Morristown Municipal	181,620	37,950	32,529	18,975	0	271,074
New Airport-MSA 1	0	0	0	0	0	0
New Airport-MSA 3	0	0	0	0	0	0
Newark Liberty International	988	988	14,813	2,963	0	19,750
Newton	10,588	107	0	0	0	10,695
Ocean City Municipal	17,946	1,008	0	1,008	202	20,164
Old Bridge	18,095	3,718	496	2,479	0	24,787
Princeton	40,498	5,062	2,531	2,531	0	50,622
Red Lion	13,836	1,230	0	307	0	15,373
Red Wing	12,500	0	0	0	0	12,500
Robert J. Miller Airpark	26,098	5,643	2,116	1,058	353	35,267
Rudy's	120	0	0	0	30	150
Sky Manor	24,262	1,055	0	527	527	26,372
Solberg-Hunterdon	36,164	932	0	0	186	37,282
Somerset	18,140	14,267	0	8,153	204	40,764
South Jersey Regional	51,141	5,947	595	1,189	595	59,466
Southern Cross	3,200	0	0	0	0	3,200
Spitfire Aerodrome	5,854	418	0	2,091	0	8,363

Table 9-13
EXISTING GENERAL AVIATION OPERATIONS BY EQUIPMENT TYPE, Continued

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Total Operations
Sussex	30,453	3,062	170	170	170	34,026
Teterboro	67,750	25,406	169,375	19,760	0	282,292
Trenton-Mercer	41,975	72,491	16,257	2,532	0	133,255
Trenton-Robbinsville	26,488	2,381	298	298	298	29,762
Trinca	11,053	228	0	0	114	11,395
Twin Pine	11,520	120	0	120	240	12,000
Vineland Downstown	13,048	1,535	0	768	0	15,350
Woodbine Municipal	18,480	385	0	193	193	19,250
TOTAL—GENERAL AVIATION OPERATIONS	**1,267,093**	**305,316**	**277,584**	**126,090**	**6,167**	**1,982,250**

Sources: Airport Management Records, Wilbur Smith Associates.

Note: Tables may not sum to totals due to rounding.

Table 9-14
PROJECTED GENERAL AVIATION OPERATIONS BY EQUIPMENT TYPE 2005

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Total Operations
Aeroflex-Andover Field	23,300	1,300	0	1,300	0	25,900
Alexandria Field	28,200	1,500	0	1,600	0	31,300
Atlantic City International	19,400	18,500	13,400	12,600	0	63,900
Bader Field	9,900	400	0	3,700	0	14,000
Blairstown	20,600	1,500	0	1,000	1,100	24,200
Bucks	800	100	0	0	0	900
Camden County	12,300	2,300	200	1,600	100	16,500
Cape May County	10,400	9,200	10,000	300	1,600	31,500
Central Jersey Regional	25,800	11,700	2,000	2,100	400	42,000
Cross Keys	36,300	2,000	0	2,000	0	40,300
Eagles Nest	1,400	400	0	0	0	1,800
Essex County	164,500	30,700	7,000	18,700	0	220,900
Flying W	35,400	3,600	0	2,100	0	41,100
Greenwood Lake	26,100	3,000	0	800	800	30,700
Hackettstown	19,600	0	0	0	0	19,600
Hammonton Municipal	18,300	5,300	800	2,700	300	27,400
Kroelinger	2,400	0	0	0	0	2,400
Lakewood	24,800	1,100	300	300	300	26,800
Li Calzi Airpark	4,000	0	0	0	0	4,000
Lincoln Park	56,100	5,000	400	1,300	0	62,800
Linden Municipal	43,300	11,100	8,100	17,800	0	80,300
Little Ferry SPB	0	0	0	0	0	0
Marlboro	23,900	300	0	800	0	25,000
Millville Municipal	23,300	12,600	4,600	2,100	0	42,600
Monmouth Executive	42,700	16,500	10,200	1,500	0	70,900
Morristown Municipal	187,100	39,100	34,900	21,400	0	282,500
New Airport-MSA 1	0	0	0	0	0	0
New Airport-MSA 3	0	0	0	0	0	0
Newark Liberty International	0	0	0	0	0	0
Newton	10,600	100	0	0	0	10,700
Ocean City Municipal	17,100	900	0	900	200	19,100
Old Bridge	19,300	3,800	500	2,500	0	26,100
Princeton	42,800	5,100	2,600	2,600	0	53,100
Red Lion	13,700	1,200	0	300	0	15,200
Red Wing	12,500	0	0	0	0	12,500
Robert J. Miller Airpark	27,900	6,000	2,400	1,100	400	37,800
Rudy's	200	0	0	0	0	200
Sky Manor	25,300	1,100	0	600	600	27,600
Solberg-Hunterdon	38,600	1,000	0	0	200	39,800
Somerset	19,700	14,400	0	8,500	300	42,900
South Jersey Regional	53,300	6,200	700	1,500	600	62,300
Southern Cross	3,200	0	0	0	0	3,200
Spitfire Aerodrome	6,100	500	0	2,300	0	8,900

Table 9-14
PROJECTED GENERAL AVIATION OPERATIONS BY EQUIPMENT TYPE 2005, Continued

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Total Operations
Sussex	31,400	3,400	400	300	300	35,800
Teterboro	72,100	25,500	172,100	19,800	0	289,500
Trenton-Mercer	44,600	73,800	18,100	2,800	0	139,300
Trenton-Robbinsville	27,600	2,500	300	300	300	31,000
Trinca	11,100	200	0	0	100	11,400
Twin Pine	11,500	100	0	100	300	12,000
Vineland Downstown	13,400	1,600	0	800	0	15,800
Woodbine Municipal	15,900	300	0	200	200	16,600
TOTAL—GENERAL AVIATION OPERATIONS	**1,377,800**	**324,900**	**289,000**	**140,300**	**8,100**	**2,074,100**

Sources: Airport Management Records, Wilbur Smith Associates.

Note: Tables may not sum to totals due to rounding.

Table 9-15
PROJECTED GENERAL AVIATION OPERATIONS BY EQUIPMENT TYPE 2010

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Total Operations
Aeroflex-Andover Field	24,200	1,300	0	1,300	0	26,800
Alexandria Field	29,200	1,500	0	1,700	0	32,400
Atlantic City International	20,400	18,900	14,700	13,100	0	67,100
Bader Field	7,600	400	0	3,800	0	11,800
Blairstown	24,600	1,600	0	1,100	1,100	28,400
Bucks	800	100	0	0	0	900
Camden County	12,700	2,300	200	1,600	200	17,000
Cape May County	-200	9,500	11,000	300	1,700	22,300
Central Jersey Regional	27,700	12,100	2,200	2,300	800	45,100
Cross Keys	38,900	2,100	0	2,100	0	43,100
Eagles Nest	2,500	500	0	0	0	3,000
Essex County	164,600	31,500	11,300	19,500	0	226,900
Flying W	37,100	3,700	0	2,200	0	43,000
Greenwood Lake	30,600	3,000	0	800	800	35,200
Hackettstown	20,200	0	0	0	0	20,200
Hammonton Municipal	7,400	5,400	1,600	2,400	300	17,100
Kroelinger	2,400	0	0	0	0	2,400
Lakewood	16,400	1,200	300	300	300	18,500
Li Calzi Airpark	4,000	0	0	0	0	4,000
Lincoln Park	63,800	5,300	700	1,400	0	71,200
Linden Municipal	11,100	11,700	9,200	15,200	0	47,200
Little Ferry SPB	0	0	0	0	0	0
Marlboro	26,400	300	0	800	0	27,500
Millville Municipal	28,000	13,100	5,100	2,200	0	48,400
Monmouth Executive	35,700	17,100	11,200	1,600	0	65,600
Morristown Municipal	178,900	40,300	37,300	23,800	0	280,300
New Airport-MSA 1	3,700	1,800	4,800	700	0	11,000
New Airport-MSA 3	1,400	700	2,300	300	0	4,700
Newark Liberty International	0	0	0	0	0	0
Newton	10,600	100	0	0	0	10,700
Ocean City Municipal	20,300	900	0	900	200	22,300
Old Bridge	19,900	3,900	500	2,600	0	26,900
Princeton	45,200	5,200	2,700	2,700	0	55,800
Red Lion	13,900	1,200	0	300	0	15,400
Red Wing	12,500	0	0	0	0	12,500
Robert J. Miller Airpark	30,200	6,300	2,600	1,100	400	40,600
Rudy's	200	0	0	0	0	200
Sky Manor	26,500	1,100	0	600	600	28,800
Solberg-Hunterdon	40,500	1,100	0	0	200	41,800
Somerset	21,300	14,500	0	8,800	400	45,000
South Jersey Regional	55,200	6,500	900	1,800	700	65,100
Southern Cross	3,200	0	0	0	0	3,200
Spitfire Aerodrome	6,500	500	0	2,500	0	9,500

Table 9-15
PROJECTED GENERAL AVIATION OPERATIONS BY EQUIPMENT TYPE 2010, Continued

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Total Operations
Sussex	36,200	3,800	700	400	400	41,500
Teterboro	70,900	25,600	174,800	19,900	0	291,200
Trenton-Mercer	47,200	75,200	20,000	3,100	0	145,500
Trenton-Robbinsville	28,900	2,600	300	300	300	32,400
Trinca	11,100	200	0	0	100	11,400
Twin Pine	11,500	100	0	100	300	12,000
Vineland Downstown	13,800	1,600	0	800	0	16,200
Woodbine Municipal	20,700	300	0	200	200	21,400
TOTAL—BASED AIRCRAFT	**1,366,400**	**336,100**	**314,400**	**144,600**	**9,000**	**2,170,500**

Sources: Airport Management Records, Wilbur Smith Associates.

Note: Tables may not sum to totals due to rounding.

Table 9-16
PROJECTED GENERAL AVIATION OPERATIONS BY EQUIPMENT TYPE 2020

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Total Operations
Aeroflex-Andover Field	26,100	1,400	0	1,400	0	29,000
Alexandria Field	30,500	1,600	0	1,900	0	33,900
Atlantic City International	23,100	19,600	17,300	14,200	0	74,100
Bader Field	8,500	500	0	4,100	0	13,100
Blairstown	29,600	1,700	0	1,400	1,200	33,800
Bucks	900	100	0	0	0	1,000
Camden County	13,600	2,300	200	1,700	500	18,200
Cape May County	-500	10,000	12,900	400	1,800	24,600
Central Jersey Regional	31,600	13,000	2,500	2,600	1,600	51,300
Cross Keys	44,900	2,300	0	2,300	0	49,400
Eagles Nest	5,700	700	0	0	0	6,400
Essex County	164,500	33,100	19,800	21,100	0	238,500
Flying W	40,600	3,900	0	2,300	0	46,800
Greenwood Lake	37,600	3,100	0	900	900	42,400
Hackettstown	21,800	0	0	0	0	21,800
Hammonton Municipal	8,100	5,700	3,300	1,700	300	19,100
Kroelinger	2,400	0	0	0	0	2,400
Lakewood	19,200	1,300	300	300	300	21,400
Li Calzi Airpark	4,000	0	0	0	0	4,000
Lincoln Park	79,500	5,800	1,400	1,500	0	88,300
Linden Municipal	14,900	13,000	11,400	10,100	0	49,300
Little Ferry SPB	0	0	0	0	0	0
Marlboro	24,000	300	0	800	0	27,500
Millville Municipal	30,900	14,100	6,200	2,300	0	53,500
Morristown Municipal	42,000	18,300	13,200	1,900	0	75,300
Monmouth Executive	174,600	42,600	42,100	28,600	0	287,900
New Airport-MSA 1	13,900	5,400	14,500	2,200	0	36,000
New Airport-MSA 3	11,200	2,100	7,000	1,000	0	21,300
Newark Liberty International	0	0	0	0	0	0
Newton	10,600	100	0	0	0	10,700
Ocean City Municipal	22,400	1,000	0	1,000	300	24,700
Old Bridge	20,800	4,200	600	2,700	0	28,300
Princeton	47,900	5,400	2,900	2,900	0	59,000
Red Lion	13,900	1,200	0	300	0	15,400
Red Wing	12,500	0	0	0	0	12,500
Robert J. Miller Airpark	34,900	6,900	3,100	1,200	500	46,500
Rudy's	100	0	0	0	0	200
Sky Manor	27,800	1,100	0	700	700	30,300
Solberg-Hunterdon	45,000	1,200	0	0	300	46,500
Somerset	22,800	14,800	0	9,400	500	47,500
South Jersey Regional	59,300	7,100	1,200	2,500	800	71,000
Southern Cross	3,200	0	0	0	0	3,200
Spitfire Aerodrome	7,600	600	0	2,800	0	11,100

Table 9-16
PROJECTED GENERAL AVIATION OPERATIONS BY EQUIPMENT TYPE 2020, Continued

Airport Name	Single Engine	Multi Engine	Jet	Helicopter	Other	Total Operations
Sussex	41,300	4,600	1,200	500	600	48,200
Teterboro	67,800	25,900	180,300	20,100	0	294,100
Trenton-Mercer	52,900	77,900	23,800	3,600	0	158,200
Trenton-Robbinsville	31,500	2,700	400	400	400	35,400
Trinca	11,100	200	0	0	100	11,400
Twin Pine	11,400	100	0	100	300	12,000
Vineland Downstown	14,800	1,700	0	800	0	17,400
Woodbine Municipal	22,600	400	0	300	300	23,600
TOTAL—BASED AIRCRAFT	**1,485,400**	**359,000**	**365,600**	**154,000**	**11,400**	**2,377,500**

Sources: Airport Management Records, Wilbur Smith Associates.

Note: Tables may not sum to totals due to rounding.

IV. COMMERCIAL AIR SERVICE PROJECTIONS

This section presents commercial air service projections for New Jersey system airports. Three airports, namely, Newark Liberty International Airport, Atlantic City International Airport, and Trenton-Mercer Airport, provide scheduled commercial service in New Jersey. Commercial airline activity has been projected in terms of passenger enplanements and airline operations. Historic and projected U.S. commercial service trends are discussed in detail in Chapter Two, Trends. The projections presented below for Newark Liberty International have been derived from forecasts prepared by the Port Authority of New York and New Jersey. The FAA (in their *Terminal Area Forecasts*) developed the projections of enplanements and commercial service operations for Trenton-Mercer and Atlantic City International. The forecasts presented in this section have been extrapolated through the 2020 planning period. These projections were developed prior to September 11, 2001.

A. Newark Liberty International Airport

Between 1990 and 2000, New Jersey's total statewide enplanements increased from 11.0 million to 17.6 million. (See **Table 9-17**.) This represents an average increase of 4.8 percent per year. Newark Liberty International Airport accounted for 97 percent of all passengers enplaned in New Jersey
in 2000. According to Airports Council International (ACI), Newark Liberty International ranked as the 18th largest airport in the world in terms of total enplanements. In 2000, 36 scheduled carriers (including 19 international carriers) provided nonstop service to over 130 destinations worldwide
from Newark Liberty International. Continental Airlines, the airport's largest carrier, enplaned over half of the airport's passengers in 2000.

Commercial service operations at Newark Liberty International grew at a rate less than that experienced by enplanements between 1990 and 2000. Commercial service operations reached 430,000 by 2000, up from 357,000 in 1990. This represents an average annual rate of growth of

1.9 percent. The reasons for the lower rate of growth experienced by operations, when compared to enplanements, can be attributed to increased carrier load factors and the replacement of smaller planes with larger aircraft on certain routes.

Table 9-17
HISTORIC AND PROJECTED COMMERCIAL SERVICE ACTIVITY AT NEWARK LIBERTY INTERNATIONAL AIRPORT

Year	Enplanements	Commercial Service Operations
Historic		
1990	10,559,539	356,951
1991	10,501,990	356,541
1992	12,106,968	389,180
1993	12,842,360	417,175
1994	13,938,498	415,352
1995	13,321,698	399,622
1996	14,578,337	431,391
1997	15,506,382	442,988
1998	16,329,803	435,871
1999	16,837,163	437,543
2000	17,098,556	430,437
Projected		
2005	19,467,500	446,000
2010	21,997,000	461,000
2020*	28,084,713	492,530

Source: Port Authority of New York & New Jersey, Aviation Department, Industry Forecasting.
Notes: Projections were made prior to the events of September 11, 2001.
*Extrapolated.

The projections of enplanements and commercial service operations at Newark Liberty International presented in Table 9-17 were prepared by the Aviation Department of the Port Authority of New York and New Jersey. The data presented were developed as part of their ten year long-range forecast; these projections reflect a moderate growth scenario. Annual total enplanements are projected to reach nearly 22 million by 2010. This represents an average annual rate of growth of 2.6 percent between 2000 and 2010. Commercial service operations are projected to grow at 0.8 percent per year on average between 2000 and 2010, reaching 461,000 by 2010. The projections for 2020 have been extrapolated based on the growth projected for enplanements and commercial service operations between 2000 and 2010.

B. Atlantic City International Airport

Table 9-18 presents the historic and projected enplaned passengers and commercial service operations at Atlantic City International. Atlantic City International, the second largest airport in New Jersey (ranked by enplanements) actually experienced a decline in enplanements and commercial service operations between 1990 and 2000. In 2000, 416,000 passengers enplaned flights at Atlantic City, down from 452,000 in 1990. Enplanements peaked in 1998, exceeding 516,000 passenger boardings annually. Except for 1992, between 24,000 and 29,000 annual commercial service operations occurred at Atlantic City International. In 1992, scheduled carriers performed over 35,000 commercial service operations. In 2000, two carriers provided nonstop scheduled commercial service at the airport, including US Airways Express to Baltimore and Philadelphia and Spirit Airlines to various destinations in Florida. By comparison, six carriers provided nonstop service at the airport ten years earlier.

Table 9-18
HISTORIC AND PROJECTED COMMERCIAL SERVICE ACTIVITY AT ATLANTIC CITY INTERNATIONAL AIRPORT

Year	Enplanements	Commercial Service Operations
Historic		
1990	451,840	28,447
1991	427,595	26,802
1992	451,324	35,270
1993	442,663	29,348
1994	408,827	26,446
1995	367,892	24,257
1996	376,379	25,537
1997	446,627	28,739
1998	516,050	28,974
1999	501,690	27,247
2000	415,514	27,229
Projected		
2005	434,619	27,991
2010	467,186	28,620
2020*	534,710	29,892

Source: FAA, *Terminal Area Forecasts*.
Notes: Projections were made prior to the events of September 11, 2001.
*Extrapolated.

Using the growth rates provided by the FAA's Terminal Area Forecasts, enplanements at Atlantic City International are projected to reach 535,000 by 2020.[1] This represents an average annual growth rate of 1.3 percent. Commercial service operations are projected to grow at a lower rate over the forecast period. Commercial service operations at Atlantic City International are expected to reach nearly 30,000 annually by 2020. This represents 0.5 percent growth per year on average between 2000 and 2020.

C. Trenton-Mercer Airport

Table 9-19 reflects the historic and projected commercial service operations for Trenton-Mercer Airport. Commercial service activity fluctuated at the airport between 1990 and 2000. In the early 1990s, USAir and USAir Express served the market. However, these carriers ceased nearly all commercial operations by 1994, when less than 2,000 passengers boarded scheduled commercial airlines. In 1996, a low fare carrier, Eastwind Airlines began serving the airport with scheduled jet service to several destinations including, Boston and Greensboro. Enplanements at Trenton-Mercer peaked in 1998; over 86,000 passengers boarded Eastwind

[1] Atlantic City International is currently preparing a master plan update. However, projections from the master plan were not available when the SASP was prepared.

Airlines. By 1999, Eastwind Airlines discontinued all scheduled service. Although another carrier, Shuttle America, entered the market about the same time that Eastwind exited, the level of passenger enplanements dropped. In 2000, 66,000 passengers boarded scheduled flights at Trenton-Mercer.

Table 9-19
HISTORIC AND PROJECTED SCHEDULED COMMERCIAL SERVICE ACTIVITY AT TRENTON-MERCER AIRPORT

Year	Enplanements	Commercial Service Operations
Historic		
1990	9,653	3,993
1991	10,346	4,229
1992	29,845	5,958
1993	6,782	2,661
1994	1,864	1,696
1995	4,569	1,739
1996	70,074	4,003
1997	76,609	4,189
1998	86,389	4,506
1999	75,764	5,431
2000	66,138	9,094
Projected		
2005	73,830	9,571
2010	81,523	10,026
2020*	97,635	10,957

Source: FAA, *Terminal Area Forecasts*.
Notes: Projections were made prior to the events of September 11, 2001.
*Extrapolated.

Projections of commercial service activity at Trenton Mercer were developed by the FAA in the *Terminal Area Forecasts*. Enplanements at Trenton-Mercer are projected to grow 2.0 percent per year on average, reaching nearly 98,000 by 2020. Commercial service operations are projected to grow at a rate slightly less than enplanements. Operations are expected to reach almost 11,000 annually by 2020. Trenton-Mercer Airport currently has an Environmental Assessment underway. Included in this analysis is a terminal expansion. If the terminal expansion is approved and constructed, the airport will be able to accommodate additional commercial service activity. The forecast presented above did not take into account potential demand from projects included in the Environmental Assessment.

V. MILITARY OPERATIONS

Military operations were specifically identified for those system airports that have reported over 500 annual military operations. In 2000, four airports in New Jersey accommodated over 500 military operations. The airports in New Jersey with over 500 annual military operations are as follows:

Atlantic City International	40,809
Morristown Municipal	5,000
Trenton Mercer	5,707
Robert J. Miller Airpark	2,000

The number of annual military operations at New Jersey airports is not projected to increase during the forecast period. Military activity varies with the political climate and variation in government funding. Military activity was assumed to remain constant throughout the planning period. Projections of military operations are presented in **Table 9-20**. This table also summarizes the activity projections for each system airport.

VI. SUMMARY

This chapter has presented forecasts of aviation activity for New Jersey, including based aircraft, general aviation operations, enplanements, commercial service operations, and military operations. Table 9-20 presents a summary of each airport's total annual operations projections, including general aviation, commercial, and military activity. The projections provided in this chapter are considered planning estimates and are based on information gathered from available sources. These projections were generated to a system planning rather than master planning, level of detail. Comprehensive airport development plans will continue to provide guidance for each airport's actual development; individual airport plans are developed from an examination of each airport's local conditions and its unique operating environment.

Table 9-20
PROJECTIONS OF AVIATION ACTIVITY, BY AIRPORT

Airport Name	Associated City	Aircraft	GA Operations	Commercial Operations	Military Operations	Total Operations
Aeroflex-Andover Field	Andover					
	2000	54	24,826	0	0	24,826
	2005	55	25,900	0	0	25,900
	2010	56	26,800	0	0	26,800
	2020	58	29,000	0	0	29,000
Alexandria Field	Pittstown					
	2000	97	29,863	0	0	29,863
	2005	101	31,300	0	0	31,300
	2010	104	32,400	0	0	32,400
	2020	108	33,900	0	0	33,900
Atlantic City International	Atlantic City					
	2000	29	60,635	27,229	40,809	128,673
	2005	30	63,800	28,000	40,800	132,600
	2010	31	67,100	28,600	40,800	136,500
	2020	33	74,100	29,900	40,800	144,800
Bader Field	Atlantic City					
	2000	13	10,683	0	0	10,683
	2005	13	11,200	0	0	11,200
	2010	14	11,800	0	0	11,800
	2020	15	13,100	0	0	13,100

Table 9-20
PROJECTIONS OF AVIATION ACTIVITY, BY AIRPORT, Continued

Airport Name	Associated City	Aircraft	GA Operations	Commercial Operations	Military Operations	Total Operations
Blairstown	Blairstown					
	2000	159	23,228	0	0	23,228
	2005	163	25,700	0	0	25,700
	2010	168	28,400	0	0	28,400
	2020	177	33,800	0	0	33,800
Bucks	Bridgeton					
	2000	28	900	0	0	900
	2005	29	900	0	0	900
	2010	30	900	0	0	900
	2020	32	1,000	0	0	1,000
Camden County	Berlin					
	2000	52	16,143	0	0	16,143
	2005	53	16,500	0	0	16,500
	2010	54	17,000	0	0	17,000
	2020	56	18,200	0	0	18,200
Cape May County	Wildwood					
	2000	71	20,192	0	0	20,192
	2005	73	21,200	0	0	21,200
	2010	76	22,300	0	0	22,300
	2020	81	24,600	0	0	24,600
Central Jersey Regional	Manville					
	2000	111	37,486	0	0	37,486
	2005	123	42,500	0	0	42,500
	2010	130	45,100	0	0	45,100
	2020	145	51,300	0	0	51,300
Cross Keys	Cross Keys					
	2000	62	37,540	0	0	37,540
	2005	66	40,200	0	0	40,200
	2010	70	43,100	0	0	43,100
	2020	80	49,400	0	0	49,400
Eagles Nest	West Creek					
	2000	2	50	0	0	50
	2005	5	1,400	0	0	1,400
	2010	9	3,000	0	0	3,000
	2020	19	6,400	0	0	6,400
Essex County	Caldwell					
	2000	399	198,905	0	0	198,905
	2005	420	220,900	0	0	220,900
	2010	420	226,900	0	0	226,900
	2020	420	238,500	0	0	238,500
Flying W	Lumberton					
	2000	82	39,361	0	0	39,361
	2005	85	41,100	0	0	41,100
	2010	87	43,000	0	0	43,000
	2020	93	46,800	0	0	46,800

Table 9-20
PROJECTIONS OF AVIATION ACTIVITY, BY AIRPORT, Continued

Airport Name	Associated City	Aircraft	GA Operations	Commercial Operations	Military Operations	Total Operations
Greenwood Lake	West Milford					
	2000	57	29,523	0	0	29,523
	2005	61	32,200	0	0	32,200
	2010	66	35,200	0	0	35,200
	2020	77	42,400	0	0	42,400
Hackettstown	Hackettstown					
	2000	54	19,000	0	0	19,000
	2005	55	19,600	0	0	19,600
	2010	56	20,200	0	0	20,200
	2020	58	21,800	0	0	21,800
Hammonton Municipal	Hammonton					
	2000	67	15,080	0	0	15,080
	2005	69	16,000	0	0	16,000
	2010	72	17,100	0	0	17,100
	2020	77	19,100	0	0	19,100
Kroelinger	Vineland					
	2000	3	2,400	0	0	2,400
	2005	3	2,400	0	0	2,400
	2010	3	2,400	0	0	2,400
	2020	3	2,400	0	0	2,400
Lakewood	Lakewood					
	2000	83	15,765	0	0	15,765
	2005	87	17,100	0	0	17,100
	2010	91	18,500	0	0	18,500
	2020	100	21,400	0	0	21,400
Li Calzi Airpark	Bridgeton					
	2000	3	4,000	0	0	4,000
	2005	3	4,000	0	0	4,000
	2010	3	4,000	0	0	4,000
	2020	3	4,000	0	0	4,000
Lincoln Park	Lincoln Park					
	2000	104	58,453	0	0	58,453
	2005	112	64,800	0	0	64,800
	2010	120	71,200	0	0	71,200
	2020	139	88,300	0	0	88,300
Linden Municipal	Linden					
	2000	129	36,502	0	0	36,502
	2005	136	46,100	0	0	46,100
	2010	136	47,200	0	0	47,200
	2020	136	49,300	0	0	49,300
Little Ferry SPB	Little Ferry					
	2000	0	40	0	0	40
	2005	0	40	0	0	40
	2010	0	40	0	0	40

Table 9-20
PROJECTIONS OF AVIATION ACTIVITY, BY AIRPORT, Continued

Airport Name	Associated City	Aircraft	GA Operations	Commercial Operations	Military Operations	Total Operations
	2020	0	40	0	0	40
Marlboro	Morganville					
	2000	91	27,527	0	0	27,527
	2005	91	27,500	0	0	27,500
	2010	91	27,500	0	0	27,500
	2020	91	27,500	0	0	27,500
Millville Municipal	Millville					
	2000	98	43,760	0	0	43,760
	2005	101	46,000	0	0	46,000
	2010	105	48,400	0	0	48,400
	2020	111	53,500	0	0	53,500
Monmouth Executive	Belmar/Farmington					
	2000	219	57,229	0	0	57,229
	2005	231	61,300	0	0	61,300
	2010	244	65,600	0	0	65,600
	2020	271	75,300	0	0	75,300
Morristown Municipal	Morristown					
	2000	325	271,074	0	5,000	276,074
	2005	330	276,000	0	5,000	281,000
	2010	334	280,300	0	5,000	285,300
	2020	340	287,900	0	5,000	292,900
New Airport-MSA 1	Bergen County					
	2000	0	0	0	0	0
	2005	0	0	0	0	0
	2010	15	11,000	0	0	11,000
	2020	47	36,000	0	0	36,000
New Airport-MSA 3	Middlesex County					
	2000	0	0	0	0	0
	2005	0	0	0	0	0
	2010	14	4,700	0	0	4,700
	2020	62	21,300	0	0	21,300
Newark Liberty International	Newark					
	2000	12	19,750	430,437	0	450,187
	2005	0	0	446,000	0	446,000
	2010	0	0	461,000	0	461,000
	2020	0	0	492,500	0	492,500
Newton	Andover Township					
	2000	9	10,695	0	0	10,695
	2005	9	10,700	0	0	10,700
	2010	9	10,700	0	0	10,700
	2020	9	10,700	0	0	10,700
Ocean City Municipal	Ocean City					
	2000	29	20,164	0	0	20,164
	2005	30	21,200	0	0	21,200
	2010	31	22,300	0	0	22,300

Table 9-20
PROJECTIONS OF AVIATION ACTIVITY, BY AIRPORT, Continued

Airport Name	Associated City	Aircraft	GA Operations	Commercial Operations	Military Operations	Total Operations
	2020	33	24,700	0	0	24,700
Old Bridge	Old Bridge					
	2000	94	24,787	0	0	24,787
	2005	100	26,100	0	0	26,100
	2010	105	26,900	0	0	26,900
	2020	113	28,300	0	0	28,300
Princeton	Princeton/Rocky Hill					
	2000	162	50,622	0	0	50,622
	2005	168	53,100	0	0	53,100
	2010	172	55,800	0	0	55,800
	2020	178	59,000	0	0	59,000
Red Lion	Vincentown					
	2000	53	15,373	0	0	15,373
	2005	53	15,400	0	0	15,400
	2010	53	15,400	0	0	15,400
	2020	53	15,400	0	0	15,400
Red Wing	Jobstown					
	2000	11	12,500	0	0	12,500
	2005	11	12,500	0	0	12,500
	2010	11	12,500	0	0	12,500
	2020	11	12,500	0	0	12,500
Robert J. Miller Airpark	Tom's River					
	2000	113	35,267	0	2,000	37,267
	2005	120	37,800	0	2,000	39,800
	2010	127	40,600	0	2,000	42,600
	2020	141	46,500	0	2,000	48,500
Rudy's	Vineland					
	2000	1	150	0	0	150
	2005	1	200	0	0	200
	2010	1	200	0	0	200
	2020	1	200	0	0	200
Sky Manor	Pittstown					
	2000	89	26,372	0	0	26,372
	2005	92	27,600	0	0	27,600
	2010	95	28,800	0	0	28,800
	2020	98	30,300	0	0	30,300
Solberg-Hunterdon	Readington					
	2000	85	37,282	0	0	37,282
	2005	90	39,800	0	0	39,800
	2010	94	41,800	0	0	41,800
	2020	103	46,500	0	0	46,500
Somerset	Somerville					
	2000	199	40,764	0	0	40,764
	2005	207	42,900	0	0	42,900

Table 9-20
PROJECTIONS OF AVIATION ACTIVITY, BY AIRPORT, Continued

Airport Name	Associated City	Aircraft	GA Operations	Commercial Operations	Military Operations	Total Operations
	2010	212	45,000	0	0	45,000
	2020	218	47,500	0	0	47,500
South Jersey Regional	Mount Holly					
	2000	176	59,466	0	0	59,466
	2005	182	62,300	0	0	62,300
	2010	188	65,100	0	0	65,100
	2020	199	71,000	0	0	71,000
Southern Cross	Williamstown					
	2000	24	3,200	0	0	3,200
	2005	24	3,200	0	0	3,200
	2010	24	3,200	0	0	3,200
	2020	24	3,200	0	0	3,200
Spitfire Aerodrome	Pedricktown					
	2000	34	8,363	0	0	8,363
	2005	36	9,000	0	0	9,000
	2010	37	9,500	0	0	9,500
	2020	40	11,100	0	0	11,100
Sussex	Sussex					
	2000	143	34,026	0	0	34,026
	2005	147	37,300	0	0	37,300
	2010	151	41,500	0	0	41,500
	2020	160	48,200	0	0	48,200
Teterboro	Teterboro					
	2000	216	282,292	0	0	282,292
	2005	216	289,500	0	0	289,500
	2010	216	291,200	0	0	291,200
	2020	216	294,100	0	0	294,100
Trenton-Mercer	West Trenton					
	2000	150	133,255	9,094	5,707	148,056
	2005	155	139,400	9,600	5,700	154,700
	2010	160	145,500	10,000	5,700	161,200
	2020	170	158,200	11,000	5,700	174,900
Trenton-Robbinsville	Robbinsville					
	2000	66	29,762	0	0	29,762
	2005	68	31,000	0	0	31,000
	2010	70	32,400	0	0	32,400
	2020	75	35,400	0	0	35,400
Trinca	Andover					
	2000	15	11,395	0	0	11,395
	2005	15	11,400	0	0	11,400
	2010	15	11,400	0	0	11,400
	2020	15	11,400	0	0	11,400
Twin Pine	Pennington					
	2000	30	12,000	0	0	12,000

Table 9-20
PROJECTIONS OF AVIATION ACTIVITY, BY AIRPORT, Continued

Airport Name	Associated City	Aircraft	GA Operations	Commercial Operations	Military Operations	Total Operations
	2005	30	12,000	0	0	12,000
	2010	30	12,000	0	0	12,000
	2020	30	12,000	0	0	12,000
Vineland Downstown	Vineland					
	2000	25	15,350	0	0	15,350
	2005	26	15,800	0	0	15,800
	2010	26	16,200	0	0	16,200
	2020	27	17,400	0	0	17,400
Woodbine Municipal	Woodbine					
	2000	75	19,250	0	0	19,250
	2005	77	20,300	0	0	20,300
	2010	79	21,400	0	0	21,400
	2020	84	23,600	0	0	23,600
STATEWIDE TOTAL						
	2000	**4,203**	**1,982,250**	**466,760**	**53,516**	**2,502,526**
	2005	**4,351**	**2,074,100**	**483,600**	**53,500**	**2,611,200**
	2010	**4,504**	**2,170,500**	**499,600**	**53,500**	**2,723,600**
	2020	**4,829**	**2,377,500**	**533,400**	**53,500**	**2,964,400**

Source: Wilbur Smith Associates.

Note: Tables may not sum to totals due to rounding.

CHAPTER TEN
RECOMMENDED DEVELOPMENT PLAN

I. INTRODUCTION

The recommended development plan presented in this chapter summarizes a process that compared existing facilities and services at system airports to the facility and service objectives identified for each airport based on its recommended functional level/role in the system. **Table 10-1** presents the facility and service objectives developed for SASP airport functional levels. These objectives represent facility and service goals based on recommended roles, and the types of users anticipated for each functional level of airport in the system. **Table 10-2** summarizes the recommended stratification of system airports that resulted from the SASP analysis. Through the comparison of existing facilities, recommended functional level, and facility and service objectives, specific development needs were identified for each system airport. These development needs include all projects and project costs associated with bringing each system airport into compliance with the facility and service objectives for its recommended role.

In the following sections, estimated project costs are presented for system development needs relative to each category of facility and service objective. This data is intended to provide an estimate of total system development need by project type and by airport functional level. It is important to note that the recommended development plan includes projects at existing airport facilities as well as the construction of two new Advanced Service airports. Recommended development plans for each system airport will be presented in a following SASP task.

Table 10-1
FACILITY AND SERVICE OBJECTIVES

Scheduled Service Airports:	
ARC:	C-III or greater
Primary RWY Length:	Minimum of 6,000 feet
Primary RWY Width:	At least 150 feet
Primary RWY Strength:	60,000 Pounds
Taxiway:	Full Parallel
Navigational Aids:	CAT-II Precision Approach
Visual Aids:	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI
Lighting:	HIRL, CLTDZ Lights
Weather:	ASOS/AWOS or Tower
Services:	Phone, Restrooms, FBO, Maintenance, Jet Fuel, AvGas, Ground Transportation
Facilities:	Local and Itinerant Aircraft Parking Apron, Local and Itinerant Aircraft Storage, Air Carrier and General Aviation Terminal, Air Carrier and General Aviation Auto Parking
Advanced Service Airports:	
ARC:	C-II or greater
Primary RWY Length:	Minimum of 5,000 feet
Primary RWY Width:	At least 100 feet
Primary RWY Strength:	30,000 Pounds (accommodates all large B-II aircraft)
Taxiway:	Full Parallel for Primary Runway
Navigational Aids:	Precision Approach
Visual Aids:	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI
Lighting:	HIRL, MITL
Weather:	ASOS/AWOS
Services:	Phone, Restrooms, FBO, Maintenance, Jet Fuel, AvGas, Ground Transportation
Facilities:	Local and Itinerant Aircraft Parking Apron, Local and Itinerant Aircraft Storage, General Aviation Terminal, General Aviation Auto Parking
Priority General Service Airports:	
ARC:	B-II or greater
Primary RWY Length:	Minimum of 4,000 feet
Primary RWY Width:	Minimum of 75 feet
Primary RWY Strength:	Minimum of 12,500 lbs.
Taxiway:	Full Parallel for Primary Runway
Navigational Aids:	Non-Precision Approach
Visual Aids:	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI
Lighting:	MIRL, MITL
Weather:	ASOS/AWOS
Services:	Phone, Restrooms, FBO, Maintenance, Jet Fuel, AvGas, Ground Transportation
Facilities:	Local and Itinerant Aircraft Parking Apron, Local and Itinerant Aircraft Storage, General Aviation Terminal, General Aviation Auto Parking

Table 10-1
FACILITY AND SERVICE OBJECTIVES, Continued

General Service Airports:	
ARC:	B-I or greater
Primary RWY Length:	Minimum of 3,500 feet
Primary RWY Width:	To Meet ARC
Primary RWY Strength:	12,500 Pounds
Taxiway:	Full parallel, Partial Parallel, Connectors, or Turnarounds
Navigational Aids:	Non-Precision Approach
Visual Aids:	Rotating Beacon, Lighted Wind Cone/Segmented Circle, REILs, VGSI
Lighting:	MIRL, Taxiway Lighting/Reflectors
Weather:	Not Required
Services:	Phone, Restrooms, Fuel (Avgas)
Facilities:	Paved Aircraft Parking Apron, Aircraft Storage Units, Public Building Area,
Basic Service Airports:	
ARC:	B-I or less
Primary RWY Length:	2,200 feet or greater
Primary RWY Width:	At least 60 feet
Primary RWY Strength:	Up to 12,500 Pounds
Taxiway:	Stub and Turnaround
Navigational Aids:	Not Required
Visual Aids:	Wind Cone
Lighting:	Not Required
Weather:	Not Required
Services:	Phone, Restrooms
Facilities:	Paved or Unpaved Aircraft Parking Apron, Auto Parking
Duplicative Basic Service Airports:	
ARC:	B-I or less
Primary RWY Length:	2,200 feet or greater
Primary RWY Width:	At least 60 feet
Primary RWY Strength:	Up to 12,500 Pounds
Taxiway:	Stub and Turnaround
Navigational Aids:	Not Required
Visual Aids:	Wind Cone
Lighting:	Not Required
Weather:	Not Required
Services:	Phone, Restrooms
Facilities:	Paved or Unpaved Aircraft Parking Apron, Auto Parking

Source: Wilbur Smith Associates

Table 10-2
RECOMMENDED AIRPORT SYSTEM

SCHEDULED SERVICE AIRPORTS		
Airport Name	**Associated City**	**Current Functional Level**
Atlantic City International	Atlantic City	Scheduled Service
Newark Liberty International	Newark	Scheduled Service
Trenton Mercer	Trenton	Scheduled Service
ADVANCED SERVICE AIRPORTS		
Airport Name	**Associated City**	**Current Functional Level**
Bergen County		New Airport
Cape May County	Wildwood	General Service
Essex County	Caldwell	Advanced Service
Hammonton Municipal	Hammonton	General Service
Millville Municipal	Millville	Advanced Service
Monmouth Executive	Belmar/Farmington	Advanced Service (Allaire)
Morristown Municipal	Morristown	Advanced Service
Middlesex County		New Airport
Robert J. Miller	Toms River	Advanced Service
Teterboro	Teterboro	Advanced Service
PRIORITY GENERAL SERVICE AIRPORTS		
Airport Name	**Associated City**	**Current Functional Level**
Central Jersey Regional	Manville	General Service
Cross Keys	Cross Keys	General Service
Lincoln Park	Lincoln	General Service
Linden	Linden	General Service
Solberg-Hunterdon	Readington	General Service
South Jersey Regional	Mount Holly	Advanced Service
GENERAL SERVICE AIRPORTS		
Airport Name	**Associated City**	**Current Functional Level**
Alexandria Field	Pittstown	General Service
Blairstown	Blairstown	General Service
Camden County	Berlin	Basic Service
Eagles Nest	West Creek	Basic Service
Flying W	Lumberton	General Service
Greenwood Lake	West Milford	General Service
Lakewood	Lakewood	General Service
Princeton	Princeton	General Service
Old Bridge	Old Bridge	General Service
Sky Manor	Pittstown	General Service
Spitfire Aerodrome	Pedricktown	Basic Service
Somerset	Somerville	General Service
Sussex	Sussex	General Service
Trenton-Robbinsville	Robbinsville	General Service

Table 10-2
RECOMMENDED AIRPORT SYSTEM, Continued

Airport Name	Associated City	Current Functional Level
GENERAL SERVICE AIRPORTS		
Airport Name	**Associated City**	**Current Functional Level**
Vineland Downstown	Vineland	Basic Service
Woodbine Municipal	Woodbine	General Service
BASIC SERVICE AIRPORTS		
Airport Name	**Associated City**	**Current Functional Level**
Aeroflex-Andover Field	Andover	Basic Service
Bucks	Bridgeton	Basic Service
Hackettstown	Hackettstown	Basic Service
Ocean City Municipal	Ocean City	Basic Service
Red Lion	Vincentown	General Service
DUPLICATIVE BASIC SERVICE AIRPORTS		
Airport Name	**Associated City**	**Current Functional Level**
Kroelinger	Vineland	Basic Service
Li Calzi Airpark	Bridgeton	Basic Service
Newton	Newton	Basic Service
Redwing	Jobstown	Basic Service
Southern Cross	Williamstown	Basic Service
Trinca	Andover	Basic Service
Twin Pine	Pennington	Basic Service
SPECIALTY FACILITIES		
Airport Name	**Associated City**	**Current Functional Level**
Coach-N-Paddock Heliport	Hampton	Specialty Facility
Little Ferry Seaplane Base	Little Ferry	Specialty Facility
Holly City Heliport	Millville	Specialty Facility
Newark Heliport	Newark	Specialty Facility
Ryland Heliport/Balloonport	Whitehouse	Specialty Facility

Source: Wilbur Smith Associates

II. COSTS OF THE RECOMMENDED DEVELOPMENT PLAN

The recommended development plan presents cost estimates for bringing all system airports into compliance with facility and service objectives for their recommended system role. The costs of maintaining up-to-date airport planning documents at system airports, another SASP recommendation, are also included in the recommended plan. The methodology that was used to develop estimated costs for the recommended development plan included the following steps:

- Comparing existing facilities at each airport to the minimum facility and service objectives identified for the airport's recommended system role.
- Determining specific airport needs to reach compliance to the minimum facility and service objectives.
- Using estimated unit costs developed for the SASP and applying them to airport needs to estimate total costs associated with the recommended development plan.

In this process, facility needs were identified on an airport-by-airport basis, and the total cost of bringing each airport into compliance with its facility and service objectives was estimated individually. This chapter of the SASP presents summary cost estimates of the recommended development plan.

Unit cost estimates for specific airport development projects were developed for use in the SASP to aid in estimating the total cost of the recommended development plan. The unit cost estimates used in the SASP are presented in **Table 10-3**.

The unit cost estimates presented in Table 10-3 reflect actual costs of similar projects completed recently at New Jersey airports and other regional airports as well as industry standard averages. Where possible, actual equipment acquisition, design, engineering, construction, and inspection costs from recently completed projects were used as a baseline in the development of the unit costs in this analysis. Those unit costs for which recent actual costs were not available were estimated based on industry standard costs as shown in industry publications such as the Means Cost Guide.

Table 10-3
UNIT COST ESTIMATES

Facility	Unit Cost
SCHEDULED SERVICE AIRPORTS	
Facility	**Unit Cost**
Square Ft. New Runway (60,000 lb strength)	$9.75
Square Ft. New Taxiway	$10.80
Square Ft. New Paved Apron	$9.45
CAT-II Precision Approach (upgrade existing prec app)	$2,400,000
Rotating Beacon (On tower, w/ service)	$90,000
Lighted Wind Cone	$15,600
Lighted Segmented Circle	$19,800
REILs (per runway end)	$25,200
VGSI (per runway end)	$48,000
High Intensity Runway Lights (LF or RW w/ threshold lights)	$66.00
High Intensity Taxiway Lights (Per LF of TW)	$60.00
Center-line Touchdown Zone Lighting (Per LF of RW for 1 RW end)	$504.00
ASOS	$210,000
AWOS	$192,000
DigiWx or SuperUnicom	$42,000
Jet Fuel Facilities (10,000 Gal. Above ground)	$168,000
Planning Document	$240,000
AvGas Fuel Facilities (10,000 Gal Above ground)	$138,000
ADVANCED SERVICE AIRPORTS	
Facility	**Unit Cost**
Square Ft. New Runway (30,000 lb strength)	$8.70
Square Ft. Strengthed Runway (12.5 to 30k lbs)	$3.08
Square Ft. New Taxiway	$10.20
Square Ft. New Paved Apron	$6.36
Precision Approach	$2,400,000
Rotating Beacon (On tower, w/ service)	$90,000
Lighted Wind Cone	$15,600
Lighted Segmented Circle	$19,800
REILs (per runway end)	$25,200
VGSI (per runway end)	$48,000
High Intensity Runway Lights (LF of RW w/ threshold lights)	$66.00
Medium Intensity Taxiway Lights (Per LF of TW)	$48.00
ASOS	$210,000
AWOS	$192,000
DigiWx or SuperUnicom	$42,000
Jet Fuel Facilities (10,000 Gal. Above ground)	$168,000
Planning Document	$180,000
AvGas Fuel Facilities (10,000 Gal Above ground)	$138,000

Note: All pavement SF costs include grading, drainage, underdrain, topsoil, seed, and striping.
All costs include design and inspection

Table 10-3
UNIT COST ESTIMATES, Continued

Facility	Unit Cost
PRIORITY GENERAL SERVICE AIRPORTS	
Facility	**Unit Cost**
Square Ft. New Runway (12,500 lb strength)	$7.80
Square Ft. New Taxiway	$9.00
Square Ft. New Paved Apron	$6.75
Non-precision Approach (New markings, each RW end)	$36,000
Rotating Beacon (On tower, w/ service)	$90,000
Lighted Wind Cone	$15,600
Lighted Segmented Circle	$19,800
REILs (per runway end)	$25,200
VGSI (per runway end)	$48,000
Medium Intensity Runway Lights (LF of RW w/ threshold)	$60.00
Medium Intensity Taxiway Lights (Per LF of TW)	$55.20
ASOS	$210,000
AWOS	$192,000
DigiWx or SuperUnicom	$42,000
Jet Fuel Facilities (10,000 Gal. Above ground)	$168,000
Planning Document	$120,000
AvGas Fuel Facilities (10,000 Gal Above ground)	$138,000
GENERAL SERVICE AIRPORTS	
Facility	**Unit Cost**
Square Ft. New Runway (12,500 lb strength)	$7.20
Square Ft. New Taxiway	$7.50
Square Ft. New Paved Apron	$6.60
Non-precision Approach (New markings, each RW end)	$36,000
Rotating Beacon (On tower, w/ service)	$90,000
Lighted Wind Cone	$15,600
Lighted Segmented Circle	$19,800
REILs (per runway end)	$25,200
VGSI (per runway end)	$48,000
Medium Intensity Runway Lighting (LF of RW w/ threshold)	$60.00
Taxiway Lights (Per LF of TW)	$55.20
Taxiway Reflectors (Per LF of TW)	$1.68
Planning Document	$120,000
AvGas Fuel Facilities (10,000 Gal Above ground)	$138,000
BASIC SERVICE/DUPLICATIVE BASIC SERVICE AIRPORTS	
Facility	**Unit Cost**
Square Ft. New Runway (12,500 lb strength)	$7.20
Taxiway Stub or Turnaround	$7.50
Square Ft. New Paved Apron	$6.90
Planning Documents	$96,000.00
Wind Cone (not lighted)	$6,000

Source: NJDOT; Wilbur Smith Associates; Clough, Harbour & Associates

Note: All pavement SF costs include grading, drainage, underdrain, topsoil, seed, and striping.
All costs include design and inspection

As shown in Table 10-3, unit cost estimates were developed separately for the SASP functional levels of airport. Unit costs were developed for each of the facility or service objectives developed within each functional level of airport. While the unit costs of some facilities, such as a rotating beacon, were the same in each functional level, unit costs related to pavement varied by functional level. The variation in pavement costs between functional levels is primarily the result of different strength requirements for those surfaces. It is important to note that all unit costs presented in Table 10-3 include design, inspection, and construction costs, however, property acquisition costs that may be required to implement projects in the recommended development plan are not included. The wide variation in property acquisition costs throughout New Jersey made it impossible to develop a unit cost estimate for property acquisition. In addition, at the system planning level, it is impossible to identify specific property acquisition needs for recommended projects at system airports.

By applying the unit costs identified in Table 10-3 to the airport needs that were identified by comparing existing facilities to the facility and service objectives of each airport's recommended role, system-planning level cost estimates for the recommended plan were developed. These estimated costs of the recommended development plan are presented in the following sections of the chapter. In this chapter, the estimated costs of the recommended development plan are presented by airport functional level and for each of the facility objectives included in the SASP.

III. RECOMMENDED DEVELOPMENT PLAN - EXISTING AIRPORTS

The recommended development plan for New Jersey's system of public use airports that is summarized in this chapter includes recommended projects to bring system airports into compliance with the SASP facility and service objectives of their recommended functional role and to improve system performance relative to other SASP goals. Specific projects have been identified for facility and service objectives in the following categories:

- Airport Reference Code
- Runway length projects
- Runway width projects
- Runway strength projects
- Crosswind runway projects
- Runway Safety Area projects
- Taxiway projects
- Runway taxiway separation projects
- Navigational aid projects
- Visual aid projects
- Lighting projects
- Weather projects
- Apron area projects
- Fuel facilities projects
- Airport planning documents
- Environmental analyses

Total estimated costs of the recommended airport development and planning projects in each of the facility and service categories listed above are presented in the following sections. These estimated costs are presented by airport functional level for each type of project and then summed to present total estimated system cost for each project type. Total estimated project costs of all types of projects included in the recommended development plan are presented at the conclusion of this chapter.

A. Airport Reference Code (ARC) Projects

The SASP identified Airport Reference Code (ARC) objectives for system airports based on their recommended system role. These ARC objectives were established to promote safe operation of the types of aircraft that are anticipated to operate at system airports based on their recommended role in the system. The following ARC objectives were identified for system airports in the SASP based on their recommended functional stratification:

- Scheduled Service airports – C-III or greater
- Advanced Service airports – C-II or greater
- Priority General and General Service airports – B-I or greater
- Basic Service and Duplicative Basic Service airports – B-I or less

Each system airport's existing ARC was compared to its ARC objective based on its recommended functional role in the system. The only New Jersey airport for which an ARC upgrade is recommended is Essex County Airport. The airport has an existing ARC of B-II, based on its recommended system role it should be upgraded to meet C-II design standards.

Those airports that currently exceed the minimum ARC objective of their recommended role are assumed to maintain their current ARC. It is also important to note that the recommended development plan does not include costs associated with bringing airports into compliance with the design standards of their existing ARC. Costs of bringing all airports into compliance with the design standards of their existing ARC would be significant, however, estimating those costs would require Master Plan level detail that cannot feasibly be included in the SASP, therefore, those costs are not included in this analysis. One component of the ARC objective, Runway Safety Areas (RSAs) is currently being evaluated by the Division of Aeronautics at more than 30 system airports. Recommended improvements range from simple grading to major projects such as road relocations. Planning level costs for recommended RSA improvements at these airports will be developed as part of the on-going RSA Analysis.

B. Runway Projects

Developing and maintaining adequate runway facilities is one of the most important infrastructure goals of an airport system. Based on the recommended functional roles of system airports, and the runway objectives associated with those roles, the SASP has developed recommended runway development projects for those airports requiring improved runway facilities to better serve their anticipated roles in the system. Specific objectives were established in the SASP for the following runway characteristics:

- Runway length
- Runway width
- Runway strength
- Crosswind runway
- Runway safety area

In the following sections, the existing primary runway infrastructure at each system airport is compared to the runway facility objectives identified for each airport based on its recommended functional role in the system. Cost estimates for meeting each of the runway objectives are presented as well as a list of those airports for which runway projects are recommended.

1. *Runway Length Projects*

Runway length is one of the most important factors in determining the classes and types of aircraft that can safely operate at an airport. For the New Jersey system to adequately serve its varied demands, it is important that system airports provide sufficient runway length. Based on the functional level classifications used in the SASP and the types of aircraft that each functional level is anticipated to support, the following runway length objectives were identified for system airports:

- Scheduled Service airports – Minimum of 6,000 feet
- Advanced Service airports – Minimum of 5,000 feet
- Priority General and General Service airports – Minimum of 3,500 feet
- Basic Service and Duplicative Basic Service airports – 2,200 feet or greater

The total estimated costs of bringing all system airports into compliance with the minimum runway length objective of their recommended role are presented in **Table 10-4**.

Table 10-4
RECOMMENDED RUNWAY LENGTH PROJECTS

Airport Functional Level	Total Estimated Runway Length Project Costs
Scheduled Service	$-
Advanced Service	$1,605,150
Priority General Service	$3,311,919
General Service	$1,942,344
Basic Service	$94,068
Duplicative Basic Service	$-
Total System Estimated Cost	**$6,954,021**

Source: Wilbur Smith Associates

It is important to note that the costs presented in Table 10-4 include all design, engineering, and construction costs. Property acquisition costs are not included in the cost estimates because of the many site-specific factors that would need to be analyzed to develop reasonable estimates for each individual airport facility. The costs associated with extending turf runways are not included in this analysis.

Those system airports for which runway extension projects should be considered include the following:

- Essex County
- Hammonton Municipal
- Lincoln Park
- Alexandria Field
- Blairstown
- Eagles Nest
- Sky Manor
- Spitfire Aerodrome
- Somerset
- Woodbine
- Aeroflex-Andover Field
- Bucks
- Red Wing
- Trinca

Implementation of these recommended runway extension projects would allow system airports to better serve their intended functional role within the system. Those system airports that currently exceed the minimum runway length objective of their recommended role are assumed to maintain their current length.

2. Runway Width Projects

Adequate runway width is an important component of a safe runway system. Runway width objectives were developed for SASP functional levels based on the types of aircraft anticipated to use the airports in each level. Based on guidance provided in the FAA's Advisory Circular 150/5300-13, *Airport Design*, the following runway width objectives were identified for New Jersey system airports:

- Scheduled Service airports – At least 150 feet
- Advanced Service airports – At least 100 feet
- Priority General and General Service airports – To meet ARC objective or existing ARC, whichever is greater
- Basic Service and Duplicative Basic Service airports – At least 60 feet

Table 10-5 presents summary estimates, by recommended airport functional level, of the total costs of bringing all system airports into compliance with their runway width objectives.

Table 10-5
RECOMMENDED RUNWAY WIDTH PROJECTS

Airport Functional Level	Total Estimated Runway Width Project Costs
Scheduled Service	$
Advanced Service	$3,430,932
Priority General Service	$3,249,921
General Service	$994,392
Basic Service	$821,112
Duplicative Basic Service	$263,511
Total System Estimated Cost	**$8,759,868**

Source: Wilbur Smith Associates

The summary cost data presented in Table 10-5 includes runway-widening projects identified for the following airports:

- Essex County
- Hammonton Municipal
- Monmouth Executive
- Central Jersey Regional
- Cross Keys
- Lincoln Park
- Solberg-Hunterdon
- South Jersey Regional
- Alexandria Field
- Old Bridge
- Sky Manor
- Spitfire
- Aeroflex-Andover Field
- Camden County
- Hackettstown
- Red Lion
- Newton

Airports currently exceeding the minimum runway width objective of their recommended role are assumed to maintain their current runway width. The costs presented in Table 10-5 include projects for paved runways only, all airports with turf runways currently meet or exceed the minimum runway width objective of their recommended role. Implementation of the recommended runway widening projects will allow system airports to safely accommodate the type of aircraft anticipated to operate at the facilities based on their recommended functional level classification in the system.

3. Runway Strength Projects

Based on the types of aircraft anticipated to use airports in the SASP functional levels, runway strength objectives were developed for each level. These objectives identify the recommended pavement strength for runways at system airports that would allow them to accommodate the types of aircraft that they are intended to serve. The following runway strength objectives were identified for system airports based on their recommended functional stratification:

- Scheduled Service airports – 60,000 pounds or greater
- Advanced Service airports – 30,000 pounds or greater
- Priority General and General Service airports – At least 12,500 pounds
- Basic Service and Duplicative Basic Service airports – Up to 12,500 pounds

The estimated costs of bringing all airports into compliance with the minimum runway strength objective of their recommended functional level are presented in **Table 10-6**.

Table 10-6
RECOMMENDED RUNWAY STRENGTH PROJECTS

Airport Functional Level	Total Estimated Runway Strength Project Costs
Scheduled Service	$ -
Advanced Service	$9,011,029
Priority General Service	$917,904
General Service	$-
Basic Service	$-
Duplicative Basic Service	$-
Total System Estimated Cost	**$9,928,933**

Source: Wilbur Smith Associates

Based on the runway strength objectives identified in the SASP, runway-strengthening projects are recommended for the following system airports:

- Hammonton Municipal
- Robert J. Miller
- Lincoln Park
- Solberg-Hunterdon
- Alexandria Field
- Blairstown
- Greenwood Lake
- Old Bridge
- Somerset
- Sussex

The costs of strengthening runways at Hammonton Municipal Airport and Robert J. Miller Airport, both recommended for the Advanced Service functional level, were estimated by assuming that existing runway surfaces could be resurfaced after milling approximately one inch of the existing pavement, applying tack coat, and placing a two inch layer of asphalt base and a two inch layer of course surface asphalt over the existing runway. Design and contingency costs were also included. The other airports for which runway strengthening projects are estimated are recommended to be included in the General Service functional level. Because of the existing runway surfaces at these facilities and the lack of available data regarding their designed and/or current strength, strengthening projects at these airports were assumed to include the complete reconstruction of the runways.

4. Crosswind Runway Projects

Eleven of New Jersey's airports have paved secondary, or crosswind, runways that support aircraft operations during periods when wind conditions dictate. While the SASP did not develop facility and service objectives related to crosswind runways, paved crosswind runways at system airports were examined in this analysis. Project costs associated with widening and strengthening these runways, where appropriate based on the runway's ARC, were estimated and are presented in **Table 10-7**.

Table 10-7
RECOMMENDED CROSSWIND RUNWAY PROJECTS

Airport Functional Level	Total Estimated Runway Length Project Costs
Scheduled Service	$ -
Advanced Service	$2,182,496
Priority General Service	$-
General Service	$781,920
Basic Service	$-
Duplicative Basic Service	$-
Total System Estimated Cost	**$2,964,416**

Source: Wilbur Smith Associates

As shown in Table 10-7, crosswind runway projects recommended for system airports have a total estimated cost of approximately $2.96 million. Included in these estimated costs are recommended runway widening and strengthening projects at Monmouth Executive Airport and Alexandria Field. The recommended projects would bring each airport's crosswind runway(s) into compliance with runway width requirements and strength needs based on the ARC of the crosswind runway at each airport.

5. Runway Safety Area Projects

The New Jersey Department of Transportation, Division of Aeronautics, conducted a Runway Safety Area (RSA) Inspection for all paved runways at grant obligated general aviation airports in the State in order to meet current Federal Aviation Administration (FAA) guidelines. The RSA is a ground area surrounding a runway for which design criteria have been developed by the FAA in order to reduce the risk of damage to an aircraft inadvertently veering off of the runway. The study examined the current condition of RSAs at the applicable system airports, identified non-standard conditions, developed alternatives that address RSA deficiencies, and then identified a recommended approach for addressing RSA deficiencies at those system airports where deficiencies existed. Planning level cost estimates of the recommended approaches for addressing RSA deficiencies were also developed. Estimates of total system cost of the recommended RSA projects are summarized in **Table 10-8**.

Table 10-8
RECOMMENDED RSA PROJECT COSTS

Project Type	Total Estimated Cost
Scheduled Service	$-
Advanced Service	$15,256,200
Priority General Service	$4,576,800
General Service	$6,999,826
Basic Service	$5,920,800
Duplicative Basic Service	$120,000
Total Estimated Costs	**$32,873,626**

Source: Wilbur Smith Associates

As shown in Table 10-8, projects totaling approximately $32.9 million are recommended to address RSA deficiencies at those system airports that were included in the RSA Inspection project. Implementation of these projects is important to meeting FAA design standards at system airports and continuing to support safe airport operations at New Jersey airports.

C. Taxiway Projects

Taxiway systems are transitional facilities that support the movement of aircraft between airside and landside facilities. Aircraft must taxi to runway ends and runway exits in order to access landside facilities at the airport or to initiate a departure. The existence of taxiways at an airport allows aircraft to complete these movements off of the active runway, thereby freeing runway facilities to accommodate additional demand. Two factors that were considered in identifying recommended taxiway development projects at system airports are the following:

- Taxiway Configuration
- Runway/Taxiway Separation

Each of these factors is examined and estimated costs of recommended development projects are presented in the following sections.

1. Taxiway Configuration

Different types of taxiway configurations including full parallel, partial parallel, or no taxiway, impact operational capacity to varying degrees. The following taxiway objectives were identified for system airports based on their recommended functional stratification and anticipated activity levels:

- Scheduled Service airports – Full parallel for primary runway
- Advanced Service airports – Full parallel for primary runway
- Priority General and General Service airports – Full parallel, partial parallel, connectors, or turnarounds
- Basic Service and Duplicative Basic Service airports – Stub and turnaround

System costs of implementing the minimum taxiway objective at all airports based on their recommended SASP role are presented by functional level in **Table 10-9**.

Table 10-9
RECOMMENDED TAXIWAY PROJECTS

Airport Functional Level	Total Estimated Taxiway Project Costs
Scheduled Service	$-
Advanced Service	$-
Priority General Service	$-
General Service	$793,125
Basic Service	$-
Duplicative Basic Service	$112,500
Total System Estimated Cost	**$905,625**

Source: Wilbur Smith Associates

To better meet the facility and service objectives of their recommended functional level, taxiway improvement projects are recommended for the following airports:

- Eagles Nest
- Woodbine
- Bucks
- Vineland Downstown
- Kroelinger
- Li Calzi
- Newton
- Red Wing
- Southern Cross
- Trinca
- Twin Pine

The taxiway cost estimates presented for the General Service functional level, including Eagles Nest and Woodbine airports, assumes a full-length parallel taxiway having the width and separation required based on the airport's existing ARC. Four connector taxiways were also included in the cost estimates. All estimated taxiway project costs presented for the other airports listed above include a turnaround taxiway at both ends of the airport's runway.

2. Runway/Taxiway Separation

The FAA has identified design standards for runway and taxiway separation at airports based on the types of aircraft that use an airport on a regular basis, as determined by an airport's airport reference code (ARC). An analysis was conducted that compared existing runway/taxiway separations at New Jersey airports to the FAA design standards for the airports based on each airport's recommended functional level in the system and the ARC objective for that level. For those airports not in compliance with runway/taxiway separation standards, cost estimates were developed for constructing new taxiways that met separation standards. **Table 10-10** summarizes estimated project costs of bringing all airports into compliance with runway/taxiway separation standards.

Table 10-10
RECOMMENDED RUNWAY/TAXIWAY SEPARATION PROJECT COSTS

Airport Functional Level	Total Estimated Taxiway Project Costs
Scheduled Service	$ -
Advanced Service	$9,721,800
Priority General Service	$8,398,358
General Service	$7,102,006
Basic Service	$1,720,781
Duplicative Basic Service	$-
Total System Estimated Cost	**$26,942,945**

Source: Wilbur Smith Associates

As shown in Table 10-10 costs to bring all system airports into compliance with FAA runway/taxiway separation standards are estimated at approximately $26.9 million over the project period. Estimated costs include projects at the following system airports:

- Essex County
- Hammonton
- Central Jersey
- Cross Keys
- Lincoln Park
- Solberg-Hunterdon
- South Jersey Regional
- Alexandria Field
- Blairstown
- Flying W
- Greenwood Lake
- Sky Manor
- Spitfire Aerodrome
- Somerset
- Sussex
- Trenton-Robbinsville
- Aeroflex-Andover Field
- Camden County
- Ocean City Municipal
- Red Lion

The costs presented for runway/taxiway separation projects include only the costs of constructing new taxiways and exit taxiways that meet separation standards. Developing more detailed costs that might include costs associated with removing obstructions to the new taxiways, acquiring property, or addressing any other airport-specific factors that may arise would require detailed on-site analysis.

D. Navigational Aid Projects

Another important factor that was considered in the system adequacy analysis relates to navigational aids at system airports. A variety of navigational aids provide electronic information that allow for aircraft operations during periods of inclement weather or periods when atmospheric conditions prohibit visual flight operations at system airports. Based on the type of data provided and the decision height and distance minimums of specific types of navigational aids, they can generally be categorized as providing precision, non-precision, or visual approaches. Instrument landing systems (ILS) are an example of a precision approach, while very high frequency omni-directional radio (VOR) systems and most global positioning satellite (GPS) systems are categorized as non-precision approaches.

The following navigational aid objectives were identified for system airports in the SASP based on their recommended functional stratification:

- Scheduled Service airports – CAT-II precision approach
- Advanced Service airports – Precision approach
- Priority General and General Service airports – Non-precision approach
- Basic Service and Duplicative Basic Service airports – Not an objective (visual approach)

The estimated costs for upgrading navigational aids at system airports to comply with the minimum navigational aid objectives identified in the SASP are presented by functional level in **Table 10-11**.

Table 10-11
RECOMMENDED NAVIGATIONAL AID PROJECTS

Airport Functional Level	Total Estimated Navigational Aid Project Costs
Scheduled Service	$4,800,000
Advanced Service	$9,600,000
Priority General Service	$36,000
General Service	$72,000
Basic Service	$-
Duplicative Basic Service	$-
Total System Estimated Cost	**$14,508,000**

Source: Wilbur Smith Associates

The estimated costs summarized in Table 10-11 include the following projects at system airports:

- Atlantic City International – CAT-II precision approach
- Trenton Mercer – CAT-II precision approach
- Cape May County – Precision approach
- Essex County – Precision approach
- Hammonton Municipal – Precision approach
- Monmouth Executive – Precision approach

- Linden – Non-precision approach
- Eagles Nest – Non-precision approach
- Spitfire Aerodrome – Non-precision approach

The navigational aid improvement costs presented for Atlantic City International Airport and Trenton Mercer Airport assume that existing precision approach facilities at those airports are upgraded to meet CAT-II precision approach standards. All other navigational aid improvement costs assume the design and installation of new equipment.

E. Visual Aid Projects

While the navigational aids that were previously discussed provide electronic information, visual aids generally provide visual guidance to pilots through lighting systems and other highly visible objects such as wind cones or other wind direction indicators. Visual aids help pilots locate airports from the air, execute visual descents and landings on runways, identify the end of usable runway areas, and identify wind speed and direction at airports. The following visual aid objectives were identified for system airports in the SASP based on their recommended functional stratification:

- Scheduled Service airports – Rotating beacon, lighted wind cone or lighted segmented circle, runway end identifier lights (REILs), visual glide slope indicators (VGSI)
- Advanced Service airports – Rotating beacon, lighted wind cone or lighted segmented circle, REILs, VGSI
- Priority General and General Service airports – Rotating beacon, lighted wind cone or lighted segmented circle, REILs, VGSI
- Basic Service and Duplicative Basic Service airports – Wind Cone

The estimated costs of bringing all system airports into compliance with the minimum visual aid objectives of their recommended functional level are summarized in **Table 10-12**.

Table 10-12
RECOMMENDED VISUAL AID PROJECTS

Airport Functional Level	Total Estimated Visual Aid Project Costs
Scheduled Service	$-
Advanced Service	$199,200
Priority General Service	$270,000
General Service	$453,000
Basic Service	$-
Duplicative Basic Service	$-
Total System Estimated Cost	**$922,200**

Source: Wilbur Smith Associates

Cost estimates presented in Table 10-12 include the following visual aid projects for New Jersey airports based on their recommended functional role within the system:

- Cape May County – REILs
- Essex County – REILs
- Hammonton Municipal – REILs
- Millville Municipal – REILs
- Monmouth Executive – REILs and VGSI
- Teterboro – REILs
- Central Jersey Regional – REILs and VGSI
- Cross Keys – REILs and VGSI
- Lincoln Park – REILs
- Solberg-Hunterdon – REILs and VGSI
- South Jersey Regional – REILs
- Alexandria – REILs and VGSI
- Blairstown – REILs and VGSI
- Eagles Nest – Rotating beacon, lighted wind cone or lighted segmented circle, REILs, VGSI
- Flying W – REILs
- Lakewood – REILs and VGSI
- Princeton – REILs and VGSI
- Sky Manor – Rotating beacon
- Spitfire Aerodrome – Rotating beacon and REILs
- Somerset – REILs and VGSI
- Sussex – REILs and VGSI
- Trenton-Robbinsville - REILs

The estimated costs presented for visual aid improvement projects assumes the installation of REILs and/or VGSI at one end of the runway at the airports for which they are recommended. It also assumes that a lighted segmented circle will be installed at Eagles Nest Airport. This airport is recommended to be included in the General Service functional level.

F. Lighting Projects

The following airport lighting objectives were identified for system airports in the SASP based on their recommended functional stratification:

- Scheduled Service airports – High intensity runway lighting (HIRL) and center line touch-down zone (CLTDZ) lights
- Advanced Service airports – HIRL and medium intensity taxiway lighting (MITL)
- Priority General and General Service airports – Medium intensity runway lighting (MIRL) and taxiway lighting or reflectors
- Basic Service and Duplicative Basic Service airports – Not required

Table 10-13 presents summary cost estimates of airport lighting improvement projects that are needed to bring system airports into compliance with the minimum airport lighting objectives of their recommended role.

Table 10-13
RECOMMENDED LIGHTING PROJECTS

Airport Functional Level	Total Estimated Lighting Project Costs
Scheduled Service	$3,027,024
Advanced Service	$2,656,428
Priority General Service	$1,396,331
General Service	$677,640
Basic Service	$-
Duplicative Basic Service	$-
Total System Estimated Cost	**$7,757,423**

Source: Wilbur Smith Associates

To meet the airfield lighting objectives of their recommended functional level, the following lighting improvement projects, whose estimated costs are summarized in Table 10-13, have been identified for New Jersey airports:

- Trenton Mercer – CLTDZ lights
- Essex County – HIRL and MITL
- Hammonton Municipal – HIRL and MITL
- Millville Municipal – HIRL and MITL
- Monmouth Executive – HIRL and MITL
- Central Jersey Regional – Taxiway lighting (MITL)
- Cross Keys – MIRL and taxiway lighting or reflectors
- Lincoln Park – Taxiway lighting or reflectors
- Solberg-Hunterdon – Taxiway lighting (MITL)
- Blairstown – Taxiway lighting or reflectors
- Eagles Nest – MIRL and taxiway lighting or reflectors
- Greenwood Lake – MIRL
- Princeton – Taxiway lighting or reflectors
- Old Bridge – Taxiway lighting or reflectors
- Spitfire – MIRL
- Sussex – MIRL and taxiway lighting or reflectors

The cost estimates presented in Table 10-13 assume that taxiway lighting is needed for all Priority General Service airports while taxiway reflectors are sufficient to meet the taxiway component of the airfield lighting objective at General Service airports.

G. Weather Projects

The following weather reporting objectives were identified for system airports in the SASP based on their recommended functional stratification:

- Scheduled Service airports – Automated surface observing system (ASOS), automated weather observing system (AWOS), or air traffic control tower (ATCT)
- Advanced Service airports – ASOS or AWOS
- Priority General - ASOS or AWOS
- General Service airports – Not an objective
- Basic Service and Duplicative Basic Service airports – Not an objective

Table 10-14 presents costs estimates of bringing system airports into compliance with weather reporting objectives identified in the SASP.

Table 10-14
RECOMMENDED WEATHER PROJECTS

Airport Functional Level	Total Estimated Weather Project Costs
Scheduled Service	$-
Advanced Service	$420,000
Priority General Service	$1,050,000
General Service	$-
Basic Service	$-
Duplicative Basic Service	$-
Total System Estimated Cost	**$1,470,000**

Source: Wilbur Smith Associates

System analysis indicates that Hammonton Municipal Airport and Morristown Municipal Airport are the only Advanced Service airports for which weather reporting improvements are recommended. Weather reporting equipment is also recommended for the following Priority General Service Airports; Central Jersey Regional, Cross Keys, Lincoln Park, Linden, and Solberg-Hunterdon.

H. Fuel Facility Projects

Based on the fuel facility objectives identified in the SASP, Eagles Nest Airport is the only airport for which fuel facility improvements are needed based on its recommended role in the system. An AvGas fuel storage facility should be installed at the airport. The total cost of installing an AvGas fuel storage facility at Eagles Nest Airport is estimated at $138,000. It is important to note that because fuel facility projects at system airports are not eligible for public funding, the cost of the fuel facility project recommended for Eagles Nest Airport is not included in the total costs of the recommended development plan that is presented at the conclusion of this analysis.

I. Apron Area Projects

Apron area needs at system airports were identified through a process that independently estimated total based aircraft and itinerant aircraft apron area needs at each system airport. Total apron area requirements were estimated for current activity levels at each airport as well as for 2005, 2010, and

2020 based on activity projections presented for each airport in Chapter Nine. The recommended development plan identifies current apron area needs as well as incremental apron area development that may be required over the SASP's 20-year project period.

Based aircraft apron area requirements are estimated by using the following process:

- The current percentage of total based aircraft that are tied down is calculated at each system airport
- The current percentage of each airport's based aircraft fleet that is tied down is applied to airport-specific based aircraft projections for years 2005, 2010, and 2020
- Based aircraft apron area requirement calculation assumes 300 square yards per based aircraft tied down
- Total based aircraft apron area requirement is estimated

Itinerant aircraft apron area requirements are estimated by using the following process:

- Airport-specific projections of itinerant general aviation aircraft operations that were developed in Chapter Nine are used to estimate itinerant aircraft demand
- Assume the following for each system airport: 50 percent of itinerant operations are arrivals; 80 percent of itinerant arrivals require apron; itinerant aircraft requiring tie down space need approximately 300 square yards of apron
- Total Itinerant apron area requirements are calculated based on daily use

Table 10-15 presents summary estimates of total apron area project needs at system airports over the 20-year study period.

Table 10-15
RECOMMENDED APRON AREA PROJECTS

Airport Functional Level	Total Estimated Apron Project Costs
Scheduled Service	$-
Advanced Service	$8,963,069
Priority General Service	$6,939,996
General Service	$7,591,398
Basic Service	$2,690,138
Duplicative Basic Service	$1,540,080
Total System Estimated Cost	**$27,724,680**

Source: Wilbur Smith Associates

The costs included in Table 10-15 were developed by comparing total estimated apron area need to existing apron facilities at system airports for the current year as well as for 2005, 2010, 2020.

J. Airport Planning Documents

Airport planning documents provide a means through which airport facilities can identify their long-term facility needs while identifying and protecting the resources required to support their development. While the types and frequencies of planning documents that may be required at different types of airports may vary, airport planning documents are important to all facilities regardless of their size and role. The following airport planning document objectives were identified for system airports in the SASP based on their recommended functional stratification:

- Scheduled Service airports – Airport planning document updated every five years
- Advanced Service airports – Airport planning document updated every five years
- Priority General and General Service airports – Airport planning documented completed every 10 years or as needed
- Basic Service and Duplicative Basic Service airports – Airport planning documents should be completed as needed

Estimated costs of implementing the recommended planning document objectives at system airports over the study period are summarized in **Table 10-16**.

Table 10-16
RECOMMENDED AIRPORT PLANNING DOCUMENT COSTS

Project Type	Total Estimated Cost
Scheduled Service	$2,160,000
Advanced Service	$4,320,000
Priority General Service	$960,000
General Service	$1,680,000
Basic Service	$864,000
Duplicative Basic Service	$-
Total Estimated Costs	**$9,984,000**

Source: Wilbur Smith Associates

The cost estimates presented in Table 10-16 assume the following unit costs for airport planning documents completed at system airports:

- Scheduled Service airports – $240,000
- Advanced Service airports – $180,000
- Priority General Service airports – $120,000
- General Service airports – $120,000
- Basic Service airports – $96,000
- Duplicative Basic Service airports – no plans recommended

Total planning document costs for system airports were developed based on the date of each airport's most recently completed planning document, the airport's recommended role in the system, and the planning document costs presented above.

K. Environmental Assessment Costs of Recommended Projects

An important consideration in implementing the projects included in the recommended development plan for system airports is completing the necessary environmental analyses. Environmental analyses are typically conducted prior to construction and/or development of major airport facilities or expansion of existing facilities to ensure that environmentally or ecologically sensitive areas will not be substantially impacted by the project. In the SASP's analysis of the recommended development plan, cost estimates were developed for environmental analyses that may be required for specific projects recommended for implementation at system airports. **Table 10-17** presents summary estimates of environmental analyses costs at system airports over the 20-year planning period, based on the types of projects identified for each airport.

Table 10-17
ENVIRONMENTAL ANALYSIS COSTS OF RECOMMENDED PROJECTS

Project Type	Total Estimated Cost
Scheduled Service	$-
Advanced Service	$1,440,000
Priority General Service	$1,260,000
General Service	$2,520,000
Basic Service	$300,000
Duplicative Basic Service	$144,000
Total Estimated Costs	**$5,664,000**

Source: Wilbur Smith Associates

As shown in Table 10-17, estimated costs associated with environmental analyses for the development plan are estimated at approximately $5.7 million over the planning period. These environmental analysis costs estimates were developed based on the following assumptions:

- Airport functional level upgrade: $600,000
- Runway extension, 500 ft. or greater: $300,000
- Runway extension, less than 500 ft.: $180,000
- Apron or taxiway paving, General Service or higher: $60,000
- Miscellaneous paving project, Basic Service or lower: $24,000

As shown, environmental costs associated with the recommended plan take into account the relative magnitude of the recommended project as well as the type of airport for which the project is recommended. As with any planning level estimate, actual costs associated with environmental analyses of the recommended development could be significantly different than the estimates.

L. Summary of Total Recommended Development Plan Costs at Existing Airports

Table 10-18 presents the total estimated costs of the recommended development plan for upgrading existing airports in the New Jersey system of public-use facilities to meet the facility and service objectives for their recommended role in the system.

Table 10-18
RECOMMENDED DEVELOPMENT PLAN
EXISTING AIRPORT FACILITIES

Airport Functional Level	Total Estimated Recommended Development Plan Project Costs
Scheduled Service	$9,987,024
Advanced Service	$66,294,899
Priority General Service	$38,378,404
General Service	$30,460,057
Basic Service	$12,216,341
Duplicative Basic Service	$2,707,941
Total System Estimated Cost	**$160,044,666**

Source: Wilbur Smith Associates

It is important to note that these costs represent estimates of infrastructure development at system airports. Land acquisition costs for expansion projects, pavement maintenance costs, and other costs associated with hangar construction and small capital equipment needs at system airports are not included in the costs presented in Table 10-18.

IV. RECOMMENDED DEVELOPMENT PLAN – NEW AIRPORTS

To improve system performance in the Advanced Service functional level, the SASP includes the construction of two new Advanced Service airports in New Jersey. Although specific sites for these facilities are not identified in the SASP, system performance and current coverage gaps in both Bergen and Middlesex counties would be addressed by the development of these airports. Cost estimates for infrastructure development of two new Advanced Service airports are presented in **Table 10-19**.

Table 10-19
NEW ADVANCED SERVICE AIRPORT DEVELOPMENT COSTS: TWO NEW FACILITIES

Project Type	Total Estimated Cost
Runway Development	$8,700,000
Taxiway Development	$3,570,000
Navigational Aids	$4,800,000
Visual Aids	$366,000
Lighting	$1,140,000
Weather	$420,000
Fuel Facilities	$-
Site Selection Study (1 each)	$1,200,000
Apron	$865,755
Planning Documents	$720,000
Total Estimated Cost	**$22,981,755**

Source: Wilbur Smith Associates

The estimated project costs presented in Table 10-19 include infrastructure development costs associated with the facility and service objectives identified for Advanced Service airports. It is important to note that property acquisition costs that may be incurred in the development of these facilities are not included.

V. RECOMMENDED DEVELOPMENT PLAN – TOTAL COSTS

The recommended development plan presented in the SASP identifies specific projects for implementation at system airports. These recommendations are based on a comparison of each airport's existing facilities and the facility and service objectives of each airport's recommended role in the system. The recommended development plan assumes that system airports will be brought into compliance with the facility and service objectives of their recommended role during the SASP's 20-year study period. Total estimated costs of the recommended development plan are presented in **Table 10-20**.

Table 10-20
RECOMMENDED DEVELOPMENT PLAN
TOTAL ESTIMATED COST

Project Type	Total Estimated Cost
Scheduled Service	$9,987,024
Advanced Service: Existing	$66,294,899
Advanced Service: New	$22,981,755
Priority General Service	$38,378,404
General Service	$30,460,057
Basic Service	$12,216,341
Duplicative Basic Service	$2,707,941
Total Estimated Costs	**$183,026,421**

Source: Wilbur Smith Associates

The infrastructure development costs presented in Table 10-20 do not include the followings types of costs that may significantly increase system funding needs over the study period:

- Property acquisition costs that may be required for projects in the recommended development plan
- Pavement and other facility maintenance costs
- Ancillary facility and equipment needs not included in the facility and service objectives developed for SASP functional levels.

VI. SUMMARY OF RECOMMENDED DEVELOPMENT PLAN

The recommended development plan summarized in this chapter presents estimated costs for projects recommended at system airports to improve the overall performance of New Jersey's aviation system. As has been presented in this analysis, the total estimated cost of the recommended development plan is approximately $183 million over the 20-year period. Of that total amount, approximately $23 million is related to the development of two new Advanced Service airports. The remaining $160 million represents the estimated costs associated with bringing all existing system airports into compliance with the facility and service objectives of their recommended SASP functional level.

Table 10-21 presents a summary of estimated project costs of the recommended development plan by airport functional level.

Table 10-21
RECOMMENDED PROJECT COST SUMMARY ESTIMATED PROJECT COST BY FUNCTIONAL LEVEL

Airport Functional Level	Total Estimated Project Costs		Percentage of System Total
Scheduled Service	$	9,987,024	5.5%
Advanced Service	$	66,294,899	36.2%
New Advanced Service	$	22,981,755	12.6%
Priority General Service	$	38,378,404	21.0%
General Service	$	30,460,057	16.6%
Basic Service	$	12,216,341	6.7%
Duplicative Basic Service	$	2,707,941	1.5%
System Total	**$**	**183,026,421**	**100.0%**

Source: Wilbur Smith Associates

Table 10-22 summarizes estimated costs of the recommended development plan by project type.

Table 10-22
RECOMMENDED PROJECT COST SUMMARY ESTIMATED PROJECT COSTS BY PROJECT TYPE

Recommended Project Type	Total Estimated Project Costs		Percentage of System Total
Runway Length	$	6,954,021	3.8%
Runway Width	$	8,759,868	4.8%
Runway Strength	$	9,928,933	5.4%
Crosswind Runway	$	2,964,416	1.6%
Runway Safety Area	$	32,873,626	18.0%
Taxiway	$	905,625	0.5%
Runway/Taxiway Separation	$	26,942,945	14.7%
Navigational Aids	$	14,508,000	7.9%
Visual Aids	$	922,200	0.5%
Lighting Projects	$	7,757,423	4.2%
Weather	$	1,470,000	0.8%
Apron Area	$	30,409,608	16.6%
Airport Planning Documents	$	9,984,000	5.5%
Environmental Analysis	$	5,664,000	3.1%
New Advanced Airports	$	22,981,755	12.6%
System Total	**$**	**183,026,421**	**100.0%**

Source: Wilbur Smith Associates

The projects costs included in the recommended development plan represent infrastructure development costs and include engineering, design, and construction costs of the recommended projects. Only those projects related to the facility and service objectives for system airports are included in the recommended plan. It is important to note that the project costs do not include estimates of land acquisition costs or maintenance costs of the recommended projects, nor costs associated pavement maintenance and management projects.

TECHNICAL APPENDIX A
CAPACITY ANALYSIS

I. INTRODUCTION

The ability of an aviation system to adequately accommodate demand for aviation activity is vital to determining the adequacy of the overall airport system. As airports reach key benchmarks in terms of demand/capacity ratios, delay and congestion increase exponentially. Facility and capacity enhancement projects become necessary or at least desirable at capacity constrained airports.. Capacity enhancement projects typically include runway improvements, taxiway improvements, NAVAID improvements, or other facility improvements. At the system planning level, capacity considerations are important to understanding how the state system, as a whole, and regional/metropolitan systems within the state can accommodate current and projected future levels of activity. Understanding airport-specific capacity issues, as well as statewide and regional capacity issues, is important in identifying facility improvements that will be necessary to alleviate potential capacity constraints.

Annual airfield operating capacity is defined as the number of aircraft operations that an airfield configuration can accommodate when there is a continuous demand for service (i.e., an aircraft is always waiting to depart or land). This definition is referred to as the ultimate capacity, maximum throughput rate, or annual service volume (ASV). The FAA has developed a methodology that provides a quantifiable measure of an airport's annual operating capacity by estimating its ASV. The calculation and analysis of ASV is an important tool in the short and long-range planning process at the state system level, regional/metropolitan level, as well as at individual system airports.

The calculation of ASV at an airport typically leads to the development of a demand/capacity ratio. As the term implies, this ratio measures the total number of annual aircraft operations at an airport relative to that airport's total ASV. General planning guidelines dictate that when an airport reaches a demand/capacity ratio of 60 percent, or an airport is operating at 60 percent of capacity, planning for capacity enhancement projects should be initiated. A demand/ capacity ratio of 80 percent generally indicates that the construction of capacity enhancement projects should be initiated.

The methodology used to examine capacity issues in this system plan develops planning estimates of individual airport ASVs and compares them to current levels of activity occurring at those facilities. This comparison establishes demand/capacity ratios for each system airport. The methodology used in this study to develop an estimate of ASV for each system airport is discussed in this report. Estimates of gross ASV were developed for each New Jersey airport based on an approved FAA methodology; then deductions to gross ASV are estimated using actual facility considerations at each airport. Current activity levels at each airport are then compared to net ASV at each airport to develop a demand/capacity ratio. This process is explained in detail in the following sections:

- Determination of Gross ASV
- Determination of ASV Deductions
- Calculation of Net ASV
- Identification of Demand/Capacity Ratio

II. DETERMINATION OF GROSS ASV

The initial step in this capacity analysis is determining each airport's gross ASV. Gross ASVs at New Jersey's airports were estimated based on a methodology presented in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*. Using this methodology, each airport's ASV is estimated based on the following two factors:

- Runway Configuration
- Airport Mix Index

A. Runway Configuration

Different airfield configurations result in differing annual operating capacity levels. The number of active runways, as well as the orientation of those runways, is a primary consideration in determining an overall operational capacity at each system airport. In addition, runway intersections, runway separations, and airport traffic patterns also impact ASV. With multiple runways, the ability to operate those runways simultaneously is also an important consideration in determining an airport's ASV.

The initial step in estimating gross ASV for each New Jersey airport included comparing each airport's runway configuration to diagrams of standard airfield layouts presented in AC 150/5060-5. Runway configurations presented in the advisory circular range from single runway airports to airports with multiple intersecting and/or multiple parallel runways. Once the general airfield configuration of each airport is identified, each airport's mix index, or percentage of large (Class C and D) aircraft operating at that airport, must be determined to develop an estimate of gross ASV. In calculating ASV, aircraft that fall into Class C and D are determined by their weight.

B. Mix Index

The fleet mix index, or percentage of heavy aircraft operating at an airport, is an important factor in determining an airport's ASV. For the purposes of calculating capacity, aircraft are categorized according to their size and approach speed as presented in **Table A-1.**

Table A-1
AIRCRAFT CLASSIFICATIONS FOR CAPACITY ANALYSIS

Aircraft Classification	Takeoff Weight (Pounds)	Types of Aircraft	Estimated Approach Speed (knots)
A	12,500 or less	Small single engine	95
B	12,500 or less	Small single engine	120
C	12,501 to 299,999	Large	130
D	300,000 or more	Heavy	140

Source: FAA Advisory Circular 150/5060-5, "Airport Capacity and Delay," December 1, 1995.

Annual operational capacity at an airport *decreases* as the diversity of aircraft approach speeds and aircraft sizes grows. Aircraft approaching or departing an airport are spaced according to differences in approach speeds. As the difference in speeds grow, the required spacing or separation between aircraft increases, and the operating capacity of the airport decreases. Similarly, heavy aircraft create greater wingtip vortices during flight which results in need for greater separation between heavy aircraft and lighter aircraft following them. This increased separation reduces an airport's capacity. The greater the difference in size, speed, and configuration of the aircraft in the operating fleet, the greater the separation required between the aircraft and, therefore, the lower the operational capacity of the airport.

In order to estimate the ASV for each airport using its existing runway configuration, each airport's mix index must be determined. Mix indexes for system airports are calculating by using the following equation:

Mix Index = C + 3D
Where C = Percent of airplanes over 12,500 but not over 300,000 lbs.
D = Percent of airplanes over 300,000 lbs.

The following mix index ranges are used for this capacity analysis:

- 0 to 20 percent
- 21 to 50 percent
- 51 to 80 percent
- 81 to 120 percent
- 121 to 180 percent

Once the runway configuration and the airport specific mix index have been determined, the ASV can be estimated. **Table A-2** includes replications of a diagrams contained in FAA Advisory Circular 150/5060-5 and is presented to illustrate the methodology used to determine ASV values for all system airports.

Table A-2
CALCULATION OF AIRPORT MIX INDEX

Runway-use Configuration	Mix Index % (C + 3D)	Annual Service Volume (total operations)
Single Runway	0 to 20 21 to 50 51 to 80 81 to 120 121 to 180	230,000 195,000 205,000 210,000 240,000
Parallel Runways Note: runway separation of between 700 and 2499 feet.	0 to 20 21 to 50 51 to 80 81 to 120 121 to 180	355,000 275,000 260,000 285,000 340,000

Source: FAA Advisory Circular 150/5060-5, "Airport Capacity and Delay," December 1, 1995.

As an example, the data presented in Table 2 indicates that an airport with a single runway and a mix index of 21 to 50 percent would have an estimated ASV of 195,000 operations. An airport with parallel runways and a similar mix index (21 to 50 percent) would have an ASV of 275,000 annual operations.

Based on this methodology described above and the planning estimates in FAA Advisory Circular 150/5060-5, ASV estimates for each New Jersey airport have been developed and they are presented in the **Capacity Analysis Summary Table**.

III. IDENTIFICATION OF ASV DEDUCTIONS

After determining each system airport's gross ASV, it is important to examine how other factors at the airport may impact its calculated annual operating capacity. As previously described, the methodology used in this analysis to estimate gross ASV considered runway configurations and operational fleet mixes at all system airports. Additional factors, such as runway surfaces, also impact an airport's operational capacity. Although the planning estimates developed by the FAA in AC 150/5060-5 are useful for general planning purposes, in order to better estimate system-wide capacity and to identify potential capacity constraints for the system, additional factors must be taken into consideration. In this analysis, these additional factors were examined for each individual airport, and where applicable, deductions to each airport's gross ASV were taken. These deductions were based on the estimated impact that certain facilities, or lack of facilities, have on each airport's operational capacity.

The following factors were examined to identify ASV deductions at each airport:

- Runway Surface
- Approach Type
- Taxiway Type
- Air Traffic Control Tower (ATCT)

A. Runway Surface

The surface of the runway system at an airport can impact that airport's ASV in several ways. These impacts are the result of several factors that can include the level of friction provided by the runway surface type as well as the impacts that weather conditions may have on that surface. There are a number of runway surface types in place at system airports. Paved surface runways are typically comprised of asphalt or concrete. At other airports, those typically supporting lighter general aviation aircraft, turf, gravel, and/or a combination of surface types may be in place.

Paved surface runways provide a higher degree of friction. Therefore, paved runways, allow aircraft to reach take-off speeds and/or brake upon landing in shorter distances; this minimizes the time each aircraft spends on an active runway. Paved runways help to support an airport's calculated ASV. In addition, paved surfaces are minimally impacted by rain and other weather conditions which allow them to be operational the majority of the time. For these reasons, paved surface runways can usually accommodate more aircraft operations on annual basis than a turf or gravel runway that provides less friction and may be inoperable due to rain and other weather conditions over a higher percentage of time.

Table A-3 presents the assumptions that were applied to estimate the impacts that runway surface types have on operational capacities at New Jersey airports.

Table A-3
RUNWAY SURFACE CAPACITY DEDUCTIONS

Runway Surface Type	Deduction
Asphalt or Concrete	No ASV deduction
Asphalt and Turf or Gravel	5% of Gross ASV
Turf or Gravel	10% of Gross ASV

Runway surface type deductions for each New Jersey airport, where applicable, are presented in the **Capacity Analysis Summary Table**.

B. Approach Type

The type of approach that is available at an airport can also significantly impact an airport's ASV. Approaches are designed to aid pilots and aircraft during their arrival at an airport. Based on the type of approach available, data is provided to the pilot that allows him to locate the airport or a specific runway end even when the airport is not visible due to darkness, clouds, or other surface conditions. The type of approach that is available at an individual airport is dependent on a number of factors related to airport facilities, electronic equipment, and airport location relative to natural and/or man-made obstructions.

Approach types are generally categorized as precision, non-precision, or visual. Precision approaches provide locational and glide slope data to a specific runway end, while non-precision approaches only provide locational data to a runway end. Visual approaches require the pilot to be able to visually locate the airport and a runway before an approach can be initiated. In general, precision approaches provide the most data to pilots, and therefore, can safely support aircraft operations in the most demanding of weather conditions. As a result, airports with precision approaches are operational a higher percentage of the time; on annual basis, runway with a precision can accommodate higher levels of aircraft operations. Non-precision approaches and visual approaches support runway utilization and airport landings, to varying degrees, a lower percentage of time.

Precision and non-precision approaches have published procedures that are available for use by all pilots flying that approach. These uniform approach procedures result in a controlled operating environment in an airport's airspace. This operating environment includes an acceptable separation between aircraft operating on the same approach. Because visual approaches require visual contact with airport facilities and other aircraft operating in airport environs, the separation required between aircraft completing visual approaches is significantly greater than in the controlled environment created by precision and non-precision approaches. The increased separation required for visual approaches results in a decrease in the ASV for those airports supported only by visual approaches.

Table A-4 summarizes the impact assumptions that were used to determine how different approach types can affect airport's annual operational capacity. In this analysis, airports were categorized by the most demanding approach available, and deductions in ASV were estimated based on approach type.

Table A-4
APPROACH TYPE CAPACITY DEDUCTIONS

Approach Type	**Deduction**
Precision Approach	No ASV deduction
Non-precision Approach	5% of Gross ASV
Visual Approach	10% of Gross ASV

Deductions based on approach type for each New Jersey airport, where applicable, are presented in the **Capacity Analysis Summary Table**.

C. Taxiway Type

The type of taxiway system, or lack of taxiway system, supporting a runway system can significantly impact an airport's ASV. When arriving to and/or departing from a runway, aircraft must taxi to runway ends and runway exits in order to access landside facilities at the airport or to initiate a departure. The existence of taxiways at an airport allows aircraft to complete these movements off of the active runway, thereby freeing that runway for use by other aircraft.

Different types of taxiway configurations including full parallel, partial parallel, or no taxiway, impact operational capacity to varying degrees. To account for the impact that different taxiway systems have on operational capacity, various percentage deductions were applied to each airport's ASV.

Table A-5 presents the taxiway deductions to gross ASV used in this analysis.

Table A-5
TAXIWAY TYPE CAPACITY DEDUCTIONS

Taxiway Type	Deduction
At least one full length parallel taxiway	No ASV deduction
At least one partial parallel taxiway	5% of Gross ASV
No parallel taxiway	10% of Gross ASV

Taxiway type deductions for each New Jersey airport, where applicable, are presented in the **Capacity Analysis Summary Table**.

D. Air Traffic Control Tower

Air Traffic Control Towers (ATCT) at airports play an important role in managing aircraft traffic flows both in the air and on the ground. The controlled operating environment and controlled movement of aircraft resulting from an ATCT promotes efficient airport operations. Where ATCT are not present, operational capacity is reduced.
Table A-6 summarizes the methodology that was used to estimate the impact that the lack of an ATCT has on an airport's operational capacity.

Table A-6
ATCT CAPACITY DEDUCTIONS

ATCT	Deduction
Yes	No ASV deduction
No	10% of Gross ASV

The deductions to operational capacity that were applied to airports not having ATCTs are presented in the **Capacity Analysis Summary Table**.

IV. DETERMINATION OF NET ASV

As shown in the **Capacity Analysis Summary Table**, various facility-related deductions to ASV in each of the categories discussed in this report were estimated for each New Jersey airport. The sum of these deductions was subtracted from the airport's gross ASV to reflect each airport's net ASV. The net ASV used in this system planning analysis incorporates FAA estimates of gross ASV based on runway configuration and mix index and estimated ASV deductions. As discussed, the operational capacity deductions adopted for use in this system planning process were based on the presence or the lack of certain facilities (runway surface, approach type, and air traffic control tower). As shown in the **Capacity Analysis Summary Table**, net ASVs at New Jersey general aviation airports range from over 225,000 annual operations at Teterboro Airport to approximately 126,500 annual operations at several of New Jersey's smaller airports with turf runways.

V. IDENTIFICATION OF DEMAND/CAPACITY RATIO

Estimates of net ASV at system airports were compared to current activity levels to determine their demand/capacity ratios. The demand capacity ratio is the ratio of total annual operations at an airport to that airport's estimated ASV. Airport demand/capacity ratios, as calculated in this analysis, are presented in the **Capacity Analysis Summary Table**. Estimated demand/capacity ratios at New Jersey general aviation airports currently range from approximately 130 percent at Morristown Municipal Airport to 0 percent at several system airports with a minimal number of annual aircraft operations.