Airport Master Plan Update

and

Strategic Long-Range Visioning Plan

Prepared By:

URS

In Association With:

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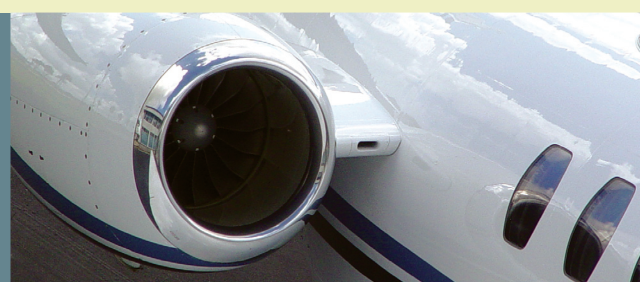
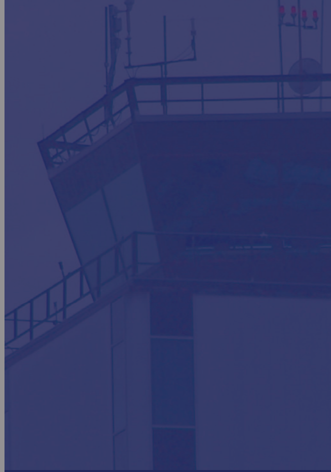
Ron Miller & Associates

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

September 2010





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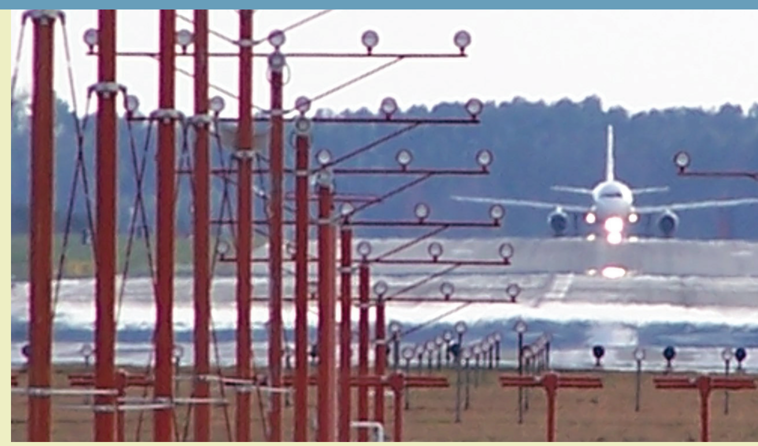

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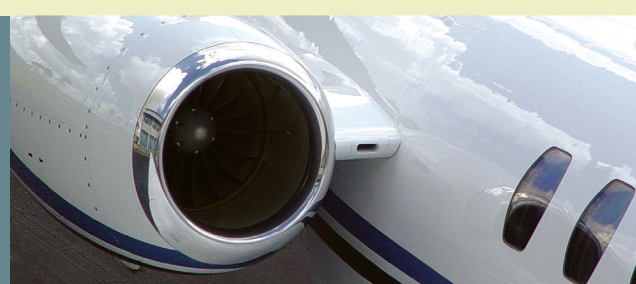

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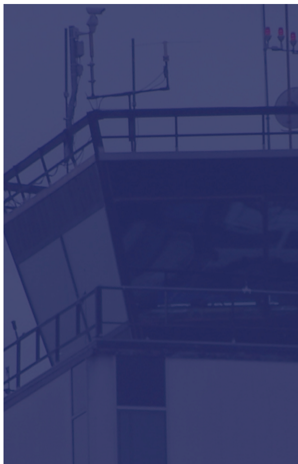

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SECTION 1.0
INTRODUCTION

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PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

SECTION 1.0

INTRODUCTION

1.1 AIRPORT OWNERSHIP AND MANAGEMENT

The Piedmont Triad Airport Authority (PTAA) owns, maintains, and operates the Piedmont Triad International Airport, (PTI) and as such, owns airport property, acquires land, enters into legal contracts and leases, and makes all rules and regulations for the use, operation, and control of the airport. The PTAA may incur debt and generally has all the rights and powers given to counties and municipalities by the State of North Carolina relating to municipal airports. The FAA's three letter designation for this airport is GSO.

The daily operation, maintenance, planning, design, and construction of PTI are managed by the PTAA which comprises a seven-member board. All members are resident voters from the surrounding communities and counties. Two members are from the City of High Point, one appointed by the High Point City Council, and the other appointed by the Guilford County Board of Commissioners. Two are from the City of Greensboro, one appointed by the Greensboro City Council, and the other appointed by the Guilford County Board of Commissioners. One is from the City of Winston-Salem appointed by the Winston-Salem City Council. One is from Guilford County at large and is appointed by the Guilford County Board of Commissioners. One is from unincorporated Forsyth County and is appointed by the Forsyth County Board of Commissioners. The Executive Director and staff of full-time and part-time employees operate the airport. The 4,000-acre airport campus is home to 50 companies that employ approximately 4,500 full-time workers engaged in providing support of air carrier and general aviation operations, aircraft manufacturing, aircraft maintenance and repair, air freight, warehousing and a number of other aviation-related enterprises.

1.2 AIRPORT MASTER PLAN

An Airport Master Plan is a tool used by airport owners to plan growth and guide development to meet existing and future needs of airport users. The Federal Aviation Administration (FAA) recommends that airport owners update their Airport Master Plans periodically to document the existing and future operational capability of the airport, enhance safety and identify facility and capital improvements needs. A typical Airport Master Plan represents a 20-year development concept for the airport. To remain eligible to received FAA AIP funding for needed airport improvement projects, the FAA recommends that an airport's Master Plan be reviewed and updated every 5 to 7 years. The last Airport Master Plan update was completed for PTI in 1994.

This Airport Master Plan Report outlines the PTAA's preferred conceptual design for Long-Term development of PTI. The Airport Master Plan Update Report explains and the Airport Layout Plan (ALP) drawing set graphically depicts the airport development plan concept and provides pertinent technical information and data upon which recommendations for future development are based.

1.3 AIRPORT LAYOUT PLAN

The ALP drawing set is a set of planning drawings and is not intended to provide design engineering accuracy. Individual items such as runway coordinates, obstruction survey data, and application of airport design standards must comply with Federal survey standards. The ALP is a key "communication" and "agreement" document between the airport owner and the FAA. It represents an understanding between the airport owner and the FAA regarding the current and future development and operation of the airport. As part of the ALP drawing set, a single Airport Layout Drawing (ALD) is reviewed and approved by signature by the airport owner and the FAA local Airports District Office and serves as a record of aeronautical requirements, both present and future, and as a reference for community deliberations on land use proposals and budget resource planning. The supporting drawings included in the ALP drawing set are considered appended to the ALP and are a part of it.

The FAA uses the ALP primarily for the following purposes:

- Aeronautical studies of proposals for the development of nearby airports and objects that may affect the navigable airspace, and proposals for on-airport development;
- Siting of new and relocated FAA facilities and equipment;
- Analysis of operational changes;
- Development of new standard instrument approach procedures; and
- Determination of land needed for aeronautical purposes.

Because the approved ALP represents an agreement between the airport owner and the FAA regarding how the airport will develop, and for AIP grant assurance compliance purposes, it is also imperative that the airport owner develop the airport in accordance with the ALP. The FAA requires an airport owner keep their ALP current to remain eligible to receive Federal funding for certain airport improvement projects. The approved ALP enables the airport sponsor and the FAA to plan for facility improvements at the airport. It also allows the FAA to anticipate budgetary and procedural needs. The approved ALP also allows the FAA to protect the airspace required for airport facility or approach procedure improvements.

1.4 PREVIOUS AIRPORT MASTER PLAN UPDATES

In 1997, an Airport Master Plan Update was initiated. In 1998, FedEx selected PTI as the location for a new Mid-Atlantic hub. At that time, it was recognized that the development the FedEx Mid-Atlantic hub facility would require major improvements to the airfield and the local system of surface transportation roadways that surround the airport. Because these changes would require additional detailed planning, design, environmental review and permitting, the 1997 Airport Master Plan Update was suspended indefinitely in the summer of 1999.

Since that time, however, current and on-going developments of two large logistical and manufacturing facilities on the airport have generated the need for the timely identification, planning and development of additional on-airport land uses and facilities. It was also recognized that non-airport land uses located immediately adjacent to the airport will most likely change in direct response to the development of key airport facilities (runways, taxiways and other aviation related functions) and to increased latent demand for airport-compatible "aviation-related" industries. On-going improvements to the airfield, surface transportation and infrastructure have occurred since the 1994 Airport Master Plan and have been documented within the most current ALD that has been conditionally-approved by and is on file with the FAA's Atlanta Airports District Office.

Improvements that have been completed at PTI since the suspension of the 1997 Airport Master Plan Update include the following:

- Expansion of the Passenger Terminal's North Concourse,
- Realignment of Bryan Boulevard,
- Main Terminal Expansion to Accommodate new Passenger and Baggage Screening Facilities,
- Construction of a Comair Maintenance Facility,
- Construction of additional General Aviation Hangars,
- Construction of a 9,000-foot Parallel Runway 5L/23R and associated taxiway system,
- Construction of Cross-Field Taxiway System,
- Construction of an Additional Airfield Electrical Vault,
- Upgrade of Visual Guidance Lighting Systems,
- Upgrade of Runway Visual Range System serving Runway 5R/23L,
- Upgrade of Instrument Landing System Equipment,
- Expansion of the Cessna Citation Service Center Apron,
- Construction of the FedEx Mid-Atlantic Hub,
- Construction of Honda Aircraft Company's Headquarters and HondaJet Research and Development Facility, and
- Construction of a New Remote ARFF/Command Center Facility.

Once these improvements were completed, or nearly completed, the PTAA and Airport staff decided that the time was right to look ahead to identify current and future needs required to maintain safe and efficient airport operations, and to plan for future growth of the airport. It is apparent from these recent major developments that have occurred at PTI since 1999, the decision to suspend the previous 1997 Airport Master Plan Update was timely and prudent.

1.5 NEED FOR THIS AIRPORT MASTER PLAN UPDATE

This Airport Master Plan Update was initiated in late 2007 by the PTAA with work beginning in 2008. There are five primary reasons why the PTI Airport Master Plan is being updated, namely:

1. Response to Anticipated Changing User Demand and Economic Development Opportunities

It is recognized that the City of Greensboro, Guilford County and the Piedmont Triad Region must respond to the continued population, business, educational and economic growth. These planned and anticipated changes will require improvements to the region's surface and air transportation infrastructures.

2. Required Timeline to Develop Needed Airport Improvements

Because the types of improvements required to enhance the utility and vitality of the airport will take several years to implement, it is important that the Airport Master Plan Update clearly identify and prioritize the various airport improvement that are anticipated to occur within the Near-Term (0-5 years), Intermediate- (6-10 years) and Long-Term (11-20 years). Further, anticipated changes in regional aeronautical demand at PTI require that such planning serve to fully identify the need and timing for such airport improvements. Major airport improvements may require extended timelines in which to complete environmental review, permitting, design, and construction.

3. Need for the Development of a Strategic Long-Range Visioning Approach to Airport Planning for PTI

A typical update of an Airport Master Plan considers the Airport's needs over a five-, ten-, and 20-year planning period. The accuracy of the aviation activity forecasts and the overall usefulness of the planning , however, becomes less certain over time as the accuracy of predictions of long-range (beyond five years) future facility development needs evolve, or because of unanticipated changes in the aviation demand (e.g., shifts in passenger air travel or air cargo demand). Other unforeseen events or opportunities for airport facility development (e.g., the development of the FedEx Mid-Atlantic Hub facility at PTI) can also serve to have pronounced changes to an airport's future plans.

Historically, airport master planning has been limited to a 20-year planning horizon that is typically considered a reasonable time frame within which to plan for future facility needs, conduct needed environmental due-diligence, acquire needed land. The traditional role of competing resources such as compatible land and funding; however, have not fostered the concept of a long-range planning of airports or the idea that there is a need to develop a forward-looking strategic plans that address the future needs of the airport beyond the typical 20-year planning period

4. Strategic Airport Master Planning Considerations (Beyond 20 Years)

As part of this Airport Master Plan Update, the PTAA and staff also asked URS to look beyond the typical 20-year planning window to determine how the airport might grow over the next 21 to 50 years to determine how and in which geographic direction the airport might possibly grow in the future. As documented as part of the November 2001 *Environmental Impact Statement (EIS) for the Proposed Runway 5L/23R, Proposed New Overnight Express Air Cargo Sorting and Distribution Facility and Associated Developments*, 40 alternative airport expansion options were considered. After careful review of each alternative airport development option, the FAA determined that future growth and expansion of the airport would most likely occur in a northwest direction. It was further determined that future airport development and growth in the northwest direction would most likely impose the least amount of social and environmental impacts and would be the most cost effective to achieve. The EIS observed that these land areas offer or possess the following attributes or opportunities:

- Least amount of development,
- Relatively undeveloped transportation infrastructures,
- Minimal induced secondary impacts, and
- Minimal social-economic and industrial/commercial impacts.

By contrast, potential airport expansion within surrounding land areas located to the southeast and southwest would be constrained due to the existing network of surface transportation which includes the Western Urban Loop, Interstate 40, and the Norfolk Southern Railroad Rail Line. The relative location and proximity of a major fuel storage and transfer depot having an extensive underground piping system was also considered to impose major constraints to future airport growth and development to the southeast Light industrial and corporate land use would also further inhibit airport growth in these areas. For similar reasons, airport development to the northeast and to the south would be constrained when considering existing surface transportation arteries and existing residential land use.

The vision for the growth of the airport includes the possible development of a third parallel runway that would be constructed northwest of Runway 5L/23R at a runway-to-runway centerline separation of 4,300 feet. The future ultimate development footprint of the airfield would include a network of connecting crossfield taxiways that would be situated between the existing three-runway system and the proposed third parallel runway. It is envisioned that land uses located in proximity to future Taxiway Golf, which would serve Runway 5L/23R in the future and the proposed third future parallel runway, would support the development of additional air cargo and associated distribution facilities.

To accommodate the physical development and safety-related protection of a possible third parallel runway, portions of State Highway 68 west of the airport would be relocated and realigned westward. Access to the airport from the entire region would be facilitated by a new interchange to the northeast of the current airfield that would be anchored by the new Interstate 73.

It is important to note that the current FAA-approved forecasts developed and used for this Airport Master Plan Update do not indicate future levels of aviation activity that would support the typical need for the development of the proposed third parallel runway and realignment of existing surface transportation infrastructures within the 20-year planning time frame. It should be further noted that it is impossible to predict precisely when future aviation activity demand would trigger the need for the development of a third parallel runway for airfield capacity enhancing purposes. In all probability, several future updates to this Airport Master Plan Update will occur before aviation activity levels increase to warrant the need for the development of another parallel runway.

That said; however, the planning for, and the depiction of a proposed third parallel runway is considered prudent from a long-range airport master planning consideration standpoint. One prime example of the need for considering a new parallel runway as part of the PTAA's strategic long-range panning is the recent development of parallel Runway 5L/23R. The construction of this widely-space parallel runway was completed in 2009, but was first planned for and depicted on PTI's Airport Layout Plan Drawing in 1968 for long-range planning purposes, some 41 years earlier. It should also be carefully noted that the timing of Runway 5L/23R was in response to the stated logistic and operational needs specific to the FedEx Mid-Atlantic Hub facility. Accordingly, the planning and depiction of the future third parallel runway is presented for Long-Term strategic airport planning and development purposes only. It should also be noted that other users of the airport (e.g., airlines, general aviation and other airport tenants) also benefit from the availability and use of the new parallel runway.

Information presented for Long-Term airport master planning (e.g., beyond the typical 20-year planning window) will require review and acceptance by local land use planners, surrounding political subdivisions and land owners. Without the proper and timely communication of the PTI's strategic airport master plan, the ability for the PTAA to preserve the capability to develop elements of the proposed long-range airport development plans would be at risk. Accordingly, this Airport Master Plan Update presents these long-range and strategic planning considerations to provide meaningful information that serves to inform interested reviewers, land owners and airport stakeholders of future patterns of airport growth that may occur.

To identify and conceptually address long-range planning issues that are not typically considered within a 20-year airport master planning horizon, John D. Kasarda, Ph.D., Chief Executive Officer of Aerotropolis Business Concepts, LLC provided meaningful insight and planning guidance to the long-range visioning included within this Airport Master Plan Update. Dr. Kasarda provided planning strategies and recommendations regarding the need to identify, acquire and preserve adjacent non-airport owned land areas that surround the airport for future aviation-related uses. Referencing "*The Piedmont Triad Aerotropolis Plan: From Guidelines to Implementation*" published September 2008, authored by John D. Kasarda, PhD., and Stephen J. Appold, PhD., was instrumental in providing insightful planning guidance not typically included with most Airport Master Plans. These recommendations are included in **Appendix H,** *Strategic Long-Term Planning Considerations Report* as part of Airport Master Plan Update as authored by John D. Kasarda, PhD., Stephen J. Appold, PhD., and Patrick Howell, PhD. Such conceptual planning served to augment, facilitate, identify and foster potential airport facility and land acquisition opportunities that PTAA might undertake as part of its strategic long-range visioning plan for the airport.

The PTAA decided to include this Longer-Term view for the following reasons:

- As the governing body responsible for maintaining a safe, accessible and efficient airport, the PTAA believes it is prudent to create a long range vision for the airport.

- The FedEx Mid-Atlantic hub and other concurrent facility development and associated activities are expected to generate significant economic development on and near the airport. The PTAA believes it prudent to have a plan for that growth, when it occurs.

- Honda Aircraft Company's decision to locate its World Headquarters at the airport demonstrates that the airport is a prime location for similar operations by others. The PTAA wants to be prepared for that potential.

- Airport growth over the Long-Term will require the acquisition of land. The PTAA needs Long-Term direction in its land acquisition planning.

- Planning staffs in jurisdictions surrounding the airport need information from the PTAA that will help them in developing land use plans for their respective jurisdictions that will be compatible with the anticipated Long-Term growth of PTI.

- Land owners and potential home buyers surrounding the airport deserve to know the PTAA's long-range vision for expansion of PTI so that they may make informed decisions.

- In its role as an economic generator, the airport has few remaining undeveloped on-airport sites that can accommodate aviation-related activities that desire an airport location. The airport needs to identify additional land that may be purchased for future development of aviation-related industrial use.

- The community has a keen interest in the Piedmont Triad Aerotropolis Plan. The PTAA and airport staff believes showing future airport growth on the ALD would be of interest to the public as the Piedmont Triad Aerotropolis Plan takes shape.

5. Consideration of FAA's Next Generation Air Transportation System (NextGen)

To meet the challenges faced by the U.S. aviation industry, the federal government is planning for the development of the Next Generation Air Transportation System (NextGen). This on-going and wide-ranging FAA initiative is slated to transform and revolutionize the current air traffic control system by leveraging new technologies, such as satellite-based navigation, surveillance, and networking. The initiative involves meaningful collaboration among government departments and agencies, as well as companies in the aerospace and related industries. It is recognized that each of the nation's airports will serve as the nexus for many of the transformational elements to be deployed as NextGen becomes a reality.

As part of the Airport Master Plan and Strategic Long-Range Visioning Plan, key planning goals were identified that directly support the FAA's NextGen development, namely:

- **Airport Preservation**

  Many airports are threatened by encroachment by residential land uses, erection or construction of hazards to air navigation, conversion of once compatible land use to non-compatible uses, non-sustainable operating costs and lack of community support. Land use decisions are local and state concerns that reflect the political nexus of many interests: residential communities, developers, local governments, and airport users. Lack of support from communities that do not understand the importance of their airport is also a key factor. Accordingly, advocacy and sponsorship of the airport by local businesses, users, and the community is important for Long-Term preservation. This Airport Master Plan Update provides information upon which local decision makers and land use planners can make timely and informed decisions regarding the airport's long-range development plans, the need to preserve airport-compatible land uses surrounding the airport and the need to identify and quantify future land acquisition for airport development purposes.

- **Optimized Airfield Design**

FAA-prescribed airport design standards are used to guide airport development as appropriate for today's aircraft and operational procedures. NextGen is projected to substantially increase the capacity of the nation's airspace through improved communications, reduced runway separation standards and more direct aircraft routing. This will make it necessary for airports to provide airside and landside capacity to complement the increased airspace capacity provided by NextGen.

This Airport Master Plan Update considers NextGen in terms of potential future airside facility requirements that include recommendations to preserve the capability to development a future third parallel runway that would be optimized to provide simultaneous independent instrument approach capabilities. Although the timing for the development of the third parallel runway has not been identified, the Airport Master Plan identifies the land area requirements, safety-related setbacks requirements and the need to protect navigable airspace beyond each end of the runway, should such runway development come to fruition.

- **Protection of Navigable Airspace**

To facilitate the implementation of NextGen, it will be important to identify and protect airspace resources in the vicinity of PTI and along the ingress/egress paths to each runway end. When the ALP drawing set is conditionally-approved by the FAA, all future development of buildings, towers or other structures in proximity to the proposed future third parallel runway will be evaluated for potential adverse impacts to the associated navigable airspace for that runway.

- **Airport Development Supporting NextGen Capacity Improvements**

The FAA's implementation of NextGen makes it important that airports have the inherent flexibility to provide the airport capacity to accommodate potential increased levels of aircraft, passenger and cargo activity. In addition to the airfield optimization mentioned above, it will be important to consider other aspects of the airport such as passenger terminal facilities, cargo facilities, roadways, parking.

This Airport Master Plan Update goes beyond the typical 20-year planning period and provides a far-reaching planning outlook with regard to the need for the PTAA to provide adequate land areas for future airport expansion and to attain and preserve the capability to accommodate future roadway, terminal and airside apron capacity that will serve to balance and complement airspace capacity enhancement provided by NextGen.

1.6 GOALS OF THE AIRPORT MASTER PLAN

The primary purpose of any Airport Master Plan is to provide guidance for the future development of the airport which will satisfy existing and anticipated future aviation demand in a financially feasible and responsible manner, while also addressing associated financial, environmental, and socioeconomic issues and concerns.

The main goal of this Airport Master Plan Update is to create a guide for the development of PTI that will allow for the timely and systematic response to on-going changes in aviation demand at the airport, and to preserve the capability to accommodate unforeseen aviation demand and economic development opportunities. The Airport Master Plan Update will serve as a planning and decision-making tool that can be used by PTAA to develop the necessary improvements at PTI required to address and satisfy Immediate- and Long-Term aviation demand, while also remaining competitive among other commercial airports within the region. This Airport Master Plan Update is intended to become a management tool that reflects PTAA's policies and preferences, and was developed with close coordination with all appropriate Federal, regional, and local agencies.

In support of this purpose, the following key airport master planning goals have been identified:

- Identify strategic airside, landside, surface access and airspace protection improvements that are needed to optimize operational capability, enhance safety and strengthen the economic aspects of the airport.
- Establish a phased implementation schedule for recommended Short- (0 to 5 years), Intermediate- (6 to 10 years), and Long-Term (11-20 years) airport development.
- Identify Short-Term airport improvement requirements and recommend appropriate actions needed to optimize Short-Term funding opportunities.
- Ensure that Short-Term actions and recommendations do not preclude Long-Term planning options.
- Consider the economic, environmental concerns and interests of the local public and government agencies as part of the airport master planning process.
- Identify potential associated adverse environmental impacts that may result from the implementation of recommended airport improvements.
- Adopt and/or make recommendations regarding the current land uses both on and off the airport that would include, but would not be limited to land use compatibility recommendations for land acquisition, compatible zoning and the minimization of airport-generated noise.
- Achieve and maintain balanced airport development.
- Determine activity level triggers for future airport facility expansion.
- Develop a plan that can be incrementally expanded to meet the demand as needed.
- Provide an efficient system of airport master planning and facility development programming.
- Create awareness and generate involvement that leads to public acceptance and support of the Airport Master Plan and Strategic Long-Range Visioning Plan.

In recognition that the PTAA has decided to look beyond the typical 20-year Airport Master Plan planning horizon, specific goals were identified for a farther-looking Airport Master Plan that will provide a framework which can be used to guide future airport development and satisfy aviation demand in a financially feasible and cost-effective manner. These goals serve to maintain the PTAA's ability to:

- Create a long-range vision for the airport (21-50-years out),
- Determine the Long-Term configuration, land area and land use needs of the airport.
- Promote state, regional, and local coordination for planning and implementation.
- Plan for unforeseen, yet anticipated demand for the development of large economic development projects on or near the airport when it occurs.
- Identify the Long-Term need for acquisition of additional land to accommodate airport expansion and development needs.
- Provide timely information to local planners and developers within the surrounding jurisdictions to promote the future development of land uses in vicinity of the airport that are compatible with anticipated Long-Term airport growth.
- Provide land owners and potential home buyers surrounding the airport information regarding the PTAA's long-range vision for airport expansion so that they may make informed decisions.
- Maintain the airport's role as an economic generator.
- Develop and maintain the ability to facilitate airport land acquisition and facility development that are compatible with the Aerotropolis concept.
- Attain and maintain the ability to attract world-class companies similar to those of FedEx and Honda Aircraft Company.
- Remain cognizant of and maintain the ability to accommodate emerging trends in aviation, and
- Develop measures to encourage compatible land use development.

1.7 OBJECTIVES OF THE AIRPORT MASTER PLAN UPDATE

This Airport Master Plan Update provides a flexible and cost-effective guide for the future development of PTI through the year 2027 within the typical 20-year planning period. Physical improvements needed to meet projected levels of passengers, aircraft operations, and air cargo tonnage during the 20-year planning process is identified. The platform for determining airport needs over the next 10 years includes the following objectives:

- Update aviation demand forecasts through the 20-year planning period (2007-2027);

- Identify demand-driven aviation-related facilities based on forecasted Million Annual Passengers (MAP), annual air cargo activity levels, and annual aircraft operations;

- Identify airport development alternatives, land development alternatives, and revenue-generating opportunities to meet the projected aviation activity demand;

- Develop a 0 to 10-year Capital Improvement Plan (CIP) to accommodate projected annual demand and recommend a Financial Plan to implement the CIP; and

- Update the ALP drawing set to address the recommended CIP and to comply with FAA airport planning and design criteria.

Similar to the reasons for identifying specific goals that will guide the 20-year strategic long-range visioning process; specific objectives were identified for examining the 21 to 50-year planning horizon. The Airport Master Plan Update strategic vision process took a number of issues into consideration, including most feasible direction for airport growth, future potential needed changes to the local surface transportation configuration, potential associated environmental impacts and potential long-range regional and airport changes based upon the proposed Piedmont Triad Aerotropolis Plan that were outlined and recommended by Dr. Kasarda and Dr. Appold as part of this Airport Master Plan Update. In addition, the planners and airport staff:

- Commissioned a report by Dr. Kasarda to create a concept of PTI airport growth over the next 21 to 50-year planning period relying on his expertise in long-range strategic planning for airports.

- Relied on information provided in a study performed for the PTI in the fall of 2008 by Guilford Realty Group Inc, which using tax value information, examined the potential cost of acquiring land targeted for purchase in Phases 1, 2 and 3 in the Airport Master Plan Update Long-Term vision.

- Conducted interviews with representatives of the North Carolina Department of Transportation (NCDOT) to determine the preferred route for Interstate 73, which is planned near the airport and will have direct impact on airport growth to the east.

- Conducted interviews with representatives of the NCDOT to determine the feasibility of moving Highway 68 to the west to accommodate airport growth.

- Reviewed alternative growth patterns for the airport with associated costs, anticipated environmental impacts and potential for adverse noise exposure impacts to noise-sensitive communities.

- Determined the most workable paths for cross-field taxiways that would; a) make highest and best use of the new parallel Runway 5L/23R by providing access to future tenants who will require airfield access; and b) link to a future third parallel runway, should airport demand require it in future years.

1.8 FAA AIRPORT MASTER PLAN UPDATE APPROVAL PROCESS

The development of this Airport Master Plan Update and the strategic long-range visioning, inclusive of the ALP drawing set, was produced based upon prescribed airport planning guidelines and development standards and established regulations found in FAA Advisory Circulars (AC) 150/5070-6B, *Airport Master Plans* and 150/5300-13, *Airport Design*. The FAA does not approve an airport owner's Airport Master Plan, but rather accepts it based upon the FAA's conditional approval, meaning the FAA has no direct interest in Near-, Intermediate- or Long-Term planning for the airport. The role of the FAA is to prescribe and enforce airport development and operating standards and to provide funding participation for eligible development projects that are deemed necessary for the safe and efficient operation of the public use airport.

The ALP drawing set comprises a single ALD and other supporting drawings that are reviewed and approved based upon conformance with current FAA prescribed planning and design guidelines. A current ALP which has FAA approval from the standpoint of safety, utility, and efficiency of the airport, shall be required before an airport development project is approved. Accordingly, the FAA conditionally-approves the airport owner's ALD for the following reasons:

Safety - Airport development should be planned to:

- Provide for the safe operation of the airport,
- Satisfy current FAA airport design standards, and
- Provide for the safe operation of aircraft.

Utility - Airport development should be as useful as possible for airport purposes to:

- Make the best use of available land,
- Minimize impact of off-airport structures and land uses on-airport operations, and
- Adequately provide for future users.

Efficiency - Airport development should provide for maximum airport efficiency to:

- Provide adequate capacity to meet forecasted aviation activity demand with minimum delays,
- Provide unrestricted access to the airfield and adjacent aviation-related land uses, and
- Provide, planning a parallel runway system, adequate runway centerline-to-centerline separation to provide the greatest optimization of airfield capacity.

FAA approval of the ALP requires that all existing and proposed airport development depicted on the plan satisfy current FAA airport design standards, or current FAA-approved Modification of Airport Design standards. It also means that the FAA must find that the proposed airport development shown on the ALP be useful and efficient. ALP approval by the FAA is required for Airport Improvement Program (AIP) and/or

Passenger Facility Charge (PFC) funding. For the purposes of this Airport Master Plan Update and strategic long-range visioning, review and conditional approval of the ALP will be conducted and granted by the FAA's Airports District Office and the FAA's Southern Regional Headquarters (ASO) respectively, both located in Atlanta, Georgia.

The following FAA offices will review the PTI Airport Master Plan ALP:

- Atlanta Airports District Office (ADO): conformance with airport design standards; modifications to design standards; runway safety area determinations, etc.

- Flight Procedures (ATL-FPO): impacts on existing and proposed instrument approach and departure procedures; feasibility of proposed instrument procedures.

- Flight Standards (FSESO-31): aircraft operational safety (including ground movements).

- Airway Facilities (ASO-474): confirming location of existing and proposed FAA facilities, effects of proposed development on existing and planned FAA facilities, line-of-sight, etc.

- Air Traffic (ASO-532): efficiency of airspace use; traffic pattern conflicts.

- Local (PTI) ATCT: effects on air traffic control procedures and facilities; efficiency of the airport, particularly taxiway layout and runway configuration.

- Airports Division (ASO-620): airport safety; compliance with FAR Part 139 (certificated airports); declared distances at certificated airports.

- Security (CASFO): assure all development is compatible with security requirements; protection of FAA facilities is adequate to deny access to unauthorized personnel. (Coordinate with Security only when controlled access, security fencing, or facilities planning decisions are necessary), and

- Regional Runway Safety Program Office (ASO-1R): comment on the safety of airport geometry in terms of preventing runway incursions. (Coordinate with ASO-1R only on large and medium hub airports and other airports with a complex geometric layout.)

Two types of FAA approval of the ALP are granted:

1. Unconditional Approval - all items of proposed development requiring environmental processing have received environmental approval.

2. Conditional Approval- environmental processing has not been completed for all of the items of proposed development requiring it.

The FAA's approval of the ALP drawing set does not represent a commitment to provide Federal financial assistance to implement any development or air navigation facilities shown on the plan. Nor does it mean that the FAA will find funding of the proposed airport development justified. Further, FAA approval does not imply that the proposed airport development is eligible or justified for AIP or PFC funding, or that FAA agrees with all of the development shown on the plan. Justification of projects that may be eligible for federal funding participation must be based on aeronautical need.

1.9 AIRPORT MASTER PLAN GUIDANCE

The Airport Master Plan Update and strategic long-range visioning was developed referencing airport planning and design guidance prescribed by FAA included, but was not limited to:

<u>FAA Advisory Circulars</u>

- 150/5060-5, *Airport Capacity and Delay*;
- 150/5070-6B, *Airport Master Plans*;
- 150/5300-13, *Airport Design*;
- 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports*; and
- 150/5325-4B, *Runway Length Requirements for Airport Design*.

<u>FAA Orders</u>

- 5050, 4B, *NEPA Implementing Instructions for Airport Actions*;
- 1050.1E, *Environmental Impacts: Policies and Procedures*;
- 1000.1A, *Policy Statement of the FAA*;
- 5300.1F, *Modifications to Agency Airport Design, Construction, and Equipment Standards*;
- 5100.38A, *Airport Improvement Program (AIP) Handbook*;
- 5190.6A, *Airport Compliance Handbook*;
- 5010.4, *Airport Safety Data*; and
- 5200.8, *Runway Safety Area Program*.

<u>Other References</u>

- Code of Federal Regulations (CFR) Part 77, *Objects Affecting Navigable Airspace*.
- FAA Southern Region Airports Division, A Guide for ADO Program Managers for Airport Layout Plan (ALP) Review and Approvals.

1.10 AIRPORT MASTER PLAN TASKS

Specific tasks included in this Airport Master Plan Update are as follows:

Task 1 <u>Project Mobilization</u> - This task is limited to the review and finalization of the Airport Master Plan Update scope, schedule, study team members, meeting locations and format, coordination procedures, and specific key issues.

Task 2 Facilities/Existing Conditions Inventory - This task includes the collection of data and information pertinent to PTI, the surrounding land uses and an overview of the current condition of existing airport facilities and structures.

Task 3 Forecasts of Aviation Activity - This task documents past aviation activity levels and provides a forecast of anticipated future levels of aviation activity that includes projections of aircraft operations, passenger and cargo enplanements, and anticipated changes in aircraft size throughout the Near-, Intermediate-, and Long-Term planning periods.

Task 4 Demand/Capacity Analysis and Identification of facility needs - This task calculates the hourly and annual capacities of the airfield, passenger handling capabilities and of the terminal and capabilities of other supporting facilities at the airport. This task also identifies new or expanded facilities that would be necessary to satisfy existing or forecasted future aviation activity demand.

Task 5 Analysis of Alternative Development Plans - This task evaluates one or more potential airport development schemes that would serve to satisfy needed airport improvements previously identified.

Task 6 Development Plans - This task involves detailing the selection and adoption of the Preferred Alternative Plan.

Task 7 Environmental Strategy Plan - This task includes an overview and identification of those factors listed in FAA Order 5050-4B, *NEPA Implementing Instructions for Airport Actions* and FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures* that are most likely to be affected by the recommended airport improvements and related developments.

Task 8 Implementation Plan – This task includes preparation of a list of recommended improvements for forecast aviation activity levels associated with Near-Term (0 to 5-year), Intermediate-Term (6 to 10-year), and Long-Term (11 to 20-year) time frames.

Task 9 Capital Improvement Program - This task includes the implementation and cost estimates for improvements over the Near-, Intermediate-, and Long-Term planning periods. The phasing of the CIP will be adjusted to meet financial feasibility requirements.

Task 10 Financial Action Plan - This task discusses potential sources of funding that would be needed to develop the recommended airport improvement projects. The potential impact on operating revenue and expenses, debt service requirements and discretionary cash, as well as revenue enhancements, will also be addressed.

Task 11 Airport Layout Plan (ALP) Set Development - This task involves updating and reformatting the ALP drawing set. The ALP Drawing Set comprised a single Airport ALD and twenty-six supporting drawings. Collectively, these drawings depict existing and proposed future development of the airport and supporting airport facilities as recommended in the Airport Master Plan Update. As reviewed by the FAA, the PTAA's Airport Master Plan Update is accepted by the FAA. A project depicted on the ALD however, requires review and subsequent formal approval by the FAA prior to the determination of eligibility for federal funding participation. Further, any proposed airport or related facility improvements recommended within the Airport Master Plan Update and depicted on the ALP may also require environmental review and permit approval prior to actual development.

1.11 AIRPORT MASTER PLAN TEAM ORGANIZATION

This Airport Master Plan Update was conducted by URS Corporation (Prime Consultant) serving at the direction of PTI management. Three sub-consultants to URS also participated with the Airport Master Plan Update performing key assignments. Jacobs Consultancy developed portions of the forecasts of aviation activity and the entirety of the financial action plan, Ron Miller & Associates provided assistance in areas of advising the PTAA and airport staff regarding community liaison, outreach and public involvement, and John D. Kasarda, Ph.D., CEO of Aerotropolis Business Concepts, LLC participated in the development of the strategic long-range visioning considerations.

1.12 COMMUNICATIONS AND COORDINATION

Throughout this Airport Master Plan Update, progress/coordination meetings were held with representatives from PTAA senior management, PTAA development staff, FAA, NCDOT, Baker and Associates, the LPA Group and URS team members. These meetings were held to coordinate the Airport Master Plan Study task and time schedule.

The planning period included opportunities for the public and the FAA to review the draft Airport Master Plan Update and to provide comment. The public comment schedule was as follows:

- The initial draft Airport Master Plan Update presented at public meeting of the Piedmont Triad Airport Authority.
- A public information workshop to allow the public to ask questions publicized a week in advance and held the evening following the afternoon PTAA meeting.
- Meetings with key stakeholders, local planners, airport tenants, government officials and others following initial presentation of the draft Airport Master Plan Update.
- The draft Airport Master Plan Update available at PTI; libraries in Greensboro, High Point and Winston-Salem; and, on the airport’s website during a 107-day comment period.

- Public comment on the draft Airport Master Plan Update accepted by mail, by hand at the airport and through the website.
- A Public Hearing on the Airport Master Plan Update.
- Public comment collected and considered for the preparation of the final draft of the Airport Master Plan Update.
- Portions of the draft final study reviewed by the Federal Aviation Administration.

Appendix I includes the information on public/stakeholder presentations and public comments.

Upon FAA acceptance, draft study becomes the primary planning document for the PTAA. The final Airport Master Plan Update recommendations will reflect the collective knowledge, insight, and opinions of various participants and stakeholders in the Airport Master Plan Update.

1.13 AIRPORT MASTER PLAN ORGANIZATION

The Airport Master Plan Update is organized into nine sections, which are listed as follows:

Section 1.0: Introduction
Section 2.0: Existing Conditions
Section 3.0: Forecasts of Aviation Activity and Airport Land Needs
Section 4.0: Demand/Capacity and Facility Requirements
Section 5.0: Airport Development Options
Section 6.0: Strategic Master Plan Implementation
Section 7.0: Environmental Analysis
Section 8.0: Financial Action Plan
Section 9.0: Airport Layout Plan Set Development

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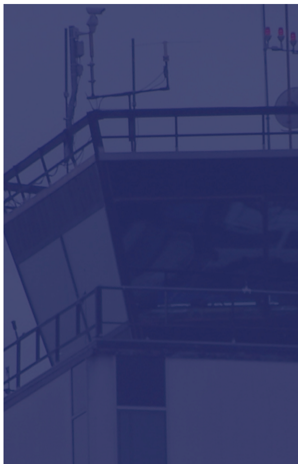


Airport Master Plan Update
and
Strategic Long-Range Visioning Plan

SECTION 2.0
EXISTING CONDITIONS

Prepared By:
URS

In Association With:
JACOBS CONSULTANCY

rma
Ron Miller & Associates

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

SECTION 2.0

EXISTING CONDITIONS

2.1 INTRODUCTION

This section of the Airport Master Plan Update provides a general description of the airport, existing facilities and conditions of the airfield, passenger terminal, buildings, hangars, surface transportation system, fueling facilities, air traffic control and airfield operations, delineated wetlands, airport utilities, and local meteorological conditions.

This information is later used within this Airport Master Plan Update to assist in formulating development recommendations and establishing the financial and operational effects of each recommendation. Existing data and information, as derived from other sources, were also compiled for use in this inventory effort to avoid redundancy and duplication of data collection efforts. In addition, Piedmont Triad Airport Authority (PTAA) staff provided historical and current data and information necessary to document the level of aviation activity and conditions of facilities at the Piedmont Triad International Airport (PTI). PTI is owned and operated by the PTAA.

A list of acronyms is included in **Appendix A**, *Acronyms*.

2.2 AIRPORT HISTORY

A brief overview of PTI history is presented in **Appendix B**, *Airport History*.

2.3 GENERAL DESCRIPTION OF AIRPORT

2.3.1 AIRPORT LOCATION

The airport is located approximately 10 miles west of the Central Business District (CBD) of the City of Greensboro; 17 miles east of Winston-Salem; and, 10 miles north of High Point, North Carolina. An airport location map is provided on **Figure 2-1**.

An aerial photograph of the airport (dated March 2009) is shown on **Figure 2-2** and depicts the construction of the airport's third runway (Runway 5L/23R operational since January 2010), associated taxiway system and recent changes to the local roadway system that surrounds and serves the airport. The airport property encompasses 3,926 acres of land as shown on **Figure 2-3.**

The airport's published field elevation, which is defined as the highest point on an airport's usable runway, is 926 feet above mean sea level (MSL) and the coordinates of the Airport Reference Point (ARP) is 36°06'04.773" N and 79°56'28.045" W. The topography around the airport can be described as hilly.

2.3.2 *REGIONAL PERSPECTIVE, MARKET SERVICE AREA AND SURROUNDING LAND USE*

The Greensboro-High Point-Winston-Salem Area is referred to as the *Piedmont Triad Region*. It encompasses 12 counties and a population of more than 1.5 million people. This area of North Carolina is a major manufacturing, trade, transportation, and financial center for the state and the southeastern United States.

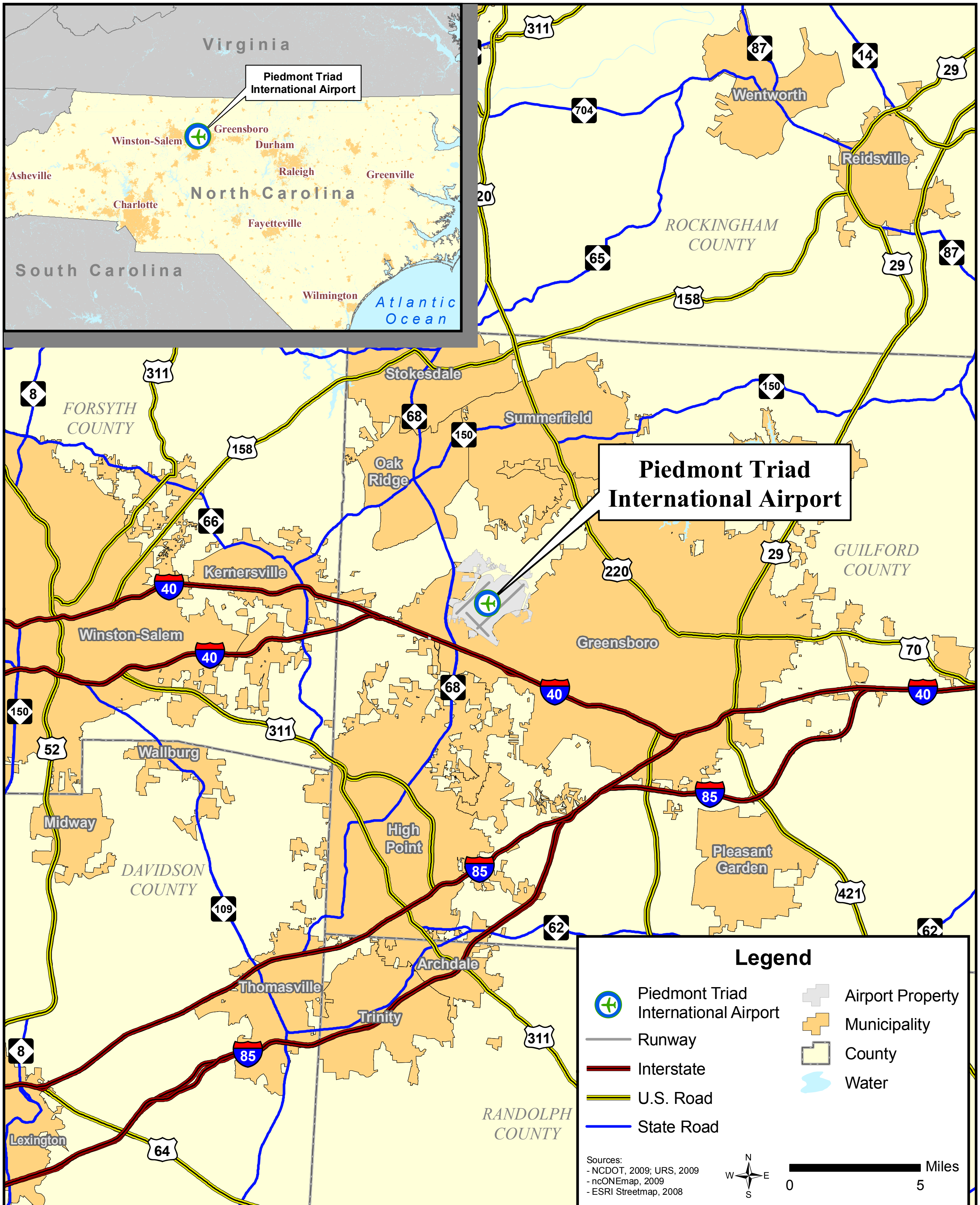
The airport's core market service area encompasses the twelve North Carolina counties of Surry, Stokes, Rockingham, Caswell Yadkin, Forsyth, Guilford, Alamance, Davie, Davidson, Randolph and Montgomery. The core market area also includes the six southern Virginia counties of Carroll, Floyd, Patrick, Franklin, Henry and Pittsylvania. Collectively, this market service area has a population of approximately 1.8 million.

An additional northern catchment area includes the southern Virginia counties of Grayson, Wythe, Pulaski, Montgomery, Roanoke, Bedford, Campbell and Halifax representing a population of 613,000. An additional western catchment area includes the North Carolina counties of Ashe, Alleghany, Wilkes, Alexander, Iredell, Rowan, Catawba, Caldwell and Watauga representing a population of 780,000.

Land uses surrounding the airport are a mixture of residential, commercial, mixed use commercial, industrial/corporate, and mixed use corporate uses. Residential land uses dominates the area immediately north and east, and selective areas to the west, with commercial land uses to the northeast. To the south, land use consists of industrial/corporate uses mixed with commercial and some residential. Land areas west of the airport are of mixed use comprising residential, industrial/corporate, and mixed use corporate uses. Currently, Guilford County has a comprehensive plan that was adopted and placed into effect in late 2006.

2.3.3 *EXISTING AIRLINE SERVICE*

As presented in **Table 2-1**, 25 individual air-carriers provide scheduled service at PTI of which, three regional airlines service as operators for United Airlines and US Airways. The scheduled service also includes five dedicated air cargo carriers. The scheduled passenger airlines provided nonstop service to 17 domestic destinations.



PIEDMONT TRIAD INTERNATIONAL AIRPORT

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PTAA PIEDMONT TRIAD AIRPORT AUTHORITY

AIRPORT LOCATION MAP

FIGURE 2-1

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J:\Greensboro Master Plan Update\MPU REPORT\Section 02 – Inventory\Figures\FIG 2-2.dwg 11/22/2010 16:05

PIEDMONT TRIAD INTERNATIONAL AIRPORT

Airport Master Plan Update

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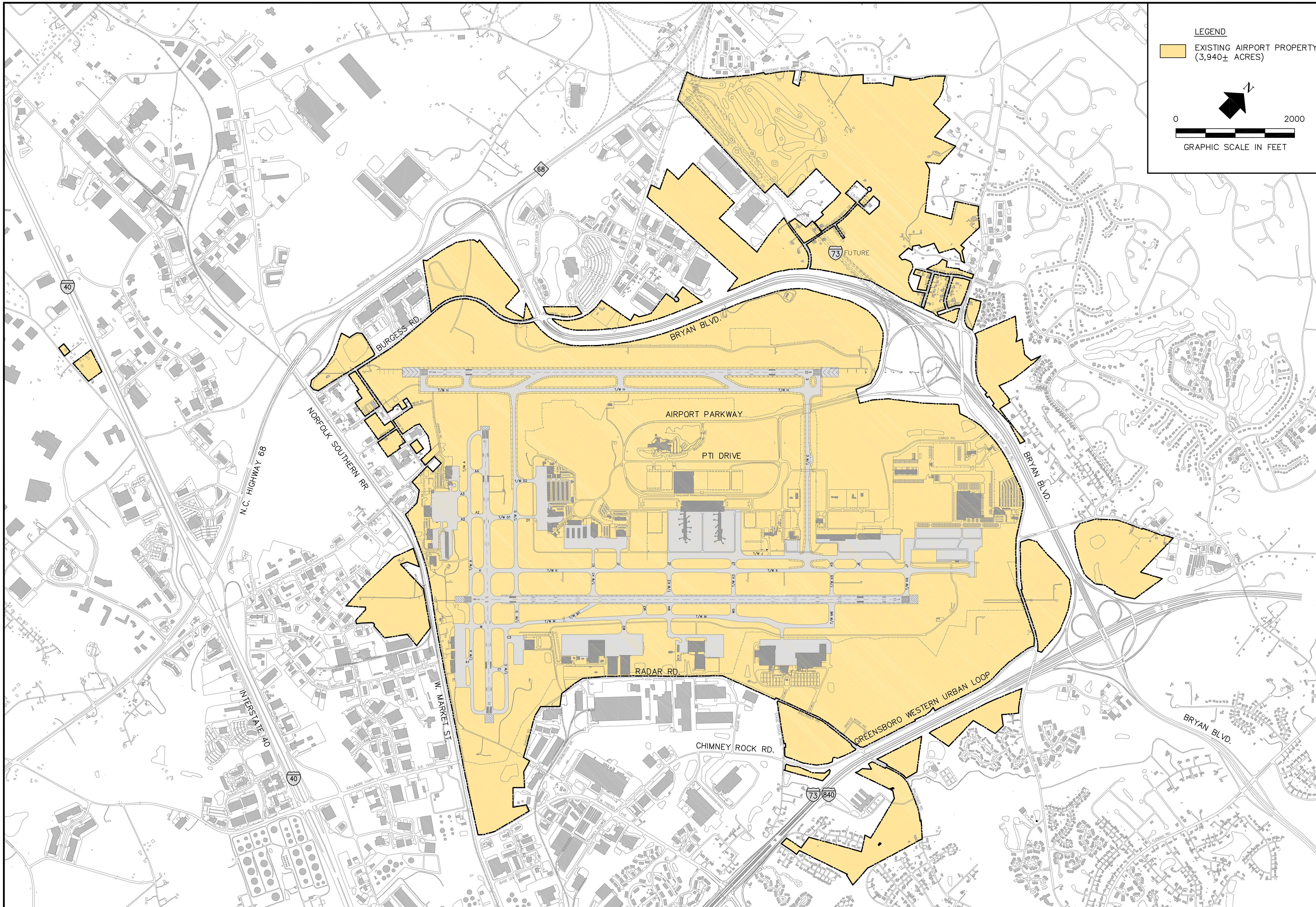
AERIAL PHOTOGRAPH

FIGURE 2-2



PIEDMONT TRIAD INTERNATIONAL AIRPORT
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AIRPORT PROPERTY MAP

FIGURE 2-3

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TABLE 2-1
AIRLINE SERVICE AT PTI

Major Airlines	Regional Airlines	Air Cargo
1. Allegiant 2. Continental Airlines 3. Delta Airlines 4. United Airlines 5. US Airways	1. Air Wisconsin (US Airways) 2. American Eagle 3. ASA (Delta) 4. Chautauqua (United Airlines and US Airways) 5. Comair (Delta) 6. Continental Express 7. Freedom (Delta) 8. Go Jet (United Airlines) 9. Mesa (United Airlines and US Airways) 10. Piedmont (US Airways) 11. PSA Airlines (US Airways) 12. Republic (US Airways) 13. Pinnacle (Delta) 14. Skywest (Delta) 15. Trans State (United Airlines)	1. Airborne Express 2. FedEx 3. Mountain Air Cargo 4. TradeWinds 5. United Parcel Service

Source: PTAA, May 2009.

2.4 DESCRIPTION OF EXISTING FACILITIES AND CONDITIONS

The following is a brief description of existing conditions of key airport facilities and buildings. Much of this information was collected with the assistance of airport management, PTI administrative staff, and airport tenants.

2.4.1 AIRFIELD

2.4.1.1 Runways

PTI has three active runways. Parallel Runways 5R/23L and 5L/23R serve as the airport's primary runways and are oriented in a north-east/south-west direction. Runway 14/32 serves as the airport's crosswind runway and is oriented in a north-west/south-east direction. The combination and orientation of the three runways satisfy the FAA's recommended 95 percent wind coverage requirement.

Each runway is capable of accommodating the wheel loading bearing weight and runway take-off distance requirements of most air carrier aircraft. The airport's newest runway, 5L/23R became operational in January 2010. The rehabilitation of Runway 5R/23L and associated taxiways was completed in 1999. Runway 23L was last extended in 1982 and Runway 14/32 was last rehabilitated in the 1980s. **Figure 2-4** depicts the existing airfield layout at PTI.

The centerline-to-centerline separation between parallel runways 5R/23L and 5L/23R, is 5,100 feet and thus allows independent, simultaneous arrivals and departures under certain instrument meteorological conditions (IMC).

Tables 2-2 through 2-4 list the physical characteristics, lighting, and navigational aids (NAVAIDs) of each runway. **Figure 2-5** depicts the location and description of each airfield visual and electronic NAVAID.

Land and Hold Short Operations

When the Airport Traffic Control Tower allows simultaneous operations on the two intersecting runways (5R/23L and 14/32), Land and Hold Short Operations (LAHSO) are available for arrivals to Runways 14 and 23L to increase airport capacity without compromising safety. LAHSO is an air traffic control procedure that requires pilot participation to balance the needs for increased airport capacity and system efficiency, consistent with safety. LAHSO is a voluntary operation and a pilot may deny a LAHSO clearance at the pilot's discretion.

When landing on Runway 14, aircraft are allowed to utilize the available landing length of 3,450 feet, but must hold short of intersecting Runway 5R/23L. When landing on Runway 23L, aircraft may land on the available runway length of 9,200 feet, but must hold short of Runway 14/32. The available landing distance is measured from the landing threshold to the hold point.

Declared Distance Criteria

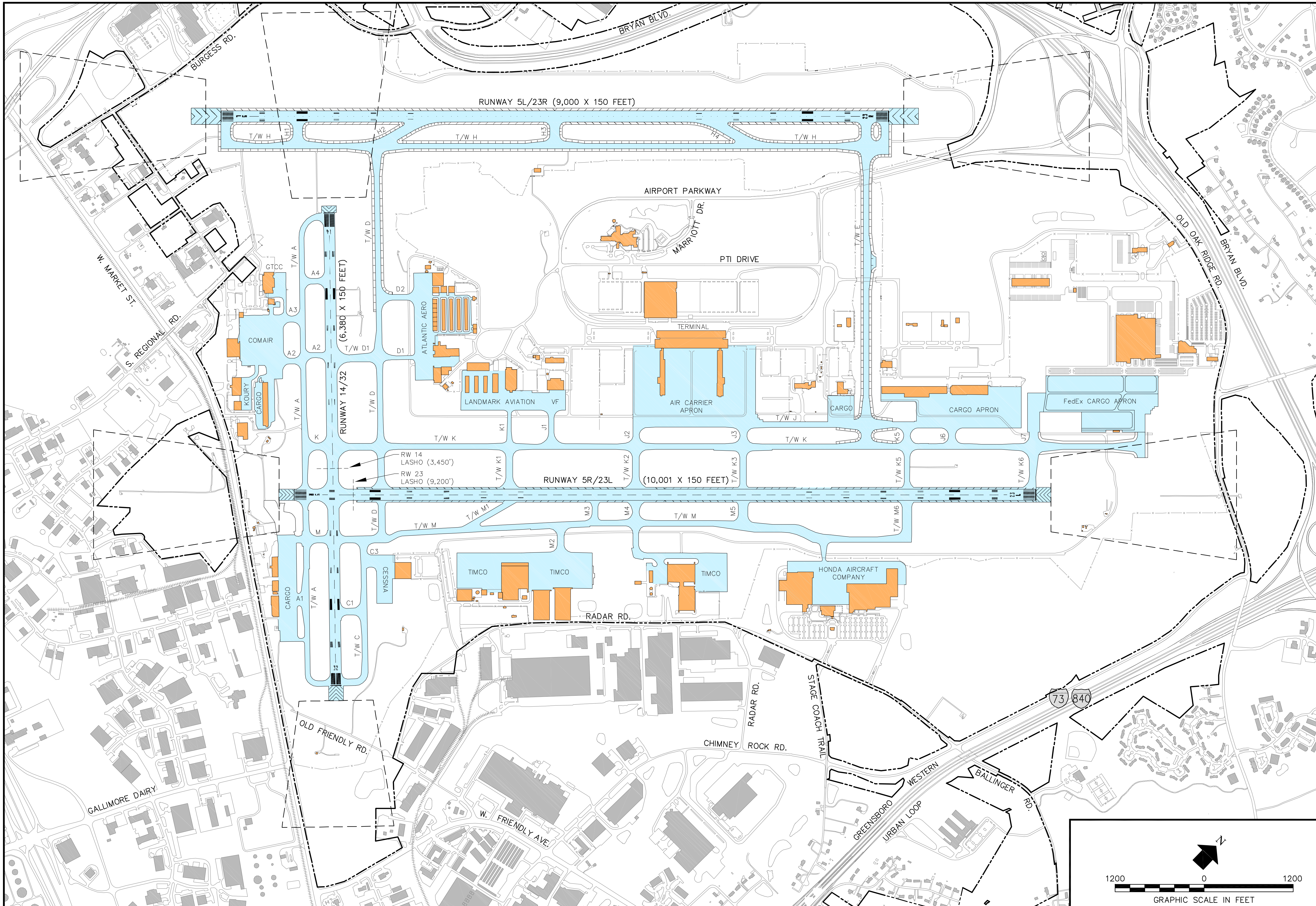
The use of declared distance criteria is applied to Runway 23L because the portion of the Runway Safety Area extending beyond the departure end of the runway is only 600 feet in length, 400 feet shorter than the required length of 1,000 feet. Accordingly, the published Accelerated Stop Distance Available (ASDA) length for departing aircraft and Landing Distance Available (LDA) length for arriving aircraft are each 9,601 feet, 400 feet less than the total runway physical length of 10,001 feet.

2.4.1.2 Taxiways

PTI is served by a system of parallel and connecting taxiways that provide access between the passenger terminal, Fixed Base Operators (FBOs), corporate hangars, cargo ramps, and maintenance facilities. All taxiways are 75 feet in width, unless noted otherwise, and are lighted with a Medium Intensity Taxiway Lights (MITL) (see **Figure 2-5**).

Taxiway A

Taxiway A is a full-length parallel taxiway located 375 feet (runway centerline-to-taxiway centerline) southwest of Runway 14/32. This taxiway provides access to areas on the southwest side of the airfield, which is home to general aviation maintenance facilities, corporate and cargo hangars, PTAA Maintenance, Airport Fire Station, and the Guilford Technical Community College (GTCC) Aviation Center. Taxiways A1, A2, and A3 serve as connector taxiways to the apron/ramp areas of Tradewinds, Air Cargo, and Comair, respectively. Connector Taxiways A2 and A4 are located between Taxiway A and Runway 14/32.



PIEDMONT TRIAD INTERNATIONAL AIRPORT

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AIRFIELD LAYOUT

FIGURE 2-4

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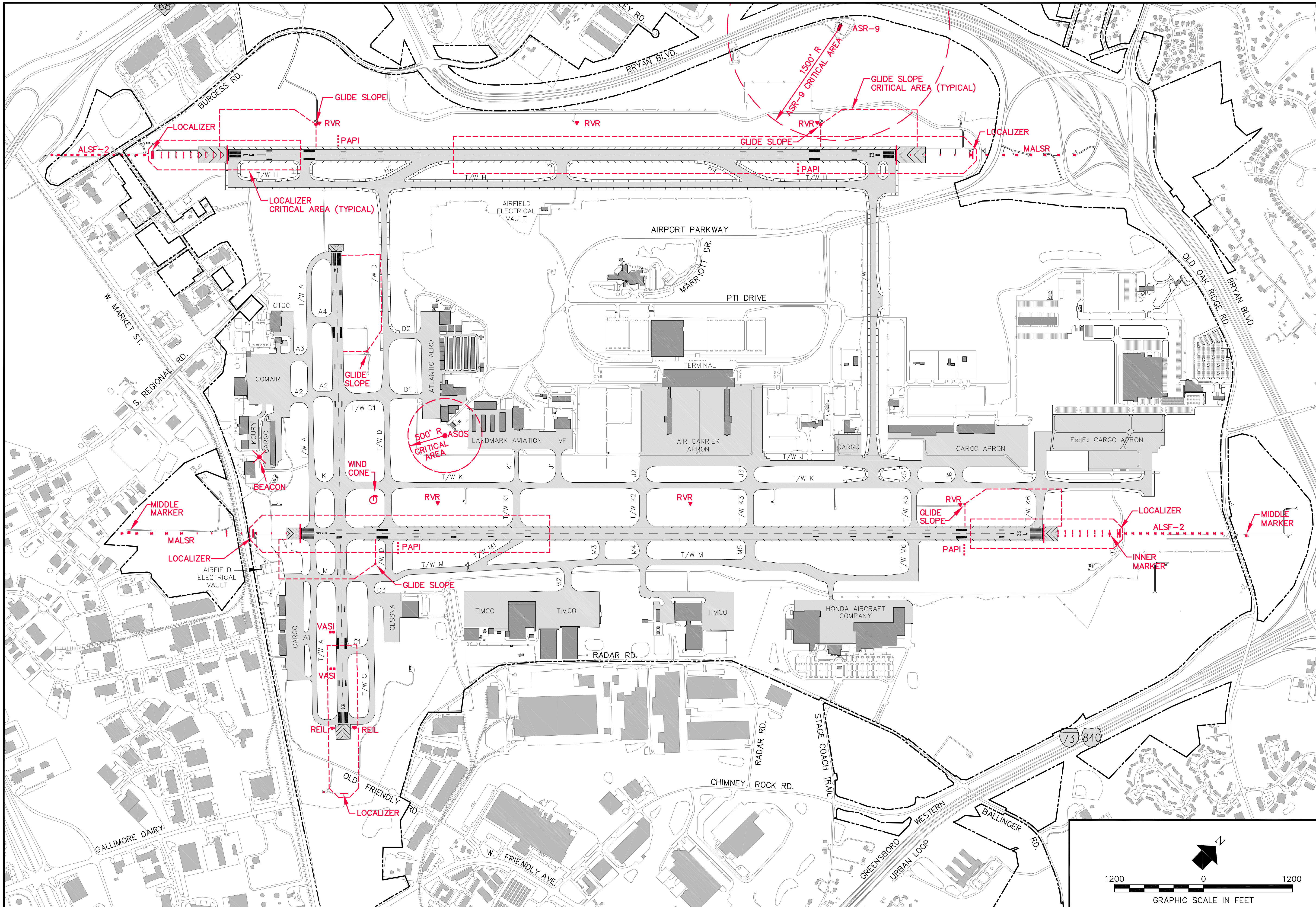

PIEDMONT TRIAD INTERNATIONAL AIRPORT

Airport Master Plan Update

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PTAA PIEDMONT TRIAD AIRPORT AUTHORITY

AIRFIELD NAVAIDS

FIGURE 2-5

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TABLE 2-2
RUNWAY 5R/23L DATA

Item		Runway 5R/23L	
Runway Length/Width/Shoulder Width		10,001'/150'/25'	
Airport Reference Code		D-IV	
Critical Design Aircraft		MD-11	
Effective Gradient (Percent)		0.137	
Percent Wind Coverage (20 kts/23 mph)		99.86%	
Runway Pavement	Strength (000 lbs.)	124 SW,170 DW, 240 DTW	
	Surface Type/Friction	Asphalt/Grooved	
Maximum Runway Elevation (above MSL)		900.4'	
Runway Lighting		HIRL, CL, TDZL-RW 23L	
Runway Marking		Precision	
Item		**5R**	**23L**
End Elevations (MSL)		899.5'	885.8'
End Coordinates	Latitude	36°05'27.8084" N	36°06'36.5133" N
	Longitude	79°56'40.7701" W	79°55'13.1174" W
Runway Protection Zone (RPZ)	Length	2,500'	2,500'
	Width - Inner/Outer	1,000'/1,750'	1,000'/1,750'
Approach Lighting		MALSR	ALSF-2
Runway Touchdown Zone Elevations (MSL)		900.4'	889.4'
FAR Part 77 Imaginary Surfaces	Approach Category	Precision, CAT II	Precision, CAT II
	Inner Approach Surface Slope	50:1	50:1
NAVAIDs	Electronic Navigation Aids	VORTAC, ILS, LOC, DME	ILS, LOC, IM, MM, DME
	Visual Approach Aids	PAPI-4	PAPI-4
Published Approach Minimums (Cloud Ceiling/Visibility)	ILS CAT I or LOC	1,100'/2,400'RVR (200'/1/2 MI.)	1,089'/1,800'RVR (200'/1/2 MI.)
	ILS CAT II	RA 1,000'/ 1,200' RVR	RA 106'/ 1,200' RVR
	RNAV(GPS)	1,100'/2,400'RVR (200'/1/2 MI.)	1,089'/2,400'RVR (200'/1/2 MI.)
	VOR/DME	N/A	1,300'/2,400'RVR (400'/1/2 MI.)
	VOR	1,300'/2,400'RVR (400'/1/2 MI.)	N/A

Note: See Appendix A for complete list of Acronyms.
Source: URS, January 2010.

TABLE 2-3
RUNWAY 5L/23R DATA

Item		Runway 5L/23R	
Runway Length/Width/Shoulder Width		9,000'/150'/25'	
Airport Reference Code		D-V	
Critical Design Aircraft		MD-11	
Effective Gradient (Percent)		0.72	
Percent Wind Coverage (20 kts/23 mph)		99.86%	
Runway Pavement	Strength (000 lbs.)	124 SW,170 DW, 240 DTW	
	Surface Type/Friction	Asphalt	
Maximum Runway Elevation (above MSL)		916.5'	
Runway Lighting		HIRL, CL, TDZL	
Runway Marking		Precision	
Item		**5L**	**23R**
End Elevations (MSL)		916.5'	855.6'
End Coordinates	Latitude	36°05'57.32" N	36°06'59.16" N
	Longitude	79°57'32.58" W	79°56'13.70" W
RPZ	Length	2,500'	2,500'
	Width - Inner/Outer	1,000'/1,750'	1,000'/1,750'
Approach Lighting		ALSF-2	MALSR
Runway Touchdown Zone Elevations (MSL)		916.5'	855.6'
FAR Part 77 Imaginary Surfaces	Approach Category	Precision, CAT III	Precision, CAT I
	Inner Approach Surface Slope	50:1	50:1
NAVAIDs	Electronic Navigation Aids	ILS, LOC, DME	ILS, LOC, DME
	Visual Approach Aids	PAPI-4	PAPI-4
Published Approach Minimums (Cloud Ceiling/Visibility)	ILS CAT I or LOC	1,117'/1,800'RVR (200'/1/2 MI.)	1,056'/2,400'RVR (200'/1/2 MI.)
	ILS CAT II	RA 113'/ 1,200' RVR	N/A
	ILS CAT IIIa	RVR 07 (700' RVR)	N/A
	ILS CAT IIIb	RVR 06 (600' RVR)	N/A
	RNAV(GPS)	1,117'/2,400'RVR (200'/1/2 MI.)	1,056'/2,400'RVR (200'/1/2 MI.)

Note: See Appendix A for complete list of Acronyms.
Source: URS, January 2010.

TABLE 2-4
RUNWAY 14/32 DATA

Item		Runway 14/32	
Runway Length/Width/Shoulder Width		6,380’/150’	
Airport Reference Code		D-IV	
Critical Design Aircraft		MD-11	
Effective Gradient (Percent)		0.398	
Percent Wind Coverage (20 kts/23 mph)		99.80%	
Runway Pavement	Strength (000 lbs.)	123 SW,170 DW, 244 DTW	
	Surface Type/Friction	Asphalt/Porous Friction Courses (PFC)	
Maximum Runway Elevation (above MSL)		925.4’	
Runway Lighting		HIRL	
Runway Marking		Precision	
Item		**14**	**32**
End Elevations (MSL)		925.4’	900.0’
End Coordinates	Latitude	36°05’58.1283” N	36°05’13.3998” N
	Longitude	79°57’08.8050” W	79°56’13.9854” W
RPZ	Length	2,500’	1,700’
	Width - Inner/Outer	1,000’/1,750’	1,000’/1,510’
Approach Lighting		NONE	NONE
Runway Touchdown Zone Elevations (MSL)		925.4’	902.0’
FAR Part 77 Imaginary Surfaces	Approach Category	Precision, CAT I	Non-Precision
	Inner Approach Surface Slope	50:1	34:1
NAVAIDs	Electronic Navigation Aids	ILS, LOC, MM	NONE
	Visual Approach Aids	NONE	REIL, VASI-4
Published Approach Minimums (Cloud Ceiling/Visibility)	ILS CAT I	1,126’/2,400’RVR (200’/1/2 MI.)	N/A
	RNAV(GPS)	1,320’/4,000’RVR (400’/3/4 MI.)	1,400’/1 Mile (500’/1 MI.)
	NDB	1,440’/4,000’RVR (600’/3/4 MI.)	N/A

Note: See Appendix A for complete list of Acronyms.
Source: URS, January 2010.

Taxiway C

This taxiway parallels Runway 14/32 along its south end and has a 400-foot runway centerline-to-taxiway centerline separation. This taxiway provides access to Runway 32 and directly serves the Cessna Citation repair facility. Connector Taxiway C1 is located between Taxiway C and Runway 14/32.

Taxiway D

Taxiway D partially parallels Runway 14/32 and is located northeast of Runway 14/32 and has a 650-foot runway centerline-to-taxiway centerline separation. Taxiway D connects to Taxiway M and newly constructed Taxiway H. The recently completed extension (January 2010) of 1,965 linear feet of Taxiway D is between Taxiway Connector D2 and Taxiway H. Taxiway D crosses Runway 5R/23L, Taxiway K, and Connector Taxiways D1 and D2 that directly serve the Atlantic Aero apron. Taxiway D1 connector is 50 feet wide.

Taxiway E

This taxiway is a newly constructed (January 2010) crossfield taxiway connecting Runway 5L/23R with Taxiway J and K.

Taxiway H

Taxiway H is a recently constructed (January 2010) full parallel taxiway to newly constructed Runway 5L/23R and is located southeast of the runway and has a 400-foot runway centerline-to-taxiway centerline separation. Taxiway H connects to Connector Taxiways H1, H2, H3, and H4. Taxiway H also connects and crosses crossfield Taxiway D and Taxiway F.

Taxiway J

Taxiway J partially parallels Runway 5R/23L and Taxiway K and connects the terminal and northeast cargo apron. Connector Taxiway J1 connects Taxiway K and an apron area currently used by the VF Corporation. Connector Taxiways J2 and J3 connect Taxiway K and the air carrier apron. Connector Taxiways J6, J7 and J8 connect Taxiway K and the cargo apron.

Taxiway K

Taxiway K is a full parallel taxiway to Runway 5R/23L and is located northwest of the runway and has a 650-foot runway centerline-to-taxiway centerline separation. Traversing from the southwest to the northeast and beginning at Taxiway A, Taxiway K intersects and crosses Runway 14/32, Taxiway D, Connector Taxiways K1, K2, K3, K4, and K5 and terminates at Connector Taxiway K6. Connector Taxiway K1 connects Runway 5R/23L and the Landmark Aviation Apron. Connectors Taxiways K2 through K6 connects Runway 5R/23L and Taxiway K. Portion of Taxiway K between Taxiway Connector J7 and J8 was recently constructed and completed (January 2010). Taxiway K1 connector is 50 feet wide.

Taxiway M

This taxiway is located along the southeast side of Runway 5R/23L and parallels most of the runway. Traversing the airport from the southwest to the northeast, Taxiway M begins at Taxiway A and crosses Runway 14/32 and terminates at Connector Taxiway M6. Connector Taxiways M1, M3, M4, M5, and M6 all connect Taxiway M and Runway 5R/23L. Connector Taxiway M2 connects Taxiway M to the southern-most Triad International Maintenance Company (TIMCO) apron. Taxiway M, between Connector Taxiways M5 and M6, also provides an access for the Honda Aircraft Company to Runway 5R/23L.

2.4.1.3 Apron Areas

There are 15 aircraft apron areas at PTI and are as depicted on **Figure 2-4**. The Terminal Area apron accommodates air carrier aircraft, while the UPS and Air Cargo aprons are limited for use by larger and smaller cargo aircraft. The TIMCO, TradeWinds, and Comair apron areas are used exclusively for aircraft maintenance and/or itinerant parking and can accommodate large-to-medium size commercial aircraft. The GTCC, Cessna, Koury, HondaJet, Atlantic Aero, and Landmark Aviation apron areas typically accommodate smaller general aviation and corporate aircraft. **Table 2-5** identifies the apron areas and use, and provides the apron area in square yards and a number of tie-downs, where available.

2.4.1.4 Helipads

There are no designated helipads on the airport. Occasional transient helicopter operators utilize the Landmark Aviation and Atlantic Aero FBO aprons.

2.4.2 PASSENGER TERMINAL, BUILDINGS, HANGARS, AND OTHER FACILITIES

The descriptions of existing buildings located within the boundaries of PTI are provided in **Appendix C**, *Airport Building Facilities*. An inventory of building facilities and the locations is presented in **Figure 2-6**.

TABLE 2-5
APRON AREAS

Name	Use	Area (Sq. Yards)	Aircraft Tie-downs
Air Carrier Apron	Air Carrier	167,390	None
Vacant (former UPS Apron)	Air Cargo	8,667	None
Cargo Apron (south of FedEx)	Air Cargo	72,000	None
FedEx Cargo Apron	Air Cargo	106,300	None
HondaJet Apron	Aircraft Manufacturing	54,800	None
TIMCO Apron (next to HondaJet site)	Aircraft Maintenance	22,890	None
TIMCO Apron (next to Cessna site)	Aircraft Maintenance	84,660	None
Cessna Apron	Aircraft Maintenance	16,585	None
TradeWinds Apron	Air Cargo	39,740	None
Koury Apron	Private	6,700	None
Comair Apron	Aircraft Maintenance	44,240	None
GTCC Apron	Aircraft Maintenance	6,000	None
Atlantic Aero Apron	Corporate FBO	39,818	58
Landmark Aviation Apron	Corporate FBO	30,224	31
VF Corporation Apron	Corporate	9,000	None

Source: URS Corporation, January 2010.

2.4.2.1 Passenger Terminal Area

The passenger terminal at PTI was constructed in October of 1982 replacing the former passenger terminal that was located on the southwest side of the airport. The terminal is centrally located north of Runway 5R/23L and south of Runway 5L/23R. The landside area of the terminal is directly accessible via Bryan Boulevard to an inner loop road (Airport Parkway) and a two-level passenger curbside access system. The passenger terminal area also provides auto parking lots for departing and arriving passengers. The auto parking is further described in **Section 2.4.3.3**, and depicted in **Figure 2-7**.

Terminal Building

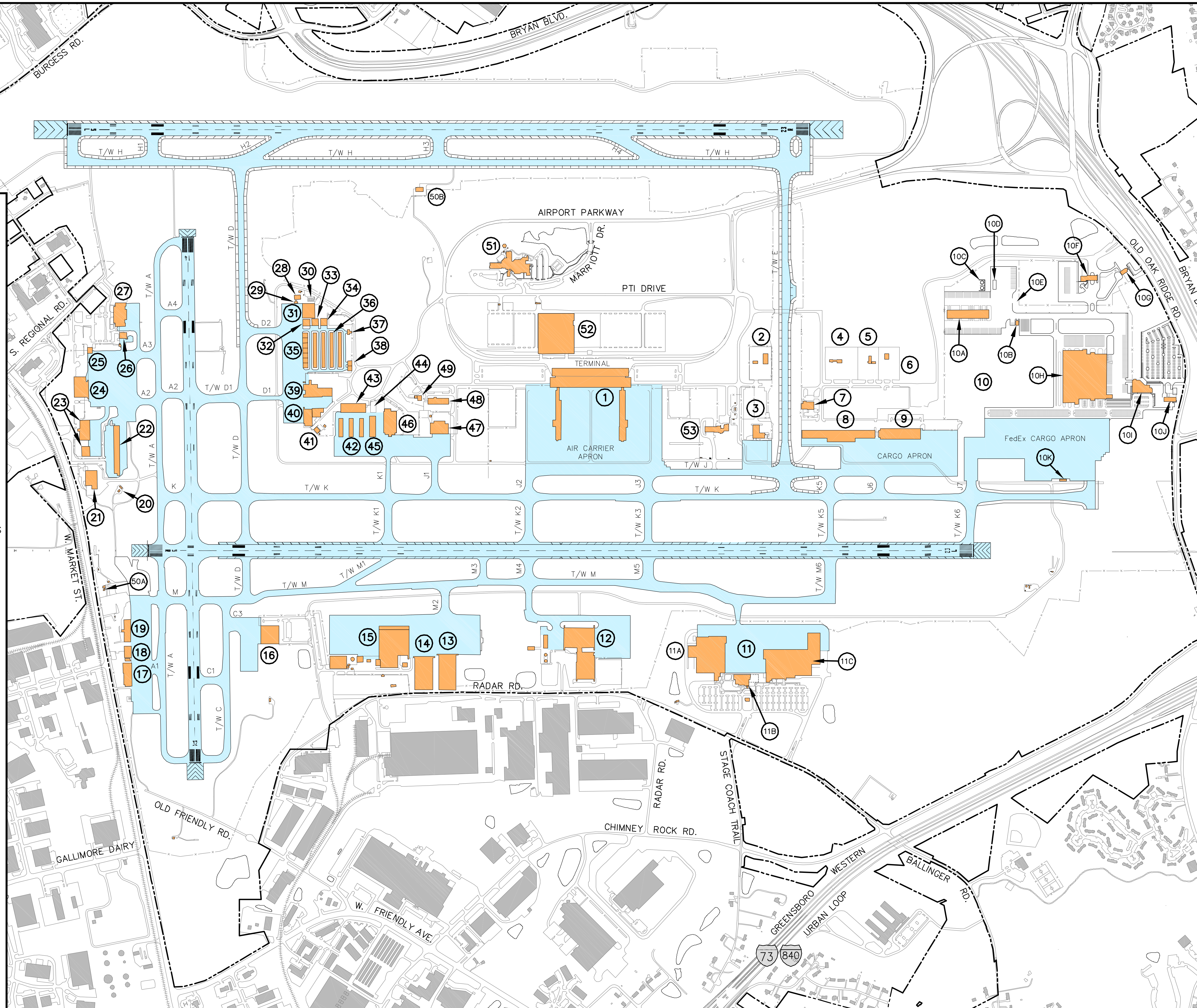
The terminal building has three levels; a basement service level, a public arrivals/baggage claim level, and a public departures level. The terminal building has a linear design with two concourses designated as “North Concourse” and “South Concourse” that extend outward at right angles to the terminal building.

Basement Service Level - A non-public basement level serves terminal support and maintenance functions and consists of drive-through access, auto parking, maintenance shops, equipment storage, and electrical and mechanical rooms. The basement service level is depicted in **Figure 2-8**.

Lower Arrivals/Baggage Claim Level - The lower level of the terminal serves as the arrival (arriving/deplaning) level consisting of all outbound baggage make-up, inbound baggage claim areas, and airline baggage offices. This level also includes baggage screening equipment that is located at each end of the terminal, airport operations, law enforcement, and security. The remaining space consists of car rental counters, limousine and taxi dispatch facilities, welcome center, public meeting/greeting area, public restrooms, and circulation areas. The lower levels of the north and south concourses are also used for airline office space. The lower arrivals/baggage claim level layout is depicted in **Figure 2-9**.

Upper Departures Level - The upper level of the terminal consists of space for departing/enplaning passengers, airline ticket counters, airline offices, concession space, game room, airport authority office space, public circulation, seating areas, and restrooms. Passenger security screening checkpoints are located at each end of the terminal at the entry to each concourse. The upper departure level concourse is used for passenger holding areas, boarding gates, concession, restrooms, and circulation areas. The upper departure level layout is depicted in **Figure 2-10**.

Table 2-6 provides a list of airlines in each concourse along with their gates and the types of aircraft they presently use.



BUILDING INDEX

1. TERMINAL
2. HERTZ
3. VACANT (FORMER UPS-SCS)
4. NATIONAL/ALAMO
5. AVIS BUDGET GROUP
6. ENTERPRISE
7. FLIGHT KITCHEN
8. AIR CARGO BLDG 2
9. AIR CARGO BLDG 3
10. FedEx COMPLEX
10A. GSE MAINTENANCE BUILDING
10B. DEICING STORAGE BUILDING
10C. FUEL FARM (AIRCRAFT)
10D. FUEL ISLAND
10E. FUEL FARM (AUTOMOTIVE)
10F. SECURITY ENTRANCE FACILITY
10G. CUSTOMER SERVICE BUILDING
10H. MAIN SORT BUILDING
10I. ADMINISTRATION BUILDING
10J. OPERATIONS SUPPORT BUILDING
10K. RAMP SUPPORT BUILDING
11. HONDA AIRCRAFT COMPANY
11A. RESEARCH & DEVELOPMENT BUILDING
11B. ADMINISTRATION BUILDING
11C. MANUFACTURING BUILDING
12. TIMCO MAINTENANCE HANGAR
13. TIMCO MAINTENANCE HANGAR 2
14. TIMCO MAINTENANCE HANGAR 3
15. TIMCO MAINTENANCE HANGAR 4
16. CESSNA AIRCRAFT SERVICE CENTER
17. LINCOLN FINANCIAL/JETSTREAM AIR, LLC HANGARS
18. TRADEWINDS HANGAR
19. TRADEWINDS HANGAR
20. FAA BUILDING
21. PTAA MAINTENANCE BUILDING
22. AIR CARGO BLDG 1
23. KOURY AVIATION HANGAR
24. COMAIR HANGAR
25. STORAGE BUILDING
26. AIRPORT FIRE STATION (ARFF)
27. GTCC AVIATION SCHOOL
28. ATLANTIC AERO STORAGE SHED
29. PRIVATE T-HANGAR
30. ATLANTIC AERO – FUEL FARM
31. ATLANTIC AERO – HANGAR
32. PIEDMONT CHEMICAL INDUSTRIES – HANGAR
33. ATLANTIC AERO – HANGAR
34. ATLANTIC AERO – HANGAR
35. ATLANTIC AERO – HANGAR
36. ATLANTIC AERO – SHADE HANGARS
37. PRIVATE T-HANGAR
38. PRIVATE HANGARS
39. ATLANTIC AERO FBO BUILDING/MAINTENENCE
40. ATLANTIC AERO – HANGAR/MAINTENANCE
41. NATIONAL WEATHER SERVICE
42. LANDMARK – T-HANGARS
43. LANDMARK – HANGAR
44. LANDMARK – FUEL FARM
45. LANDMARK – HANGAR
46. LANDMARK FBO BUILDING/MAINTENANCE
47. VF CORPORATION – CORPORATE HANGAR
48. FAA FLIGHT STANDARDS DISTRICT OFFICE
49. FAA AIRPORT TRAFFIC CONTROL TOWER (ATCT)
50A. AIRFIELD ELECTRICAL VAULT
50B. AIRFIELD ELECTRICAL VAULT
51. MARRIOTT HOTEL
52. AUTO PARKING GARAGE
53. REMOTE ARFF/COMMAND CENTER

N

1200 0 1200

GRAPHIC SCALE IN FEET

PIEDMONT TRIAD INTERNATIONAL AIRPORT

Airport Master Plan Update

URS

PTAA PIEDMONT TRIAD AIRPORT AUTHORITY

BUILDING INDEX

FIGURE 2-6

J:\Greensboro Master Plan Update\MPU REPORT\Section 02 – Inventory\Figures\FIG 2-6.dwg 11/22/2010 16:48

J:\Greensboro Master Plan Update\MPU REPORT\Section 02 - Inventory\Figures\FIG 2-7.dwg 02/12/2010 15:45

PIEDMONT TRIAD INTERNATIONAL AIRPORT
Airport Master Plan Update

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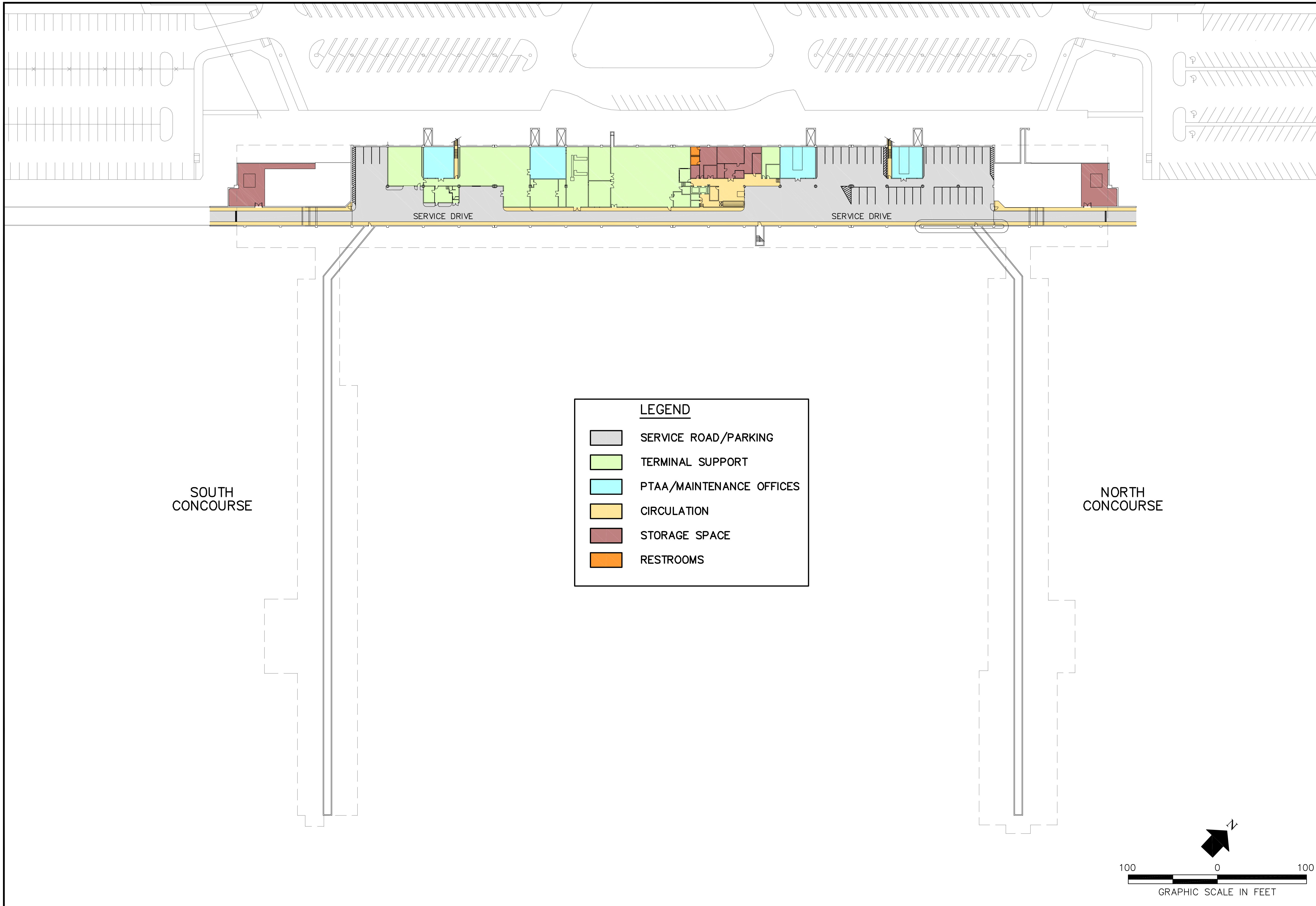
PTAA PIEDMONT TRIAD AIRPORT AUTHORITY

TERMINAL AREA LAYOUT

FIGURE 2-7



PIEDMONT TRIAD INTERNATIONAL AIRPORT

Airport Master Plan Update

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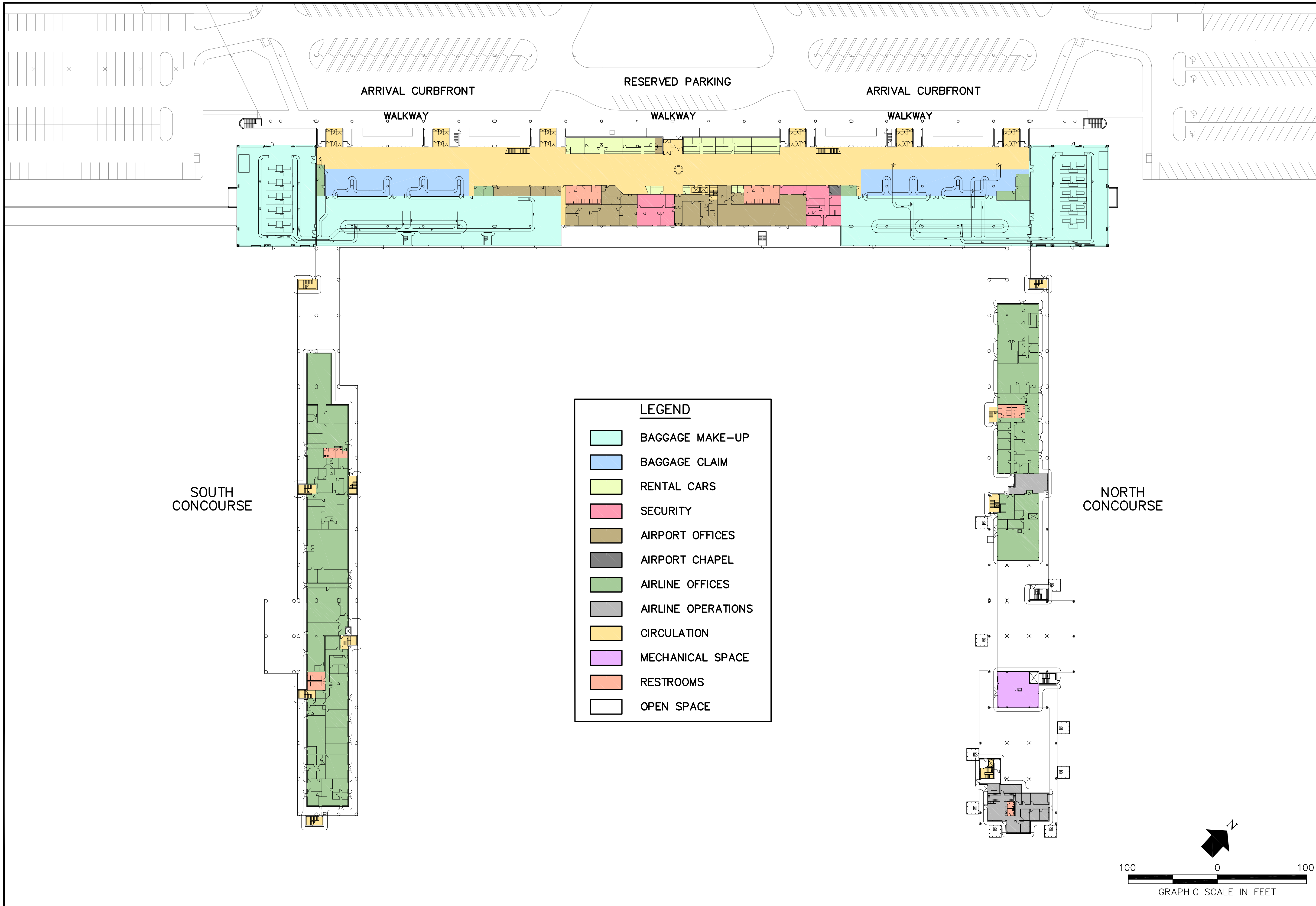
TERMINAL LAYOUT - BASEMENT/SERVICE LEVEL

FIGURE 2-8



PIEDMONT TRIAD INTERNATIONAL AIRPORT
Airport Master Plan Update

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TERMINAL LAYOUT - ARRIVALS LEVEL

FIGURE 2-9

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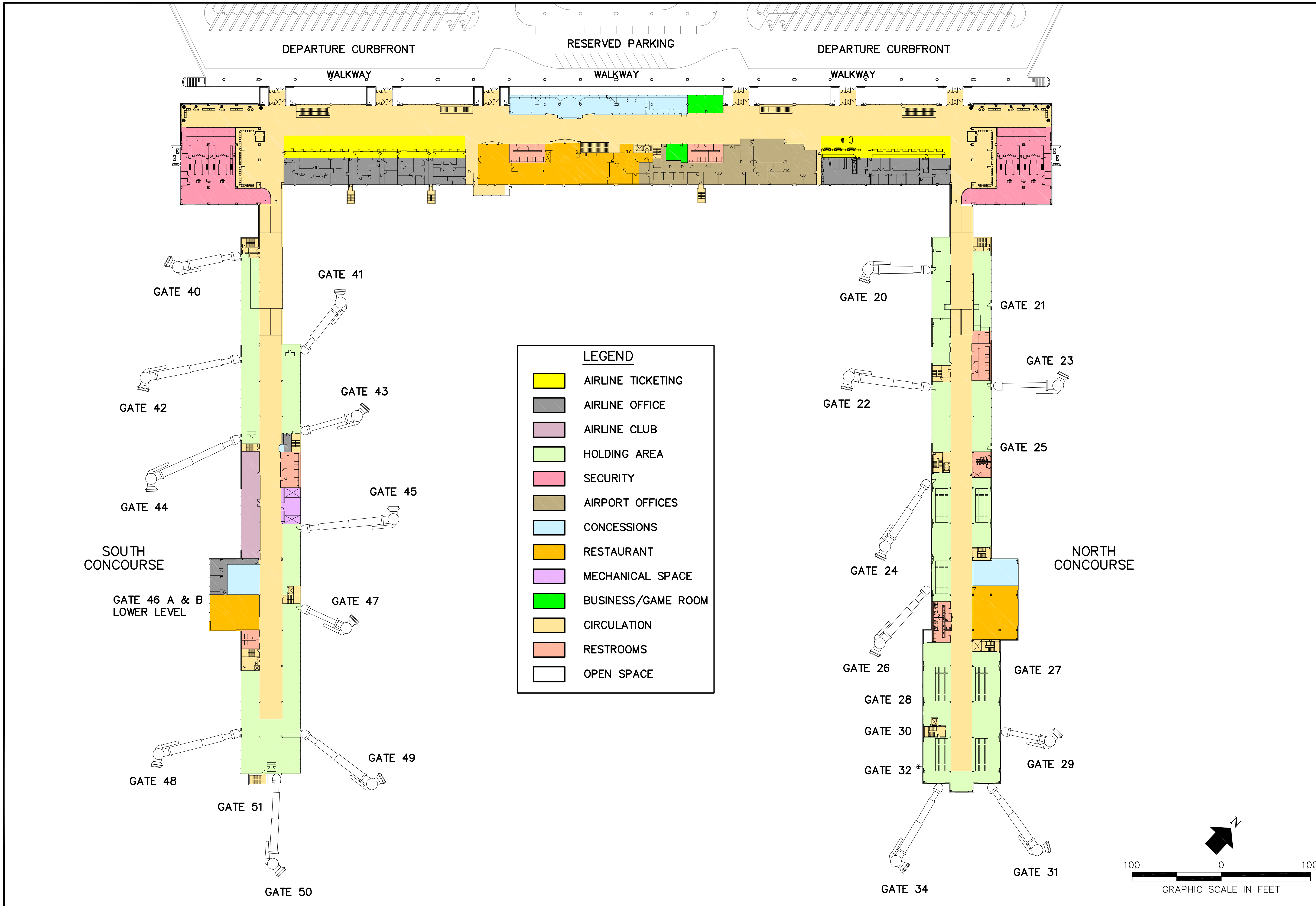

J:\Greensboro Master Plan Update\MPU REPORT\Section 02 - Inventory\Figures\FIG 2-10.dwg 09/17/2009 11:36

PIEDMONT TRIAD INTERNATIONAL AIRPORT
Airport Master Plan Update
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PTAA PIEDMONT TRIAD AIRPORT AUTHORITY

TERMINAL LAYOUT - DEPARTURE LEVEL

FIGURE 2-10

TABLE 2-6
TERMINAL AIRLINE GATE ASSIGNMENTS

Airline/Operator	Concourse	Gates	Aircraft Type
Allegiant	North	25	MD-83, MD-87
American Airlines	South	50, 51	MD80/S80
American Eagle	South	50, 51	ERJ-145
Continental Airlines	North	24, 26	B737-300/500
Continental Express	North	24, 26	ERJ-135, ERJ-145
Delta Air Lines	North	29, 30, 31, 32, 34	B737-800, MD-80/88
Delta Air Lines/ASA	North	29, 30, 31, 32, 34	CRJ-100/200/700
Delta Air Lines/Comair	North	29, 30, 31, 32, 34	CRJ-100/200
Delta Air Lines/Freedom	North	29, 30, 31, 32, 34	ERJ-145
Delta Air Lines/Skywest	North	29, 30, 31, 32, 34	CRJ-800/900
United Airlines	South	48	B737-300/500, B757, A319/320
United Airlines/Chautauqua	South	48	RJU/ERJ-145
United Airlines/Go Jet	South	48	CRJ-700
United Airlines/Mesa	South	48	CRJ-100/200
United Airlines/Trans State	South	48	ERJ-145
US Airways	South	40, 42, 43, 44, 45, 46	B737-200/400, B757-200, A319/320/321
US Airways/Air Wisconsin	South	40, 42, 43, 44, 45, 46	CRJ-100/200
US Airways/Chautauqua	South	40, 42, 43, 44, 45, 46	RJU/EMB145
US Airways/Mesa	South	40, 42, 43, 44, 45, 46	CRJ-900
US Airways/Piedmont	South	40, 42, 43, 44, 45, 46	DASH8-100/200/300
US Airways/PSA Airlines	South	40, 42, 43, 44, 45, 46	CRJ-200/700
US Airways/Republic	South	40, 42, 43, 44, 45, 46	DASH8-200, EMB-170

Note: Gates 20, 21, 22, 23, 27, 28, 40, 41 and 47 are vacant. Gate 30 provides staircase access to ground floor for Gate 32 passenger loading/unloading. Gate 33 does not exist.
Source: PTAA, June 2009.

2.4.2.2 Support Facilities

Airport Traffic Control Tower (ATCT) – The ATCT was commissioned on July 1974, and has a height of 87.75 feet Above Ground Level (AGL). It is located north of existing Landmark Aviation FBO, next to Federal Aviation Authority (FAA) Flight Standards District Office (FSDO) building. The ATCT is open 24 hours a day, 7 days a week. There are 68 auto parking spaces designated for ATCT staff.

FAA Flight Standards District Office (FSDO) – The FSDO is a local FAA office located next to the ATCT and VF corporate hangar. The FSDO was opened in 2000 and provides enforcement of United States Federal Aviation Regulations, accident reporting, aircraft modifications and permits, certification and surveillance of air operators, air agencies, and airmen, enforcement and investigation, and aviation safety education and training. There are 69 auto parking spaces designated for the FSDO employees.

Airport Fire Station – The PTI has two Aircraft Rescue and Firefighting (ARFF) facilities; one constructed in 1964; and second constructed in April of 2010. Both stations are maintained by the PTAA. The first ARFF station is located on the southwest side of the airport adjacent to the GTCC Aviation Center and serves as a secondary ARFF facility. The station consists of four single-loaded vehicle bays that house four aircraft rescue and firefighting vehicles. The station also includes a kitchen, exercise room, day room, mechanical room, sleeping quarters, protective equipment storage space, restrooms, office area, and a Chief's office. The station is approximately 6,500 square feet in size. It is operational 24 hours a day, 7 days a week. The second remote ARFF/Command Center station is located in the midfield, northeast of the north concourse and serves as a primary ARFF facility. The station consists of four single-loaded vehicle bays that house three aircraft rescue and firefighting vehicles. The station also includes a kitchen, exercise room, day room, mechanical room, sleeping quarters, protective equipment storage space, restrooms, lockers, office area, conference and training room, agent and tank storage, and captains and a Chief's office. Additionally, the ARFF/Command Center facility includes the Command Center, staff and equipment that were relocated from the lower level of the existing terminal. The facility is approximately 20,400 square feet in size which 16,000 square feet is designated for ARFF and 4,400 square feet for Command Center. It is also operational 24 hours a day, 7 days a week.

The ARFF is presently equipped to meet the requirement of Index C. An airport's ARFF index is determined by the length of the longest air carrier aircraft with scheduled service that averages five or more daily departures. The critical aircraft at PTI is the McDonnell Douglas MD-80 series. Air Carrier aircraft within ARFF Index C include those at least 126 feet long but less than 159 feet long. The FAA requires an airport within Index C to have a minimum of three aircraft rescue and firefighting vehicles. These vehicles and special equipment are identified in **Table 2-7**.

TABLE 2-7
AIRCRAFT RESCUE AND FIREFIGHTING VEHICLES AND EQUIPMENT

Model Year	Make/Type	Water Capacity (Gallons)	Foam Capacity (Gallons)	Dry Chemical (Purple-K) Capacity (Pounds)
2000	KME RIV	500	80	500
1992	E-One Titan HPR 4x4	1,500	200	N/A
1992	E-One Titan HPR 4x4	1,500	200	N/A
2007	E-One Titan HPR 4x4	1,500	207	500
2009	Oshkosh	1,500	210	460 (Halotron)
2000	Ford F-350	300	40	N/A
2007	Chevrolet Silverado 2500 HD	N/A	N/A	N/A
N/A	Trailer	N/A	500	N/A

Source: Aircraft Rescue and Firefighting Chief, February 2009.

The 2000 Ford F-350 serves as command and rescue vehicle and is also equipped with special tools and medical equipment.

Airport Maintenance – The airport maintenance facility is located on the south side of the airport behind the Air Cargo Building # 1 and is maintained by the PTAA. The maintenance building contains approximately 28,400 square feet of space and accommodates numerous maintenance equipment including trucks, tractors, mini loaders, lawn mowers, and snow removal plows.

During the winter season, airport maintenance keeps the airport operational and has all the necessary equipment to maintain continuous airfield operations during ice and snow conditions.

2.4.2.3 *FBOs, Fueling Facilities, and Services*

The smaller FBO currently serving at the airport is Koury Aviation. The two major FBOs currently serving the airport, Atlantic Aero and Landmark Aviation, provide services such as aircraft charters, aircraft sales, storage, maintenance, and fueling to general aviation and commercial air carriers.

Koury Aviation

Started in April of 2008, Koury Aviation is a private company that provides a Flight School (TAA Flight School), Maintenance Shop, and private Jet Charter services. As part of Koury Aviation, TAA Flight Training school offers private, instrument, commercial, multi-engine and CFI training. Koury Aviation has an approximate 30,000 square-foot facility with 6,700 square-yard apron. The company is located on the south side of the airport between Comair and airport's maintenance buildings.

Atlantic Aero

The Atlantic Aero FBO is located on the west side of Runway 5R/23L and has a 45,600 square-foot hangar/office facility that serves as its main customer service building. Atlantic Aero also maintains nine corporate hangars, shade hangars (consisting of 38 spaces), three large maintenance hangars, three private corporate hangars, and two private T-hangars. Atlantic Aero has a 39,818 square-yard apron that can accommodate based and itinerant aircraft.

Currently, Gulfstream V and Global Express represent the largest itinerant aircraft visiting the FBO on a regular basis. Boeing 727 and 737 aircraft occasionally visit the FBO but are limited to a one-hour use of the apron because of wheel load bearing issues.

The FBO experiences its busiest period during one weekend in March or April when hosting the "Bonanza Event." During this event, 40 to 55 aircraft are parked on the apron and Taxiways D and D2 are temporarily closed. Other busy periods occur in during the months of April and October due to the "Furniture Market" that typically involves use of the FBO and its facilities by 50 or more corporate jets.

There are 43 based aircraft at Atlantic Aero, of which there are 35 single-engines, four twin-engines, and four jets. The Atlantic Aero has 270 auto parking spaces.

The Atlantic Aero fuel facility is located near its maintenance building and includes four above-ground Jet-A and one above-ground Avgas storage tanks that have a total storage capacity of 80,000 gallons and 15,000 gallons, respectively. The fuel storage capacities for Atlantic Aero are listed in **Table 2-8**. Jet-A fuel is delivered to the airport via pipeline from a fuel depot facility located approximately 2 miles south of the airport. Avgas is delivered to the FBO via fuel trucks from commercial providers every 30 to 45 days. The distribution of Jet-A and Avgas to aircraft served by the FBO is via fuel trucks.

Landmark Aviation

Landmark Aviation is located east of Atlantic Aero and has an approximate 46,050 square-foot hangar/office facility as the main customer service building. Landmark Aviation maintains one bulk corporate hangar, one large corporate hangar, and three T-Hangars (10 units each). Landmark Aviation has 30,224 square-yards of apron area that can accommodate based and itinerant aircraft.

The FBO experiences its busiest period during the first and third quarter of each year for the "Furniture Market" and during football and basketball seasons. The aircraft utilizing Landmark's apron facilities include Boeing 737/757 and Airbus 300 aircraft. The FBO averages 60 based aircraft, of which 70 percent are single-engine, 10 percent are twin-engine, and 20 percent are jets.

Landmark Aviation has 160 auto parking spaces.

The Landmark Aviation fuel facility is located near its bulk corporate aircraft storage hangar. The two fuel storage sites are depicted on **Figure 2-6**. Landmark Aviation has four underground Jet-A, one underground Avgas, and two underground auto gas storage tanks providing a total storage capacity of 100,000 gallons, 10,000 gallons, and 12,000 gallons, respectively. The fuel storage capacities for Landmark Aviation are listed in **Table 2-8**. Jet-A fuel is delivered to the airport via pipeline from a fuel depot facility located approximately 2 miles south of the airport. Avgas is delivered to the FBO via fuel trucks from commercial providers on average every 30 days. The distribution of Jet-A and Avgas to aircraft served by the FBO is via fuel trucks.

Each of the respective aprons provide tie-down space for both locally-based and itinerant aircraft ranging in size from light single propeller-driven aircraft, to larger cabin-class turbo-props and jets. These aprons also accommodate occasional itinerant operations by corporate and charter operators utilizing B-727s and B-737s based on space availability and pavement load bearing capabilities.

TABLE 2-8
FBO FUEL STORAGE CAPACITY

Operator	Type of Fuel	Number of Tanks	Capacity (Gallons)
Atlantic Aero	Jet-A	4	80,000
Atlantic Aero	Avgas	1	15,000
Landmark Aviation	Jet-A	4	100,000
Landmark Aviation	Avgas	1	10,000
Landmark Aviation	Auto Gas	2	12,000

Source: Atlantic Aero and Landmark Aviation, January 2008.

2.4.2.4 Air Cargo Operators/Tenant/Facilities

Five dedicated Air Cargo operators provide all-cargo service at PTI and include: FedEx, DHL Express, Mountain Air Cargo, TradeWinds, and United Parcel Service (UPS). All other airlines provide a varying amount of belly-cargo services based on space available. **Table 2-9** depicts the Air Cargo Building Space/Tenant Inventory.

FedEx Mid-Atlantic Hub Facility

In 1998, FedEx chose PTI for the development of its Mid-Atlantic Sort Hub Facility. In October of 2002, FedEx and PTI executed a 25-year lease in which FedEx agreed to open the facility beginning 2009 (Phase 1). In 2004, construction began on a new parallel runway and associated taxiway system to support FedEx operations. Today, FedEx Mid-Atlantic Sort Hub Facility is open and operational. The FedEx Hub will strategically serve east coast destinations and is projected to generate 12,350 annual aircraft operations in its first phase. Upon completion of Phase 2, the projected number of annual aircraft operations will increase to 32,760.

Mountain Air Cargo

Mountain Air Cargo, an express cargo carrier, provides cargo flight services to FedEx. Mountain Air Cargo operates Cessna 208 Caravan aircraft.

DHL Express

DHL Express currently leases 14,950 square feet of space within Air Cargo Building #3.

TradeWinds

TradeWinds provides domestic and international air cargo transport services. It is located on the south side of the airport where it leases a hangar and apron.

United Parcel Service (UPS)

United Parcel Service (UPS) operates two separate services at the airport, express overnight cargo and ground cargo. The air cargo operation is located in Air Cargo Building #2. The space leased by the UPS within Air Cargo Building #2 consists of 3,276 square feet. UPS operates a single Douglas DC-8-71CF/-73CF at the airport that is parked on the ramp in front of Air Cargo Building #2.

Belly Cargo Airlines

Delta, Comair, and Continental airlines lease space within Air Cargo Building #1and #2, but utilize building space for the storage and maintenance of ground service equipment.

U.S. Postal Service

The U.S. Postal Service (USPS) currently leases 12,001 square feet of space within Air Cargo Building #2.

Ramp Services

Three separate ground handlers, Aviation Repair Technology, Quantem, and Jetstream lease space within Air Cargo Building #2. Aviation Repair Technology provides ground service and light maintenance and leases 4,158 square feet of space. Quantem provides ground service and leases 168 square feet of office space. Jetstream provides ground handling for Allegiant Airlines, United Airlines and US Airways Airlines, and leases 2,646 square feet of space.

TIMCO

TIMCO provides Maintenance, Repair, and Overhaul (MRO) services at the airport and leases 10,000 square feet of space within Air Cargo Building #3 for storage of aircraft parts.

TABLE 2-9
AIR CARGO BUILDING SPACE/TENANT INVENTORY

Tenant	Building Area (Sq. Ft.)
Air Cargo Building #1	
1-4. Comair	1,920
1-5. Vacant	1,500
1-7. Vacant	3,000
1-8. Vacant	2,000
1-9. Vacant	1,000
-- Piedmont Triad Airport Authority	19,905
Total	**29,325**
Air Cargo Building #1A	
Landmark Aviation	3,000
Total	**3,000**
Air Cargo Building #2	
A. Continental	7,560
B. Aviation Repair Technology	4,158
-- Vacant	2,142
C. Delta	3,780
D. Vacant	3,150
E. UPS	3,276
F. Piedmont Triad Airport Authority-Mechanical	1,281
F. Quantem	168
G. Vacant	8,945
H. U.S. Postal Service (USPS)	12,001
I. Jetstream	2,646
J. Vacant	5,017
-- Piedmont Triad Airport Authority-Mechanical	1,260
Total	**55,384**
Air Cargo Building #3	
A. Vacant	18,150
-- TIMCO	10,000
B & C. DHL (Airborne)	14,950
D. Vacant	5,200
-- Piedmont Triad Airport Authority-Mechanical	1,200
Total	**49,500**
TradeWinds Cargo Building	
Hangar B	24,300
Total	**24,300**
UPS-SCS Building	
Vacant	16,808
Total	**16,808**
FedEx Building	
Main Sort Building	317,200
Total	**317,200**
TOTAL	**495,517**

Source: Piedmont Triad Airport Authority Leasing Records, January 2010.

2.4.2.5 Industrial Aviation

Honda Aircraft Facility

The Honda Aircraft Company established a Research and Development facility at the airport in 2000 that was initially located within one of the Atlantic Aero corporate hangars for the development of the HA-420 HondaJet prototype production model. The HondaJet is classified as a Light Jet. In February 2007, the company initiated construction on its corporate headquarters and manufacturing facility at the airport that is located on the south side of Runway 5R/23L, east of TIMCO and is approximately 350,000 square feet in size. Production of the HondaJet is scheduled to begin in 2011.

TIMCO

TIMCO began operation in the fall of 1990 and provides aviation Maintenance, Repair, and Overhaul (MRO) services for major commercial airlines, regional air carriers, aircraft leasing companies, air cargo carriers, and the United States Military. TIMCO facilities consist of four large conventional hangars with a total of approximately 511,150 square feet of space. All four facilities are located parallel and south of Runway 5R/23L between the Honda Aircraft facility and the Cessna Citation Service Center.

Cessna Citation Service Center

The Cessna Citation Service Center began operation at the airport in 1994 and serves as a FAA Certified Part 145 Repair Station providing a complete line of airframe and engine maintenance, inspection, and repair services. The facility also provides avionics repair and modification. The Cessna Citation Service Center comprises approximately 50,000 square feet of hangar/office space. The facility is located on the east side of Runway 5R/23L, west of TIMCO facilities, at the intersection of Taxiway C and M.

Comair Maintenance Facility

The Comair Maintenance facility began operation in 2006 and serves as a maintenance base for Comair regional jets. The maintenance facility is approximately 41,000 square feet in size and is located on the south side of the airport.

VF Corporation Hangar

VF Corporation corporate hangar provides aircraft storage and air transportation services for VF Corporation. The facility began operation in 1999. The facility is approximately 32,455 square feet in size and is located east of Landmark Aviation facilities, west of Taxiway K.

2.4.2.6 Commercial/Institutional Facilities

Marriott Hotel

The Marriott Hotel was constructed in 1983 and consists of 298 rooms and one suite. The hotel is approximate 68,060 square feet in size and is located on the west side of the Long-Term parking lots. The roadway access to the hotel is via Marriott Drive via Airport Parkway. The hotel provides on-site auto parking for their employees and customers and a shuttle service to the passenger terminal.

Guilford Technical Community College (GTCC) Aviation Center

The T.H. Davis Aviation Center is part of GTCC, a two-year accredited community college. The Center opened at PTI in 1990 and offers two aviation programs: Aviation Management and Career Pilot Technology and Aviation Systems Technology. The Aviation Center is located on the southwest side of the airport adjacent to the ARFF building and includes an approximate 6,000 square-yard apron. Roadway access is available via Regional Road.

2.4.3 SURFACE TRANSPORTATION SYSTEM

This section provides preliminary descriptions of the existing surface transportation systems. This information was obtained from existing data provided by PTAA, previous studies, and on-airport site visits.

2.4.3.1 Regional Roadway System Serving PTI

Access is provided to PTI from various regional highways and local surface streets. Three major roadways are located in the vicinity of the airport; State Highway 68, Interstate Highway 40 (I-40), and newly constructed (December 2007) I-840. **Figure 2-11** depicts the regional roadway system serving the airport. The following summarizes the key roadways serving PTI.

Bryan Boulevard

Bryan Boulevard is a four-lane road located to the north of the airport. The main entrance/exit to the passenger terminal building is provided via Airport Parkway, which connects directly with Bryan Boulevard via an interchange.

State Highway 68

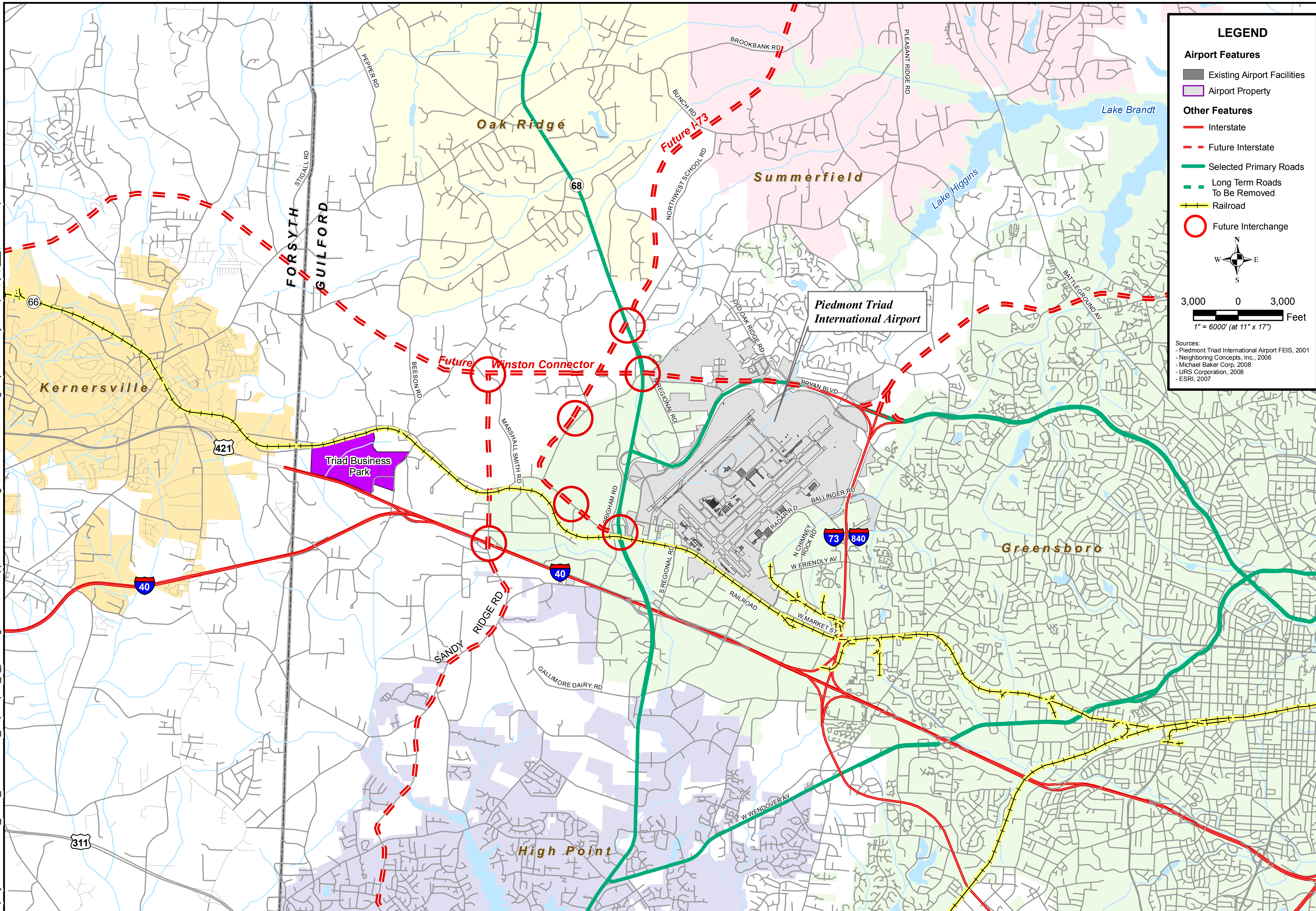
State Highway 68 is a four-lane highway located on the west side of the airport and connects also with I-40 to the south. State Highway 68 serves as one of the two main access points to the terminal entrance/exit roadway via Bryan Boulevard.

I-40

I-40 is an eight-lane highway located on the south side of the airport and connects to I-85 which provides access to the Central Business District (CBD) of Greensboro. Airport traffic generated in the Winston-Salem area has its most convenient access to the airport via I-40 and newly constructed I-840.

I-840

I-840 (identified by NCDOT as part of the Western Urban Loop) is a section of the Greensboro Urban Loop, a 41-mile planned beltway, which when completed, will encircle the City of Greensboro. I-840 is open to traffic and is located directly east of the airport, between I-40 and Bryan Boulevard. This beltway provides direct access to Bryan Boulevard that also provides direct access to and from the airport. I-840 is an eight-lane beltway.



PIEDMONT TRIAD INTERNATIONAL AIRPORT
Long-Term Planning Considerations

PTAA PIEDMONT TRIAD AIRPORT AUTHORITY

SURROUNDING AIRPORT VICINITY

FIGURE 2-11

H:\projects\Piedmont_Triad_International_Airport\ptia_lt_planning\12006503\Applications\mxd\Figure 2-11, Surrounding Airport Vicinity.mxd (JM.rpf, hde, 03-29-10)

2.4.3.2 On-Airport Roadway System

The on-site system serves vehicular traffic to the passenger terminal, service vehicles, air cargo facilities, the Marriott Hotel, and employees. The following summarizes the existing on-airport roadway system and functions. The on-airport roadway system is depicted on **Figure 2-12**.

Airport Parkway

Vehicular access to the terminals is provided via Airport Parkway, a multi-lane, one-way roadway that circles the north site of the passenger terminal. Airport Parkway provides direct access to the Marriott Hotel via Marriott Drive, as well as direct access to general aviation facilities on the west side of the existing terminal via PTI Drive.

PTI Drive

PTI Drive provides access to the Atlantic Aero and Landmark Aviation general aviation FBOs and to the National Weather Station, ATCT, FAA FSDO, and the VF hangar. As it crosses through Airport Parkway, PTI Drive also provides access and exits to and from the Marriott Hotel, as well as exits from the Long-Term parking lots. As PTI Drive continues, it intersects Airport Parkway again and connects to Cargo Road and then to North Terminal Service Road. PTI Drive is a two-lane single direction roadway.

Cargo Road

Cargo Road is a two-lane roadway providing access to the cargo facilities located east of the existing passenger terminal.

Terminal Loop Circulation System/Curbside Roadways

The terminal access is provided via ramps from Airport Parkway to the terminal curbside roadways and the parking areas.

Upper and lower curbside roadways are located along the front of the terminal. The two-lane upper level roadway serves departing passengers and permits private vehicles and taxis/limos to drop passengers at the curbside for check-in procedures. It also provides an access to the garage parking lot and return car rental lot. The two-lane lower level roadway serves arriving passengers and provides for passenger pick up by private vehicles outside of the baggage claim area of the terminals. The two-lane lower level roadway also provides garage access. The lower level curb also provides terminal access by airport parking buses, limos, taxis, and other vehicles retrieving arriving passengers.

Radar Road

Radar Road provides access to airport tenants on the southeast side of the airport via North Chimney Rock Road (partially reconstructed in 2007). This two-lane roadway connects to West Market Street via Old Friendly Road and West Friendly Avenue. To the east, Radar Road connects with Ballinger Road via a connector constructed in 2007.

West Market Street

West Market Street provides access to airport tenants on the southwest side of the airport. This five-lane roadway connects to State Highway 68 from Guilford College Road.

2.4.3.3 Terminal Auto Parking

There are multiple auto parking areas in the vicinity of the passenger terminal that are designated for general public, employees, valet, and car rental use. The terminal parking areas are depicted previously on **Figure 2-7**.

A multi-level parking garage is located directly across from the terminal and provides approximately 2,177 auto parking spaces. Levels 1, 2, 3, and 4 accommodate Short-Term and Long-Term parking. The entrance is located across from the arrivals/baggage claim level. Parking fees are collected at three separate booths (two are cashiers booths and one is automated). No shuttle is provided to or from the garage.

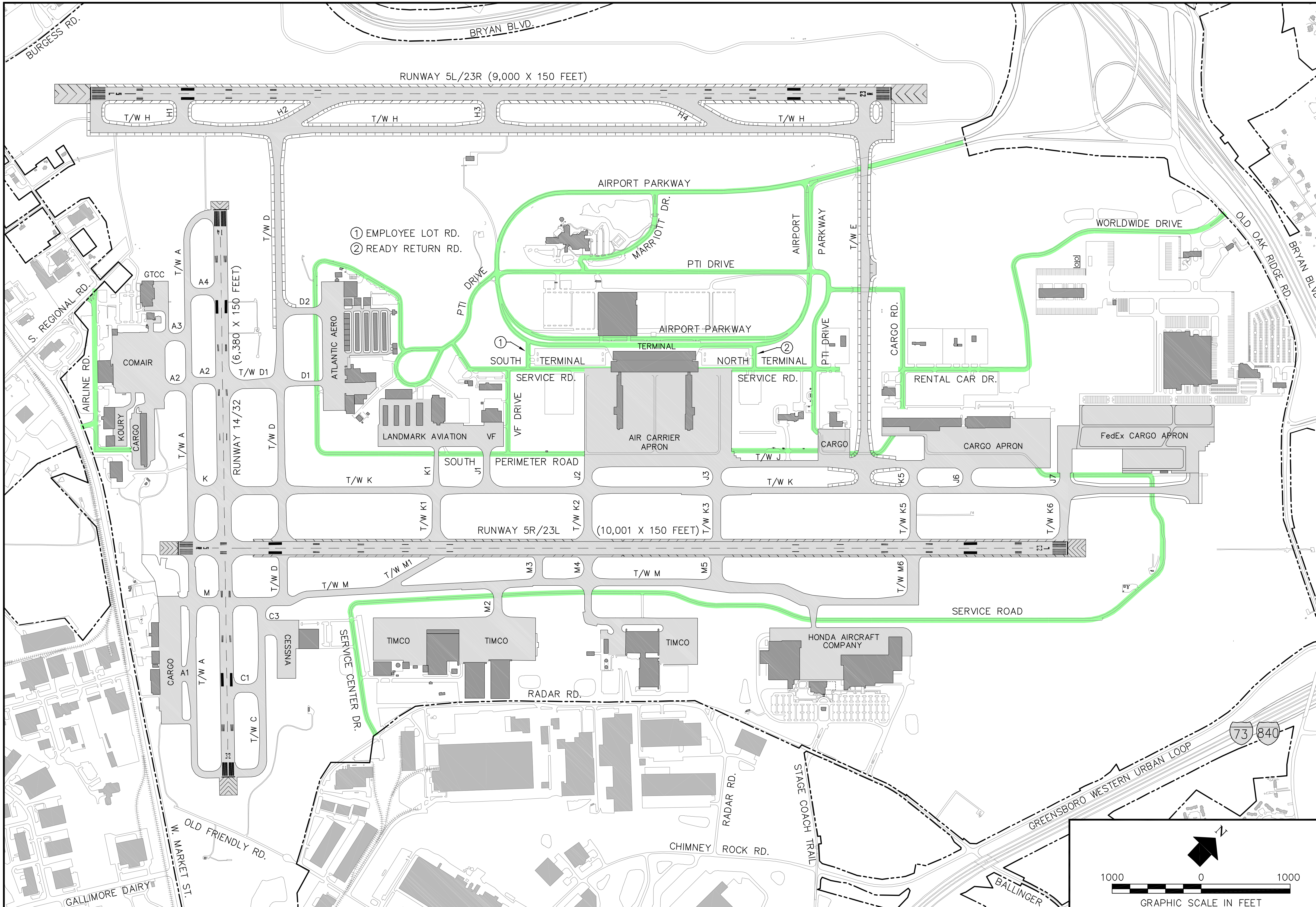
Long-Term North and South Parking Lots are located on both sides of the parking garage providing a total of 1,867 auto parking spaces. Free shuttle services to/from each parking lot are available to and from the terminal, operational 24 hours a day at 10- to 20-minute intervals. Parking fees are collected at four booths that are located between Long-Term South Lot and a garage with a direct access to PTI Drive.

Valet drop-off is available at the center of the upper departure level and available for pick-up on the lower arrival level. There are 9 spaces available in the center upper level terminal, and 48 spaces in the lower level baggage area. There are also 482 spaces available on the former US Airways parking lot (west of the south concourse) that the USA Parking Valet operator is leasing from the airport.

Employee parking is available in two separate locations. The first lot designated as North Employee Lot is located northeast of the terminal and provides 250 spaces. The second lot designated as South Employee Lot is located southwest of the terminal and provides 438 auto parking spaces.

The Rental car ready/return lot is located at the northeast end of the passenger terminal building. Additionally, a total of 60 covered car rental spaces are located on the lower arrival level. The car rental lot is accessible from both upper and lower levels.

A summary of terminal auto parking is provided in **Table 2-10**.



PIEDMONT TRIAD INTERNATIONAL AIRPORT

Airport Master Plan Update

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PTAA PIEDMONT TRIAD AIRPORT AUTHORITY

ON-AIRPORT ROADWAY SYSTEM

FIGURE 2-12

J:\Greensboro Master Plan Update\MPU REPORT\Section 02 – Inventory\Figures\FIG 2-12.dwg 11/22/2010 16:56

TABLE 2-10
AUTO PARKING SPACES

Terminal Auto Parking	Number of Spaces
General Public Parking	
Parking Garage	2,177
Long-Term North Lot (East of Garage)	1,056
Long-Term South Lot (West of Garage)	811
Metered (Upper Level)	159
Metered (Lower Level)	100
Subtotal	**4,303**
Employee Parking	
North Employee Lot (East of Concourse)	250
South Employee Lot (West of Terminal)	438
Subtotal	**688**
Valet Parking	
Valet Lot (West of Concourse)	482
Subtotal	**482**
Rental Car Ready/Return Lot	
North Parking (East of Terminal)	286
Subtotal	**286**
Total	**5,759**

Source: Piedmont Triad Airport Authority Parking Records, December 2008

2.4.4 RENTAL CAR FACILITIES

The five rental car agencies, Alamo/National, Avis, Dollar/Thrifty, Enterprise, and Hertz have counter facilities within the lower level of the terminal. All of the agencies, except for Thrifty, have offices and maintenance facilities near the passenger terminal, located on the northeast side. These facilities are accessible via Cargo Road. Thrifty has its facilities located on Regional Road.

2.4.5 AIRSPACE, AIR TRAFFIC CONTROL, AND AIRPORT OBSTRUCTIONS SURVEY

The airspace, air traffic control, and airfield operations specific to PTI are discussed in detail in **Appendix D**, *Airspace, Air Traffic Control, and Airport Obstructions Survey*.

2.4.6 AIRPORT UTILITIES

Electric - Duke Energy serves PTI with three-phase electrical service via overhead primary distribution lines near Airport Parkway where they transition to underground service. The service to the airside facilities at the airport is via service lines routed to electrical vaults located near the end of Runway 5R. The primary service lines serving the electrical equipment in these vaults are located along West Market Street. Duke Energy maintains and services these lines from their local Greensboro offices.

Potable Water - The City of Greensboro provides potable water service to the airport via a “loop” system which originates south of Radar Road as a 16-inch water main. The water main passes through the industrial park south of Radar Road, then turns toward Runway 5R/23L near the roadway intersection of

Ballinger Road and Stage Coach Trail and ultimately crosses Runway 5R/23L between taxiways K3 and K5. The water main continues along this route to the intersection on the circulation loop roadway which leads toward the Marriott Hotel, north of the terminal building, then turns toward the Marriott Hotel, passes between the Marriott Hotel and the southernmost Long-Term parking lot, and turns toward the FBOs. When passing though the FBO area, it then crosses Runway 14/32 near Taxiway D toward West Market Street. There it turns to the southeast and progresses along the highway right-of-way until it ties to its original point of entrance to the airport southeast of Friendly Avenue.

Water service to the air cargo facility is via a 12-inch water main which ties to “the loop.” Water service to the terminal building is from a secondary loop of 6-, 8-, and 10-inch lines. Water service in the FBO area and in the area of the old terminal building site is via a series of 6-, 8-, and 10-inch lines.

Sanitary Sewer - The City of Greensboro provides sanitary sewer service to the airport via a series of gravity lines and force mains meandering more or less parallel to and then across Runway 5R/23L, ultimately discharging into a sanitary trunk sewer near Radar Road. The sewer lines in the area of the terminal building, air cargo facility, and FBOs all lead to a point near the Marriott Hotel complex, where a lift station exists. An 8-inch force main, crosses Runway 5R/23L, connects with the outfall for the TIMCO maintenance hangar facility, and ultimately the trunk sewer on Radar Road.

The areas near the ARFF facility, the old terminal building, and other areas located southward along West Market Street are served by an 8-inch gravity line that ultimately connects with the same trunk sewer which is located along Radar Road and Gallimore Dairy Road.

Telephone – Bell South provides local telephone communication services to the airport. Individual airlines and other tenants use other telephone providers that best fit their needs.

Internet Service - Wireless Internet Service is currently provided at the terminal area by Opti-Fi NetworksSM.

Natural Gas - Piedmont Natural Gas Company serves the entire airport complex, including the terminal complex, the Marriott Hotel, and all FBOs and air cargo tenants.

2.4.7 LOCAL METEOROLOGICAL CONDITIONS

2.4.7.1 Seasonal Temperatures

The National Oceanic Atmospheric Administration (NOAA) compiles data relating to precipitation and temperature at various stations around the U.S. This temperature data for PTI was derived by referencing Page 9 of the *Climatology of the U.S., No. 81 for the State of North Carolina*. The average maximum (Hottest Day) temperature for Greensboro is reported to be 87.6 degrees Fahrenheit and occurs during the month of July. The coldest month of the year, however, is January with an average minimum temperature of 28.2 degrees Fahrenheit.

2.4.7.2 Meteorological Conditions

Weather conditions can affect airfield capacity, as well as the volume of operations at the airport. For airport planning purposes, weather conditions are generally classified as either Visual Meteorological Conditions (VMCs) or Instrument Meteorological Conditions (IMCs). VMCs occur when the locally reported cloud ceiling is at least 1,000 feet AGL and local visibility is at least three statue miles, and occurs 89 percent of time at PTI. IMCs occur when the cloud ceiling is less than 1,000 feet AGL and/or visibility is less then 3 statue miles, and occurs 11 percent of time at PTI.

2.4.7.3 Prevailing Winds

Another key meteorological factor is wind direction (by origin) and speed. Ideally, runways should be aligned with the prevailing wind to reduce the effects of crosswind during take-offs and landings.

Runways should be aligned with prevailing winds to minimize the adverse impacts of crosswinds. Generally, the smaller the aircraft, the more it is affected by crosswind components. The crosswind component is the resultant vector of the runway direction and existing wind that acts at a right angle to the runway. FAA AC 150/5300-13, Change 15, *Airport Design*, recommends that at least 95 percent crosswind coverage be provided by the runway system (one or more runways) at any airport. If the runway wind coverage is less than 95 percent, an additional runway(s) should be provided, with an orientation such that the combination of all runways provides 95 percent or better wind coverage. The most desirable runway orientation provides the greatest runway wind coverage with the least crosswind components, as defined by the Airport Reference Code (ARC) for that airport. **Table 2-11** describes the relationship between the crosswind speeds and ARC.

TABLE 2-11
CROSSWIND COMPONENTS

Crosswind Speed	ARC	Related Aircraft Type
10.5 Knots	A-I, B-I	Cessna, Piper, Beech
13 Knots	A-II, B-II	Falcon, Citation, Fokker 28
16 Knots	A-III, B-III, C-I through D-III	Dash8, A320, B727,737
20 Knots	A-IV through D-VI	A300, B747, 757, 767, L1011

Source: FAA AC 150/5300-13, Chapter 2, 203b Wind Conditions.

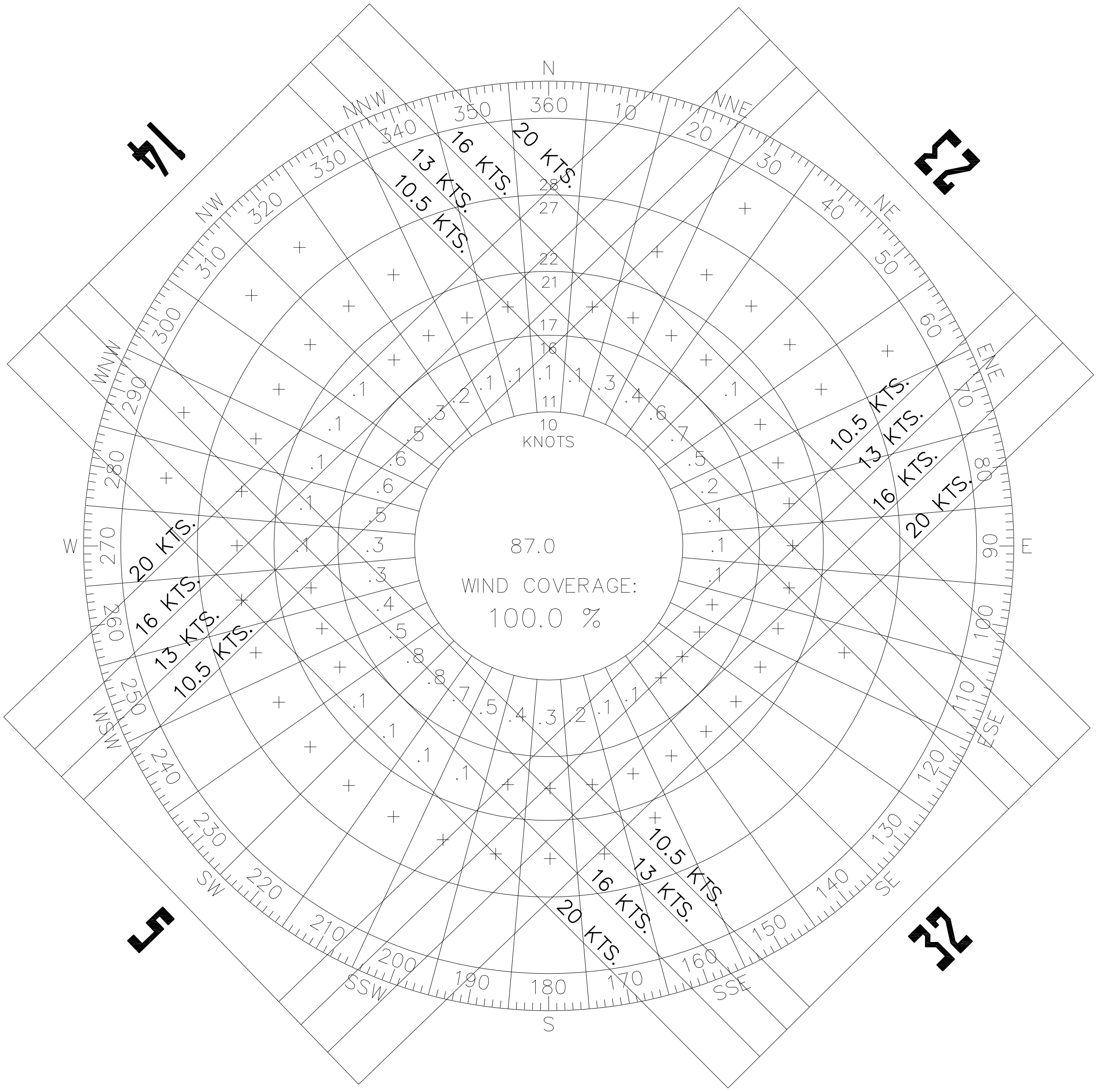
Wind coverage is the percent of time that crosswind components are within an acceptable velocity. The runway wind coverage at PTI was determined using FAA's Airport Design Program Version 4.2, Standard Wind Analysis and included calculation of the wind coverage of one or more runways and the computer-based generation of Wind Rose graphs for All-Weather, IMC, and IMC 1 meteorological conditions. The wind rose is a graphical depiction of the relative percentile occurrence of observed winds by origin (relative to true north) and velocity (measured in knots). The wind roses are depicted in **Figures 2-13 and 2-14**. For the purpose of runway wind analyses, a crosswind component can be defined as the wind that occurs at a right angle to the runway centerline. Crosswind components of 10.5, 13, 16, and 20 knots were used for analyzing the runway system at PTI. Runway crosswind coverage is presented in **Table 2-12** and illustrates that Runway 5/23 fully satisfies the 95 percent crosswind coverage requirements through all wind speeds. Runway 14/32 however, does not provide the 95 percent All-

Weather runway crosswind coverage for wind speeds less than 13 knots or during IMC and IMC1 conditions for wind speeds less than 16 knots. When considering the combined coverage of all three runways, the runway crosswind coverage is well above the 95 percent minimum threshold.

TABLE 2-12
RUNWAY CROSSWIND COVERAGE

Meteorological Condition	Runway[1]	Runway Crosswind Coverage by Percent			
		10.5 Knots	13 Knots	16 Knots	20 Knots
All-Weather	5/23	95.94	97.75	99.36	99.86
IMC[2]	5/23	98.24	99.15	99.83	99.95
IMC-1[3]	5/23	98.08	99.08	99.81	99.95
All-Weather	14/32	92.13	95.48	99.05	99.80
IMC[2]	14/32	89.92	93.94	98.67	99.60
IMC-1[3]	14/32	88.91	93.33	98.51	99.50
All-Weather Combined	5/23 & 14/32	99.52	99.89	99.98	100.00
IMC Combined	5/23 & 14/32	99.75	99.95	100.00	100.00
IMC-1 Combined	5/23 & 14/32	99.72	99.94	100.00	100.00

[1] – Assumes bi-directional operations.
[2] – IMC: Ceiling <1,000 feet and/or Visibility <3 miles.
[3] – IMC-1: Ceiling <1,000 feet and/or Visibility <3 miles, but Ceiling ≥200 feet and Visibility ≥1/2 mile.
Source: FAA Microcomputer Airport Design Program, Version 4.2, January 2008.
FAA AC 150/5300-13 Change 15, *Airport Design*.
URS Corporation, January 2008.

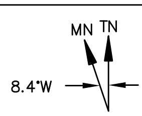


METEOROLOGICAL CONDITION	RUNWAY USE	WIND COVERAGE CROSSWIND COMPONENT (PERCENT)			
		10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
ALL WEATHER	5/23	95.94	97.75	99.36	99.86
ALL WEATHER	14/32	92.13	95.48	99.05	99.80
ALL WEATHER COMBINED	5/23 & 14/32	99.52	99.89	99.98	100.00

SOURCE:

NATIONAL CLIMATIC DATA CENTER
WEATHER STATION 72317
GREENSBORO PIEDMONT, NORTH CAROLINA
DATA PERIOD: 1997–2006
OBSERVATIONS: 80,911

WIND ROSE
FAA MICROCOMPUTER AIRPORT DESIGN PROGRAM, VERSION 4.2



TN = TRUE NORTH
MN = MAGNETIC NORTH

NOTE:

THIS CHART PLOTS, FOR THE DATA PERIOD, THE RECORDED OCCURRENCES (IN PERCENT) OF WIND BY DIRECTION AND SPEED. THE RECTANGULAR BOXES REPRESENT THE ULTIMATE MAXIMUM ACCEPTABLE CROSSWIND COMPONENT FOR THE RUNWAY 10.5, 13, 16, AND 20 KNOTS FOR RUNWAYS 5/23 AND 14/32, RESPECTIVELY. THE WIND COVERAGE CAPABILITY OF THE AIRFIELD IS THUS DETERMINED BY TOTALING ALL OCCURRENCES FALLING WITHIN THE RECTANGLES.

RUNWAYS ARE NUMBERED USING MAGNETIC HEADINGS WHILE WIND DATA IS PRESENTED USING TRUE HEADINGS. THEREFORE, THERE IS A 8.4 DEGREE DIFFERENCE BETWEEN THE RUNWAY HEADINGS AND THE WIND ROSE HEADINGS.

PIEDMONT TRIAD INTERNATIONAL AIRPORT

Airport Master Plan Update

PTAA PIEDMONT TRIAD AIRPORT AUTHORITY — URS

ALL WEATHER WIND ROSE

FIGURE: 2-13

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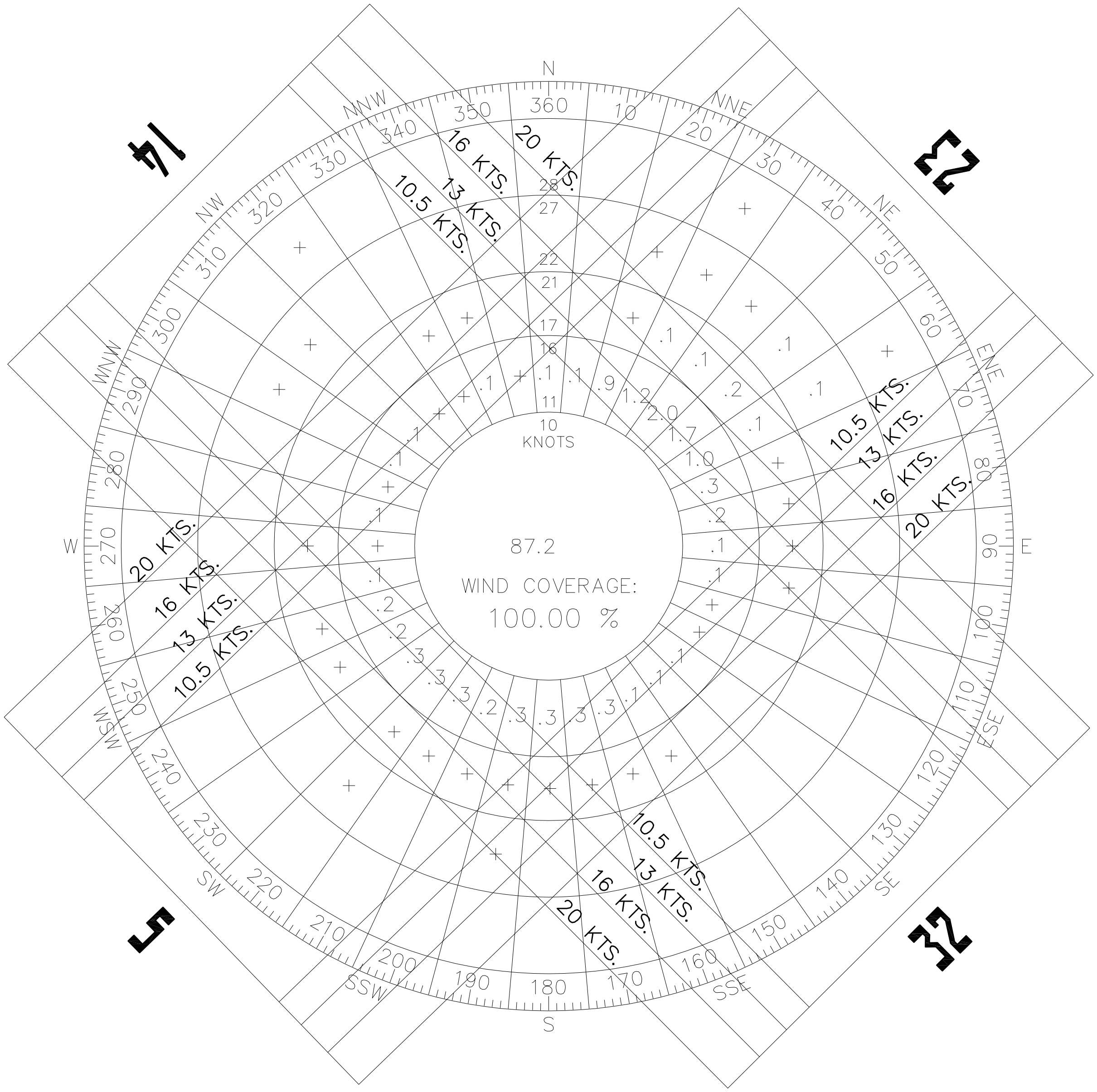
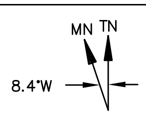


METEOROLOGICAL CONDITION	RUNWAY USE	WIND COVERAGE CROSSWIND COMPONENT (PERCENT)			
		10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
IMC–1	5/23	98.08	99.08	99.81	99.95
IMC–1	14/32	88.91	93.33	98.51	99.50
IMC–1 COMBINED	5/23 & 14/32	99.72	99.94	100.00	100.00

SOURCE:

NATIONAL CLIMATIC DATA CENTER
WEATHER STATION 72317
GREENSBORO PIEDMONT, NORTH CAROLINA
DATA PERIOD: 1997–2006
OBSERVATIONS: 8,818

WIND ROSE
FAA MICROCOMPUTER AIRPORT DESIGN PROGRAM, VERSION 4.2



TN = TRUE NORTH
MN = MAGNETIC NORTH

NOTE:

THIS CHART PLOTS, FOR THE DATA PERIOD, THE RECORDED OCCURRENCES (IN PERCENT) OF WIND BY DIRECTION AND SPEED. THE RECTANGULAR BOXES REPRESENT THE ULTIMATE MAXIMUM ACCEPTABLE CROSSWIND COMPONENT FOR THE RUNWAY 10.5, 13, 16, AND 20 KNOTS FOR RUNWAYS 5/23 AND 14/32, RESPECTIVELY. THE WIND COVERAGE CAPABILITY OF THE AIRFIELD IS THUS DETERMINED BY TOTALING ALL OCCURRENCES FALLING WITHIN THE RECTANGLES.

RUNWAYS ARE NUMBERED USING MAGNETIC HEADINGS WHILE WIND DATA IS PRESENTED USING TRUE HEADINGS. THEREFORE, THERE IS A 8.4 DEGREE DIFFERENCE BETWEEN THE RUNWAY HEADINGS AND THE WIND ROSE HEADINGS.

PTAA
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PIEDMONT TRIAD INTERNATIONAL AIRPORT

Airport Master Plan Update

URS

IMC WIND ROSE

FIGURE: 2-14

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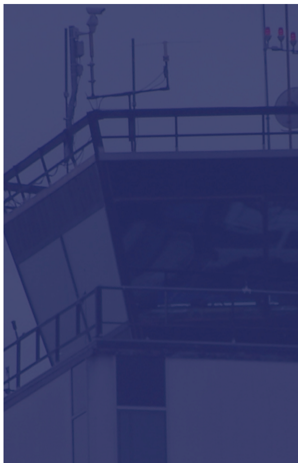


Airport Master Plan Update
and
Strategic Long-Range Visioning Plan

Prepared By:

URS

In Association With:

JACOBS CONSULTANCY

r|m|a
Ron Miller & Associates

SECTION 3.0
FORECAST OF AVIATION ACTIVITY AND AIRPORT LAND NEEDS

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

SECTION 3.0

FORECASTS OF AVIATION ACTIVITY AND AIRPORT LAND NEEDS

3.1 AVIATION AND AIRPORT LAND NEEDS

The Forecast of Aviation Activity is the empirical basis for the air facility improvement recommendations included in the 20-year Airport Master Plan Update. The Forecast encompasses an inventory of all aircraft activity at the airport including passenger service, general aviation service and air cargo service. The Forecast examines this activity in past years, and places it in the context of economic, employment and population growth trends in order to project aviation activity at the airport over the next five, 10, 15 and 20 years.

Jacobs Consultancy was retained by URS Corporation to update the aviation traffic forecasts that were prepared in conjunction with the 1994 *Master Plan Update* for Piedmont Triad International Airport (PTI). This forecasting assignment involved the prediction of the impact of current trends on air traffic at PTI in the future. The full text of Jacobs' analysis may be found in **Appendix E** of this document.

The FAA reviews each airport owner's aviation activity forecast to ensure that the forecast is based upon reasonable planning assumptions, uses current data, and is developed using appropriate forecast methods. The draft Aviation Activity Forecast was transmitted to the FAA's Airports District Office in Atlanta, Georgia, on November 24, 2008. On May 11, 2009, the FAA formally approved the submitted draft aviation activity forecast through the planning year 2022. The FAA's approval letter may also be found in **Appendix E** of this document.

To create a more complete picture of airport needs, URS Corporation also created a Forecast of Airport Land Needs for the airport. With the recent completion of a FedEx Mid-Atlantic hub, the construction of the Honda Aircraft Company headquarters campus, the construction of the Comair maintenance hangar, and expansions at Cessna and TIMCO repair and maintenance facilities, the airport has demonstrated its attractiveness as a site for significant economic development, particularly in the specialized markets of aircraft maintenance and manufacture, as well as logistics.

It is reasonable to assume that the recent completion of a new parallel runway and ancillary airport and ground transportation improvements will further enhance the airport's ability to attract new tenants and encourage the expansion of existing tenant activities and associated facility development. This means that the most significant airport growth in the next two decades is most likely to be driven more by tenant demand for development space at the airport than by increased aviation activity as typically measured in passenger movements and aircraft operations. Airport Master Planning for this airport embraces that anticipated trend. See **Section 5** for a complete discussion of Forecast of Airport Land Needs.

3.2 AVIATION ACTIVITY

3.2.1 CURRENT ECONOMIC AND POPULATION TRENDS

Even before the current economic recession, population and employment trends, both standard indicators of economic vitality, were not robust in the Piedmont Triad region.

- Piedmont Triad population growth has slowed in recent years, growing at a lower rate than the state, though at a greater rate than the nation as a whole.
- Income growth in the Piedmont Triad is less than income growth statewide and less than income growth across the nation.
- Piedmont Triad employment growth for the past 10 years has lagged the nation and the state.
- The Piedmont Triad has the highest percentage of employment in the manufacturing sector—the one sector that is in decline in all areas.
- More encouraging, the Piedmont Triad has the highest proportion of education and health services employment, the nation's most rapidly growing sectors of employment.
- Also encouraging, the Triad has never had the kind of boom-bust economy that has unsettled other parts of the country. The region is transitioning away from a manufacturing economy and has made significant wage gains in financial, professional, and education health sectors (Keith Debbage, author 2010 Greensboro State of the City report).

3.2.2 CURRENT TRENDS IN AIR SERVICE

Aviation activity trends at the Piedmont Triad International Airport reflect the Piedmont Triad's economic and employment trends.

- Between 2001 and 2008, the number of average daily flight departures at PTI declined from 96 to 68, due in part to the terrorist attacks on September 11, 2001, an economic recession, the withdrawal of Low Cost Carriers (LCC) from the airport and competition from neighboring air carrier airports in Raleigh and Charlotte.
- There has been a transition from the use of mainline jets at the airport to smaller regional jets as airlines have attempted to reduce fuel costs and increase load factors on individual flights.
- Over the past few years, enplanements at the airport decreased by 19 percent. During the same period, airfares paid at the airport increased 15.7 percent on average. It is important to note that Raleigh-Durham International Airport (RDU) experienced a similar reduction in enplanements over the same period, as have many airports nationwide.

3.2.3 UNDERLYING FACTORS IN AIR SERVICE TRENDS

Several developments account for the decline in passenger traffic and the increase in airfares paid at PTI. As stated above, the withdrawal of LCCs, such as Airtran in 2004, reduced schedules by legacy carriers, and lower fares at competing Charlotte/Douglas International Airport (CLT) and RDU have all worked to erode scheduled flights at PTI while driving up fares.

In recent years, as the attractiveness of better service offerings and lower airfares available at CLT and RDU increased, PTI experienced an erosion of its traffic to these airports. By 2007, one of every two passengers for whom PTI is the more convenient airport chose to fly from either CLT or RDU instead, according to a study by Sabre Airline Solutions.

3.2.4 CURRENT TRENDS IN AIR CARGO SERVICE

Cargo aircraft traffic at PTI grew significantly in the 1990s, but has since decreased. The cargo carried in the belly of passenger airlines has declined for three reasons: 1) a shift by passenger carriers to smaller size regional jets, which have minimal belly cargo carrying capacity; 2) restrictions placed on air carriers post 9-11 regarding the type of cargo they may carry; 3) a growing dependence on express cargo carriers such as UPS and FedEx. A significant increase in cargo tonnage is expected at the airport in the next few years as the FedEx Mid-Atlantic hub initiates and fully develops its hubbing operations. Indeed, air cargo at the airport was up significantly in the final months of 2009.

3.3 MODEST AVIATION ACTIVITY GROWTH

Given the financial challenges facing airlines in general, the high cost of fuel, the predominance of regional jets at PTI – which are vulnerable to high fuel costs - and the weak demographic, economic, air service and air traffic trends in the Piedmont Triad, passenger traffic growth at the airport is unlikely to be robust. PTI's low passenger growth may be further reduced by the increasing strength of air service at both RDU and CLT.

However, there are two factors that could positively impact passenger growth, but which carry a high degree of uncertainty:

- Airport related growth could stimulate economic growth across the Piedmont Triad over the Mid- to Long-Term, creating greater demand for passenger service.
- At some point, one or more LCCs or other specialized carriers might discern a business opportunity at the Airport and launch service.

3.4 FORECAST ASSUMPTIONS

Given the current uncertainties in the airline traffic forecasting environment, particularly as it relates to PTI, various factors could cause enplanements at the airport to be higher or lower than those presented in this Airport Master Plan Update. For this reason, negative-growth and high-growth scenarios were developed to bracket the Base Case forecast, representing a likely range of variation in traffic levels that could occur through 2030.

3.4.1 BASE CASE PASSENGER FORECAST

The Base Case forecast assumes that the Piedmont Triad will continue to grow modestly, regional jets will continue to dominate passenger service at PTI, high jet fuel costs will continue, passenger enplanement leakage to CLT and RDU will stabilize, and commercial service to the airport will remain at current levels and grow slowly over the forecast period.

3.4.2 NEGATIVE-GROWTH FORECAST SCENARIO

The negative growth forecast assumes a worst-case scenario that includes a worsening of the local economy, a network withdrawing service from PTI, higher fuel costs and greater passenger enplanement leakage to CLT and RDU.

While it is not anticipated that all of the above events would occur, one or more such events could deprive PTI of any growth over the forecast period. For this reason, a negative-growth scenario was selected to serve as the lower boundary rate of the traffic forecast range.

For the purpose of the Airport Master Plan Update, a 2 percent per year traffic decline, the same rate of traffic decline experienced at PTI from 1998 to 2007, was selected as the lower bound for the forecast.

3.4.3 HIGH-GROWTH FORECAST SCENARIO

Similarly, there are a number of events that could occur over the forecast period that would cause traffic growth at PTI to exceed the levels envisioned in the Base Case forecast, including an improvement in the local economy; an increase in network airline service, a LCC begins service at PTI and lower fuel costs making regional jets more popular.

Again, while it is not anticipated that all of the above events would occur, one or more such events could boost growth significantly over the forecast period. The resulting rate of growth is difficult to predict. For the purpose of this Airport Master Plan Update, the FAA's current forecast growth rate for U.S. domestic airline passenger traffic (2.7 percent per year) was selected as the upper bound for the traffic growth forecast.

3.5 LOW COST CARRIER IMPACT ON PTI ENPLANEMENTS

Low cost carriers have operated at PTI intermittently since the last Airport Master Plan Update was conducted in 1994. LCCs that have operated at the airport include Peoples Express, Eastwind, Continental Lite, Independence Air, AirTran and Skybus Airlines. Allegiant Air currently offers low cost fares at PTI.

Each time a LCC provided service at the airport, there was a corresponding increase in enplanements at the airport during the period in which the LCCs operated at the airport. The most dramatic spike in enplanements due to the arrival of a LCC occurred in 1994-1995 when Continental Lite operated at the airport. Enplanements also increased markedly when Independence Air and AirTran operated at the airport during 2004 and 2005, despite the lingering negative impacts on airlines and air service of the September 11, 2001, terrorist attacks.

However, due to its low-cost fare structure, Allegiant Air is currently a popular airline at the airport. It has not had the impact on enplanements at the airport of earlier LCCs, primarily because its flight service is limited to destinations in Florida.

The consistent positive impact of LCCs on enplanements at PTI suggests that the PTI market, which includes central North Carolina, western North Carolina and parts of southside Virginia, is a distinct market that responds positively to low fares. When fares are competitive at PTI, the airport retains passengers who live in proximity to PTI. When PTI fares become less competitive, passengers tend to look at airports in Charlotte and Raleigh for low-cost options.

The introduction of a LCC in the Piedmont Triad market would in all likelihood bring passengers back to PTI who are now traveling to CLT and RDU to purchase lower fare tickets. In addition, if fares are low enough, an additional market may be created.

3.5.1 SKYBUS EFFECT

Skybus Airlines, as a privately-held airline based in Columbus, Ohio, operated as a LCC modeled after the European airline Ryanair. The business model was heavily reliant on flying routes where other airlines did not have direct flights. The airline operated a fleet of Airbus 319s. Skybus Airlines marketed itself as an LCC, selling the first ten seats on each scheduled flight for $10. Skybus AIrlines' first passenger flights out of Columbus began on May 22, 2007.

In that same month, Skybus Airlines also began service from Piedmont Triad International Airport (PTI) to Port Columbus International Airport (CMH). In October of 2007, Skybus Airlines announced that PTI would become its second base of operations, serving as a "Focus Airport" with additional plans to expand scheduled service to nine additional cities in 2008. After a short presence at PTI, Skybus Airlines ceased operations in April 2008.

During that time, Skybus Airlines illustrated a unique impact on the Piedmont Triad market. Based on the available data provided by PTAA, Skybus Airlines at PTI generated additional passenger demand without adversely affecting air travel markets at CLT or RDU. This new type of passenger was willing to fly to mid-size airports at smaller destination cities in order to secure an extraordinarily low fare for air travel. **Table 3-1** lists the Skybus Airlines impact on PTI/CMH of operating one daily flight during the 3rd quarter 2007 versus the 3rd quarter 2006 when ther was no direct service between the airports.

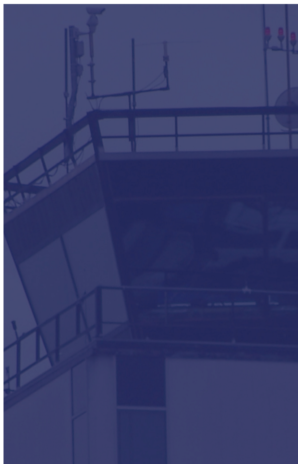
TABLE 3-1
SKYBUS IMPACT ON PTI/CMH

Airport Designator	Pre-Skybus 3rd Quarter 2006			Post-Skybus 3rd Quarter 2007		
	Average PDEW	Average Fare	Average Daily Revenue	Average PDEW	Average Fare	Average Daily Revenue
CLT	76.3	$170	$12,939	77.9	$186	$14,521
PTI	12.6	$162	$2,048	124.0	$52	$6,449
RDU	71.7	$109	$7,812	84.3	$107	$8,995

Source: DOT O&D
PDEW - Passenger Daily Each Way
CMH - Port Columbus International Airport
CLT - Charlotte/Douglas International Airport
PTI – Piedmont Triad International Airport
RDU - Raleigh-Durham International Airport

Based on the information shown in **Table 3-1**, an average number of daily passengers traveling each way or PDEW increased from 12.5 to 124. During the same period, the average fare decreased from $162 to $52. Daily revenue, however, tripled from $2,048 to $6,449.

The PDEW, average fare and daily revenue for CLT and RDU are shown to stay relatively unchanged during the same period. Thus, it is safe to assume that Skybus Airlines operations at PTI had no discernable impact on CLT and RDU market share. In fact, CLT and RDU passenger numbers increased even though the average fares remained stable or increased slightly over this period. This indicates that in addition to a Piedmont Triad market for low-cost service, which would bring travelers back to PTI from CLT and RDU, there is an additional market of travelers who would not otherwise fly but who will respond positively to extremely low fares.



Airport Master Plan Update

and

Strategic Long-Range Visioning Plan

Prepared By:

URS

In Association With:

JACOBS CONSULTANCY

r|m|a

Ron Miller & Associates

SECTION 4.0

DEMAND/CAPACITY ANALYSIS AND FACILITY/SPACE REQUIREMENTS

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

SECTION 4.0

DEMAND/CAPACITY ANALYSIS AND FACILITY/SPACE REQUIREMENTS

4.1 INTRODUCTION

Forecasts of aviation demand discussed in the previous section and fully presented in **Appendix E**, *Forecast of Aviation Activity and Record of Transmittal to FAA,* through the year 2030. The forecasts include projections of annual passenger enplanements, aircraft operations, based aircraft, aircraft fleet mix, and peaking characteristics for both passenger enplanements and aircraft operations. Using this information, the capacities of specific components of the airport system such as: the airfield, general aviation facilities and support facilities are evaluated to determine if they are able to accommodate forecasted levels of demand without incurring significant delays or an unacceptable decrease in service levels. If deficiencies are identified, a determination of the approximate size and timing of new facilities is made. During the course of the Airport Master Plan Update, terminal, ground access and airspace capacity were not addressed or quantified because the elements were considered to have ample capacity or useful life.

The requirements for any new facilities needed to accommodate projected demand in a safe and efficient manner are also presented in this section.

4.2 AIRFIELD

4.2.1 DEMAND/CAPACITY ANALYSIS

The methods used for analyzing airfield capacity are described in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*. The capacity assessment methodologies in this Advisory Circular (AC) describe how to measure an airfield's hourly capacity and its annual capacity, which is referred to as Annual Service Volume (ASV). Hourly capacity is defined as the maximum number of aircraft operations that can be accommodated by the airfield system in one hour. It is used to assess the airfield's ability to accommodate peak hour operations. ASV is defined as a reasonable estimate of an airport's annual capacity. As the number of annual operations increase to the calculated ASV value, the average delay incurred by each aircraft operation increases at an increasing rate. When the levels of annual aircraft operations are equal to the ASV, average delay to each aircraft operation is approximately one to four minutes depending upon the mix of aircraft using the airport. When the number of annual operations exceeds the calculated ASV, moderate to severe levels of congestion and delay will occur. ASV is used to assess the adequacy of the airfield design, including the number and orientation of runways and the supporting system of taxiways.

A calculation of the airfield's hourly capacity and annual service volume is based upon a number of factors that typically include:

- Meteorological Conditions - The percentage of time visibility or cloud cover are above certain pre-established minimum values;
- Aircraft Mix - The relative mix (as percentage) of operations conducted by different categories of aircraft;

- Runway Use - The percentage of time each runway is used over time;
- Percent Touch-and-Go - The percent of touch and go operations in relation to total aircraft operations;
- Percent Arrivals - The percent of arrivals in relation to departures during peak periods of aircraft movement; and
- Exit Taxiway Locations - The number, location and type of exit taxiways available to landing aircraft.

4.2.1.1 Meteorological Conditions

Meteorological conditions have a significant effect upon runway use, which, in turn, affect an airfield's capacity. During Visual Meteorological Conditions (VMC), runway use is usually determined by the direction of the prevailing winds. During Instrument Meteorological Conditions (IMC), runway use is dictated by the type and availability of instrument approach capabilities and published instrument approved procedures. PTI has an Airport Traffic Control Tower (ATCT) that is operational 24 hours a day, 7 days a week.

On the basis of 10-year historical meteorological data recorded for PTI, it is estimated the airport operates under VMC conditions 89 percent of the time and under IMC conditions the remaining 11 percent of the time.

4.2.1.2 Aircraft Fleet Mix

Table 4-1 summarizes representative aircraft types found in each aircraft classification based on maximum gross takeoff weight as presented in **Appendix E**, *Forecast of Aviation Activity and Record of Transmittal to FAA*. Based on Flight Explorer™ data for the 12-month period, 9/26/07 through 9/24/08, Class C aircraft comprise 82 percent of aircraft operations, and Class A and Class B comprise 18 percent of aircraft operations. The airport does not currently accommodate aircraft having Class D characteristics. This, however, will change when FedEx begins operating DC-10-10 air cargo aircraft at their Mid-Atlantic Hub in 2010. The airport's current mix index is calculated at 82 percent, determined by the following equation:

Mix Index (82) = Class C Operations (82) + (3 * Class D Operations (0))

TABLE 4-1
TYPICAL AIRCRAFT FLEET MIX

Class	Aircraft Type	
Class A	*Small Single-Engine (Gross weight 12,500 pounds or less)*	
Typical Aircraft	Cessna 172/182	Mooney 201
	Beech, Bonanza	Piper Cherokee/Warrior
Class B	*Small, Twin-Engine (Gross weight 12,500 pounds or less)*	
Typical Aircraft	Beech Baron	Mitsubishi MU-2
	Cessna 402	Piper Navajo
	Rockwell Shrike	Cessna Citation I
	Beechcraft 99	Beech King Air
Class C	*Large Aircraft (Gross weight 12,500 pounds to 300,000 pounds)*	
Typical Aircraft	Douglas DC-9	A-320/A-321
	Boeing 727	MD-80
	Boeing 737	A-319
	Boeing 757	Embraer 135/145
	CRJ-200	CRJ-700
Class D	*Large Aircraft (Gross weight more than 300,000 pounds)*	
Typical Aircraft	Boeing 767	Airbus A-330
	Boeing 777	Boeing 747
	DC-10-10	MD-11

Source: FAA AC 150/5060-5 *Airport Capacity and Delay*, 1983.
Compiled by URS Corporation, 2008.

4.2.1.3 Runway Use

As described in Section 2, *Existing Conditions*, the airport has three runways: Runway 5R/23L, Runway 5L/23R, and Runway 14/32. Runways 5R/23L and 5L/23R are primary runways, while Runway 14/32 is a secondary crosswind runway. Runways 5R/23L and 5L/23R are used approximately 95 percent of the time due to prevailing wind conditions. Runway 14/32 is used the remaining 5 percent of the time. Utilization of specific runway ends is provided in **Table 4-2**.

TABLE 4-2
RUNWAY END UTILIZATION

Runway End	Utilization (%)
5R	13.00
23L	74.50
5L	3.75
23R	3.75
14	2.50
32	2.50

Source: FAR Part 150 Study for Piedmont Triad International Airport, Nov 2007.
(Runway end utilization derived using runway utilization rates as shown in Table A-9).
Assumes Phase 2 of FedEx operation.

4.2.1.4 Touch-and-Go Operations

Touch-and-go operations occur when an aircraft lands and takes off without making a full stop. This is usually done for the purpose of practicing landings. Touch-and-go operations do not occupy the runway for the same length of time when compared to full-stop landings or departures but impose limitations to the intermixing of aircraft class sizes (i.e. by weight and associated approach speed). Therefore, an airfield with a designated non-primary parallel touch-and-go runway having a high number of touch-and-go operations can normally accommodate a greater number of operations. Based on a review of ATCT counts, touch-and-go activity at PTI is estimated to be minimal or non-existent.

4.2.1.5 Percentage Arrivals

The number of arrivals as a percentage of total aircraft operations has an important influence on a runway's hourly capacity. For example, a runway used exclusively for arrivals will have a different capacity than a runway used exclusively for departures or a runway accommodating a mixture of arrivals and departures. In general, the higher the percentage of arrivals, the lower the hourly capacity of a runway. This is because arrivals usually have a longer runway occupancy time than departures. Arrivals were assumed to comprise 50 percent of peak hour operations at PTI.

4.2.1.6 Exit Taxiway Locations

Exit taxiways affect airfield capacity because their location along a runway directly influences aircraft runway occupancy times. The longer an aircraft occupies the runway, the lower the capacity of that runway. When exit taxiways are strategically located, landing aircraft can quickly exit the runway, and increased runway capacity can be achieved.

All three runways at PTI are served by at least one full length parallel taxiway and numerous exit/connector taxiways. Runway 5R/23L has a total of eight exits that are located along its west side and seven exit/connector taxiways that are located on its east side. Runway 5L/23R has a total of seven exit/connector taxiways that are located on the east side of the runway. Runway 14/32 has a total of six exit/connector taxiways that are located on the south side of the runway and five exit/connector taxiways that are located on the north side of the runway.

4.2.2 AIRFIELD CAPACITY ANALYSIS RESULTS

The capacity of the airfield was calculated on both an hourly and annual basis using the methodologies specified in FAA Advisory Circular 150/5060-5 *Airport Capacity and Delay*. The results of these analyses are presented in the following paragraphs.

4.2.2.1 Hourly Airfield Capacity

Hourly capacity values were determined for the three-runway system using the following equation:

$$\text{Hourly capacity of the runway component} = C * T * E$$

Where: C = Base Capacity,

T = Touch-and-Go Factor, and

E = Exit Factor.

The base capacity number (C) is derived from the hourly airfield capacity graphs for the three-runway system contain in the FAA AC 150/5060.5 *Airport Capacity and Delay,* Figure 3-10 and 3-51. The base capacity numbers were determined to be 115 for VMC and 105 for IMC. The touch-and-go factor is also derived from the capacity graphs using information previously presented. The T factor is 1.0 for both VMC and IMC. The exit factor was derived from the capacity graphs using information previously presented on the location of taxiway exits and was determined to be 1.0 for VMC and IMC.

Using the data presented in the preceding sections and the graphs referenced above, it was determined that the three-runway configuration hourly capacity during VMC, assuming 50 percent arrivals, is 115 operations (115 * 1 * 1). The airfield's hourly capacity during IMC, also assuming 50 percent arrivals, is 105 operations (105 * 1 * 1). Therefore, it can be concluded that the three-runway system will have sufficient capacity to accommodate forecasted peak hour operations without incurring significant delay. These data are presented in **Table 4-3**.

TABLE 4-3
HOURLY AIRFIELD CAPACITY

Year	VMC Hourly Capacity	IMC Hourly Capacity	Unconstrained Forecast Peak Hour Operations
2007	115	105	33
2012	115	105	40[1]
2017	115	105	63[1]
2027	115	105	63[1]

Source: URS Corporation, 2008.
Note: [1]This represents 24 FedEx peak hour departures by 2012 and 63 peak hour departures by 2017. The number of FedEx operations in each phase is based on the EIS completed in 2001.

As shown in Table 4-3, the VMC and IMC hourly capacities are greater than peak hour demand, therefore hourly capacity of the airfield will be adequate to accommodate projected demand during the 20-year study period.

4.2.2.2 Annual Airfield Capacity

An airfield's ASV is calculated by determining the following three items:

- The weighted hourly capacity: Cw,
- The daily demand ratio: D, and
- The hourly demand ratio: H.

The weighted hourly capacity is calculated via a formula considering the hourly capacity values during VMC and IMC as well as the percentage of time each weather condition occurs. The weighted hourly capacity (Cw) of PTI was calculated to be 113.90 operations.

The daily demand ratio (D) is calculated by dividing the annual number of aircraft operations by the average daily operations during the peak month. This calculation (107,254 / 307) results in a daily demand factor of 349.4 for PTI. This value falls within the range of 310 to 350 listed in the FAA advisory circular as being typical daily demand factors for an airport with a mix index between 51 and 180. As presented in Section 4.2.1.2, the airport has a mix index (C+3D) of approximately 82 percent.

The hourly demand ratio (H) is calculated by dividing the average daily operations during the peak month by the average peak hour operations during the peak month. This calculation (307 / 33) results in a daily demand factor of approximately 9.3 for PTI. This ratio is much lower than the range of 11 to 15 listed in the FAA advisory circular as being typical hourly demand ratios for an airport with a mix index (C+3D) between 51 and 180.

Using the values derived, the current ASV for PTI is presented in the following equation:

$$ASV = C\ (113.90) * D\ (349.4) * H\ (9.3) = 370{,}189 \text{ operations}$$

The result of the equation is relatively high ASV for a multi-runway airfield. According to the FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, a typical ASV range for multi-runway airfield is approximately 305,000 to 370,000.

Beginning 2014 it is assumed that the FedEx will initiate its Class D aircraft operations. As a result, the calculated ASV will decrease slightly (3.4 percent), therefore, the relative percentage of total annual operation to ASV will increase by approximately one percent.

As shown in **Table 4-4**, the airport's projected ASV exceeds the projected annual aircraft operational demand throughout the 20-year study period. Therefore, it can be concluded that the existing airfield has adequate capacity to accommodate projected annual and hourly levels of aircraft operational demand.

TABLE 4-4
COMPARISON OF ASV AND ANNUAL DEMAND

Year	Forecasted Aircraft Operations	Calculated ASV		Forecasted Operations as a Percentage of ASV	
		Existing	Future	w/o Class D	w/ Class D
2007	107,254	370,189	370,189	29 %	29 %
2012	130,892	370,189	370,189	35 %	35 %
2017[1]	148,348	370,189	357,513	40 %	41 %
2027[1]	158,308	370,189	357,513	43 %	44 %

Note: [1]Assumes FedEx operations of Class D aircraft begins in 2014.
Source: FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*.
URS Corporation, 2008.

4.2.2.3 Delay Analysis

Delay is defined as the difference between constrained and unconstrained operating time, or as the difference between the actual time required for an aircraft to perform an operation, (arrival, departure, on taxi movement), and the non-delayed time required to conduct that same operation. On the basis of visual observations and consultation with ATC personnel, very little aircraft operational delay occurs at PTI. However, in order to confirm results of the visual observations, an analysis of aircraft delay was performed using the FAA's Airport Design Program, Version 4.2 (see **Appendix F**). The analysis indicated that operational delay at PTI would be approximately 12 seconds per operation at current activity levels, and is expected to increase to as much as 24 to 30 seconds per operation with activity levels predicted for 2027. This equates to annualized delay of 21 minutes of total annual delay in 2007, increasing to as much as 79 minutes in 2027. These levels of delay are insignificant and indicate that aircraft delay will not be an issue throughout the 20-year study period.

4.2.3 AIRFIELD FACILITY REQUIREMENTS

4.2.3.1 Airport Design Criteria

To properly and consistently plan future needs of airport facilities, current FAA prescribed airport design criteria must be identified and applied. Airport design criteria are specified by the Airport Reference Code (ARC) that consists of two components. The first component designates the aircraft approach category, and relates to the approach speed (operational characteristics) of aircraft. The second component is the airplane design group and relates to the wingspan (physical characteristics) of the aircraft. **Table 4-5** provides Airport Design criteria.

TABLE 4-5
AIRPORT DESIGN CRITERIA

Aircraft Approach Category	
Category	Approach Speed
A	Less the 91 Knots
B	91 to 120 Knots
C	121 to 140 Knots
D	141 to 165 Knots
E	166 Knots or Greater
Airplane Design Group	
Group	Wing Span
I	Up to 48 Feet
II	49 to 78 Feet
III	79 to 117 Feet
IV	118 to 170 Feet
V	171 to 213 Feet
VI	214 Feet or Greater
Airplane Design Group – Tail Height	
Group	Tail Height
I	Up to 19.9 Feet
II	20 to 29.9 Feet
III	30 to 44.9 Feet
IV	45 to 59.9 Feet
V	60 to 65.9 Feet
VI	66 Feet or Greater

Source: FAA Advisory Circular 150/5300-13, *Airport Design*, Changes 1 - 15 inclusive.

4.2.3.1.1 Aircraft Approach Category

A review of aircraft presently using, and forecasted to use PTI reveals the aircraft in approach category D (i.e., approach speed of 141 knots or more but less than 161 knots) regularly use the airport. This includes the Boeing 737-800 and McDonnell Douglas MD-83 and certain business jets (i.e. Gulfstream V), as well as aircraft that are typically used for charter operations at the airport such as the Boeing 757 and 767. Therefore, approach category D will be used to plan future airfield facilities associated with all three runways.

4.2.3.1.2 Airplane Design Group

Although larger air carrier aircraft, such as the Boeing 757 and 767, use PTI on an occasional basis, the Boeing 777 is anticipated to be the largest aircraft in terms of wingspan to regularly use PTI in the future.[1] This aircraft has a wingspan of approximately 212.6 feet, which places it within design group V (i.e., a wingspan of 171 feet up to but not including 213 feet). For planning purposes, it is also anticipated that the Airbus 380 could operate at the airport in the future with planned widening of Runway 5R/23L and selected taxiways. Airbus 380 being the largest commercial aircraft in operation today has a wingspan of approximately 261.8 feet which places it within design group VI.

[1] The FAA defines regular use as a minimum of 500 or more current or planned itinerant aircraft operations per year.

4.2.3.1.3 Airport Reference Code

The Airport Reference Code (ARC) is determined by combining the Aircraft Approach Category letter with the Airplane Design Group number. Therefore, the ARC for future planning at PTI for Runway 5R/23L is D-VI, for Runway 5L/23R is D-V and for Runway 14/32 is D-IV.

4.2.3.2 Airfield Geometric Requirements

4.2.3.2.1 Runway Safety Areas

Runway Safety Areas (RSA) are defined by the FAA as "surfaces surrounding a runway that are prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." Runway safety areas consist of a relatively flat graded area free of objects and vegetation that could damage aircraft. According to FAA guidance, the RSA should be capable, under dry conditions, of supporting aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft. **Table 4-6** presents the FAA standards for the RSA dimensions at PTI in comparison to their existing dimensions.

TABLE 4-6
RUNWAY SAFETY AREA CRITERIA

	FAA Design Standard		Existing Dimensions	
Runway	**Length (Feet Beyond Runway End)**	**Width (Feet, Centered on Runway Centerline)**	**Length**	**Width**
5R	1,000	500	600	500
23L	1,000	500	1,000	500
5L	1,000	500	1,000	500
23R	1,000	500	1,000	500
14	1,000	500	1,000	500
32	1,000	500	1,000	500

Source: FAA Advisory Circular 150/5300-13, *Airport Design*, Changes 1-15 inclusive.
Piedmont Triad International Airport, 2008.

The RSAs for Runways 5L/23R and 14/32 meet FAA standards. A portion of the RSA extending beyond the approach end of Runway 5R does not meet FAA standards at a length of 600 feet. This non-standard condition has been addressed by use of FAA-approved Declared Distance criteria.

4.2.3.2.2 Runway Object Free Area

In addition to the RSA, an Object Free Area (OFA) is also defined around runways in order to enhance the safety of aircraft operations. The FAA requires that an OFA be cleared of all objects except those that are related to navigational aids and aircraft ground maneuvering. However, unlike the RSA, there is no physical component to the OFA. Thus, there is no requirement to support an aircraft or emergency response vehicles.

The OFA for runways serving aircraft in approach categories D-IV, D-V and D-VI (Runway 14/32, Runway 5L/23R and Runway 5R/23L respectively), is 800 feet in width and extends 1,000 feet beyond each runway end.

Similar to the RSA for Runway 5R, the OFA extending beyond the approach end of Runway 5R does not meet FAA standards and has been addressed by using FAA-approved Declared Distance Criteria.

4.2.3.2.3 Centerline Separation Standards

Referencing FAA Advisory Circular 150/5300-13, Change 15, *Airport Design*, centerline separation standards are prescribed to dictate the minimum distance between various facilities such as taxiways, aprons, and other operational areas from runways. These centerline separation standards ensure aircraft can safely operate without risk of collision and that no part of an aircraft on a taxiway penetrates the runway safety area or runway Obstacle Free Zone (OFZ).

Referencing Table 2-2, *Runway Separation Standards for Aircraft Approach Categories C & D*, the minimum runway centerline-to-taxiway centerline separation standard for D-IV and D-V Runways 14/32 and 5L/23R, respectively, is 400 feet. The runway centerline-to-taxiway centerline separation for parallel Taxiway A that is located along southwest side of Runway 14/32 is currently 375 feet, 25 feet less than the minimum required separation distance of 400 feet. The runway centerline-to-taxiway centerline separation for D-VI Runway 5R/23L is 500 feet. The runway centerline-to-taxiway centerline separation for potion of parallel Taxiway M that is located along southeast side of Runway 5R/23L between Taxiway D and M6 is currently 385 feet, 15 feet less than the minimum required separation distance. It is recommended, for the future planning purposes, that the runway centerline-to-taxiway centerline separation for these two respective parallel taxiway systems be increased to 400 feet.

These prescribed minimum centerline separation values, however, apply to airports located at sea level. At higher elevations, an increase to these separation distances may be required to keep taxiing and holding airplanes clear of the OFZ.

Runways 5L, 5R, 23L, 23R and 14 each have published precision instrument approach procedures. Runway 5L has published visibility minimums that range from ½ mile to 600 feet. Runways 5R and 23L have published visibility minimums that range from ½ mile to 1,200 feet Runway 14L has published visibility minimums of ½ mile. Because Runways 5L, 5R and 23L all have published visibility minimums of less than ½ mile, this further increases the separation centerline-to-centerline separation distance to 550 feet plus required OFZ elevation adjustment.

It should be noted that the FAA's the most recent change to Advisory Circular, (Change 15) further notes that when runways serve airplanes having Category D approach speeds, the runway-to taxiway centerline separation distances are increased 1 foot for each 100 feet of airport elevation above sea level. Accordingly, because the airport has a field elevation of 945 feet above sea level, the centerline separation distances at PTI would be increased by 9.45 feet. It is recognized that the existing runway-to-taxiway centerline distances vary for each system of parallel taxiways and, per this latest prescribe change, may not fully comply with these new runway-to-taxiway centerline separations standards. No changes to the design or layout of the existing runways or taxiways to address or fully satisfy these field elevation-specific increased centerline separation distances are planned at this time.

4.2.3.2.4 Runway Length

As previously discussed in Section 2, *Existing Conditions*, the current runway length for Runway 5R/23L is 10,001 feet. Runway 5L/23R is 9,000 feet in length and Runway 14/32 is 6,380 feet in length. The ultimate plans for Runway 5R/23L include the future extension to an ultimate length of 12,735 feet that will require the continued application and use of Declared Distance criteria at each end. The ultimate plans for Runway 5L/23R include the future extension to the southwest to an ultimate runway length of 10,000 feet. Runway 14/32 is planned be extended to an ultimate length of 9,190 feet.

<u>Airport-Specific Operational Requirements Analysis</u>

As shown in **Appendix G**, the aircraft runway takeoff and landing length requirements are listed for specific commercial, general aviation propeller and business jet engine aircraft operating at their respective maximum gross take-off and maximum landing weights during no wind, hottest day, and contaminated runway (wet) conditions at PTI. Each takeoff and landing length data table is sorted by ascending take-off length and represents the entire nationally-inventoried fleet of commercial and general aviation aircraft.

Based on the data presented, 100 percent of the propeller-driven general aviation and business jet aircraft fleet can operate without runway take-off length (payload and/or non-stop trip length) restrictions. The take-off length requirements for commercial aviation jet aircraft, however, are much greater. At a current length of 10,001 feet, Runway 5R/23L can fully accommodate (i.e., without similar restrictions) approximately 56 percent of the commercial aviation fleet, when operating at Maximum Gross Take-Off Weight (MGTOW). At the proposed ultimate extended length of 12,735 feet, Runway 5R/23L could accommodate approximately 82 percent of the commercial aviation fleet when operating at MGTOW. In reality, when considering scheduled non-stop trips that were occurring at PTI in May 2008 (longer-haul routes including Miami, Dallas/Ft. Worth, Houston and Minneapolis-St. Paul), with Dallas/Ft. Worth being the longest distance of approximately 1,000 miles, it can be safely assumed that 100 percent of the commercial fleet mix having a wingspan of ADG-V or less can operate at these runway lengths. In respect to general aviation aircraft, including business jets, the current Runway 5R/23L length of 10,001 feet can fully accommodate 100% of its fleet when operating at MGTOW. General aviation aircraft travels in the national market from coast to coast and internationally.

4.2.3.2.5 Runway Width

Runway width requirements are determined by Airplane Design Group (ADG) standards. The recommended width for runways serving aircraft in ADG-V is 150 feet. All three runways at PTI currently have a width of 150 feet and fully satisfy FAA design standards. However, at such time that larger aircraft having ADG-VI characteristics operate at the airport on a sustained basis (500 or more annual itinerant operations), Runway 5R/23L must be widened to a width of 200 feet.

4.2.4 AIRFIELD DESIGN/MARKING/LIGHTING REQUIREMENTS

4.2.4.1 Runways

4.2.4.1.1 Pavement Strength

Pavement strength requirements are related to three primary factors: 1) the weight of aircraft anticipated to use the airport, 2) the landing gear type and geometry, and 3) the volume of aircraft operations. According to the airport's FAA Form 5010, *Airport Master Record*, Runway 5R/23L and Runway 5L/23R have pavement strengths of 124,000 pounds single-wheel loading; 170,000 pounds dual-wheel loading; and 240,000 pounds dual tandem loading. Runway 14/32 has pavement strengths of 123,000 pounds single-wheel loading, 170,000 pounds dual-wheel loading, and 244,000 pounds dual tandem loading. These strengths are sufficient to accommodate all existing aircraft operating on these runways. At such time that aircraft having ADG VI characteristics operate at the airport on a sustained basis, pavement strengths for Runway 5R/23L should be increased.

4.2.4.1.2 Markings/Signage

Currently, all three runways have proper runway pavement markings for the type of published instrument approach capabilities they support. All three runways have precision instrument runway markings. These runway markings meet FAA standards; therefore, no changes to pavement marking are required. At such time that aircraft having ADG VI characteristics operate on Runway 5R/23L on a sustained basis, changes in airfield geometry may dictate the relocation or adjustment to sign locations along designated taxi paths of these aircraft.

4.2.4.1.3 Edge Lighting

All three runways are equipped with High Intensity Edge Lighting (HIRL). These runway lighting systems are appropriate for runways with precision and non-precision approaches, respectively. No changes to these lighting systems are required. At such time that aircraft having ADG VI characteristics operate on Runway 5R/23L on a sustained basis, changes in airfield geometry may dictate the relocation or adjustment to runway edge lighting.

4.2.4.2 Taxiways

4.2.4.2.1 Pavement Strength

The current taxiway strengths are sufficient to accommodate all existing aircraft operating on the taxiway system. However, certain taxiway strengths and widths will need to be addressed in order to accommodate the operational weights of the aircraft, such us Boeing 767, 777, and McDonnell Douglas DC-10-10 that will use the airport on a more sustained basis (a minimum of 500 or more current or planned itinerant aircraft operations per year).

4.2.4.2.2 Edge Marking/Signage

All taxiway edge marking and signage fully satisfy current airport design standards and are therefore adequate for the 20-year planning period. At such time that aircraft having ADG VI characteristics operate on Runway

5R/23L and parallel Taxiway K and certain connectors on a sustained basis, changes in airfield geometry may dictate the relocation or adjustment to edge marking and signage along designated paths of these aircraft.

4.2.4.2.3 Edge Lighting

The existing taxiway system has medium intensity taxiway edge lighting that fully satisfies current airport design standards and is therefore adequate for the 20-year planning period. At such time that aircraft having ADG VI characteristics operate on Runway 5R/23L on a sustained basis, changes in airfield geometry may dictate the relocation or adjustment to edge lighting along designated taxi paths of these aircraft.

4.2.4.2.4 Holding Bays

There are no holding bays on the taxiway system at PTI, and none are needed or planned for capacity purposes.

4.2.5 VISUAL GUIDANCE LIGHTING SYSTEMS

Five types of visual guidance lighting systems are currently installed at the airport. A High Intensity Approach Lighting System with Sequenced Flashing Lights (ALSF-2) serves Runways 5L and 23L; a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) serves Runways 5R and 23R; a 4-box Visual Approach Slope Indicator System (VASI) serves Runway 32; a 4-box Precision Approach Path Indicator System (PAPI) serves Runways 5R/23L and 5L/23R; and Runway End Identification Lights (REILs) serve Runway 32.

It is recommended that the VASI system, installed on Runway 32, be upgraded to a PAPI system, and the Runway 5R approach lighting system be upgraded to ALSF-2 from its current MALSR. The ALSF-2 system is required when the runway is commissioned for Category II/III ILS configuration, providing lower instrument approach minimums than Category I. It is further recommended that the capability to re-install the former MALSR system on Runway 14 be retained.

4.2.6 SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM

The Surface Movement Guidance and Control System (SMGCS) is a combination of signage, lighting and markings which allow safer airport operation in terms of providing a designated route on airfield system for the aircraft to maneuver to and from the apron and/or gate parking area during low visibility conditions. The SMGCS plan is currently in development at PTI. The following **Table 4-7** indentifies the SMGCS requirements and provides current availabilities at the airport. The SMGCS plan will serve aircraft operating on Runway 5L/23R and Runway 5R/23L supporting CAT II, and CAT IIIa precision approach operations, which provides visibility minimums of 1,200’ RVR to 600’ RVR.

TABLE 4-7
SMGCS REQUIREMENTS

Description	Visibility Minimums of 1,200' RVR to 600'RVR	Visibility Minimums of less than 600'RVR	Currently Available at PTI
Physical Requirements			
Taxiway Edge Lights	Required	Required	Yes
Taxiway Centerline Lights			No
100' Spacing for SMGCS 1,200' RVR	Required	Not Applicable	No
50 ' Spacing for SMGCS < 600' RVR	Not Applicable	Required	No
Runway Guard Lights	Required	Required	In Development
Stop Bar Lights	Not Required	Required	No
Taxi Guidance Signs	Required	Required	Yes
Geographic Position Markings	Not Required	Required	In Development
Monitoring of Lighting Aids	Required	Required	In Development
Surface Movement Surveillance System	Required	Required	No
Taxiway Holding Position Markings	Required	Required	Yes
Clearance Bar Lights	Not Required	Required	No
SMGCS Plan Elements			
Organize Working Group	Required	Required	In Development
Low Visibility Procedures	Required	Required	In Development
Apron Traffic Management Plan	Not Required	Required	No
Taxiing Assistance in Non-Movement Areas	Not Required	Required	No
Airport Low Visibility Taxi Route Chart	Required	Required	In Development
Vehicular Traffic Restrictions	Recommended	Required	In Development

Source: FAA Advisory Circular 120-57A, Surface Movement Guidance and Control System, 12/19/1996.
Baker Corporation, 2009.

Taxiway centerline lights were recently installed on Taxiway E and H and all connector taxiways to Runway 5L/23R. The airport plans to install taxiway centerline lights on Taxiway K and D and Taxiway K Connectors when funding becomes available.

4.3 Proposed New Airport Traffic Control Tower

As part of the design considerations for Runway 5L/23R, a study was conducted to verify that Airport Traffic Control Tower (ATCT) controllers could achieve and maintain the required line-of-site from the existing tower cab to all runway/taxiway movement areas. This study further verified the need for increased observation heights to achieve and maintain lateral discrimination capabilities and to detect, recognize and identify objects on the airport surface such as aircraft or vehicles that would operate along all movement areas. As part of the same study, it was concluded that the current ATCT would not fully satisfy these minimum visibility guidelines, indicating a need for the eventual construction of a new ATCT. Based on these findings and conclusions, an ATCT Siting Study was conducted to identify suitable locations for the construction of a new ATCT facility. The proposed ATCT is located approximately 500 feet northwest of the existing ATCT location, adjacent to PTI Drive.

4.4 Proposed New Federal Inspection Station

The airport currently has no Federal Inspection Station (FIS) to process international passengers or cargo. PTAA has been approached by an airline to provide FIS services at the airport to facilitate international service to and from PTI. The FIS would not be constructed without such an agreement with an airline. FedEx currently operating at the airport supports the development of a FIS facility at PTI. Today, international cargo shipments are inspected by the local U.S. Customs and Border Protection office personnel located off the airport.

It is proposed that an FIS facility be constructed using approximately 6,500 square feet of existing space located on the lower level of the north concourse.

4.5 On-Airport Navigational Aid Requirements

The airport currently has an Instrument Landing System (ILS) installed on Runways 5R/23L, 5L/23R and 14. The ILS is also supported by the localizer and glide slope antennas. No other on-airport Navigational Aids are required.

4.6 Terminal Area Demand/Capacity Analysis

As part of this Airport Master Plan update, no detailed terminal capacity analysis was conducted. This, in part, was because the existing terminal complex and supporting surface transportation system were considered to have ample capacity and useful life. Selected elements of the landside component of the terminal system were briefly examined.

4.6.1 LANDSIDE

4.6.1.1 Curbfront

An interview with airport staff revealed that the curbfront does not experience any significant congestion issues and will remain adequate throughout the 20-year planning period.

4.6.1.2 Rental Car

An interview with various rental car companies revealed that the rental car space is adequate for current and future demand. However, when the FedEx Mid-Atlantic Hub facility expands for Phase 2, the rental car service facilities must be relocated.

4.6.1.3 Parking

4.6.1.3.1 Existing Parking Demand and Capacity

A review and evaluation was performed of existing and future parking demand and capacity for the airport. The evaluation of existing parking capacity has been based on a review of site plans, a field inventory and interviews with airport parking personnel.

A detail description of existing parking facilities is presented in Chapter 2, *Existing Conditions.* Based on the interview with airport parking personnel, it has been determined that the average day of peak month parking demand throughout most of the airport facilities is currently about 70% of the existing capacity. In other words, most of the parking facilities have approximately 30% vacant spaces during a typical day of the peak month. However, most of the airport parking operators indicated there was approximately 10% more demand during previous peak seasons, prior to the current economic downturn. Consequently the base parking demand has been estimated at approximately 80% of the existing capacity.

Table 4-8 provides a summary of the existing parking demand and capacity. **Figure 2-8** illustrates existing parking facilities. As seen in **Table 4-8**, all parking areas appear to have ample available capacity with the existing demand.

TABLE 4-8
EXISTING PARKING DEMAND AND CAPACITY SUMMARY

PARKING FACILITY	Existing Parking Capacity	Existing Parking Demand	Available Spaces
General Public Parking			
Parking Garage	2,177	1,742	435
Long-Term North Lot (East of Garage)	1,056	845	211
Long-Term South Lot (West of Garage)	811	649	162
Metered (Upper Level)	159	127	32
Metered (Lower Level)	100	80	20
Subtotal	**4,303**	**3,443**	**860**
Employee Parking			
North Employee Lot (East of Concourse)	250	200	50
South Employee Lot (West of Terminal)	438	350	88
Subtotal	**688**	**550**	**138**
Valet Parking			
Valet Lot (West of Concourse)	482	386	96
Subtotal	**482**	**386**	**96**
Rental Car Ready/Return Lot			
North Parking (East of Terminal)	286	229	57
Subtotal	**286**	**229**	**57**
Total	**5,759**	**4,608**	**1,151**

Source: PTAA Parking Staff, December 2008.
URS Corporation, December 2008.
Parking Demand and Capacity Units: Parking Spaces

4.6.1.3.2 Future Parking Demand and Capacity

The future parking demand has been calculated by augmenting the existing parking demand, using a growth rate similar to the projected growth in enplanements, which is depicted in **Table 4-9**. Based on the projected increase of the parking demand, there will be sufficient parking capacity available through the enplanement levels projected for 2017 as the parking facilities will be approximately 93% occupied. See **Table 4-10**. Since parking areas can be deemed as functionally full when they reach 95% of their capacity and this threshold may be triggered around 2020, it is recommended that the PTAA initiate efforts to investigate the feasibility of additional parking facilities to meet the projected demand.

TABLE 4-9
ENPLANEMENT FORECASTS

Year	Enplanements	Difference (+/-)	Average Annual Growth Rate	5-Yr Growth Rate Factor
2007	*1,027,570			
2012	1,107,675	80,105	1.56%	7.80%
2017	1,163,856	136,286	1.33%	6.63%
2022	1,223,037	195,467	1.27%	6.34%

Source: Piedmont Triad International Airport Master Plan Update, Chapter 3 *Forecast of Aviation Activity*, Table 3-28, 2009.
URS Corporation, December 2008.

*Note: Enplanements as reported by FAA in the 2007 TAF.

TABLE 4-10
ESTIMATED FUTURE PARKING DEMAND

PARKING FACILITY	Existing Parking Capacity	2012 Parking Demand	2017 Parking Demand	2022 Parking Demand
General Public Parking				
Parking Garage	2,177	1,877	2,002	2,129
Long-Term North Lot (East of Garage)	1,056	911	971	1,033
Long-Term South Lot (West of Garage)	811	699	746	793
Metered (Upper Level)	159	137	146	155
Metered (Lower Level)	100	86	92	98
Subtotal	**4,303**	**3,710**	**3,957**	**4,208**
Employee Parking				
North Employee Lot (East of Concourse)	250	216	230	244
South Employee Lot (West of Terminal)	438	378	403	428
Subtotal	**688**	**594**	**633**	**672**
Valet Parking				
Valet Lot (West of Concourse)	482	416	443	471
Subtotal	**482**	**416**	**443**	**471**
Rental Car Ready/Return Lot				
North Parking (East of Terminal)	286	247	263	280
Subtotal	**286**	**247**	**263**	**280**
Total	**5,759**	**4,967**	**5,296**	**5,631**
Future Demand to Existing Capacity Ratio		**86.2%**	**92.0%**	**97.8%**

Source: PTAA Parking Staff, December 2008.
URS Corporation, December 2008.

The area for rental car and overflow parking has been identified and is located on the current airport campus between Taxiway H and Airport Parkway. This area is currently under construction.

4.6.1.4 Bus/Limo/Taxi

A local/regional bus service operated by the Piedmont Authority for Regional Transportation (PART) regularly operates every hour to the airport. The PART bus station is located approximately 3 to 4 miles southwest from the airport. A single taxi service has a concession to operate at PTI. The taxi service has a "staging" area located in the lower level center baggage. Eight to 10 spaces are designated for taxi service use. Parking for tour buses and limos has been designated with a single parking space at each end of the terminal building and on both levels of the terminal (total 4 spaces). The main purpose for these tour buses/limos is to pick up occasional tour groups from the airport and transport them to other destinations. Based on interviews with airport staff, the spaces for buses, limos and taxis are adequate for current and future demand.

4.6.2 TERMINAL BUILDING

Discussions with airport management indicate that the existing passenger terminal and supporting infrastructure are adequate to satisfy existing and anticipated future demand levels throughout the next 10 to 20 years. Therefore, planning and capacity analysis was not conducted for this element of the airport.

4.6.3 APRON AREA

4.6.3.1 Gate Utilization Analysis

Aircraft gate utilization is a major factor not only in determining the availability of gates for new entrants and current air carriers, but also in influencing gate management controls at an airport. Based on discussions with the airport staff, the gate utilization is fairly low at the PTI in terms of the number of turns per gate, that is, the number of times an aircraft arrives, is loaded, and departs.

4.6.3.2 Gate Requirements

The terminal currently provides a total of 25 gates. Eleven gates are located in the south concourse, and, thirteen are located in the north concourse. A total of six gates are without jet bridges (one in the south concourse and five in the north concourse). A detailed drawing illustrating the location of the gates and jet bridges is provided in **Figure 2-11** of Chapter 2, *Existing Conditions*. Additionally, **Table 2-6** provides detailed information on airline gate occupancy and availability, and indicates a total of six gates being vacant for potential use by current airline tenants or new entrants. This indicates that the terminal has adequate capacity to meet current and future capacity requirements.

4.6.3.3 Lighting

The airport apron area lighting fixtures are currently located on top of each concourse. Ten lighting fixtures are located on the South Concourse, while 12 are located on the North Concourse. The lighting fixtures are spaced on both sides of each concourse. When lights are illuminated, they cover the gate and servicing area. This provides adequate capacity for current and future demand.

4.6.3.4 Tug Roads

The tug roads on apron areas are approximately 20 feet wide and are marked for two-way traffic. Tug access to the gates and areas for the servicing of aircraft are unlimited. However, based on forecast for activity at PTI, the tug roads are adequate for current and future demand.

4.6.3.5 Servicing Area

The servicing area is used for servicing an aircraft, and is designated and marked on the apron for all Ground Service Equipment (GSE). The servicing area is adequate for current and future demand.

4.7 Air Cargo Demand/Capacity Analysis

A detailed description of current tenants at PTI and the respective size of the building area is presented in Section 2, *Existing Conditions,* **Table 2-9**. The airport has a total of six air cargo facilities (Air Cargo Buildings #1, #2 and #3, TradeWinds Cargo Building, former UPS-SCS building, and FedEx Main Sort Building) which include apron areas. These air cargo facilities totaling of 503,717 square feet of space were constructed to support air cargo operations at the airport, including all cargo, belly-freight, and mail. However, as discussed in **Appendix E***,* there has been a significant decline during the past several years in both belly-freight and mail. This change resulted from a significant shift in the fleet mix at PTI from air carrier to regional jet aircraft limiting cargo capabilities. Furthermore, restrictions were imposed on the type of cargo that could be carried on passenger aircraft following the events of September 11, 2001. Therefore, an approximate 50 percent of its current square-footage capacity is being used for air cargo purposes. **Table 4-11** indicates Air Cargo Building #2 and #3 existing and replacement space. **Table 4-12** indicates Air Cargo Building #1 existing and replacement space, and Table **4-13** indicates PTAA storage requirements for existing and replacement space.

TABLE 4-11
AIR CARGO BUILDING #2 & #3 REPLACEMENT

Tenant	Existing Building Space (Sq. Ft.)	Replacement Building Space (Sq. Ft.)	Replacement Building Space + 20% (Sq. Ft.)
Air Carriers – Belly Cargo			
Continental	7,560	8,000	9,600
Delta	3,780	4,000	4,800
USPS	12,001	12,000	14,400
Total	**23,341**	**24,000**	**28,800**
Air Carriers – Express Cargo			
UPS	3,276	3,300	3,960
DHL	14,950	15,000	18,000
Total	**18,226**	**18,300**	**21,960**
GSE/Other			
Aviation Repair Technology	4,158	4,200	5,040
Quantem	168	200	240
Jetstream	2,646	2,700	3,240
TIMCO	10,000	10,000	12,000
Total	**16,972**	**17,100**	**20,520**
TOTAL	**58,539**	**59,400**	**71,280**

Source: Piedmont Triad Airport Authority Leasing Records, January 2010.
URS Corporation, 2010.

TABLE 4-12
AIR CARGO BUILDING #1 REPLACEMENT

Tenant	Existing Building Space (Sq. Ft.)	Replacement Building Space (Sq. Ft.)	Replacement Building Space + 20% (Sq. Ft.)
Comair	1,920	2,000	2,400
TOTAL	**1,920**	**2,000**	**2,400**

Source: Piedmont Triad Airport Authority Leasing Records, January 2010.
URS Corporation, 2010.

TABLE 4-13
PTAA STORAGE REQUIREMENTS

Tenant	Existing Building Space (Sq. Ft.)	Replacement Building Space (Sq. Ft.)	Replacement Building Space + 20% (Sq. Ft.)
PTAA (Air Cargo Bldg. #1)	19,905	20,000	24,000
PTAA-Mechanical (Air Cargo Bldg. #2)	1,281	1,500	1,800
PTAA-Mechanical (Air Cargo Bldg. #2)	1,260	1,500	1,800
PTAA-Mechanical (Air Cargo Bldg. #3)	1,200	1,500	1,800
TOTAL	**23,646**	**24,500**	**29,400**

Source: Piedmont Triad Airport Authority Leasing Records, October 2008.
URS Corporation, 2009.

Due to the current airfield improvements and future option of FedEx expansion, Air Cargo Building # 2 and # 3 will be demolished, and thus 71,280 S.F. of building space is recommended to be replaced "in-kind" in order to accommodate current tenants. Additionally, Air Cargo Building # 1 will have to be demolished due to its age and physical condition. The new "in-kind" replacement building is recommended to have a 2,400 S.F. Further, PTAA storage that is currently located in three separate buildings is recommended to provide one 29,400 S.F. building to accommodate all PTAA's needs.

4.8 General Aviation

The purpose of this evaluation is to determine the capacity of existing two major general aviation facilities (Atlantic Aero and Landmark Aviation) and their ability to meet forecasted levels of demand during the planning period.

In this analysis, the following types of facilities were evaluated:

- Storage hangars; and
- Based and transient aircraft apron areas.

Details of the facility analysis are provided in the following sections.

4.8.1 Storage Hangars

4.8.1.1 Demand/Capacity Analysis

The demand for storage hangars is dependent upon the number and types of aircraft expected to be based at an airport, as well as local climatic conditions, airport security, and owner preferences. The percentage of based aircraft that are stored in hangars varies from state to state, but is usually greatest in regions that are subject to extreme weather conditions.

Demand for storage hangars is usually estimated by assuming that a certain percentage of aircraft owners will desire hangars for their aircraft. The percentage of owners desiring hangar space usually varies by type of aircraft. It is assumed that a greater percentage of owners of high-performance aircraft will desire hangar space as compared to owners of low performance aircraft. Thus, this analysis assumes that 100 percent of turboprop, jet, and rotorcraft will desire hangar space and that 80 percent of single-engine and twin-engine piston aircraft will desire hangar space.

The analysis estimates demand for T-Hangars and larger executive/corporate and conventional (i.e. bulk or common storage) hangars whose owners desire convenient access to FBO services and the greater amount of space storage. The primary users of shade hangars and T-hangars are owners of smaller single and light twin-engine aircraft that prefer the security and the convenience of direct access provided by T-hangars. Therefore, the analysis assumes that all jet engine aircraft and rotorcraft would be stored in executive/corporate and conventional hangars and most single-engine and light twin-engine piston aircraft would be stored in shade hangars and T-hangars.

The projected hangar allocation demand and hangar space requirements for the 20-year planning period are presented in **Table 4-14 and Table 4-15.**

TABLE 4-14
HANGAR ALLOCATION ASSUMPTIONS

Aircraft Type/ Hangar Type		Existing Based Aircraft	Allocation by Year			
			2007	2012	2017	2027
Single Engine						
(80%) Hangar						
T-Hangar	(95%)	59	51	52	54	56
Corporate	(5%)	3	3	3	3	3
(20%) Apron		15	13	14	14	15
	Subtotal	**77**	**67**	**69**	**71**	**74**
Multi Engine						
(80%) Hangar						
T-Hangar	(80%)	6	18	19	20	21
Corporate	(20%)	2	5	5	5	5
(20%) Apron		2	6	6	6	6
	Subtotal	**10**	**29**	**30**	**31**	**32**
Jet Engine						
(100%) Hangar						
Executive/Corporate	(40%)	6	9	11	13	19
Conventional	(60%)	10	13	16	19	29
(0%) Apron		0	0	0	0	0
	Subtotal	**16**	**22**	**27**	**32**	**48**
Rotorcraft						
(100%) Hangar						
T-Hangar	(0%)	0	0	0	0	0
Corporate	(100%)	0	2	3	3	4
(0%) Apron		0	0	0	0	0
	Subtotal	**0**	**2**	**3**	**3**	**4**
	TOTAL	**103**	**120**	**128**	**137**	**159**

Source: URS Corporation, 2009.

TABLE 4-15
HANGAR SPACE REQUIREMENTS

Description	Existing Conditions	Year				Hangar Space Required
		2007	2012	2017	2027	
Based Aircraft						
Single Engine	77	67	69	71	74	--
Multi Engine	10	29	30	31	32	--
Jet Engine	16	22	27	32	48	--
Rotorcraft	0	2	3	3	4	--
Subtotal	**103**	**120**	**128**	**137**	**159**	**--**
Aircraft Storage (Multi-Aircraft Storage Space)						
T-Hangar (units)	70	69	71	74	77	7
Executive/Corporate	7	9	11	13	19	12
Corporate Hangar	8	10	11	11	12	4
Conventional Hangar	43	13	16	19	29	--
Subtotal	**128**	**101**	**109**	**117**	**137**	**--**

Source: URS Corporation, 2009.

4.8.1.2 Hangar Space Requirements

Table 4-14 and **Table 4-15** present the assumed allocation of (demand for) hangar space and hangar space requirements. As tables indicate, this approach estimates no need for additional conventional (i.e., T-hangars) hangars. This conclusion is in conflict with management at the two FBO who expressed a desire for additional executive/corporate hangars.

It is important to note that the estimates are based upon assumptions of demand, thus, the actual demand for hangar space can vary from the estimate.

4.8.2 AIRCRAFT APRON

4.8.2.1 Demand/Capacity Analysis

For the purposes of planning, FBO-operated apron areas should be provided for based aircraft that are not stored in hangars and itinerant aircraft. No clear distinction is made between the apron demand areas for based general aviation aircraft and itinerant general aviation aircraft at PTI. Parking space for aircraft is provided on two general aviation ramps; each located in the vicinity of the FBO general aviation service centers. The available ramp space consists of approximately 39,818 square yards of paved apron for 58 aircraft tie-downs on the Atlantic Aero ramp and approximately 30,224 square yards of paved apron for 31 aircraft tie-downs on Landmark Aviation ramp. Chapter 2, *Existing Conditions*, Figure 2-7 illustrates the locations of apron areas and Table 2-5 provides apron area details.

The majority of aircraft based at either FBO typically park in front of the corporate and T-hangars, while itinerant aircraft park closer to the general aviation service center. During peak periods, Taxiway D2 adjacent to Atlantic Aero is closed and used for parking itinerant aircraft.

The demand for based aircraft apron space was calculated by subtracting aircraft assumed to be based in hangars from the total number of aircraft projected to be based at the airport throughout the study period. The required apron area was calculated by applying an industry standard of 300 square yards per each based aircraft. The demand for transient apron space was calculated using the existing split between based apron space and itinerant apron space. Required aircraft apron space for transient aircraft was calculated by applying an industry standard of 560 square yards per each itinerant aircraft.

Table 4-16 presents projected demand for apron space for based and itinerant aircraft at PTI.

TABLE 4-16
APRON DEMAND/CAPACITY AND REQUIREMENTS ANALYSIS

Category	Existing Capacity	Projected Demand			
		2007	2012	2017	2027
Based Aircraft Tie-Downs	63	19	20	20	21
Based Aircraft Apron Area (S.Y.)	18,900	5,700	6,000	6,000	6,300
Transient Aircraft Tie-Downs	26	8	8	8	9
Transient Apron Area (S.Y.)	14,560	4,480	4,480	4,480	5,040
Total Tie-Downs	89	27	28	28	30
Total Apron Area (S.Y.)	33,460	10,180	10,480	10,480	11,340

Source: URS Corporation, 2009.

4.8.2.2 Apron Requirements

As **Table 4-16** indicates, the existing capacity well exceeds the projected demand. Thus, additional apron space for based and transient aircraft is not needed. However, on occasion, high peaks of itinerant aircraft do occur at both FBO's apron locations (furniture events, sporting events, etc.) that would interrupt the aircraft taxi flows on the ramp and create congestion due to high volume of visiting aircraft.

4.8.3 AVIATION FUEL STORAGE FACILITIES

As noted in Section 2, *Existing Conditions*, the airport has two FBOs that supply general aviation and commercial aircraft with fuel. Atlantic Aero's historical fuel sales (2006 through 2007) for AVGAS and Jet-A are listed in **Table 4-17**.

TABLE 4-17
ATLANTIC AERO – HISTORICAL FUEL SALES (GALLONS)

MONTH	AVGAS		JET A	
	2006	2007	2006	2007
January	5,211	6,053	67,019	78,140
February	4,994	3,842	65,837	72,357
March	9,537	9,057	99,839	136,995
April	5,617	6,584	113,619	102,780
May	4,871	7,905	93,412	82,797
June	4,880	4,771	90,379	78,530
July	5,094	5,587	73,904	76,199
August	6,112	5,210	98,397	83,263
September	5,517	4,899	82,998	84,238
October	7,489	5,853	116,439	103,179
November	5,083	6,171	99,458	76,008
December	4,195	2,984	94,800	63,847
TOTAL	**68,600**	**68,916**	**1,096,101**	**1,038,333**
Monthly Average	5,717	5,743	91,342	86,528
Monthly High	9,537	9,057	116,439	136,995
Monthly Low	4,195	2,984	65,837	63,847
Average Day Peak Month	308	292	3,756	4,419

Source: Atlantic Aero Management, 2008.

Monthly fuel sales reports for Avgas and Jet-A were obtained from the Atlantic Aero Management personnel. The reports indicate that peak month sales for Avgas occurred in March 2006 with a total of 9,537 gallons. The peak month fuel sales for Jet-A occurred in March 2007 with a total of 136,995 gallons. Peak month fuel sales for Avgas and Jet-A were divided by 31 (days) to derive average daily sales during the peak month. Average daily fuel sales during the peak month were 308 gallons for Avgas and 4,419 gallons for Jet-A. On the basis of the 15,000-gallon capacity for Avgas (for existing fuel storage capacity refer to Chapter 2, *Existing Conditions*, Table 2-8), a 48-day fuel supply is currently provided. With respect to Jet-A, an 18-day supply exists on the basis of the existing 80,000-gallon capacity. Atlantic Aero typically purchases Avgas once every 30 to 45 days and is delivered via fuel tracks. Jet-A, however, is purchased when demand dictates and is delivered via pipeline from an off site fuel depot facility. These capacities are adequate for existing and future levels of demand.

The fuel sales for Landmark Aviation could not be verified, however, an interview with Landmark Aviation management reveals that Avgas is delivered to the FBO via fuel truck from commercial providers on average every 30 days. Jet-A fuel is delivered to the airport via pipeline from an off site fuel depot facility when demand dictates. Further, based on the interview, there are no deficiencies with respect to fuel storage or fueling capabilities. This indicates that these capacities are adequate for existing and future fuel storage demand.

4.9 Commercial/Institutional Tenant Space

4.9.1 TIMCO AVIATION SERVICES, INC.

TIMCO Aviation Services has expanded several times since it opened at the airport in 1990, most recently in 2004. The company foresees an additional expansion of their facilities that would include additional maintenance shops, hangar, ramp, ramp access and parking space.

4.9.2 CESSNA CITATION SERVICE CENTER

Cessna Citation Service Center experienced major congestion on its frontage apron and has reported a lack of appropriate building space for logistics, maintenance and repair purposes. Recently, Cessna has begun design of an expansion of its facility towards the southeast of its current location, and is planning to double its current building size. The apron was expanded at the end of 2008, doubling its size.

4.9.3 COMAIR MAINTENANCE FACILITY

The Comair Maintenance facility is a fairly recent addition to the airport. Since 2006, the facility provides maintenance services for Comair regional jets that meet current and future demand. No further plans for potential expansion are known at this time.

4.9.4 HONDA AIRCRAFT FACILITY

Honda Aircraft Company established its headquarters at the airport in 2006. This new division of Honda Motor Company manufactures the innovative HondaJet, a light business jet. The company has also constructed a headquarters and research and development facilities at the airport.

4.9.5 GUILFORD TECHNICAL COMMUNITY COLLEGE (GTCC) AVIATION CENTER

The GTCC T.H. Davis Aviation Center is a well-equipped modern aviation maintenance training facility. The 120,000-square-foot training facility has dedicated shops for engines, welding, composites, electrical components and sheet metal finishing. Due to the new construction of a Honda Aircraft facility, and the expansion of the TIMCO facility, the Aviation Center has rented additional building space on Radar Road, bringing the Center's total square footage to approximately 120,000 square feet. The Center trains between 300 and 400 students per year. No further immediate plans for expansion have been expressed by GTCC.

4.10 Airport Support Facilities

4.10.1 AIRPORT MAINTENANCE

As previously described in Section 2, *Existing Conditions*, airport maintenance facilities consist of a building storage area for field equipment and maintenance. Consultation with airport management indicates that the maintenance facility is sufficient to store equipment and perform maintenance activities when needed. Therefore, the existing airport maintenance facility is sufficient to meet existing and future demands.

4.10.2 AIRPORT FIRE STATION

The FAA has established specific requirements for Aircraft Rescue and Firefighting (ARFF) equipment. These requirements are shown in **Table 4-18** and vary depending upon the frequency that aircraft of various sizes serve the airport. As the table indicates, the requirements are stated in terms of "Indexes" that begin with the letter "A" for airports serving small aircraft and extend to Index "E" for airports serving large aircraft. Each Index letter defines a range for aircraft length. Index A is defined as aircraft that have a length of less than 90 feet. The longest index group with an average of 5 or more daily departures by air carrier aircraft is the Index required for the airport.

TABLE 4-18
ARFF EQUIPMENT REQUIREMENTS

Airport Index	Length[1] of Aircraft (Representative Aircraft)	Min. Number of ARFF Vehicles	Extinguishing Agents	
			Dry Chemicals (Potassium Bicarbonate) (Pounds)	*AFFF Water Required (Gallon)
A	Under 90 (Dash-8)	2	450	2,760
B	90-125 (CRJ-700)	2	450	3,740
C	126 to 158 (MD-80)	3	450	4,880
D	159 to 199 (767)	3	900	7,780
E	Over 200 (747)	4	900	9,570

[1] Length of largest aircraft providing an average of five scheduled departures per day. If there is less than an average of five daily departures by aircraft in a particular index, then the next lower index applies.

Source: NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports*, 2009 Edition, Table 5.3.1(b).

* AFFF – Aqueous Film-Forming Foam, most commonly used agent.

As described in Section 2, *Existing Conditions*, the ARFF is presently equipped to meet the Index C requirement, which meets the current demand. With the recently constructed 20,400 square-foot ARFF/Command Center facility available through the 2009 federal stimulus funds, both ARFF facilities are sufficient to meet existing and future demands.

4.10.3 AIRPORT ADMINISTRATION

The airport administration office of the PTAA is located in the terminal building on the upper and lower levels. The upper level office space consists of approximately 7,659 square feet that includes offices for the airport management and administration personnel while lower level space consist of approximately 6,859 square feet and includes office space for the Police, Badging, and Communication personnel. Consultation with airport management indicates that the PTAA has adequate space to meet the current and future demand.

4.10.4 AIRPORT UTILITIES

Airport utilities at PTI include electrical, potable water, sanitary sewer, telephone, internet service and gas. Providers of these utilities are identified in Section 2, *Existing Conditions.* No known deficiencies are noted and it is anticipated that these utilities will remain adequate throughout the 20-year planning period.

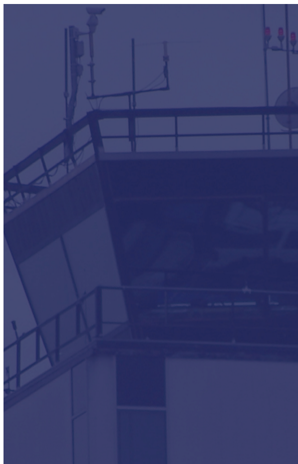
4.11 Surface Transportation

Within the last three to five years major improvements to the existing surface transportation system surrounding and serving the airport have been and are currently under way. Airport Parkway, Bryan Boulevard, Old Oak Ridge Road and the Greensboro Western Urban Loop have each been constructed or realigned to accommodate the construction of Runway 5R/23L and the FedEx Mid-Atlantic Sort Hub. Based on these recent improvements the existing surface transportation and supporting infrastructure are adequate to satisfy existing and anticipated future demand levels throughout the next 20-year planning period. Accordingly, planning and capacity analysis was not conducted for this element of the airport.

4.12 Summary of Landside Facility Requirements

The following landside improvements are recommended to occur within the 20-year planning period:

- Construct T-hangars, executive/corporate, and commercial hangar space as demand dictates;
- Expand existing GA apron area as demand dictates;
- Expand terminal concourse, apron and associated auto parking as demand dictates; and
- Construct new air cargo facilities.



Airport Master Plan Update
and
Strategic Long-Range Visioning Plan

Prepared By:
URS

In Association With:
JACOBS CONSULTANCY
rma
Ron Miller & Associates

SECTION 5.0
AIRPORT DEVELOPMENT OPTIONS

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

SECTION 5.0

AIRPORT DEVELOPMENT OPTIONS

5.1 INTRODUCTION

In addition to the Aviation Activity Forecast previously presented in Section 3.0, a forecast of airport land needs was also developed to identify and better understand the potential for increased demand for airport-owned land by existing and unidentified prospective airport tenants. Most importantly the airport land needs forecast examines on-airport land areas upon which tenant-related developments and activities could occur during the planning period and the resulting need for additional airport land required to accommodate tenant facility and activity growth.

5.2 FORECAST OF AIRPORT LAND NEEDS

The Forecast of Airport Land Needs examines the current land holdings of the PTAA, and the occupancy of that land by more than 50 commercial airport tenants. It provides a projection of the additional land areas that will be needed by the PTAA in the future to accommodate anticipated growth of airport tenants and their respective facilities and operations. The forecast considers all uses of airport-owned land, but concentrates on those land uses that 1) require direct airfield access; 2) promote economic development and employment; and 3) fit the profile of typical uses at the airport over the past 10 years.

The Forecast of Airport Land Needs is not typical of most Airport Master Plan Updates, but has been developed in this instance because of the unmistakable uptick in development activity at PTI over the past 10 years. During that timeframe, the airport has witnessed the arrival of a major FedEx hub operation that will ultimately require 250 acres of airport property; the construction of a Comair Maintenance Hangar that is a key link in the airline's maintenance network; the construction of the Honda Aircraft Company headquarters campus, which will ultimately occupy 100 acres of land; significant expansions at TIMCO, one of the major leading maintenance and repair operations; significant expansions at the T. H. Davis Aviation Center, which trains airline mechanics; and an expansion of the Cessna Service Center, which is one of Cessna's busiest maintenance facilities for its Citation line of business/corporate aircraft.

These developments, combined with continued interest in the airport by companies seeking a site to locate aviation-related activities, drive the need for this examination to better understand how this airport will likely grow during the planning period.

5.2.1 METHODOLOGY

This projection of future aviation-related land needs is based on the recent growth of commercial aviation-related tenant activity at the airport measured in acres. This analysis measured the acres leased by the airport to aviation-related tenants over the past ten years that required new land development. The total acreage needed to accommodate these new tenants or tenant expansions – 401 acres - was then compared to the total inventory of airport land dedicated to aviation-related commercial activity – 664 acres. The difference in acreage between the newly developed land occupied by commercial tenants and the total number of acres leased by the PTAA to commercial tenants provides a snapshot of the potential need for additional airport-owned acreage to accommodate future aviation-related commercial tenants.

The Forecast of Airport Land Needs also shows commercial tenant land uses in the context of other airport land uses. Not all available land owned by the PTAA can accommodate tenant growth. A significant portion of the land currently owned by the airport will be needed for aviation uses such as taxiway construction, airfield safety-related setbacks, and construction of a new Airport Traffic Control Tower (ATCT). Additional land will also be needed to construct support services such as a Fire Fighting Training Facility, a relocated Airport Surveillance Radar (ASR) and other airport-related support facilities. Most of these support facilities will be located on airport land that does not have or require direct airfield access.

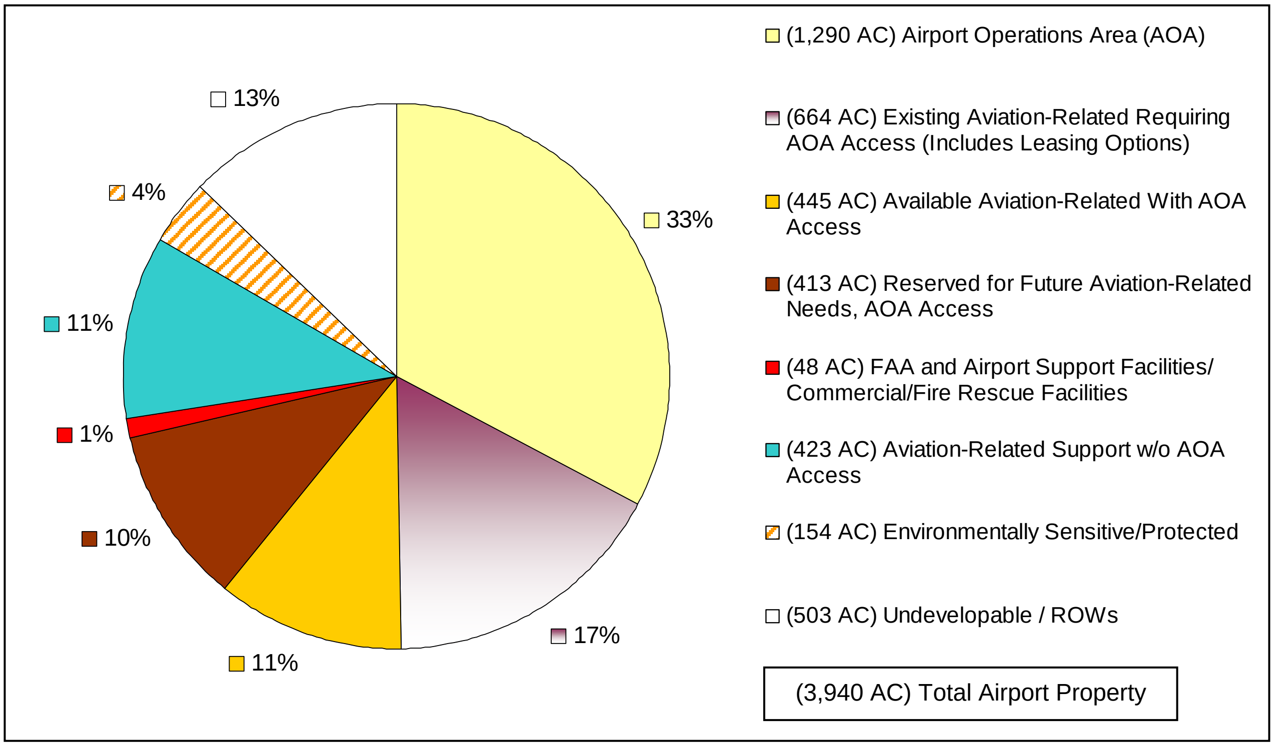
5.2.2 USES OF AIRPORT PROPERTY

The airport currently owns 3,940 acres of which, approximately 62 percent are not available for commercial tenant use. This acreage is dedicated to aviation infrastructure such as runways and associated taxiway system, terminal building and ATCT, current and future airfield support facilities such as Fire Fighting Training Facility and ASR, or they are environmentally protected or undevelopable for other reasons. **Figure 5-1** depicts the breakdown by percentages of the existing airport land use.

Of the remaining 38 percent of the acreage owned by PTAA (approximately 1,505 acres), 647 acres (17 percent of the airport total) are already occupied or reserved by tenants who lease space from the PTAA. The remaining 858 acres (22 percent of the airport total) are available for airport development, though 413 of those acres do not currently have direct airfield access. Major new taxiway or roadway construction will be necessary to create airfield access for these 413 acres. This leaves only 445 acres with direct airfield access and the potential for development as aviation-related tenant sites.

Only two portions of this available 445 acres; however, are suitable for a tenant of any significant size. Honda Aircraft Company, for example, required 100 acres of contiguous land to develop its campus at PTI. Each of the two available sites referenced above is approximately 100 acres. The first of the two sites is adjacent to and just northwest of Runway 5L/23R; the other is located adjacent to and east of Runway 5R/23L, just north of the Honda Aircraft site. (See **Figure 5-2**). The remaining developable acreage with airfield access is fragmented and scattered throughout the airport. This fragmented acreage will either be used for expansions of existing tenants such as Cessna, or for needed airfield improvements and support, or must be complemented with additional land acquisition by PTAA before it becomes useful for substantial tenant use. Thus the airport has only about 200 acres of available land that will accommodate a new tenant of significant size.

FIGURE 5-1
EXISTING AIRPORT LAND USE (PIE CHART)



Source: Piedmont Triad Airport Authority Leasing Records, January 2010.

5.2.3 CURRENT TRENDS IN AIRPORT PROPERTY USE

Tenant relocations and expansions at PTI have spiked considerably over the past 10 years. During that period, approximately 400 acres of airport land has been developed for lease by new commercial tenants or has been set aside to accommodate tenant expansions. This means more than 60 percent of the 664 acres currently being leased by the PTAA to commercial tenants has been developed and leased over the past 10 years. Of those 400 acres, two major newly-developed tenant locations – Honda and FedEx – account for 350 acres, or roughly 87 percent of the newly-developed acreage. In addition to FedEx and HondaJet, locations have been created for Comair and for TIMCO expansions. PTAA reports that interest in the airport by commercial tenants is coming increasingly from prospective tenants who will demand large tracts of land for their operations. The growth trend of tenants at the airport has been led by express overnight shipping / air cargo companies, aircraft maintenance / repair operations and aircraft manufacturing companies. The following aviation-related signature companies have either located or expanded their operations at the airport over the past 10 years.

5.2.3.1 FedEx Mid-Atlantic Hub

In June 2009, FedEx opened its fifth major hub operation in the United States at PTI. Its first phase is capable of sorting 24,000 packages per hour and will eventually be served by 20-25 aircraft. The hub will eventually be capable of sorting 72,000 packages per hour and will be served by about 63 aircraft each weekday. The

FedEx hub complex is composed of nine buildings and an apron for parking jets and currently covers roughly 165 acres.

5.2.3.2 TIMCO Aviation Services, Inc.

TIMCO Aviation Services has expanded several times since it opened at the airport in 1990, most recently in 2004. The company foresees an additional expansion of their facilities that would include additional maintenance shops, hangar, ramp, ramp access and parking space.

5.2.3.3 Cessna Citation Service Center

In recent years, the Cessna Citation Service Center experienced major congestion on its frontage apron and has reported a lack of appropriate building space for logistics, maintenance and repair purposes. Recently, Cessna has begun design of an expansion of its facility towards the southeast of its current location, and is planning to double its current building size. The apron was expanded at the end of 2008, doubling its size.

5.2.3.4 Comair Maintenance Facility

The Comair Maintenance facility is a fairly recent addition to the airport. Since 2006, the facility has provided maintenance services for Comair regional jets that meet current and future demand. No further plans for potential expansion are known at this time.

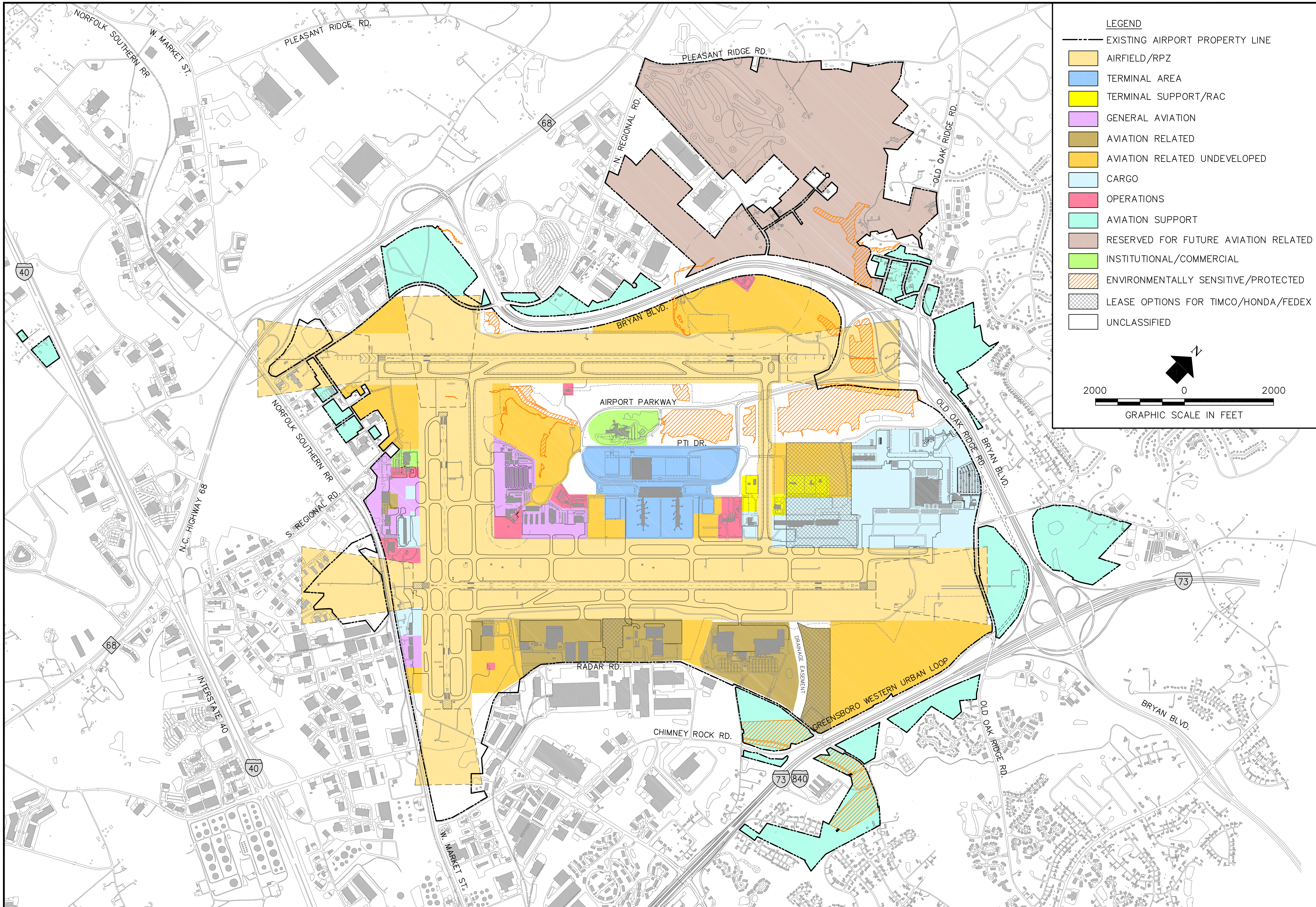
5.2.3.5 Honda Aircraft Facility

Honda Aircraft Company established its headquarters at the airport in 2006. This new division of Honda Motor Company manufactures the innovative HondaJet, a light business jet. The company has also constructed manufacturing and research and development facilities at the airport.

5.2.3.6 Guilford Technical Community College (GTCC) Aviation Center

The T.H. Davis Aviation Center on the airport campus is one of the most modern and best equipped aviation training facilities in the Southeast. Over the past two years, the Center was expanded from 36,000 square feet to 120,000 square feet in existing facilities near the airport to accommodate the training needs of Honda Aircraft Company and TIMCO. The Center could be expanded further to accommodate worker training for additional airport tenants that require it. GTCC is also planning a new logistics campus on NC 68 North near the airport.

Table 5-1 provides a 10-year history of aviation-related tenant lease holds. The table indicates the name of the tenant, lease area and lease date.



PIEDMONT TRIAD INTERNATIONAL AIRPORT

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EXISTING AIRPORT LAND USE

FIGURE 5-2

J:\Greensboro Master Plan Update\MPU REPORT\Section 05 - Airport Dev Opt\Figures\FIG 5-2.dwg 12/02/2010 15:50

TABLE 5-1
PAST 10-YEAR HISTORY OF AVIATION-RELATED LAND TENANTS

Tenant	Lease Area (S.F.)	Lease Area (Acres)	Lease Start Date
New Tenant			
FAA - FSDO	202,989.6	4.7	1/4/00
Comair	159,038.0	3.7	2/1/06
Koury	181,621.0	4.2	7/19/07
Honda	3,049,200.0	70.0	6/1/08
FedEx	179,902.8	4.1	10/1/06
FedEx	7,010,982.0	161.0	10/1/07
	7,190,884.8	**165.1**	
Subtotals	**10,783,733.4**	**247.7**	
Existing Tenant's Expansion			
Cessna	173,166.0	4.0	9/3/08
TIMCO Hangar 4	1,270,642.0	29.2	1/1/07
Subtotals	**1,443,808.0**	**33.2**	
Existing Lease Options			
TIMCO	418,935.3	9.6	--
Honda	1,306,800.0	30.0	--
FedEx	3,541,428.0	81.3	--
Subtotals	**5,267,163.3**	**120.9**	--

Source: Piedmont Triad Airport Authority, Land Leasing Records, January 2010.

5.2.4 UNDERLYING FACTORS IN AIRPORT PROPERTY USE

The announcement by FedEx in April 1998 that it would locate its Mid-Atlantic sort facility at the Piedmont Triad International Airport sparked interest in the airport by other major airport tenants for several reasons:

1) FedEx is a world leader in freight and logistics. The company's decision to locate at PTI created interest in the airport because a world leader in transportation and freight had recognized the airport's potential.

2) The FedEx Mid-Atlantic hub project included not only a sort facility, but also a new parallel runway which provides the capability to accommodate simultaneous independent arrivals and departures on the two parallel runways, runway redundancy, and increased airfield access for aviation related businesses, none of which were previously available.

3) The FedEx Mid-Atlantic hub project also included an improvement in airport access via a high speed interchange that allows easy access and exit to and from the airport on to a major interstate network that has also been improved near the airport over the past 10 years.

4) Economic development experts predict that the presence of the Mid-Atlantic FedEx hub will attract new businesses that depend on overnight shipping, as have other major FedEx hubs located in Fort Worth, Texas and Indianapolis.

These airfield and ground transportation improvements, along with the airport's underutilized capacity, combine to make the airport an attractive site for aviation-related business, particularly those businesses that need regular use of runways such as aircraft manufacturers, air cargo carriers and repair and maintenance organizations.

The location of FedEx, Honda Aircraft Company headquarters, Comair's maintenance facility and the significant expansion of TIMCO at the airport suggest that these factors will continue to attract these types of aviation-related tenants and associated activity.

5.2.5 POTENTIAL FOR STRONG TENANT GROWTH AT AIRPORT

As a result of demand for airport land for economic development projects, the airport is rapidly running out of suitable land on which such future developments could occur. Over the past 10 years, the airport has needed approximately 400 acres for new aviation-related commercial growth and expansion. Currently, there is approximately 200 acres of buildable PTAA-owned land available for potential commercial expansion. Because of newly installed infrastructure at the airport – runway, taxiways, new surface transportation features - it is reasonable to assume that demand for developable land at the airport in the near future will be significantly higher than it has been in the past.

In addition to this land deficit, some property currently owned by the PTAA is not accessible from the airfield due to physical constraints. As a result of these factors, a three-phase property acquisition plan is included in Section 6 of the Airport Master Plan Update, along with new infrastructure plans to create access to airport land to the north of Bryan Boulevard.

If it is the desire of the community that the airport continue to be a center of economic development activity, it is imperative that the airport both acquires additional land, and gains access to its currently inaccessible airport-owned property. The Airport Master Plan Update anticipates that the airport's most likely growth in the Near-Term will be the result of new tenants locating at the airport to take advantage of its outstanding infrastructure and its central location on the East Coast. Airport planning as part of this Airport Master Plan Update for PTI embraces this trend.

5.3 FUTURE AIRPORT DEVELOPMENT AREAS

The development of aviation-related land uses having direct access to the airfield will ultimately require relocation and/or abandonment of a portion of Bryan Boulevard, completion of the I-73 right-of-way corridor, relocation of existing navigational aids (e.g., FAA's Airport Surveillance Radar and meteorological reporting facilities), re-grading of development sites and construction of multiple cross-field taxiways. The acquisition and development of adjacent non-airport owned lands will be needed and will most likely occur as aviation activity demand dictates, or when opportunities for land availability and funding become available. The proposed future land acquisition primarily includes the following:

- Future Land Acquisition (Phase 1):
    - Northwest Area (204 acres);
    - Southwest Area (34 acres); and

- o Southeast Area (5 acres).

Phased acquisition of non-airport land and development of existing airport owned land is shown in **Figure 5-3**. This figure depicts the current and proposed regional system of roadways surrounding the airport. Additionally, this figure identifies the Greensboro Western Urban Loop, Bryan Boulevard, current and proposed I-73 corridor, the Norfolk Southern Railroad, and proposed improvements to the existing system of runways and taxiways. The proposed airfield improvements primarily include the following:

- Proposed Airfield Improvements:
  - o Extensions of Runway Ends 23L, 5L, 14 and 32;
  - o Potential widening of Runway 5R/23L System (ADG-VI);
  - o Development of Taxiways F, G and J;
  - o High speed exits;
  - o Realigned and extended Taxiway M;
  - o Extended Taxiways A, H and K; and
  - o Potential widening of Taxiway K (ADG-VI).

5.3.1 FUTURE AIRPORT DEVELOPMENT AREAS

Future airport development areas are depicted on **Figure 5-3** and represent contiguous areas of land that could be potentially developed for aviation-related land uses. The term aviation-related land-use as referenced within this Airport Master Plan update, assumes that users of these areas would require direct and unimpeded access to the airfield's system of runways and supporting taxiways. Certain on-airport land areas could conceivably be developed as having aviation-related uses, but without the benefit of direct access to the airfield. Such land areas are envisioned to be supportive of industries, production facilities, or other allied operations requiring proximity to the airport, or other airport tenants. A total of ten potential on-airport development areas have been identified and designated as the following:

1. Passenger Terminal Expansion Area (Third Concourse)
2. Terminal Support Area (Belly Cargo and Ground Service Equipment)
3. Terminal Parking Expansion Area
4. Terminal Rental Car Remote Parking Area
5. Southwest Aviation-Related Development Area
6. Southeast Aviation-Related Development Area
7. Northeast Aviation-Related Development Area
8. Northwest Aviation-Related Development Area
9. Extended Northwest Aviation-Related Development Area (West of Bryan Boulevard/Future I-73)
10. General Aviation Expansion Area

5.3.1.1 Passenger Terminal Expansion Area (Third Concourse)

The existing north and south terminal concourses were examined and assessed for functionality and capacity. It was determined that when demand dictates, the expansion of the passenger terminal complex would best occur with the development of a third concourse that would be configured similar to that of the existing two concourses. The third concourse is envisioned to accommodate 10 to 12 aircraft gates and adequate apron space for Airport Design Group (ADG) -III parked aircraft.

The most recent construction of a mid-field Airport Rescue and Firefighting Facility and joint Command Center (ARFF/Command Center) compromises the opportunity to develop the third concourse at the north end of the terminal. Accordingly, the development of a third passenger concourse will most likely occur at the south end the passenger terminal, adjacent to the general aviation area. This area is currently used for valet parking and must be relocated to another suitable area in proximity to the terminal.

5.3.1.2 Terminal Support Area (Belly Cargo and Ground Service Equipment)

The expansion of the FedEx apron into FedEx option areas will require the demolition and relocation of existing facilities that currently support Air Cargo Buildings #2 and #3. These buildings currently provide storage space for airline belly cargo and Ground Service Equipment (GSE) among other users. Thus, "in-kind" replacement of these facilities is required. Available land situated southwest of the new remote ARFF/Command Center and northeast of passenger terminal concourse was identified as being suitable for the development of these types of facilities. This area could conceivably accommodate one or more cargo buildings, tug and truck courts and aircraft apron parking positions providing direct access to Taxiway J.

5.3.1.3 Terminal Parking Expansion Area

The current terminal parking complex provides adequate parking space (4,303 spaces) for the airport's current level of passengers and visitors activity. In the future when terminal and concourse expansion is required, terminal parking expansion would also be evaluated to accommodate additional volumes of passengers and visitors. Terminal parking expansion will be designed to meet demands. An area was identified adjacent to and northeast of the existing parking garage. Currently, a portion of this area serves as surface-level long-term parking with capacity to accommodate approximately 1,050 vehicles.

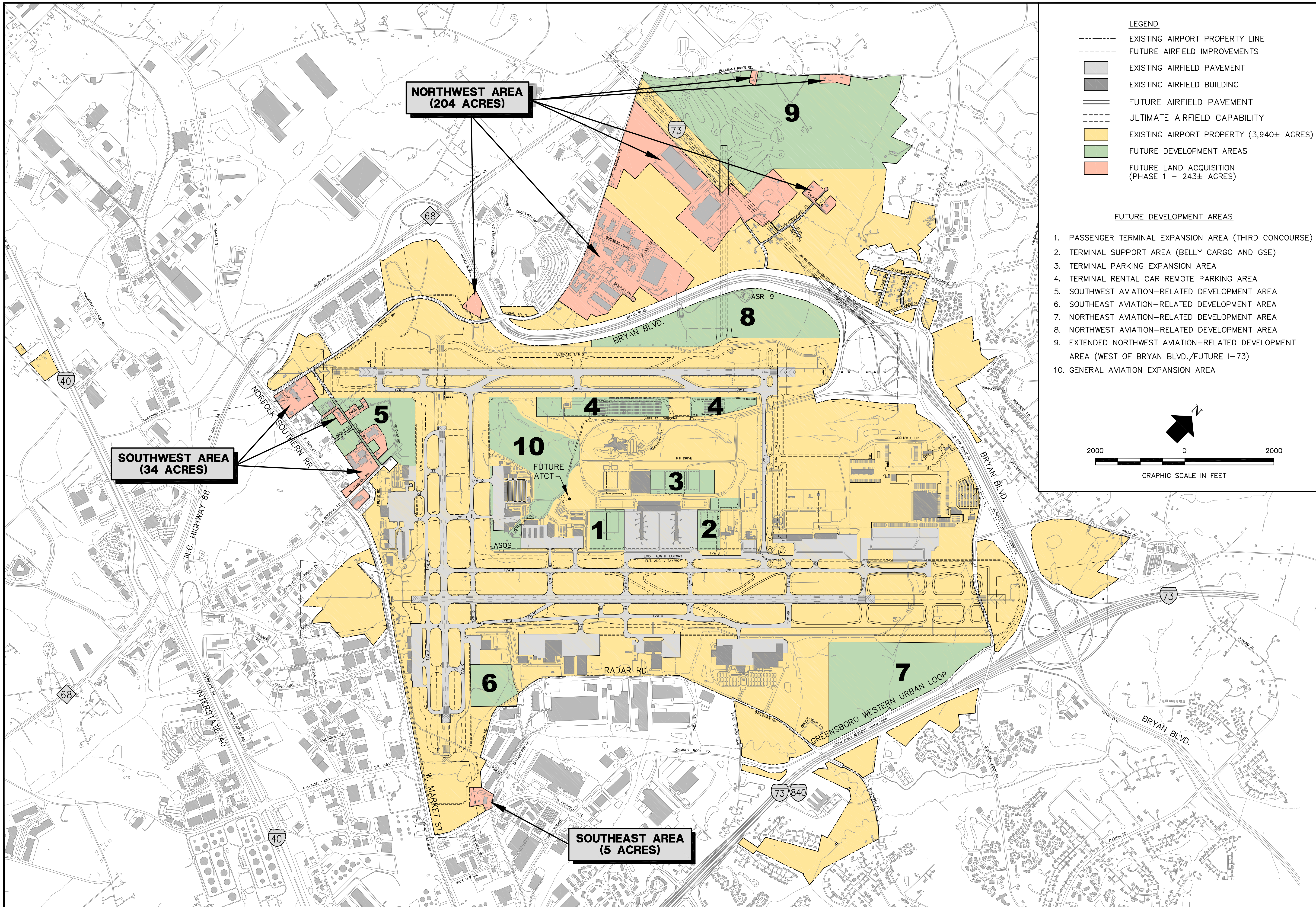
5.3.1.4 Terminal Rental Car Remote Parking Area

As with items in Section 5.3.1.2, expansion of the FedEx apron will require use of land areas currently serving as rental car parking. Accordingly, these parking facilities must be relocated and/or replaced "in-kind".

Two adjacent but separate areas situated between Taxiway H and Airport Parkway has been identified as suitable sites for the development of surface-level remote rental car parking facilities. These areas may also be alternatively used, if needed, to accommodate seasonal or peak period passenger overflow parking needs.

5.3.1.5 Southwest Aviation-Related Development Area

The area located north of West Market Street between South Regional Road and Burgess Road was identified as being suitable for the continued development of aviation-related uses. Direct and unimpeded access to the airfield can be provided to this area via the construction of taxiway extension and/or connectors. To achieve the PTAA's expressed goal of continuing to develop this quadrant of the airport to support on going and expanded general aviation/corporate related land uses, an additional 34 acres have been identified for potential acquisition.



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FUTURE LAND ACQUISITION (PHASE 1) AND AIRPORT DEVELOPMENT AREAS

FIGURE 5-3

J:\Greensboro Master Plan Update\MPU REPORT\Section 05 – Airport Dev Opt\Figures\FIG 5-3.DWG 12/02/2010 16:05

Current uses of airport land in this area include support facilities, air cargo, corporate and airline maintenance facilities, institutional (Guilford Technical Community College) and airport equipment storage.

Additional and expanded aviation-related land uses utilizing future acquired lands would include, but would not be limited to corporate aviation, air cargo, fixed based operations, and aviation-related industrial activities. This southwest development area would have surface access from West Market Street, Regional Road and Burgess Road with internal circulation roadways developed as necessary.

5.3.1.6 Southeast Aviation-Related Development Area

The southeast aviation-related development area is located adjacent and east of the Cessna Citation Service Center leasehold. It is envisioned that this parcel of on-airport land would be considered suitable for the development of commercial aviation facilities requiring direct access to the airfield and would be similar to existing aviation-related commercial operations currently operating in this area of the airport. This site is accessible from Radar Road.

5.3.1.7 Northeast Aviation-Related Development Area

Similar to the southeast development area, a northeast development area has been identified adjacent to and north of the Honda Aircraft Company lease option land area. This area is bounded by and accessible by Chimney Rock Road and the future extension of Taxiway M. It is envisioned that this larger contiguous parcel of on-airport land would be reserved and developed to accommodate aviation-related activities requiring larger leasehold tracts and would be similar to existing aviation-related commercial and manufacturing operations currently operating within this quadrant of the airport.

5.3.1.8 Northwest Aviation-Related Development Area

The northwest aviation-related development area is situated between Bryan Boulevard and future Taxiway G. This area assumes an irregular shape primarily dictated by airfield safety-related geometric setbacks for Taxiway G, Bryan Boulevard right-of-way and existing topographical terrain features. The extent of such development will be limited until such time that the ASR-9 Radar is relocated and the land features are re-graded to an expanded and level development platform. It is envisioned that this area could be developed in incremental stages as demand, or land clearing and grading opportunities dictate.

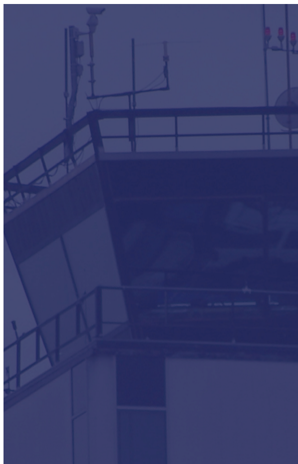
It is further envisioned that when land acquisition, relocation of the Airport Surveillance Radar, re-grading of land and realignment and/or abandonment of Bryan Boulevard occurs, the opportunity to develop a cross-field taxiway would provide direct access to the airfield. The phased development of this area should consider the need to preserve a land use corridor to facilitate the development of this future cross-field taxiway.

5.3.1.9 Extended Northwest Aviation-Related Development Area (West of Bryan Boulevard/Future I-73)

The Extended Northwest Aviation-Related Development Area is located within the northwest quadrant of the airport and is bounded by Pleasant Ridge Road, Caindale Drive, the northern most bounded property and future I-73 right-of-way corridor. This development area would be accessed via Pleasant Ridge Road. Although currently used for non-aviation related purposes (Pleasant Ridge Golf Course), this area could be developed to support allied aviation-related commercial/industrial activities that do not require direct access to the airfield. At such time that the opportunity to develop the previously mentioned cross-field taxiway exists, it is envisioned that this area could be developed to support land uses requiring direct airfield access.

5.3.1.10 General Aviation Expansion Area

The General Aviation expansion area is located northwest and adjacent to the Atlantic Aero and Landmark Aviation leaseholds. Recent completion of Taxiway D extension provides this General Aviation expansion area with direct access to the taxiway system. This development area is accessible via PTI Drive and/or Airport Parkway.



Airport Master Plan Update

and

Strategic Long-Range Visioning Plan

Prepared By:

URS

In Association With:

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SECTION 6.0

STRATEGIC AIRPORT MASTER PLAN IMPLEMENTATION

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

SECTION 6.0

STRATEGIC AIRPORT MASTER PLAN IMPLEMENTATION

6.1 INTRODUCTION

Typically, airport master planning, as prescribed in Federal Aviation Administration's (FAA) Advisory Circular (AC) 150/5070-6B, *Airport Master Plans,* occurs over a five-, ten- and 20-year planning period. This time period is considered to represent a reasonable timeframe within which to plan for future airport facility and airport development needs, conduct required environmental due-diligence and acquire additional land needed to expand the airport. The traditional role of competing resources such as compatible land and funding; however, have not fostered the concept of long-range planning of airports, or the idea that there is a need to develop a forward-looking strategic plan that addresses the future needs of the airport beyond the typical 20-year planning period. As part of this Airport Master Plan Update, the Piedmont Triad Airport Authority (PTAA) and staff requested that URS Corporation look beyond the typical 20-year planning window to determine how the airport might grow in the 21- to 50-year timeframe.

To that end, this Airport Master Plan Update presents a phased Airport Development Program that includes information and planning considerations that are envisioned to occur in three distinct phases. Phase 1 represents a ten-year Capital Improvement Program (CIP) that includes land acquisition and improvements to airfield facilities, terminal facilities infrastructure that are either pre-programmed as part of the CIP, or those airport development activities that will most likely occur as demand dictates and upon availability of funding. Subsequent Phases (2 and 3) represent 10 to 30-year and strategic 30 to 50-year planning periods. Phases 2 and 3 are not currently supported by the CIP.

6.2 EXISTING CONDITIONS

6.2.1 EXISTING AIRPORT PROPERTY

Starting in 1927 with the acquisition of an initial 700 acres of land in fee simple, the airport has grown to its current size of 3,940 acres. The purchase of additional airport property has been accomplished through various land acquisition projects that were jointly funded by various sources that have included the FAA, the State of North Carolina, and PTAA. Currently, aviation infrastructure and supporting facilities that directly support aviation-related land uses represent approximately 50 percent of the airport's total land area. The remaining 50 percent of airport-owned land comprises land uses that include, but are not limited to: disturbed, undeveloped land that has been reserved for future aviation-related purposes, protection of navigable airspace, protection of environmentally-sensitive/protected areas, institutional use, and noise compatibility. The extent of existing airport-owned property is shown in **Figure 6-1**.

6.2.2 EXISTING AIRPORT LAND USE

Currently, the airport is comprised of land uses and related facility development that support a variety of aviation-related activities typical to all airports. Airport land uses are dedicated to the support and safety of aviation-related activities conducted at the airport. The extent, shape, and location of each type of land use varies and may change over time in response to aviation activity, airport design standards, safety-related geometrics setbacks, protection of environmentally sensitive habitats, and operational requirements.

As shown on **Figure 6-2,** and for the expressed purposes of this Airport Master Plan Update, eleven land use categories have been designated. The eleven airport land uses are as follows:

- Airfield/Runway Protection Zones;
- Terminal Area;
- Terminal Support/Rental Car;
- General Aviation;
- Aviation-Related;
- Aviation-Related Undeveloped;
- Cargo;
- Operations;
- Land Areas Reserved for Future Aviation-Related;
- Institutional and Commercial; and
- Environmentally Sensitive/Protected.

The existing designated and reserved land uses located throughout the airport are described below:

6.2.2.1 Airfield/Runway Protection Zones

Land uses designated and reserved for Airfield activities include all land areas established to support and protect the entire system of runways, taxiways, associated safety-related set-backs, and Runway Protection Zones (RPZ). RPZs are trapezoidal in shape and are located 200 feet beyond each runway end. Land uses prohibited from the RPZ include: residences, places of public assembly, storage of fuel, and any development or activity that would serve to promote or attract wildlife.

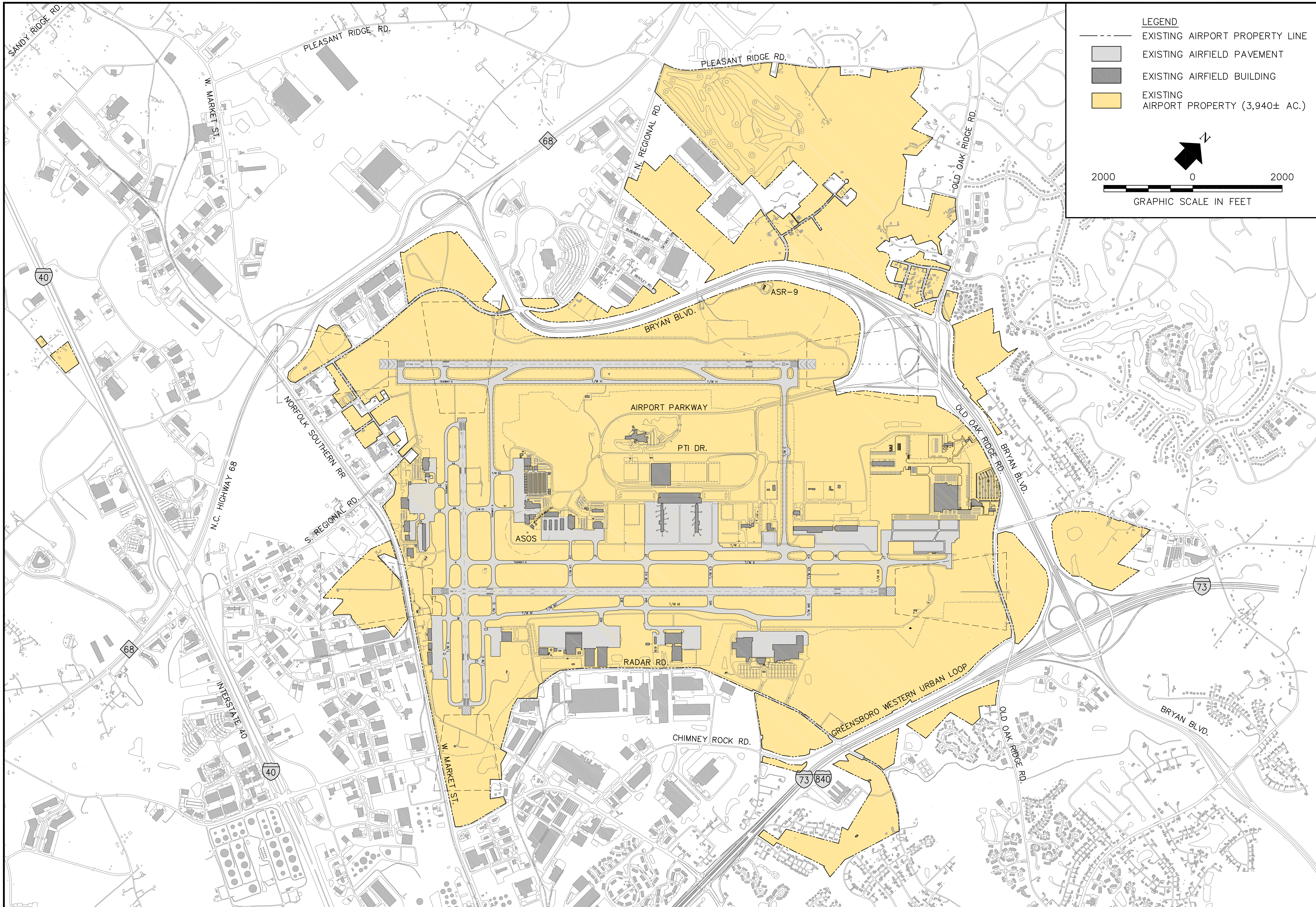
Portions of each RPZ extend beyond the airport's property boundary. Where it is determined to be impracticable for the airport owner to acquire, plan and control the land uses within the portions of the RPZ that are not owned or controlled by the airport, the FAA recommends that Avigation Easements be obtained from land owners to control land uses within these portions of the RPZ.

6.2.2.2 Terminal Area

Land uses designated and reserved for Terminal Area activities include all land areas that support the operations of the airport's passenger terminal, terminal concourses, terminal apron area, surface access roads, public parking facilities, administrative offices and airport or tenant employee parking.

6.2.2.3 Terminal Support/Rental Car

Land uses designated and reserved for Terminal Support/Rental Car activities include all land areas dedicated to the support of the terminal and rental car activities. These areas are typically located in proximity to the



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EXISTING AIRPORT PROPERTY

FIGURE 6-1

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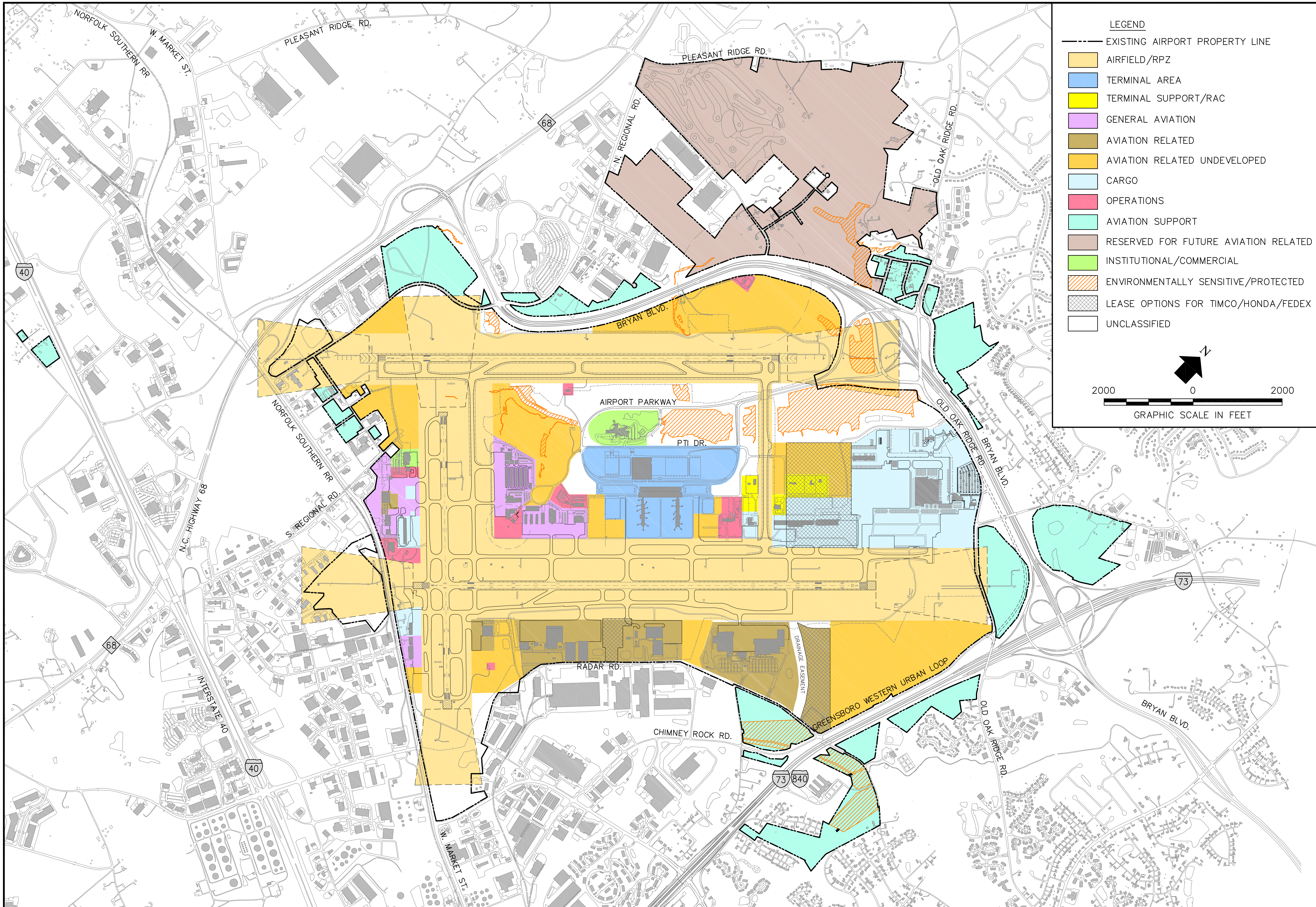

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EXISTING AIRPORT LAND USE

FIGURE 6-2

terminal building to provide convenient access for terminal support functions, rental car retail operations and rental car service needs. Terminal support areas include dedicated land use by airline operators and service providers for general aviation and commercial support activities.

6.2.2.4 General Aviation

Land uses designated and reserved for General Aviation activities include land areas that are not associated with scheduled air carrier operations or aircraft manufacturing and maintenance. These land uses provide direct access to the airfield (i.e., apron areas and airport operations areas) as well as the landside access (i.e, public parking and Fixed Based Operator (FBO) landside) from the local and regional surface transportation system. General aviation facilities include those operated in support of commercial/retail activities and privately-operated corporate activities. These facilities and services may include, but are not limited to:

- Fixed Based Operation;
- Transient Apron Areas;
- Based Apron Areas;
- Aircraft Storage Hangars;
- Aircraft Fuel Storage;
- Aircraft Sales;
- Flight Training; and
- Aircraft Maintenance.

6.2.2.5 Aviation-Related

Land uses designated and reserved for Aviation-related activities include all leased parcels that directly support aviation activities and have direct and unrestricted access to the airfield. Currently, activities within this land use include commercial and industrial activities that may include, but are not limited to aircraft maintenance and aircraft manufacturing.

6.2.2.6 Aviation-Related Undeveloped

Land uses designated and reserved for Aviation-Related Undeveloped activities include all airport land having proximity to the airfield that do not have current or pending leases or lease options, tenants, development plans. These land areas, due to their location on the airport and/or proximity to surface transportation routes and adjacent land uses, will be developed for aviation-related uses as described above. These areas are primarily located in proximity to the northeast end of Runway 5R/23L and northwest of the airport's new Runway 5L/23R. These land areas will be needed to provide the highest and best use of those runways and adjacent land uses by providing potential aviation-related industrial sites to prospective tenants requiring direct access to the runway.

6.2.2.7 Cargo

Land uses designated and reserved for Cargo activities include all land areas that support landside and airside air cargo activities. Currently, cargo land uses include the FedEx Mid-Atlantic Hub lease and other airport leasehold areas that are occupied by various air cargo operators, U.S. Postal Service, and/or belly cargo operators. These land uses are individually developed to best serve the operational needs of each air cargo operator.

6.2.2.8 Operations

Land uses designated and reserved for Operations include all land areas that support airport operations that include, but are not limited to airport administration and federal facilities (i.e., FAA and National Weather Service). These land areas vary in size, nature of use, and proximity to the airfield based upon airport maintenance and operational needs.

6.2.2.9 Land Areas Reserved for Future Aviation Related Actvities

Land uses designated and reserved for Future Aviation-Related activities include all land areas that do not currently provide direct access to the airfield but are designated and reserved for aviation-related uses. When developed in the future, these land areas, base on their relative proximity to the airfield, are considered to be compatible with the safe and efficient operation of the airport. Future airport facility development of these land areas as recommended within this Airport Master Plan Update are based upon the assumption that access to and from these areas would be provided via a series of strategically-located cross-field taxiways.

6.2.2.10 Institutional and Commercial

Land uses designated and reserved for Institutional and commercial uses include land areas currently leased to the Guilford Technical Community College (GTCC) and the Greensboro-High Point Marriott Airport hotel, respectively.

6.2.2.11 Environmentally Sensitive/Protected

Land uses designated and reserved as Environmentally Sensitive/Protected include environs and habitat that are federally- or state-protected from disturbance or removal. Future development of the airport must avoid impacts to these environmentally-sensitive habitats pursuant to previous permits, or in some cases, would require additional permitting.

6.3 AIRPORT PLANNING TIMELINE

This Airport Master Plan Update looks beyond the typical 20-year planning horizon and includes strategic long-range visioning and planning considerations. Taking this ”forward-looking” approach, a comprehensive outlook regarding the airport’s future growth potential, aeronautical role as a regional small-hub airport and as a platform for continued economic growth within the Triad Region is presented herein for consideration. This Airport Master Plan Update examines an extended “strategic” planning window that could conceivably extend over the 30-to 50-year timeframe. This much larger airport development planning window, serves to identify the airport’s potential future land area expansion needs, future expanded size and geographical direction of growth that, by its nature, conveys a more comprehensive outlook regarding the airport’s envisioned long-range development potential. Through this strategic airport planning effort, information is then available to local community planners, surface transportation planners and decision makers to better facilitate a coordinated and collaborative planning effort, for the airport and the local communities it serves.

6.3.1 NEED TO PRESERVE AIRPORT DEVELOPMENT CAPABILITIES

It is recognized today, that the airport's aeronautical role within the national system of air carrier airports and within the local region will likely evolve more quickly as a direct result of the recent addition of the FedEx Mid-Atlantic hub and other manufacturing and maintenance activities that have recently been developed at the airport. To that end, recommendations related to future airport facility planning, land acquisition and future land uses, as presented within this Airport Master Plan Update are based upon PTAA's goal of planning Long-Term for these potential developments. This has necessitated the inclusion of a strategic plan that looks 30 to 50 years into the future. This far-reaching plan requires that other local and regional surface transportation and land use planning be developed in a parallel and in a cooperative fashion. In other words, the airport's long-range planning goals will require major changes to local, state and national roadways that surround the airport. These needed changes to local roadways and land use zoning are beyond the control of PTAA. To that end, it is the intent of this long-range Airport Master Plan Update to provide meaningful and timely airport and land use planning guidance that can be referenced and utilized by other planning agencies. Only through this type of cooperative strategic planning can the envisioned future development of Piedmont Triad International Airport (PTI) be realized.

6.3.2 NEED TO PRESERVE AIRPORT-COMPATIBLE LAND USES

Strategic Long-Term planning for future airport development must identify, preserve and protect airport-compatible land uses located both on and off the airport. While PTAA has direct control of land uses within the confines of the airport's property boundary, land uses that are located adjacent to and around the airport are controlled by Guilford County an d the various municipalities that the airport serves. The decisions made by the governing bodies of these jurisdictions will have a direct and pronounced influence on PTAA's ability to grow.

Achieving the goal of preserving the capability to develop a third widely-spaced parallel runway to support aviation activity that may evolve in the future, particularly with respect to the Piedmont Triad Aerotropolis Plan, requires that PTAA clearly identify land areas that would be required to develop such facilities. This planning goal also requires that local land use planning agencies develop, maintain and protect airport-compatible land use zoning that would be required to protect and preserve the airport's capability to develop these future airfield facilities. Lastly, PTAA has the responsibility to develop the airport in a manner that provides the highest and best use of existing and future land and facilities for aeronautical and revenue-generation purposes.

6.3.3 NEED FOR LONG-RANGE REGIONAL SURFACE TRANSPORTATION PLANNING

The ability to achieve a long-range airport development plan that includes the construction of a third widely-space parallel runway will require realignment of several major surface transportation corridors in proximity to the airport. Those corridors include: future I-73, the future realignment of Bryan Boulevard, the future realignment of NC 68 and the future interchange of NC 68 and future I-73. This Airport Master Plan Update will allow PTAA to clearly identify future airport development needs to the various federal, state and local transportation and land use planning agencies that will be affected by the airport's growth.

6.4 PHASED LAND ACQUISITION AND AIRPORT DEVELOPMENT PROGRAM

This Airport Master Plan Update anticipates that PTAA will acquire additional land for aviation-related airport development purposes in three phases. This multi-phase land acquisition program may potentially occur over the next several decades as land is needed for airport growth and to accommodate new airport tenants.

Although strategically envisioned and planned as three distinct and separate phases of land acquisition, it is clearly recognized that real-world dynamics will influence the timing, methodology and financial considerations regarding when and how additional land would be acquired by PTAA. These factors may include, but would not be limited to, the availability of needed land offered by a willing seller, the price of land, the availability of funding required to purchase land, Interim- or Long-Term income generation potential of land under consideration for purchase and the need for land under consideration for purchase to directly support aviation-related activities. Thus, PTAA might find itself acquiring land within the next 10 years that was not anticipated for purchase in the Airport Master Plan Update until a later time period (i.e., Phase 2 or Phase 3), because of unforeseen circumstances, opportunities or a common sense decision to undertake such actions. Accordingly, because this Airport Master Plan Update cannot accurately predict when these circumstances might occur, the timeline for such land acquisition, as recommended, should be considered a guide rather than a rule.

6.4.1 PROPOSED PHASED AIRPORT LAND ACQUISITION PROGRAM

The proposed multi-phase acquisition of approximately 2,300 acres of land that will be required to accommodate future strategic (30-50 year) airport development needs is depicted in **Figure 6-3**. At the completion of the phased land acquisition program, the total airport land area would be approximately 6,200+ acres.

6.4.2 PROPOSED AIRPORT LAND ACQUISITION PHASE 1 (0-10 YEARS)

Proposed land acquisition within Phase 1 includes 243 acres, much of which is located northwest of Bryan Boulevard in proximity to the airport's new Runway 5L/23R, and a proposed future Taxiway G located parallel and northwest of that runway. Acquisition of this land is necessary in the Near-Term to ensure the highest and best use of the new runway and airport property that is not currently used for aviation-related purposes. That is, the airport must have adequate land in proximity to the runway to accommodate tenants who will make use of the runway.

Phase 1 envisions purchasing additional land along Regional Road and West Market Street, which is near the southwest end of the Runway 5L/23R and west of the Runway 14/32. This property will allow infill development of an area that is already largely occupied by airport cargo, maintenance and general aviation uses. An additional parcel on the southeast side of the current airport property will fill out an area in close proximity to Honda Aviation Company's headquarters and manufacturing campus, which is in turn adjacent to the existing 10,001-foot Runway 5R/23L.

The proposed multi-phased airport acquisition program is depicted in **Figure 6-4**.

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PROPOSED PHASED AIRPORT LAND ACQUISITION PROGRAM

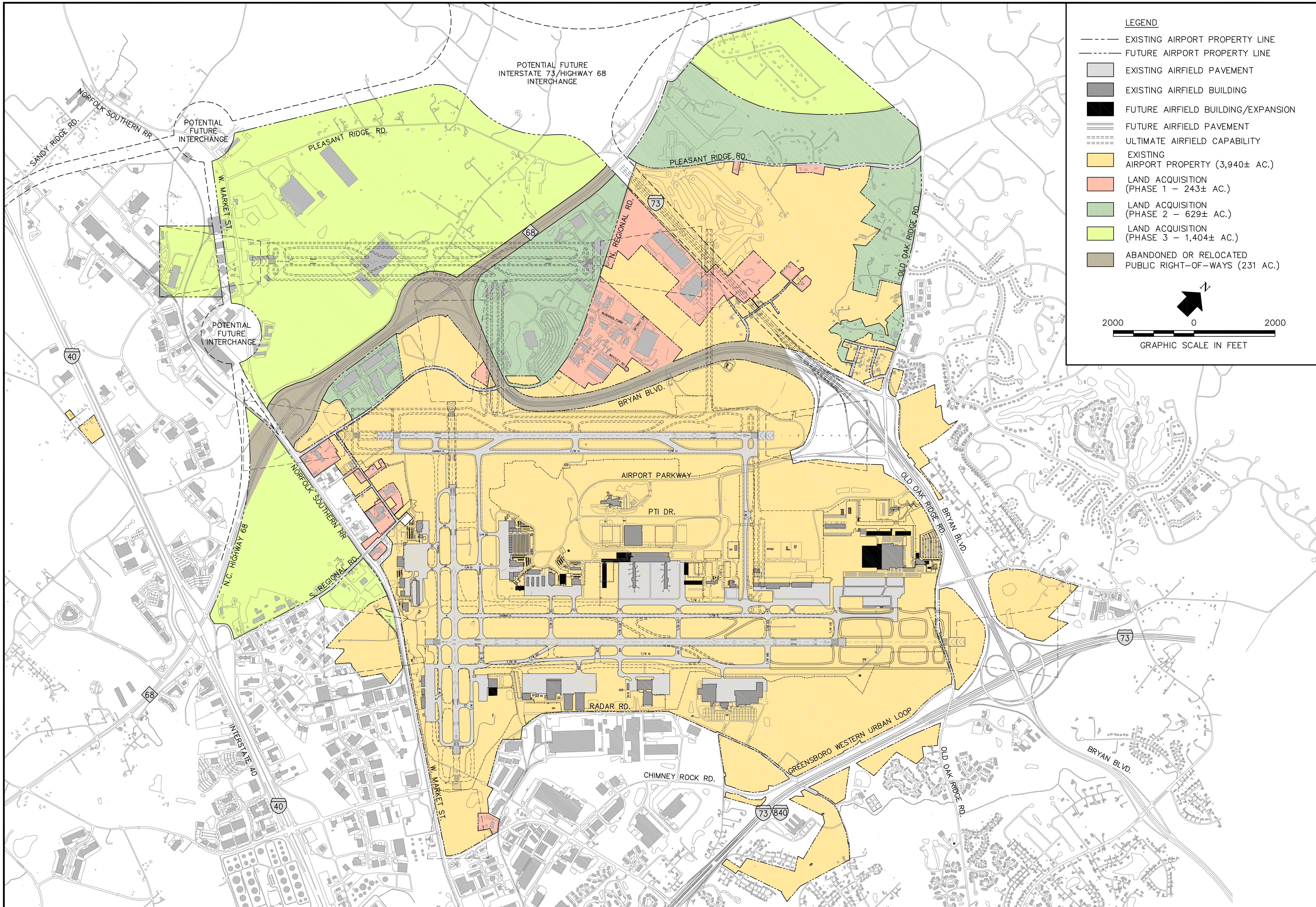
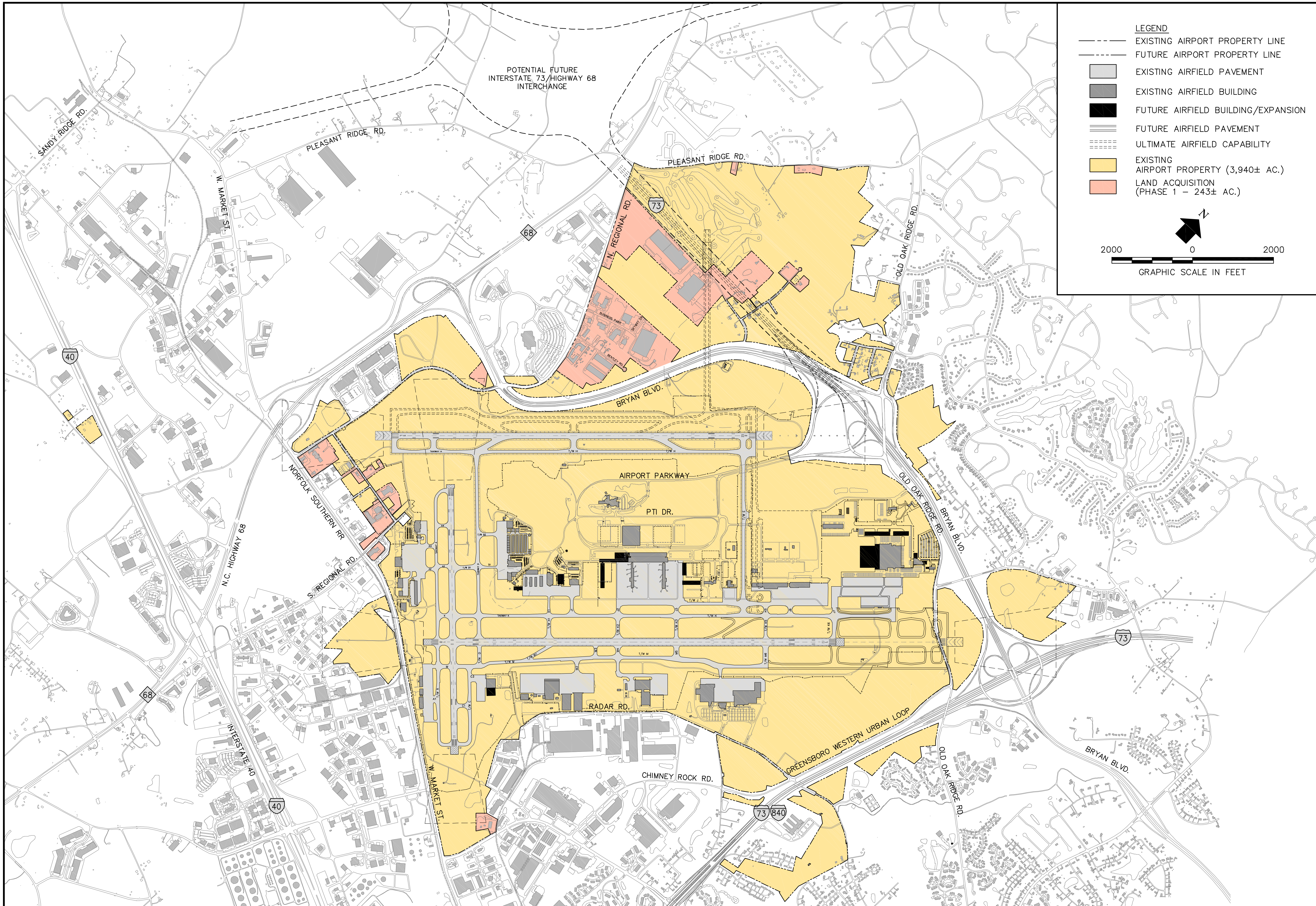


FIGURE 6-3



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PROPOSED AIRPORT LAND ACQUISITION PHASE 1 (0-10 YEARS)

FIGURE 6-4

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6.4.3 *PROPOSED AIRPORT LAND USE PHASE 1 (0-10 YEARS)*

Land uses to be developed within Phase 1 will be aviation-related and located immediately adjacent to the airfield. These land areas will be developed to best accommodate new airport tenants and their associated activities that may include, but would not be limited to: corporate general aviation or air cargo activities within the airport's southwest quadrant west of Runway 14/32 and along West Market Street, and aircraft manufacturing and maintenance east of Runway 5R/23L along Radar Road, Chimney Rock Road and west of Runway 5L/23R east of Bryan Boulevard. It is envisioned that land areas west of Runway 5L/23R and east of Runway 5R/23L will be developed to accommodate larger sized leased parcels. Aviation-related land uses along West Market Street are anticipated to be developed on a smaller scale, but with the built-in flexibility to accommodate a variety of facility layouts, shapes or sizes to best suit individual tenant operational and facility development needs.

Land areas that do not have direct access to the airfield will be developed as demand dictates to accommodate aviation-related land uses. Aviation-related land uses within the airport's northwest quadrant will require the development of a cross-field taxiway system to provide access to the existing three-runway system. The cross-field taxiway system would traverse land areas currently occupied by the airport surveillance radar, Bryan Boulevard, the Pleasant Ridge Golf Course, multiple buildings and the future I-73 right-of way corridor. To develop the northwest quadrant to its highest and best aviation-related use, it is recognized that realignment or removal of portions of Bryan Boulevard would be required and would most likely not occur until the I-73 right-of way has been fully developed and in operation. The land areas immediately adjacent to the future parallel Taxiway G and the cross-field taxiway would most likely be developed first to support aviation-related activities that require direct access to the airfield. Other land uses within the northwest quadrant may also be later developed to support aviation-related activities or, by proximity, provide allied aviation support activities and services.

Other land uses on the airport would be expanded to their fullest geographical extent and developed to their respective highest and best use. The general aviation land uses would be expanded west of Runway 14/32 and within the existing mid-field area. Passenger terminal expansion would include the addition of a third (south) concourse similar in design and size to those that exist today. The air cargo development area currently occupied by FedEx would be expanded southward to the safety area setback limits of the cross-field taxiway system. The aviation-related land uses located southeast of Runway 5R/23L would be developed to accommodate activities similar to those in use today (Maintenance, Repair and Overhaul (MRO) and aircraft manufacturing) and would most likely utilize larger parcels and/or leased areas. The proposed land use development that would most likely occur within Phase 1 (0-10 year period) is depicted in **Figure 6-5**.

6.4.4 *PROPOSED AIRPORT FACILITY DEVELOPMENT PHASE 1 (0-10 YEARS)*

Planned airfield facility improvements that may occur within Phase 1 include, but would not be limited to the following:

- Extension of Runway 5R/23L and associated parallel taxiways in the northeast direction,
- Construction of a high-speed exit taxiway for Runway 5R/23L,
- Parallel Taxiway G along the northwest side of Runway 5L/23R,

- A new cross-field taxiway to serve the area currently occupied by the Pleasant Ridge Golf Course, and
- A new cross-field Taxiway F to provide bi-directional taxi operation immediately southwest of the FedEx complex.

6.4.5 PROPOSED LAND ACQUISITION PHASE 2 (BEYOND 10 YEARS)

Phase 2 would most likely occur sometime within the 11 to 30 year timeframe and would include approximately 629+ acres comprising three geographic areas located immediately west of North Regional Road and east of NC 68; northwest of Pleasant Ridge Road; and west of Old Oak Ridge Road. The proposed Phase 2 land acquisition program is depicted in **Figure 6-6**.

6.4.6 PROPOSE AIRPORT LAND USE PHASE 2 (BEYOND 10 YEARS)

Land uses proposed to be developed within Phase 2 will be aviation-related and have direct access to the existing three-runway airfield system via the development of multiple cross-field taxiways. The highest and best use of these land uses is based upon the assumption that major changes to the local roadways system has occurred that would include: the relocation or closure of Bryan Boulevard; relocation of the airport surveillance radar; major re-grading and leveling of topographical relief features and the completion of the I-73 corridor. It is further assumed that the Pleasant Ridge Golf Course would be closed and all other previously developed buildings and/or structures have reached or exceeded their respective useful lives and have been closed, removed or abandoned.

The land areas immediately adjacent to the future parallel Taxiway G and the multiple cross-field taxiways would be developed to support aviation-related activities that require direct access to the airfield. Other land uses within the airport's northwest quadrant may also include other aviation-related development that, by proximity or function, provides allied aviation-related support activities and services. The proposed continued land use development that would most likely occur with the Phase 2 is depicted in **Figure 6-7**.

6.4.7 PROPOSED AIRPORT FACILITY DEVELOPMENT PHASE 2 (BEYOND 10 YEARS)

Planned airfield facility improvements that might possibly occur within Phase 2 include, but would not be limited to the following:

- Improvement to Taxiway M,
- Extension of Taxiway J to the south,
- Extension of Runway 14/32 and associated parallel taxiways to the southeast, and
- Construction of a second cross-field taxiway connecting Runway 5L/23R to newly acquired land areas currently located northwest of Bryan Boulevard.

6.4.8 PROPOSED ULTIMATE AIRPORT LAND ACQUISITION PHASE 3 (BEYOND 30 YEARS)

The strategic vision for the growth of the airport over the 30- to 50-year timeframe includes the potential development of a third widely-spaced parallel runway (having a minimum runway centerline-to-runway

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PROPOSED AIRPORT LAND USE PHASE 1 (0-10 YEARS)

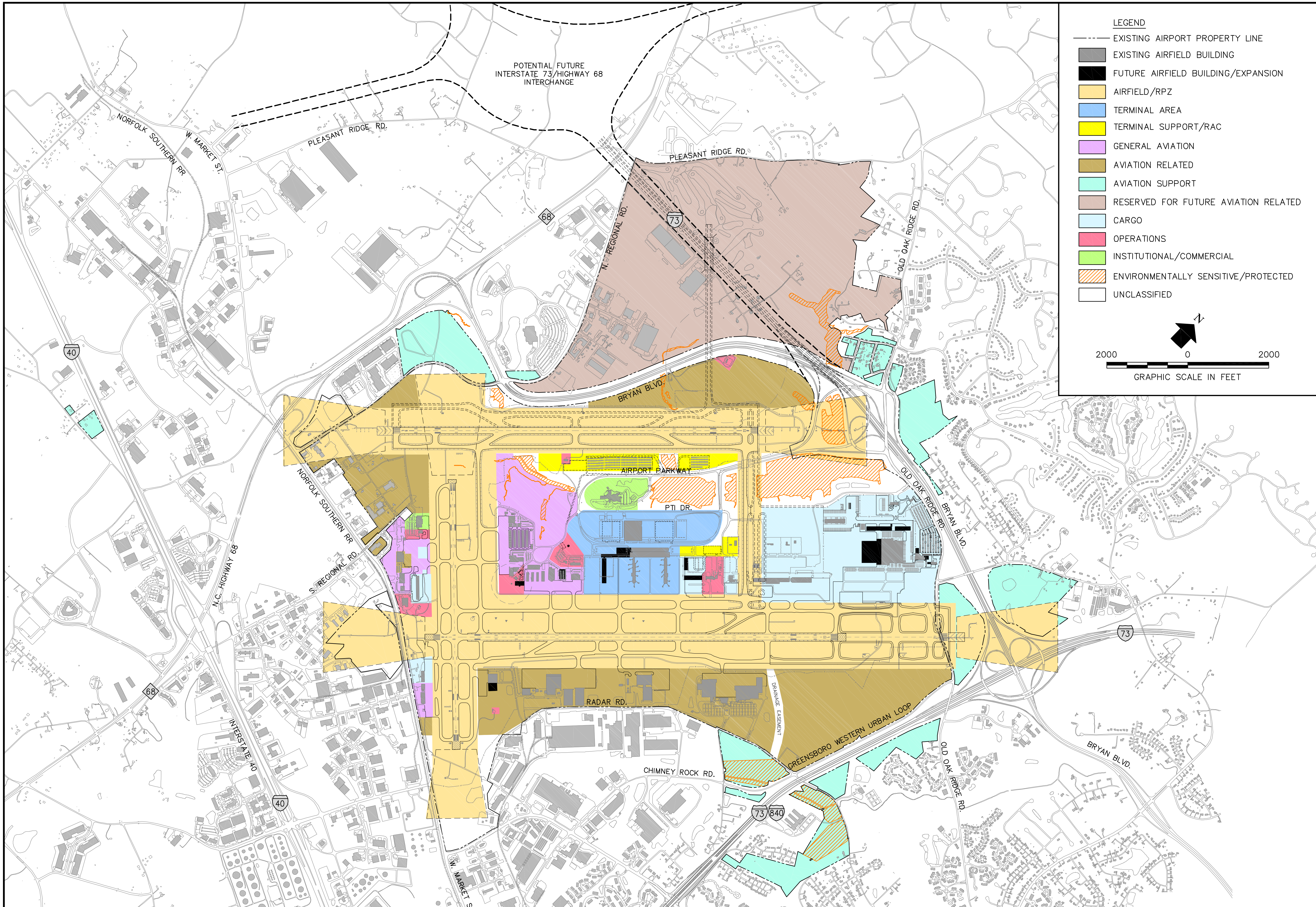

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FIGURE 6-5

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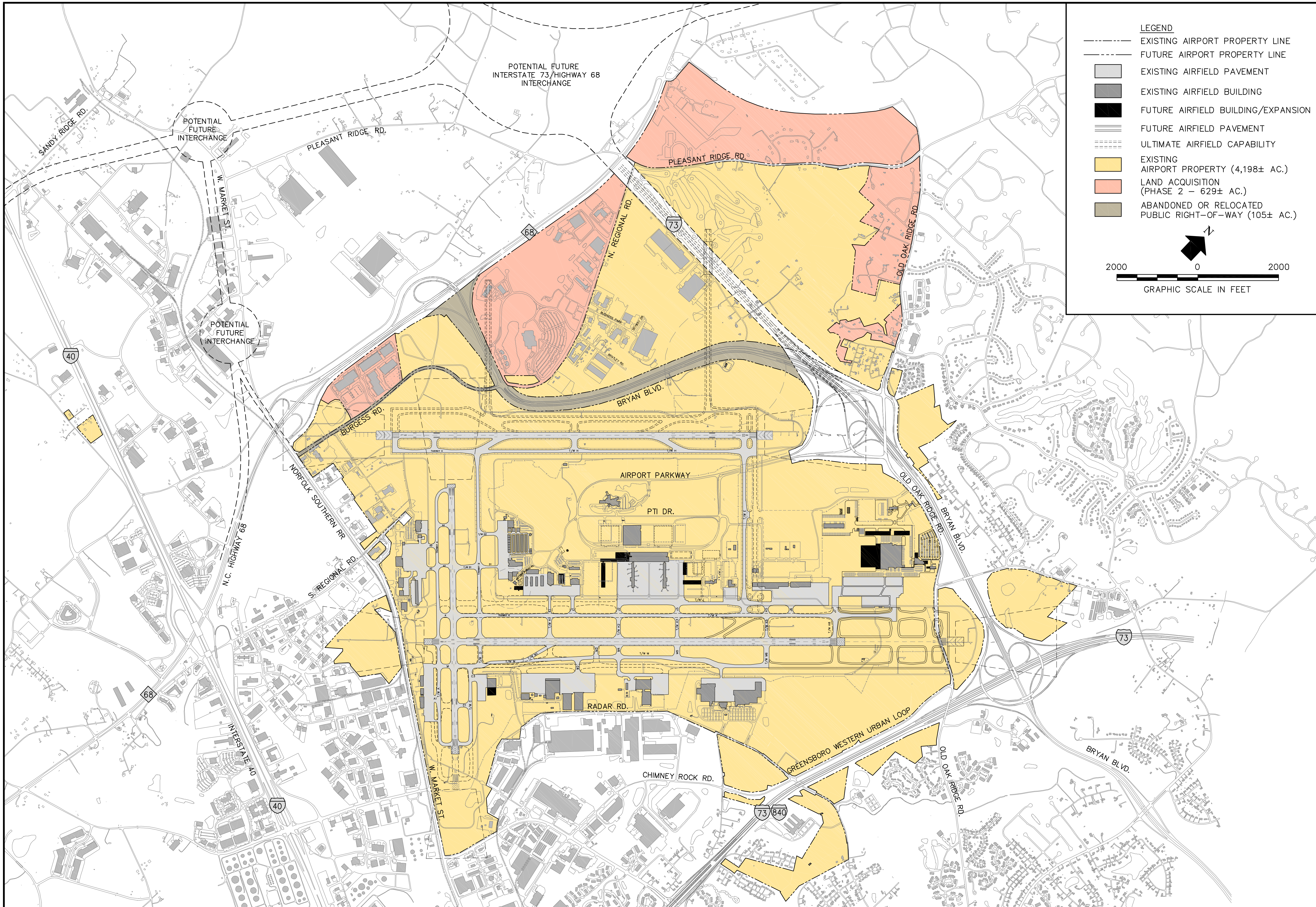

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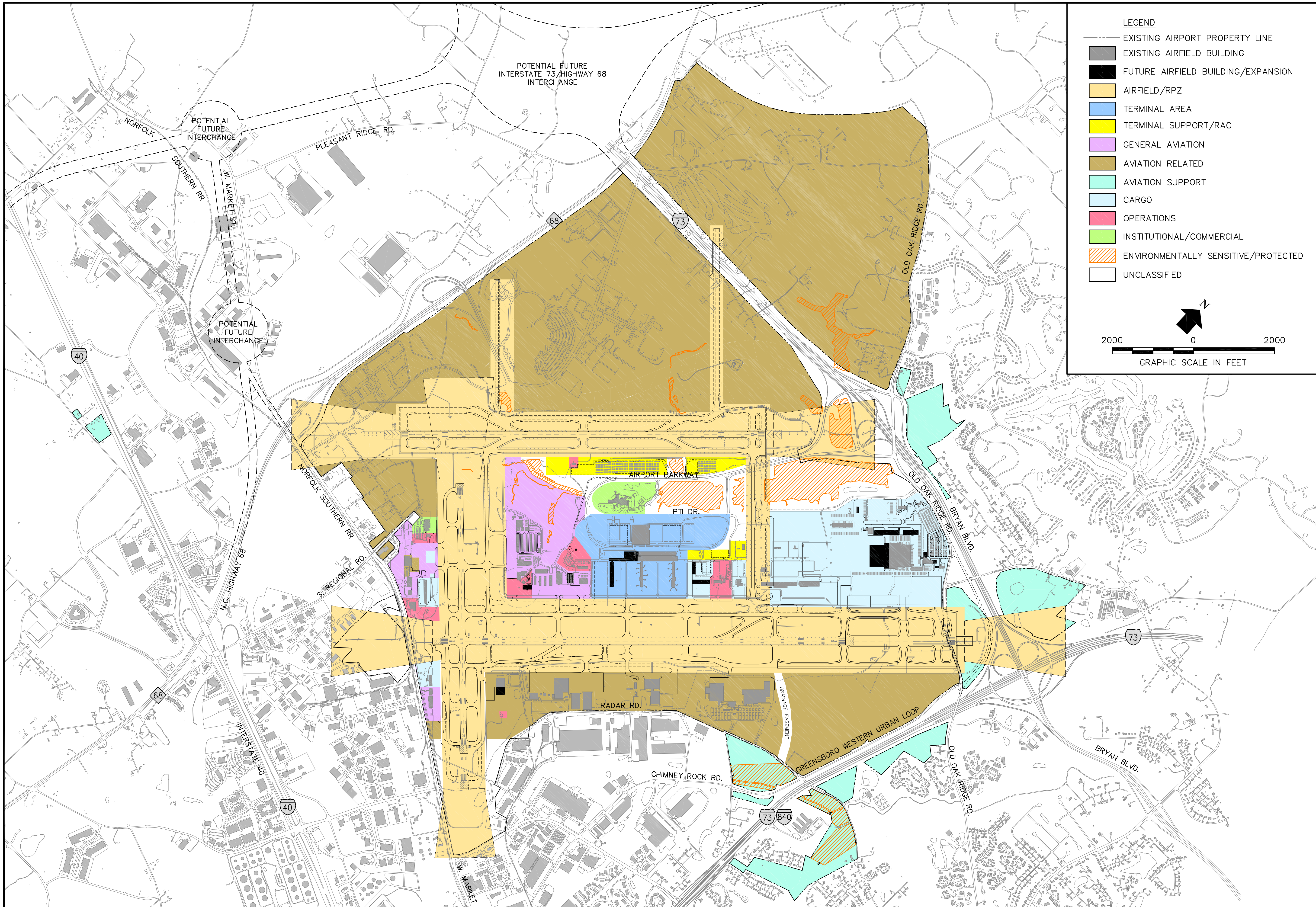
PROPOSED AIRPORT LAND ACQUISITION PHASE 2

FIGURE 6-6



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PROPOSED AIRPORT LAND USE PHASE 2

FIGURE 6-7

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centerline separation of 4,300 feet) that would be constructed northwest of Runway 5L/23R. The long-range planning vision also anticipates a possible third parallel runway that would be interconnected to the existing system of three runways via multiple cross-field taxiways previously developed within Phase 2. This third runway would be developed as demand dictates.

Potential operational demand for a third runway may be driven by the need for additional airfield capacity due to increased aviation activity at the airport overtime, or in response to the specific operational needs to provide an additional, yet independently-operated parallel runway. Such runway development may be based upon the need to support extensive or concentrated development of interconnected air cargo transport facilities, manufacturing systems or other aviation-related facility development envisioned as part of the Piedmont Triad Aerotropolis Plan.

To accommodate the potential development of a third runway, NC 68 would be relocated to the west with an interchange at I-73. It is estimated that land acquisition within Phase 3 may include approximately 1,400+ acres. The proposed phased airport land acquisition program is depicted in **Figure 6-8**.

6.4.9 PROPOSED ULTIMATE AIRPORT LAND USE PHASE 3 (BEYOND 30 YEARS)

Land uses proposed to be developed within Phase 3 will be aviation-related and have direct access to the proposed third parallel runway and the existing three-runway airfield system via the development of multiple cross-field taxiways.

The land areas immediately adjacent to the future parallel runway and cross-field taxiways would most likely be developed first to support aviation-related activities that require direct access to the airfield. Other land uses within the northwest quadrant may also be aviation-related, or by proximity, provide allied services in direct support of other aviation-related activities and services. The proposed land use development that would most likely occur with the Phase 3 is depicted in **Figure 6-9**.

6.4.10 PROPOSED ULTIMATE AIRPORT FACILITY DEVELOPMENT PHASE 3 (BEYOND 30 YEARS)

Planned airfield facility improvements that may occur within Phase include, but would not be limited to the following:

- Construction of two additional high-speed exit taxiways for Runway 5R/23L,
- Reconstruction and extension of Runway 14/32 and associated parallel taxiways to the northwest,
- Extension of Runway 5L/23R and associated parallel taxiways to the southwest,
- A new cross-field Taxiway from Taxiway G to land areas in the northwest quadrant, and
- Construction of a third parallel runway.

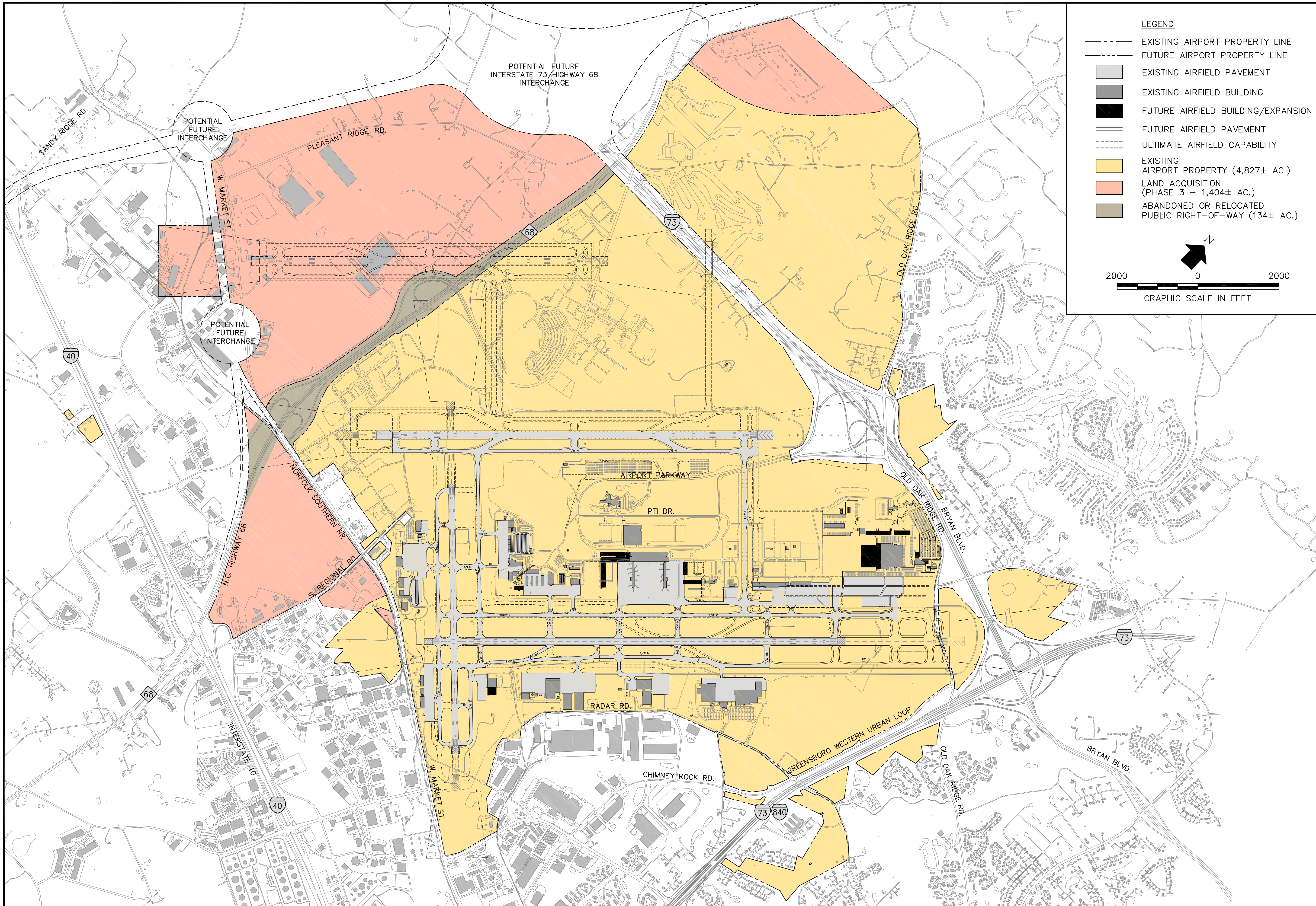
6.4.11 MULTI-MODAL FACILITY DEVELOPMENT OPPORTUNITIES

6.4.11.1 PART Bus Transfer Station

As multi-modal passenger transfer demand and funding opportunities dictate, there is potential for the development of a public bus passenger transfer station utilizing PART-owned property located on the north side of West Market Street and portions of airport-owned land. This multi-model passenger transfer facility would allow for the transfer of PART bus passengers using a dedicated wheel mounted tram or light rail system that would run between the west side of the airport and the passenger terminal curbside via a dedicated route. This dedicated route would require the construction of a tunnel system beneath proposed future extended portions of Taxiway Alpha and Runway 14/32 and existing Taxiway Delta. See **Figure 6-9.**

6.4.11.2 Potential Multi-Modal Facility Development

Utilizing the existing Norfolk Southern Rail facilities, proposed airport-owned land areas located northwest and southeast of the proposed third runway and southwest of West Market Street, the potential development of one or more multi-modal transfer facilities may exist in the future. See **Figure 6-9.**



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PROPOSED ULTIMATE AIRPORT LAND ACQUISITION PHASE 3

FIGURE 6-8

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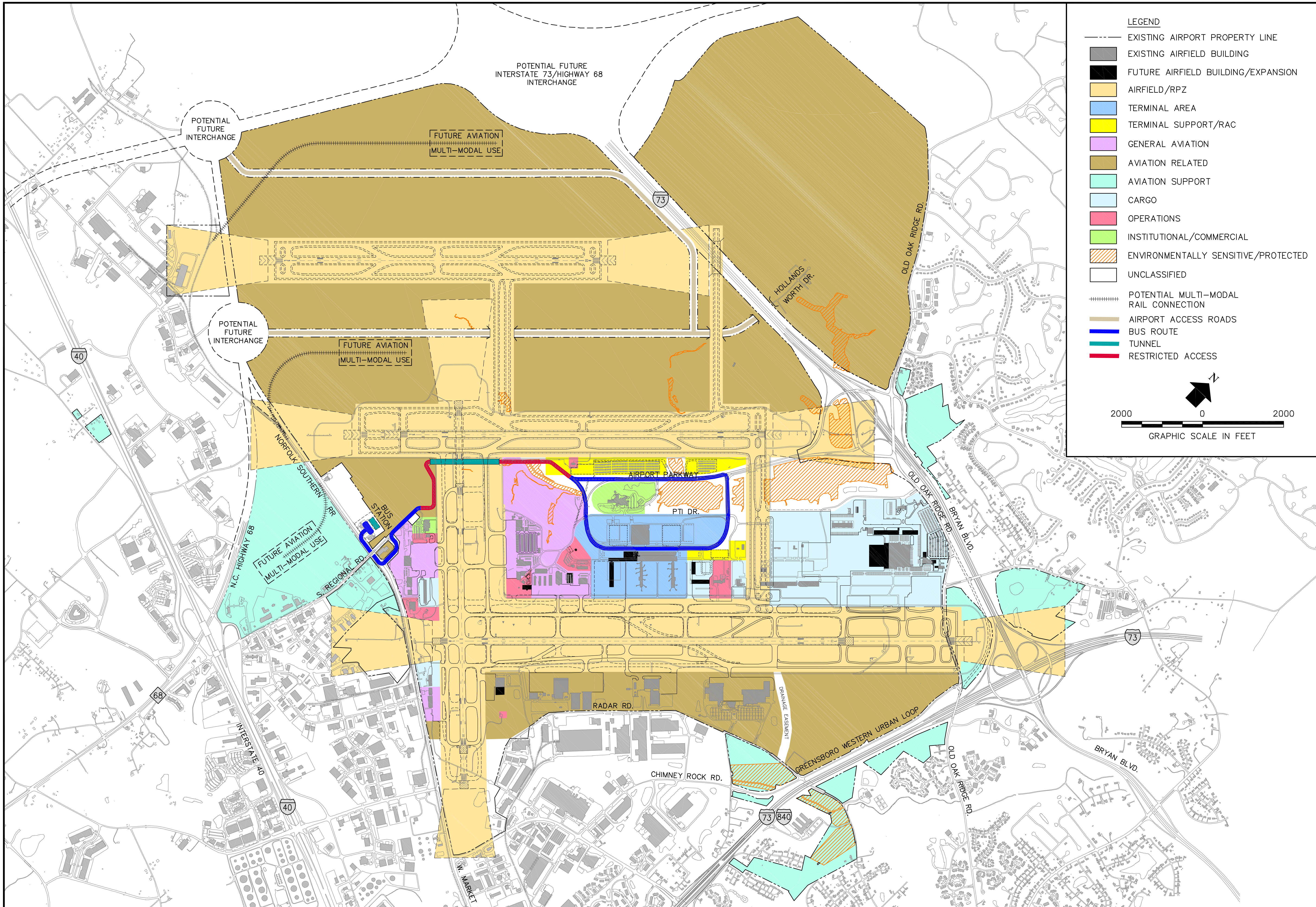

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PROPOSED ULTIMATE AIRPORT LAND USE PHASE 3

FIGURE 6-9

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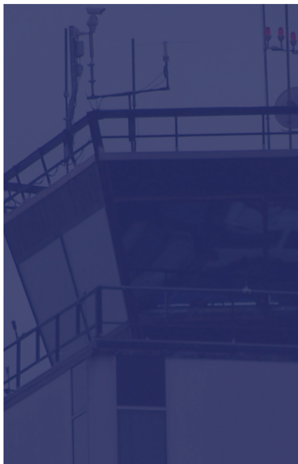

Airport Master Plan Update
and
Strategic Long-Range Visioning Plan

SECTION 7.0
ENVIRONMENTAL CONSIDERATIONS

Prepared By:
URS

In Association With:
JACOBS CONSULTANCY
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Ron Miller & Associates

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Piedmont Triad International Airport
Greensboro, North Carolina

SECTION 7.0

ENVIRONMENTAL CONSIDERATIONS

This section provides an overview of the environmental process necessary to implement the major development items identified in this update of the Piedmont Triad International Airport (PTI) Airport Master Plan. This section is not a substitute for the completion of an environmental analysis in compliance with National Environmental Policy Act (NEPA) guidelines, but rather identifies the range of potential environmental documentation which may be required pursuant to FAA Orders 1050.1E, *Environmental Impacts: Policies and Procedures*, and 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, should the recommended Airport Master Plan Update projects be implemented.

7.1 BACKGROUND

Required environmental analysis can take the form of one of three formats, briefly explained below, and detailed in FAA Order 1050.1E and FAA Order 5050.4B.

NEPA requires an environmental analysis and appropriate documentation to determine whether a Federal action has the potential to significantly impact the environment. FAA Order 1050.1E implements the provisions of NEPA for FAA actions and FAA Order 5050.4B provides specific guidance for FAA actions pertaining to airports. Depending on the scale of the project/operational action and its potential to result in significant environmental impacts, environmental documentation may consist of a Categorical Exclusion (CatEx), an Environmental Assessment (EA) and subsequent Finding of No Significant Impact (FONSI), or an Environmental Impact Statement (EIS) and its Record of Decision (ROD).

Categorical Exclusions - These are appropriate for proposed actions that have been shown to rarely cause significant environmental effects. Typical CatEx's are listed in FAA Order 1050.1E and those relating specifically to airport actions are summarized in FAA Order 5050.4B. A list of extraordinary circumstances that an analyst must consider is in those orders as well. Analysts must consider those extraordinary circumstances to aid in determining if a normally categorically excluded action may cause a significant effect.

Extraordinary circumstances are those situations where an action that is normally categorically excluded may cause significant adverse environmental impacts. The FAA determines if a normally categorically excluded action in Table 6-2 of FAA Order 5050.4B involves an extraordinary circumstance before a CatEx is granted.

Environmental Assessments - These are appropriate for proposed actions that may cause environmental impacts that are not expected to exceed any significance threshold or can be mitigated below thresholds of significance (see FAA Order 5050.4B paragraphs 800.b, 800.c, and 802.g). Thresholds of significance are defined for several environmental resource categories in FAA Order 1050.1E.

Environmental Impact Statements - These are appropriate for a proposed action that may be expected to cause significant environmental impacts, or a project that is controversial on environmental grounds.

This section is not intended to provide complete CatEx, EA, or EIS documentation of the PTI Airport Master Plan Update projects; however, it is intended to provide information on project or future airport actions which may require NEPA documentation to address environmental concerns. The information from this section provides a preliminary review of potential NEPA requirements for PTI Airport Master Plan Update projects. The need for NEPA documentation and the specific type of analysis to be proposed (e.g., Categorical Exclusions, Environmental Assessments, and/or Environmental Impact Statements) will be determined and completed for all proposed projects prior to implementation.

7.2 PRIOR ENVIRONMENTAL EVALUATIONS

Piedmont Triad Airport Authority (PTAA) has completed several environmental documents over the last 10 years. The information contained in these documents assist the PTAA and FAA in assessing the potential environmental impacts of projects recommended in the Airport Master Plan Update. The following is a list of previously prepared environmental documents that describe the environment on, and in the immediate vicinity of PTAA property.

EIS Proposed Runway 5L/23R, Proposed Overnight Express Air Cargo Sorting and Distribution Facility and Associated Developments (FedEx EIS) – November 2001 – The PTAA proposed a substantial and phased airside and landside improvement program to enable the airport to effectively meet estimated levels of activity associated with the operational requirements of a proposed FedEx Mid-Atlantic air cargo hub.

To develop this type of airport facility, two widely- spaced parallel runways (e.g., parallel runways having a minimum centerline separation of 4,300 feet.) would be needed to allow dual simultaneous operations under IMC and VMC; supporting air cargo sorting and distribution facility capable of handling 48 daily FedEx air cargo aircraft operations (24 departures) in Phase 1 and 126 daily FedEx air cargo aircraft operations (63 departures) following the completion of Phase 2, extensive taxiway network, and well-developed surface transportation infrastructure.

The proposed overnight express air cargo sorting and distribution facility and associated developments were planned from their conception to occur in two separate phases (Phase 1 and Phase 2). Phase 1 developments, as proposed by PTAA, evaluated in the FEIS and approved by the FAA in its Record of Decision for the project, included the following:

- Construction of a new parallel 9,000’ by 150’ Transport Category runway capable of accommodating Airplane Design Group (ADG) D-V air carrier aircraft (DC-10). The proposed airfield system complex consists of the runway and taxiway as described; parallel and connecting taxiways; lighting; navigational aids for Category I/III capabilities; runway safety areas and protection zones, and associated grading, drainage, and utility relocations;

- Extension of Taxiway D;
- High Speed Exit Taxiway for existing Runway 5R/23L;
- Construction and operation of Phase 1 (approximately 736,000 square feet) of an air cargo sorting/distribution facility (FedEx Mid-Atlantic Hub);
- Construction and operation of Phase 1 (approximately 174,000 square yards) of air cargo aircraft parking and air cargo ramp associated with the air cargo sorting/distribution facility;
- Construction of a new 2-mile section of Bryan Boulevard;
- Construction of one connector taxiway bridge and connector taxiway over Bryan Boulevard;
- Extension of Taxiway K to the air cargo sorting/distribution facility;
- Construction of a new interchange for Old Oak Ridge Road and Bryan Boulevard; and
- Relocation of a portion of Old Oak Ridge Road.

Phase 2 developments were envisioned to include the developments of the following addition supporting facilities and infrastructure:

- Construction and operation of Phase 2 of the air cargo sorting/distribution facility (expand the Phase 1 facility by approximately 509,000 square feet):
- Construction and operation of Phase 2 of the air cargo aircraft parking and air cargo ramp (expansion of the Phase 1 parking/ramp area by approximately 281,000 square yards);
- Extension of the north connector taxiway to the Phase 2 apron area;
- Construction of a second connector taxiway bridge and connector taxiway over Bryan Boulevard;
- Relocation of on-airport rental car service lots; and
- Relocation of two existing air cargo buildings.

Although the proposed PTIA development program was divided into two phases of activity, the FEIS considered the proposed project's direct and indirect impacts for all project elements within the Phase 1 and Phase 2 development envelopes. This included the cumulative evaluation of impacts to 21 environmental categories due to past, present, and reasonable foreseeable actions within the affected area. The FAA signed it's Record of Decision on December 31, 2001.

EA Runway 5R Safety Area Improvements – March 2007 - The PTAA proposed to implement runway safety area (RSA) and related improvements to Runway 5R/23L at PTI that would enable the airport to meet FAA RSA requirements and improve the safety of aircraft operations at the airport, as prescribed in

Advisory Circular (AC) 150/5300-13, *Airport Design*, and FAA Order 5200.8, *Runway Safety Area Program*. The purpose of the proposed project was to provide for a standard RSA on Runway 5R (1,000 feet long by 500 feet wide) that would meet all FAA standards and to achieve other safety improvements, without sacrificing runway length. The FAA signed a Finding of No Significant Impact (FONSI) on April 4, 2007.

PTI 14 CFR Part 150 – November 2008 – PTAA completed its first Part 150 Study at PTI in November 2008. The goal of the study was to establish a set of measures to reduce potential impacts of aircraft noise in the vicinity of the airport and to avoid potential new noise impacts. The Part 150 Study for PTI had two components: the Noise Exposure Maps (NEMs) and the Noise Compatibility Program (NCP). The NEMs present information about the 2006 and 2014 aircraft noise environment around PTI. The NCP presented measures designed to reduce potential impacts of aircraft noise on noise sensitive land uses around PTI and to restrict the introduction of new non-compatible land uses in locations around the airport. The NCP was based on the level of aircraft operations forecast for 2014. The FAA evaluated and approved, in part, all of the proposed measures in the Noise Compatibility Program, effective November 7, 2008.

7.3 ANTICIPATED ENVIRONMENTAL PROCESSING

The following section provides an overview of the anticipated level of environmental documentation required during the 0-5 year and 6-10 year scenarios identified in this airport MPU. **Table 7-1** summarizes the anticipated level of environmental documentation for each PTI Airport Master Plan Update project.

The following sections describe the FAA criteria for a CatEx, EA or EIS and written reevaluation (as per FAA Order 1050.1E guidance) followed by a description of PTI Airport Master Plan Update projects that would fall under each criteria.

7.3.1 CATEGORICAL EXCLUSIONS

An action on the categorically excluded list is not automatically exempted from environmental review under NEPA. In approving a CatEx the responsible FAA official will place a brief explanation in the project file as to why a project is categorically excluded. The FAA would also review any extraordinary circumstances associated with the project before deciding to categorically exclude a proposed action. The FAA will review information provided by the airport sponsor to determine if the information is sufficient to analyze the categorical exclusions and applicable extraordinary circumstance.

TABLE 7-1
ANTICIPATED LEVEL OF ENVIRONMENTAL DOCUMENTATION

		FAA Order 1050.1E[1]								
		Categorical Exclusion							Environmental Assessment	Written Reevaluation
	Airport Master Plan Update Projects	**309c**	**309d**	**310e**	**310f**	**310h**	**310n**	**310o**	**401g**	**402 and 514**
Current	Federal Inspection Station (FIS) Facility						x			
	Replace ATCT								x	
0 – 5 Years	Air Cargo Buildings, Miscellaneous Improvements to Terminal Facilities and Parking Facilities					x				
	Relocate and Upgrade ASR-9		x							
	SMGCS Update[2]									x
	Runway 14/32 Rehabilitation			x						
	Relocate ASOS	x								
6 – 10 Years	Runway 5R/23L Extension Program (to Northeast) [3]									x
	Runway 5R/23L Group VI Upgrade		x							
	Fence Relocations / Replacements / Upgrade				x					
	Storm Water System Repairs / Replacement							x		
	Terminal Apron Pavement Repairs / Replacement			x						

[1] - The columns identify the specific paragraph(s) of FAA Order 1050.1E.
[2] - Assessed in a Final EA and issued a FONSI in April 2007. A written reevaluation may be required after April 2010.
[3] - Assessed in a Final EA and issued a FONSI in April 2007. A supplemental EA mat be required for this runway extension program after April 2010.

Relocate Automated Surface Observing System (ASOS)

According to FAA Order 1050.1E, federal financial assistance for, or ALP approval of, installing or upgrading facilities and equipment, other than radars, on designated airport, including: FAA communications, navigation, surveillance and weather observation systems that do not create environmental impacts outside of airport property and do not result in any extraordinary circumstances are categorically excluded from further environmental processing.

The Automated Surface Observing System (ASOS) reports the temperature and dew point in degrees Fahrenheit, present weather, icing, lightning, sea level pressure and precipitation accumulation. The ASOS is typically located within a half-acre parcel on airport property and a total structure height of approximately 50-ft. It is anticipated that the ASOS would be relocated to a site previously disturbed, not located within a wetland or floodplain and would not result in significant environmental impacts. Therefore, this project will likely require the preparation of a CatEx under FAA Order 1050.1E, Paragraph 309c.

However, if the site for the relocated ASOS involves extraordinary circumstances, per FAA Order 1050.1E, an EA or EIS may need to be developed. The determination of whether the relocated ASOS may have a significant environmental effect would be made by considering any requirements applicable to specific resources (see Appendix A of FAA Order 1050.1E).

Relocate and Upgrade Radar System

As per FAA Order 1050.1E, federal financial assistance for, or ALP approval of, or FAA installation, repair, replacement, relocation, or upgrade of radar facilities and equipment, on designated airport property that do not create environmental impacts outside of airport property and do not result in any extraordinary circumstances is categorically excluded from further environmental processing.

As described previously in this MPU, an Airport Surveillance Radar (ASR) uses a continually rotating antenna mounted on a tower to measure the distance of the aircraft from the radar antenna and the direction of the aircraft in relation to the antenna. There would be no significant environmental impacts associated with this project. Therefore, this project will likely require the preparation of a CatEx under FAA Order 1050.1E, Paragraph 309d.

Terminal Apron Pavement Repairs and Replacement

Construction or repair of existing taxiways and aprons, including extension, strengthening, reconstruction, resurfacing, marking grooving, fillets, and jet blast facilities, that do not create environmental impacts outside of airport property and do not result in any extraordinary circumstances is categorically excluded from further environmental processing. Therefore, the proposed terminal apron rehabilitation will likely require the preparation of a CatEx under FAA Order 1050.1E, Paragraph 310e.

This project would involve additional pavement; therefore, the PTI's Stormwater Airport Management Plan would need to be updated as this project becomes ripe for implementation. Also, PTAA's Pollutant

Discharge Elimination System (NPDES) permit may need to be modified if additional stormwater outfalls result from there projects.

Airfield Improvements

According to FAA Order 1050.1E, federal financial assistance for construction or repair of a runway that is existing or taxiway, apron, loading ramp, or safety runway area including extension, strengthening, reconstruction, resurfacing, marking, grooving, fillets and jet blast facilities, provided the action will not create environmental impacts outside of an airport property is categorically excluded from further environmental processing.

As described previously in this Airport Master Plan Update, improvements to Runway 5R/23L to accommodate Airplane Design Group VI geometric and operational design standards would include the widening of the runway from 150 feet to 200 feet and possible strengthening of load bearing pavements. This runway upgrade would allow PTI to accommodate larger sizes of aircraft (e.g., A380) when there is a potential need to accommodate these types of larger aircraft at PTI. Currently, the Airport Master Plan Update's forecast of aviation activity does not include the operation of these larger aircraft at PTI in the foreseeable future. It is likely that these newer, more efficient and potentially quieter aircraft would replace older and noisier aircraft currently operating at PTI, and therefore, may not result in significant noise impacts.

Runway improvements that have potential for noise impacts (see paragraph 401k in Order 1050.1E) require that an Environmental Assessment be prepared. However, the widening project may be eligible for Categorical Exclusion with noise considered as an extraordinary circumstance. A noise analysis may be required to determine if noise impacts were significant or not. If not, the project may be processed under a Categorical Exclusion.

The rehabilitation of Runway 14/32 would include the milling and repaving of the runway to maintain its useful life. The rehabilitation would not include extending the runway nor increase operations at PTI. There would be no significant environmental impacts associated with this project.

With the implementation of the NCP measures, technology improvements of aircraft engines, and the replacement of older and noisier aircraft, aviation noise within the vicinity of PTI is not anticipated to significantly increase as a result of these projects. Therefore, these projects will likely require the preparation of a CatEx under FAA Order 1050.1E, Paragraph 310e:

- Runway 5R/23L Group VI Upgrade; and
- Runway 14/32 Rehabilitation.

Other Minor Development Items

As per FAA Order 1050.1E, construction or limited expansion of accessory on-site structures, including storage buildings, garages, small parking areas, signs, fences, and other essentially similar minor development items that do not create environmental impacts outside of airport property and do not result in any extraordinary circumstances is categorically excluded from further environmental processing. There would be no significant environmental impacts associated with fencing improvements. Therefore, this project will likely require the preparation of a CatEx under FAA Order 1050.1E, Paragraph 310f:

- Fence Relocation/Replacement.

Air Cargo Buildings, Miscellaneous Improvements to Terminal Facilities and Parking Facilities

According to FAA Order 1050.1E, construction or expansion of facilities, such as terminal passenger handling and parking facilities or cargo buildings, at existing airports and launch facilities that do not substantially expand those facilities; that do not create environmental impacts outside of airport property and do not result in any extraordinary circumstances, is categorically excluded from further environmental processing. Therefore, this project will likely require the preparation of a CatEx under FAA Order 1050.1E, Paragraph 310h:

- Air Cargo Buildings, Miscellaneous Improvements to Terminal Facilities and Parking Facilities.

Minor Expansion of Facilities

As per FAA Order 1050.1E, minor expansion of facilities, including remodeling of space in current quarters or existing buildings and do not result in any extraordinary circumstances are categorically excluded from further environmental processing.

As described previously in this MPU, the Authority has been approached by an airline to provide FIS services on the Airport so that they could provide international service to and from PTI. The design and construction of the FIS would use approximately 6,500 square feet of existing space under the north concourse and would meet the guidelines set forth by the U.S. Customs and Border Protection and FAA. This facility would not be constructed unless the Authority has an agreement with an airline to provide international service at PTI.

Therefore, this project will likely require the preparation of a CatEx under FAA Order 1050.1E, Paragraph 310n:

- Federal Inspection Station (FIS) Facility.

Stormwater System Repairs / Replacement

As per FAA Order 1050.1E, categorical exclusions for facility siting and maintenance actions include minor trenching and backfilling where the surface is restored and the excavated material is protected against erosion and runoffs during the construction period. A stormwater system repair / replacement would involve excavation, grading, and erosion control measures on the airport property. Therefore, this project will likely require the preparation of a CatEx under FAA Order 1050.1E, Paragraph 310o.

The PTI's Stormwater Airport Management Plan will be updated and its NPDES permit may need to be modified as this project becomes ripe for implementation.

7.3.2 *Environmental Assessments*

This section identifies those PTI Airport Master Plan Update projects that may require the preparation of an Environmental Assessment.

Land Acquisition

As per FAA Order 1050.1E, acquisition of land greater than three acres for, and the construction of, new office buildings and essentially similar FAA facilities are actions that normally require an EA.

As described previously in this Airport Master Plan Update, PTAA plans to acquire land within the vicinity of PTI when it becomes available for sale. Current planning by the PTAA is to acquire the land and/or lease it back to the owner until needed by the PTAA for future airport development. The parcels proposed for acquisition are located within areas zoned primarily as corporate park, multi family, and light industrial. In most instances, protective purchase of property may be authorized by the FAA if the airport must acquire individual properties that have Short-Term development planned by current owners that is incompatible with airport development plans or would increase the cost of future acquisition. The PTAA will coordinate with the FAA prior to land acquisition to determine if NEPA documentation is required prior to purchase. In either case no development would be undertaken on properties acquired until all airport development environmental clearances have been approved.

Replace Airport Traffic Control Tower (ATCT)

According to FAA Order 1050.1E, establishment or replacement of an Airport Traffic Control Tower (ATCT) normally requires the preparation of an EA. The new ATCT would be located on airport property and enable a clear line of sight to all aircraft operating areas. This project could potentially result in visual impacts. Therefore, this project will likely require the preparation of an EA under FAA Order 1050.1E, Paragraph 401g:

- Replace ATCT.

7.3.3 *Environmental Impact Statements*

None of the projects identified in the “0-5 year” or “6-10 year” scenarios are anticipated to result in the need for the FAA to prepare an Environmental Impact Statement. However, this determination will be based on no significant impact being identified in any of the EA studies addressed in Sections 7.3.2.

7.3.4 *Written Reevaluations*

According to FAA Order 1050.1E, if major steps toward implementation of a proposed action (such as the start of construction, substantial acquisition, or relocation activities) have not commenced within three years from the date of approval of the FONSI or ROD, a written reevaluation of the adequacy, accuracy, and validity of the EA or EIS will need to be prepared by the responsible FAA official. If there have been significant changes in the proposed action, the affected environment, anticipated impacts, or proposed mitigation measures, a new or supplemental EA or EIS will need to be prepared and circulated.

Air Cargo Buildings, Rental Car Facilities Site Preparation for FedEx Phase 2, and High Speed Taxiway to Runway 5R/23L

The demolition of existing air cargo buildings (#2 and #3) and existing rental car facilities were evaluated in the 2001 FedEx FEIS and have the potential to result in hazardous material impacts. The existing car rental facilities contain USTs containing gasoline and other petroleum-based products. The air cargo buildings have several USTs and above ground storage tanks containing gasoline, diesel, used oil and deicing chemicals. Existing aviation fuel storage tanks would need to be properly drained and/or decommissioned according to Federal, state and local requirements. Minor quantities of regulated substances would also need to be prepared for proper disposal. Since only small quantities of regulated materials are involved, it is not anticipated that removal of USTs and demolition of these facilities would result in significant impacts.

The FedEx Expansion Program, initially assessed within the 2001 FedEx FEIS as Phase 2, was anticipated to result in an increased forecast of aircraft operations at PTI as well as potential environmental impacts. These impacts included, but were not limited to, aviation noise, incompatible land uses, residential impacts, air quality, water resources, and energy impacts.

The FedEx expansion program (FedEx - Phase 2) would increase the number of operations at PTI and in turn increase aviation noise impacts. As previously assessed in the 2001 FedEx EIS, a total of approximately 486.2 acres of noise sensitive single-family residential land use would be within the (Day-Night Average Sound Level) DNL 65 Decibels A-weighted (dBA) noise contour of PTI. Expansion of FedEx under Phase 2 would increase the number of people and households within the DNL 65 dBA to 629 and 262, respectively. Operational emissions of CO, VOCs and NOx would, all together, increase by approximately 61 percent, when compared to a No-Action scenario. Implementation of the FedEx expansion program would increase demand on the City of Greensboro's water supply because of an additional 152 full-time and 1,502 part-time employees in Phase 2. Finally, according to FedEx, electrical demands for the sorting/distribution facility were estimated to increase from 1,250,000 under Phase 1 to approximately 2,500,000 kilowatts per month under Phase 2. Therefore, there would be an increased demand for electric power for his 6-10 years project,

Over the last 10 years, aviation forecasts at PTI have fluctuated. These differences are due, in part, to changes in the overall U.S. economy and external factors such as fuel costs. As discussed above, the FedEx expansion program would impact several environmental categories listed in FAA Order 1050.1E. The number of operations associated with the FedEx expansion program, as well as the potential to increase the number of part-time and full-time employees, has the potential to be different than the data within the 2001 FedEx EIS. As appropriate, Spill Prevention Control and Countermeasures plans may need to be developed for the handling and cleanup of potentially hazardous materials (e.g., USTs).

Although the proposed phased development of the overnight express air cargo sorting and distribution facility was divided into two phases of activity, the FEIS considered the proposed project's direct and indirect impacts for all project elements within both of the Phase 1 and Phase 2 development envelopes. Therefore, because the anticipated environmental consequences that were known or anticipated to be directly associated with this specific airport development project were based upon the completion of

Phases 1 and Phase 2 and were fully examined and evaluated in the FEIS, no further environmental documental is anticipated or planned. Accordingly, the anticipated level of environmental documentation for these specific proposed Overnight Express Air Cargo Sorting and Distribution Facility and Associated Developments (Phase 1 and 2 FedEx Mid-Atlantic Sort Hub) are not listed in **Table 7-1.**

Surface Movement Guidance and Control System

A Surface Movement Guidance and Control System (SMGCS) includes enhancing taxiing capabilities in low visibility conditions and reduces the potential for runway incursions. Improvements include additional signage, lighting, and markings. This project was previously evaluated as a connected action to the RSA improvements documented within the March 2007 *Final EA for Runway 5R Safety Area Improvements* (March 2007 Final EA) at PTI. Additional light emissions would occur as a result of stop bar lights, runway guard lights, taxiway centerline lights, and clearance bar lights. However, these lights would be within the pavement or low to ground level of the runway/taxiway system at PTI, would illuminate low light emissions, and would not result in significant impacts.

This project will likely require the preparation of a written reevaluation of the EA under FAA Order 1050.1E, Paragraph 402b(1):

- SMGCS Update.

Runway 5R/23L Extension Program (to the Northeast)

This PTI Airport Master Plan Update proposes to extend Runway 5R/23L by 2,374 feet (for a total runway length of 12,735 feet). The PTAA previously evaluated 1,474-feet of this runway extension program in the March 2007 Final EA. As described in the March 2007 Final EA, the 1,474-foot extension shifted Runway 5R/23L to the northeast, resulted in a decrease in population exposed to aircraft noise, and was issued a FONSI in April 2010. The 1,474-foot extension was also evaluated in the 2008 PTI Part 150 Study. The FAA evaluated and approved, in part, all of the proposed measures in the Noise Compatibility Program (NCP) in the 2008 PTI Part 150 study. The NCP for PTI consists of a set of measures to reduce the impacts of aircraft noise in the vicinity of PTI through the year 2014 and to avoid potential new noise impacts.

As described previously in this MPU, the Runway 5R/23L Extension Program would increase the total length of Runway 5R/23L to 12,735 feet. An additional 900-foot extension of Runway 5R/23L to the northeast, when added to the 1,474-foot extension described above, has the potential to increase aviation activity noise within residential land uses northeast of PTI and result in public controversy.

As per FAA Order 1050.1E, if major steps toward implementation of the proposed action (such as initiating the construction of the 1,474 runway extension) have not commenced within three years from the date of issuance of the FONSI (i.e., April 2010) a reevaluation of the adequacy, accuracy, and validity of the EA (i.e., March 2007 Final EA) would be prepared. In addition, the 900-foot extension of Runway 5R/23L could be combined with the reevaluation of March 2007 Final EA, in the form of a supplemental EA. The supplemental EA would reevaluate the March 2007 Final EA as well as evaluated the potential environmental impacts of the 900-foot extension as proposed in this MPU. Therefore, this project will likely require the preparation of a supplemental EA (including a reevaluation of the March 2007 Final EA) under FAA Order 1050.1E, Paragraph 402b(1):

- Runway 5R/23L Extension Program (to Northeast).

7.4 AGENCY COORDINATION

Acceptance of Federal grant funding requires compliance with the requirements set forth in FAA Order 1050.1E. The preparation and processing of environmental documentation identified in this chapter of the Airport Master Plan Update does not eliminate the possible need for additional or more detailed environmental processing. Careful coordination between the PTAA and the responsible FAA official should be conducted for every project utilizing Federal funds. In addition, it is recommended that coordination with the following municipalities and regulatory agencies also be conducted as part of development actions utilizing Federal funding or requiring environmental processing:

- Guilford County and cities of Greensboro and High Point;
- Federal, state, and local agencies responsible for the implementation of water quality regulations (e.g., Water Supply Watershed Rule) and issuance of permits (e.g., State Water Quality Certification Section 401 permit);
- U.S. Army Corps of Engineers (Wilmington District) for the implementation of wetland regulations and issuance of permits (if required);
- Federal Highway Administration and N.C. Department of Transportation;
- North Carolina State Historic Preservation Officer in accordance with Section 106 of the *National Historic Preservation Act;*
- Federal, state, and local agencies responsible for the removal and installation of underground storage tanks (e.g., North Carolina Division of Waste Management (NCDWM) Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement) and issuance of permits (e.g., National Pollutant Discharge Elimination System (NPDES) Permit);
- Applicable Parks and Recreation departments concerning planned public parks and recreational areas (potential DOT Act section 4(f) resources); and
- Local electrical and telephone suppliers and wastewater handlers prior to construction of new facilities requiring an extension of those services.

While the coordination identified in this section will assist in compliance with NEPA requirements, additional coordination and environmental processing may be necessary with other state and/or local regulatory agencies to comply with their rules and regulations.

7.5 PERMITS

The PTI Airport Master Plan Update projects would require permits and certifications prior to their final design and construction. These could include a National Pollutant Discharge Elimination System (NPDES) permit, a U.S. Army Corps of Engineers (USACE) Section 404 permit and a state section 401 Water Quality Certification, as well as other state and local permits.

Federal regulations adopted by the U.S. Environmental Protection Agency (EPA) and North Carolina Division of Water Quality (DWQ) require an NPDES permit for all construction activities disturbing 1 or more acres of land.

If deposition or redistribution of dredged or fill material occurs in a wetland, a water of the U.S., then a permit under Section 404 of the Federal Clean Water Act must be obtained from the USACE. If the USACE determines that a Section 404 permit is required because a proposed project involves impacts to wetlands or waters of the U.S., then a Section 401 Water Quality Certification is also required by the State of North Carolina. An Isolated Wetlands Permit is needed when the USACE determines that a wetland to be potentially impacted is not Section 404 jurisdictional. Isolated Wetlands Permits are issued by the North Carolina Division of Water Quality.

The North Carolina Department of Environment and Natural Resources (NCDENR) has permit assistance centers across the state to streamline the process and navigate through the permitting process.

Each permit assistance center offers a single point of contact to act as a liaison between project owner (i.e., PTAA) and the regulatory agencies. To accomplish this, NCDENR offers the following services:

- Identify environmental permits for the proposed project(s);
- Develop timelines for projected permit decisions;
- Coordinate projects requiring multiple permits with different agencies;
- Assist clients who want Express permitting for quicker permitting decisions (where Express permitting is available); and
- Track permit review times.

An Express permitting option by the NCDENR offers a more timely review of certain environmental permits than the traditional permit review process. It offers quicker decisions on permits and certifications, as well as consultation to identify necessary requirements. A pre-application meeting is required, and a complete application, along with supporting technical information, is necessary for a thorough and swift review. Higher fees are charged to support additional staff for the Express review. Multiple permits that may be required for a project can be reviewed concurrently.

Current NCDENR One-stop & Express Permit Coordinator

Patrick Grogan
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Mooresville, NC 28115
704-235-2107
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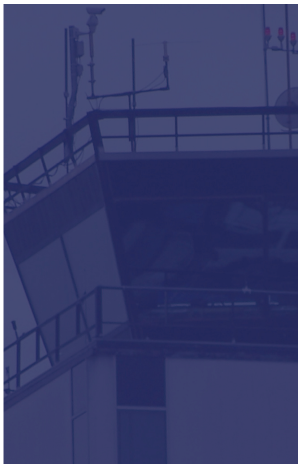


Airport Master Plan Update
and
Strategic Long-Range Visioning Plan

Prepared By:
URS

In Association With:
JACOBS CONSULTANCY
r m a
Ron Miller & Associates

SECTION 8.0
FINANCIAL ACTION PLAN

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

SECTION 8.0

FINANCIAL ACTION PLAN

8.1 BACKGROUND

The Piedmont Triad Airport Authority (PTAA) owns and operates the Piedmont Triad International Airport (PTI). The management of PTAA and its operations are carried out by a staff headed by the Executive Director, who reports directly to the Chairman of the Board of Directors.

PTAA is an independent enterprise responsible for its own financial operation and entitled to any surplus from its operations. PTAA is empowered under State of North Carolina law to issue revenues bonds; however, neither the faith and credit nor the taxing power of the State or any of its political subdivisions is pledged to the payment of the revenue bonds issued by PTAA. PTAA has no taxing power.

PTAA conducts its financial operations within the framework of its enabling legislation; Chapter 63 of the North Carolina General Statutes; the *State and Local Government Revenue Bond Act*; the Bond Order adopted by PTAA on December 21, 1990, as amended and restated by the Amended and Restated Bond Order adopted by PTAA on October 19, 1999 (Bond Order); Governmental Accounting Standards Board (GASB) standards for governmental accounting and financial reporting; SEC Rule 15c2-12(b)(5) for continuing disclosure; assurances accompanying Airport Improvement Program (AIP) grants from the Federal Aviation Administration (FAA); agreements with airlines for use of the airfield and for use and occupancy of the passenger terminal building (Airline Agreement); and other agreements with tenants and vendors as well as various other laws and regulations. Capitalized terms in this section shall have the meaning defined in the Bond Order or the Airline Agreement, unless otherwise defined.

Covenants in the Bond Order state that, among other things, PTAA will fix and revise rates, fees, rentals and charges for use and occupancy of PTI as may be necessary in order that for each Fiscal Year, revenues will be at least sufficient to meet certain financial obligations (Rate Covenant). The Rate Covenant is described in more detail below, but it generally requires that revenues, after payment of current expenses, be not less than 125 percent of debt service. This is also known as the “coverage test” or “debt service coverage.”

PTAA implements airline rates and charges at PTI on a compensatory methodology basis under an Airline Agreement, where the airlines operating at PTI are not obliged to pay additional fees to ensure compliance with the coverage test. If revenues of PTAA are not sufficient to satisfy the Rate Covenant, then PTAA comes into technical default on its covenant to bondholders. In the event of a shortfall, PTAA has no recourse to the State, to local municipalities, or to the airlines to provide the necessary revenues. In short, the risk of revenue shortfalls belongs solely and completely to PTAA.

Similarly, the capital investment decisions of PTAA are not subject to the approval of the State, local municipalities, or the airlines. While PTAA may consult with its tenants and others about capital expenditures and related matters, PTAA develops, operates, and maintains PTI as it deems in the public interest.

In the U.S., airports use multiple sources of capital to fund development including general revenue bonds, special purpose revenue bonds, AIP and state grants, Passenger Facility Charges (PFCs), Customer Facility Charges (CFCs), and internally generated cash. In addition, tenant and third-party financing can sometimes be used for certain types of projects. State and local agencies and private utility companies can play a role in financing infrastructure such as the extension of utilities to a site and the upgrade of local roads to provide airport access. Direct contributions from other political jurisdictions (public investment) can also be used as a source for airport development. PTAA has utilized most of these funding sources in the past for development at PTI.

The legal and contractual framework governing the financial operation of PTI reflects a long history of business decisions that were made in a context of facts and circumstances specific to those previous times. The cumulative effect of those earlier decisions creates the opportunities and the constraints within which current day business decisions of PTAA must be made.

For the fiscal year ended June 30, 2008 (FY 2008), PTAA's assets ($456 million) exceeded its liabilities ($189 million) by $267 million. PTAA produced an operating income of $5.8 million on $27.5 million of operating revenue and $21.7 million of operating expenses (including depreciation). Debt service coverage was 1.51x based on $17.6 million of net income available for debt service and $11.6 million of debt service on Long-Term indebtedness. PTAA expended $55 million for capital projects in FY 2008, and received $15.8 million from federal or State grants. The creditworthiness of PTAA is rated A2 by Moody's Investor Service and A- by Standard & Poor's Corporation.

8.2 PURPOSE AND SCOPE OF ANALYSIS

The objective of the Airport Master Plan Update is to provide a comprehensive plan to guide and coordinate the development of PTI facilities over the next 20 years and strategically beyond within 30- to 50-year planning window. It is also intended that the Airport Master Plan Update should serve to inform Short-Term development decisions by identifying the relationship between Short-Term decisions and Longer-Term options affecting the future potential of PTI to serve the region.

As part of the 20-year Airport Master Plan Update, this financial analysis evaluates the capacity of PTAA to finance (1) the existing Capital Improvement Program; (2) the Land Acquisition Program set out in the Airport Master Plan Update, and (3) the Short-Term and the Medium-Term Airport Master Plan Update projects (FY 2010 through 2020). The analysis also relies on the projections of passengers developed as part of the Airport Master Plan Update.

The financing capacity of PTAA is affected by various factors such as:

- Willingness and ability of airlines to pay landing fees and terminal rents imposed by PTAA for use of PTI.
- Traffic and traffic-related revenues from parking, rental car, and various in-terminal concessions.

- Ability to satisfy the Rate Covenant by an adequate margin and to preserve liquidity in order to protect against downside risks and maintain a strong credit rating.
- Future AIP grant funding levels authorized by Congress.
- Future grant funding levels available from state and other federal agencies.
- Eligibility and priority of future projects for grant funding.

There is a complex interdependency between PTAA's financing capacity and the scope, schedule, cost, and funding eligibility of PTAA's development program. This analysis covers the period from FY 2010 to FY 2020, which is referred to as the forecast period. The analysis is subdivided into four parts:

- Framework for financial operation of PTAA.
- Development plans for PTAA which includes (1) the existing Capital Improvement Program, (2) the proposed Land Acquisition Program, and (3) the proposed Short-Term and Medium-Term Airport Master Plan Update projects.
- Funding plans for each of the three major development plans.
- Financial analysis evaluating the effect of the development plans and proposed funding plans on debt service coverage, airline charges, and other financial metrics indicative of financial feasibility.

8.3 FRAMEWORK FOR FINANCIAL OPERATIONS

8.3.1 BOND ORDER

The financial operations of PTAA are governed in large part by the Bond Order authorizing the issuance of general revenue bonds. In the Bond Order, PTAA is required to meet the Rate Covenant. The Rate Covenant requires that PTAA:

> "…fix, charge and collect rates, fees, rentals and charges for the use of and services furnished or to be furnished by the Airport Facilities, and from time to time and as often as it shall appear necessary, to revise such rates, fees, rentals and charges as may be necessary or appropriate, in order that for each Fiscal Year, the Income Available for Debt Service for such Fiscal Year will be not less than the greater of (i) 125% of the Long-Term Debt Service Requirement for Parity Indebtedness only for such Fiscal Year and (ii) 100% of the Long-Term Debt Service Requirement for Parity Indebtedness and Subordinated Indebtedness for such Fiscal Year."

Additionally, the Rate Covenant requires that PTAA will take similar actions:

> "…in order that the Receipts will be sufficient in each Fiscal Year (i) to pay Current Expenses, (ii) to make the cash deposits in each Fiscal Year required by Section 5.04 (a), (b) and (c) and (iii) make the cash deposits in each Fiscal Year required by any Subordinated Indebtedness Resolution with respect to the payment of principal and interest on Subordinated Indebtedness."

Section 5.04 (a), (b) and (c) refers to required deposits to the (a) Interest Account, (b) Principal and Sinking Fund Accounts, and (c) Reserve Accounts, respectively, on account of Outstanding Bonds and Parity Debt of PTAA.

Income Available for Debt Service equals revenues minus current expenses, subject to certain adjustments.

Revenues means revenues from PTI as determined in accordance with general accepted accounting principles, but revenues do not include, among other things, grants, the proceeds of bonds or any debt, proceeds from the sale of property, and PFCs or CFCs unless designed as receipts by PTAA.

Current Expenses means PTAA's current expenses for the operation, maintenance and repair of PTI as determined in accordance with generally accepted accounting principles, but current expenses do not include, among other things, allowances for depreciation and amortization, reserves for extraordinary replacements or repairs, and debt service payments on bonds, parity debt, or subordinated indebtedness of PTAA.

The Bond Order provides that PTAA may issue additional bonds or parity debt secured by net receipts of PTAA provided that certain conditions are satisfied (Additional Bonds Test). Proceeds from additional Bonds can be used for the construction or completion of any additional project or the refunding or refinancing of any bonds, parity debt or subordinated indebtedness, subject to compliance with specified requirements. Any additional bonds and parity debt will be secured by a pledge of and lien upon the net receipts on a parity basis with the outstanding bonds. The Bond Order also permits PTAA, subject to compliance with specified requirements, to incur subordinated indebtedness, which includes Revenue Bond Anticipation notes (if designated as subordinated indebtedness) and Grant Anticipation notes.

8.3.2 AIRLINE AGREEMENT

PTAA has the power to establish airline fees and charges by regulation subject to the FAA Policy Regarding Airport Rates and Charges. It has done so from time to time, for example, with respect to landing fees for certain scheduled air carriers and certain charter, supplemental or commuter air carriers, or users which are not lessees of PTI passenger terminal. Generally, however, PTAA prefers to enter into leases or other agreements with the major users of PTI.

PTAA has entered into separate Airline Agreements with various airlines operating at PTI for a three-year term expiring December 31, 2011, with no renewal options. The Airline Agreement sets out terms and conditions for use and occupancy of PTI and establishes the methodology for calculating landing fees, terminal rental rates, and charges for aircraft parking positions payable by each airline. For the purpose of this analysis, it was assumed that provisions of the Airline Agreement relating to the calculation of airline rentals, fees, and charges would continue through the forecast period.

The Airline Agreement provides for a compensatory rate-setting methodology. Under this methodology, costs (primarily depreciation of assets, imputed interest related to such assets, and maintenance and operating expenses) are allocated to airline and non-airline cost centers defined in the Airline Agreement.

Under certain conditions, a portion of the revenues from rental car, food and beverage, merchandise, and other terminal concessions is used to reduce costs in the Terminal Area cost center (Credit Adjustment). Airlines pay their share of costs in airline cost centers in proportion to their use of airline cost centers, as measured by aircraft landed weight, terminal space under lease, and assigned apron positions. PTAA recovers the costs allocated to non-airline cost centers through non-airline revenues, such as those from parking, rental car, in-terminal concessions, and various land and building rentals. If revenues are not sufficient to meet the Rate Covenant or other obligations, the signatory airline are under no obligation to pay higher rents, fees, or charges to make up the shortfall. The Airline Agreement contains no Majority-In-Interest (MII) provision limiting PTAA's control over its operating or capital budgets.

PTAA's annual budget is for fiscal years ending June 30 while the airline rates and charges are adjusted on a calendar year basis. The rate adjustment reflects the actual cost to operate PTI in the prior fiscal year. PTAA, in its discretion, can adjust the landing fee rate during the course of a calendar year, but not more than twice in any given calendar year.

Landing fees are calculated based on the landing fee requirement and total aircraft landed weight. The landing fee requirement includes the depreciation and imputed interest calculated by PTAA in connection with the Airfield Area cost center, the interest cost associated with land in this cost center, and maintenance, operating and administrative expenses of the prior fiscal year based on audited financial data. The requirements are adjusted to account for the overpayment or underpayment during the prior fiscal year resulting from overestimates or underestimates of landed weight. The landing fee requirement is divided by the estimated total landing weight at PTI, including military and general aviation activities for which PTAA does not charge a landing fee.

Terminal rental rates are calculated based on the passenger terminal building requirement and total revenue-producing space. The passenger terminal building requirement includes the depreciation and imputed interest calculated by PTAA in connection with the Passenger Terminal Building and maintenance, operating and administrative expenses of the prior fiscal year, based on audited financial data. The requirements are offset by a Credit Adjustment, calculated as the sum of (i) 40 percent of total concession and consumer services revenues in the Passenger Terminal Building between $2,000,000 and $5,000,000 and (2) 20 percent of such revenues exceeding $5,000,000. However, if PTAA is not meeting the Rate Covenant in a given fiscal year, the Credit Adjustment will not be applied to the passenger terminal building requirement in the following calendar year. PTAA bears the vacancy risk without the ability to adjust the rate during the course of a calendar year.

The ratio of airline payments per enplaned passenger (Cost per Enplaned Passenger or CPE) is a common measure of cost that passenger airlines pay to access the air travel market through an airport. At PTI, the payments by passenger airlines for landing fees, terminal rentals, and apron fees in relation to enplaned passengers is set out in **Table 8-1**.

TABLE 8-1
AIRLINE COST PER ENPLANED PASSENGER
PIEDMONT TRIAD INTERNATIONAL AIRPORT
(FOR THE FISCAL YEAR ENDING JUNE 30)

	FY2004	FY2005	FY2006	FY2007A	FY2008A
Passenger Carrier Fees					
Landing Fees	$ 1,765,872	$ 2,127,540	$ 1,884,039	$ 1,929,213	$ 1,733,137
Apron Fees	307,818	332,706	320,468	313,192	357,894
Terminal Bldg Rental	4,096,543	4,094,210	4,219,973	5,102,006	5,444,320
Total Passenger Carrier Payments	$ 6,170,233	$ 6,554,456	$ 6,424,480	$ 7,344,411	$ 7,535,351
Enplaned Passengers	1,323,622	1,390,179	1,187,181	1,051,259	1,174,230
% Change	5.4%	5.0%	-14.6%	-11.4%	11.7%
Pssgr Carrier Pymts per Enplaned Pssgr	$ 4.66	$ 4.71	$ 5.41	$ 6.99	$ 6.42

Source: Piedmont Triad Airport Authority.

PTAA has agreed not to grant more favorable terms to other airlines that make substantially similar use of PTI, operate substantially similar aircraft, and utilize substantially similar facilities to those of the signatory airlines unless the same terms, rights and privileges are concurrently made available to the signatory airlines.

8.3.3 AIR SERVICE INCENTIVE PROGRAM

In October 2007, PTAA approved an Air Service Incentive Program, which is to be in effect from January 1, 2008, through December 31, 2010. PTAA is to pay the passenger airlines $2.15 for each passenger on nonstop flights from PTI to airports not currently served nonstop from PTI. The offer is valid only for one airline per new airport on a first-come, first-served basis. The payment from PTAA to any airline may not exceed the amount of that airline's landing fees for its nonstop flights to qualifying destinations, and the proportion of its other airport charges attributable to such service, in any given quarter. For the purpose of this analysis, it was assumed that no incentive would be paid during the forecast period.

8.4 PTAA DEVELOPMENT PLANS

This section considers the cost and phasing of the following development plans: (1) the existing Capital Improvement Program, (2) Phase 1 of the Land Acquisition Program, and (3) the Short-Term and the Medium-Term Airport Master Plan Update projects. **Table 8-2** summarizes the schedule of costs for these capital projects.

TABLE 8-2
CAPITAL PROJECTS
PIEDMONT TRIAD AIRPORT AUTHORITY
(FOR THE FISCAL YEAR ENDING JUNE 30)

	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	Estimated Project Cost (escal. dollars)
Capital Improvement Program - In Progress												
Airport Expansion Project	$19,241,250	$ 3,901,250	$ 104,000	$ 18,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 23,264,500
PTAA Projects												
Taxiway E Connector Between J and K	1,800,000	-	-	-	-	-	-	-	-	-	-	1,800,000
Taxiway D Extension to Taxiway H	7,667,000	-	-	-	-	-	-	-	-	-	-	7,667,000
Land Acquisition	3,000,000	-	-	-	-	-	-	-	-	-	-	3,000,000
Land Improvements	2,000,000	-	-	-	-	-	-	-	-	-	-	2,000,000
Remote ARFF/Command Center/Vehicle	5,595,000	-	-	-	-	-	-	-	-	-	-	5,595,000
FIS Facility	200,000	200,000	200,000	200,000	1,700,000	-	-	-	-	-	-	2,500,000
Replace ATCT	-	1,000,000	4,000,000	6,000,000	16,000,000	-	-	-	-	-	-	27,000,000
Other Projects	3,392,260	325,000	325,000	250,000	-	-	-	-	-	-	-	4,292,260
Total Capital Improvement Program - In Progress	$42,895,510	$ 5,426,250	$ 4,629,000	$ 6,468,000	$ 17,700,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 77,118,760
(0 -5 Years) Short-Term Airport Master Plan Projects												
Land Acquisition Program (Phase 1)	$ -	$ 1,000,000	$ 2,000,000	$ 2,000,000	$ 3,000,000	$ 5,000,000	$ -	$ -	$ -	$ -	$ -	$ 13,000,000
Miscellaneous Terminal Improvements	-	-	1,000,000	-	-	-	-	-	-	-	-	1,000,000
Noise Mitigation	500,000	1,000,000	2,000,000	2,000,000	2,000,000	2,500,000	-	-	-	-	-	10,000,000
Relocate and Upgrade ASR-9	-	-	-	4,000,000	8,000,000	-	-	-	-	-	-	12,000,000
SMGCS Update	-	-	-	4,000,000	4,000,000	-	-	-	-	-	-	8,000,000
Runway 14/32 Rehabilitation	-	-	-	1,000,000	2,200,000	-	-	-	-	-	-	3,200,000
Relocate ASOS	-	-	-	-	100,000	-	-	-	-	-	-	100,000
High Speed Taxiway to Runway 5R/23L	-	-	-	-	-	3,000,000	-	-	-	-	-	3,000,000
Total Short-Term Airport Master Plan Projects	$ 500,000	$ 2,000,000	$ 5,000,000	$ 13,000,000	$ 19,300,000	$ 10,500,000	$ -	$ -	$ -	$ -	$ -	$ 50,300,000
(6-10 Years) Medium-Term Airport Master Plan Projects												
Land Acquisition Program (Phase 1) Continues	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,000,000	$ 7,000,000	$ 8,000,000	$ 8,000,000	$ 9,000,000	$ 37,000,000
Prep for Fedex Phase 2	-	-	-	-	-	-	12,500,000	12,500,000	-	-	-	25,000,000
Runway 5R/23L Extension Program (to Northeast)	-	-	-	-	-	-	-	20,000,000	20,000,000	-	-	40,000,000
Runway 5R/23L Group VI Upgrade	-	-	-	-	-	-	-	10,000,000	10,000,000	-	-	20,000,000
Fence Relocations/Replacements/Upgrade	-	-	-	-	-	-	-	-	-	2,000,000	-	2,000,000
Stormwater System Repairs/Replacement	-	-	-	-	-	-	-	-	-	5,000,000	-	5,000,000
Terminal Apron Pavement Repairs/Replacement	-	-	-	-	-	-	-	-	-	-	20,000,000	20,000,000
Total Medium-Term Airport Master Plan Projects	$ -	$ -	$ -	$ -	$ -	$ -	$ 17,500,000	$ 49,500,000	$ 38,000,000	$ 15,000,000	$ 29,000,000	$ 149,000,000
Grand Total	$43,395,510	$ 7,426,250	$ 9,629,000	$ 19,468,000	$ 37,000,000	$ 10,500,000	$ 17,500,000	$ 49,500,000	$ 38,000,000	$ 15,000,000	$ 29,000,000	$ 276,418,760

Source: Piedmont Triad Airport Authority.

8.4.1 *CAPITAL IMPROVEMENT PROGRAM*

PTAA's Capital Improvement Program (CIP) includes the Airport Expansion Project and various other construction and acquisition projects (PTAA Projects).

The Airport Expansion Project, which is substantially complete, consists of four main elements: (1) improvements to a 165-acre site leased to Federal Express (FedEx) on which it constructed Phase 1 of its Mid-Atlantic Hub (Initial Hub Facility); (2) relocation of Bryan Boulevard; (3) construction of a 9,000-foot runway parallel to the existing Runway 5R/23L including land acquisition, site preparation, environmental mitigation, and related airfield improvements (Runway Program); and (4) improvements to a 70-acre site leased to the Honda Aircraft Company on which it is constructing a jet aircraft office, research, and manufacturing facility (HondaJet Project).

In addition to the Airport Expansion Project, PTAA Projects include various other construction and acquisition projects such as land purchases, land improvements, an Airport Rescue and Firefighting Facility (ARFF), a facility for Federal Inspection Services (FIS), and an Airport Traffic Control Tower (ATCT), among others. Most costs ($258 million) of the CIP had been expended by June 2009, leaving only $43 million in FY 2010 and $34 million thereafter to be spent. **Figure 8-1** depicts Phase 1 Recommended Capital Improvement Program projects.

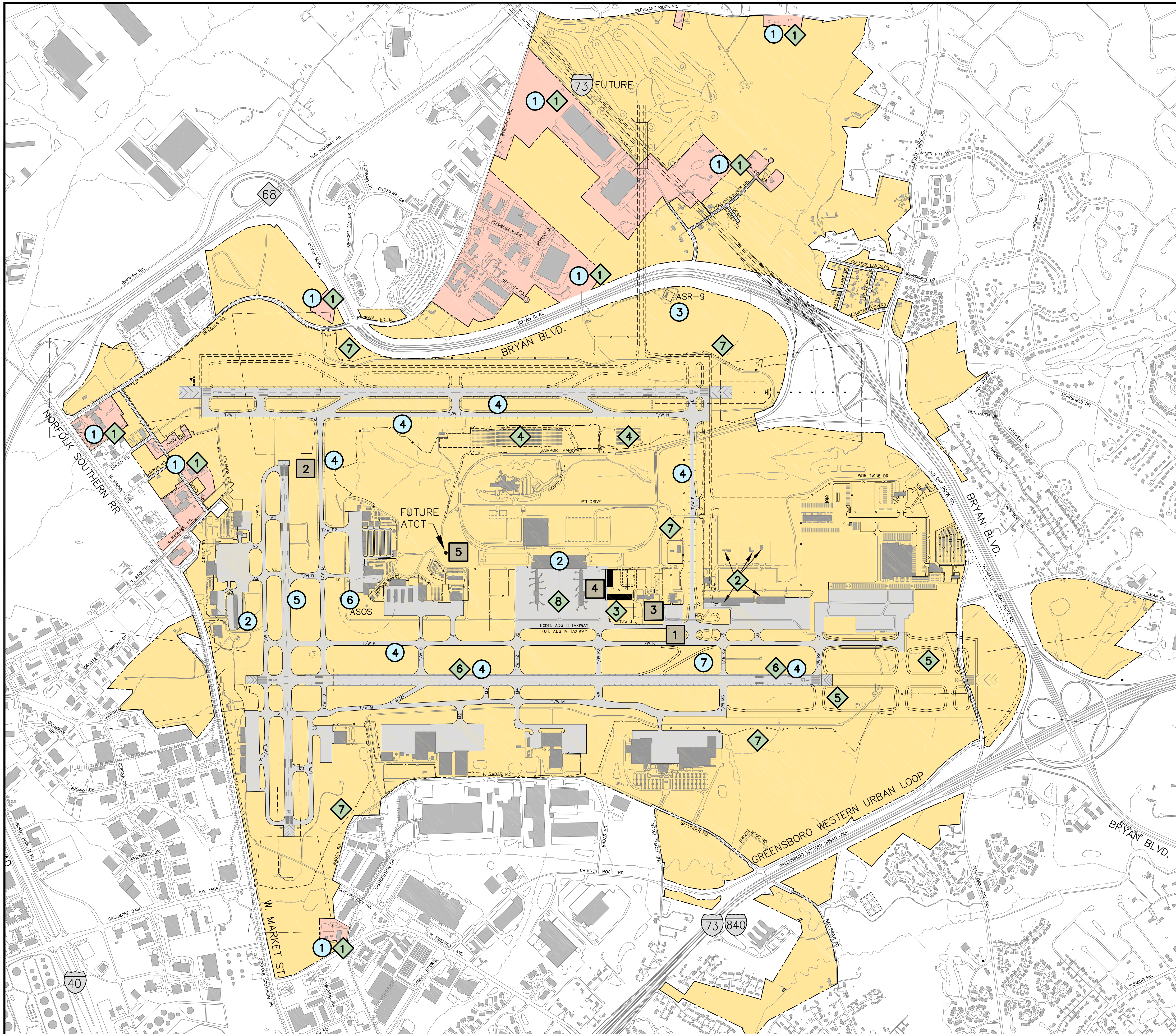
8.4.2 *LAND ACQUISITION PROGRAM*

The Land Acquisition Program is described in Chapter 6 of this Airport Master Plan Update report. The Land Acquisition Program (Phase 1) will be completed within the 10-year period with an estimated cost of $50 million.

8.4.3 *SHORT-TERM AND MEDIUM-TERM AIRPORT MASTER PLAN UPDATE PROJECTS*

The projects identified in Airport Master Plan Update are described in Chapter 6 of this Airport Master Plan Update report. This financial analysis considers the Short-Term and Medium-Term Airport Master Plan Update projects. The Short-Term projects, which includes the Land Acquisition Program for presentation purposes, are projected to occur in years 0 through 5 (FY 2010 through FY 2015) and are estimated to cost approximately $50 million, including $13 million for the Phase 1 of the Land Acquisition Program. The Medium-Term projects are projected to occur in years 6 through 10 (FY 2016 through FY 2020) and are estimated to cost approximately $149 million, including $37 million for continuance of Phase 1 Land Acquisition Program.

A number of Airport Master Plan Update projects are contingent on other events. For example, the project entitled Prep for FedEx Phase 2 is dependent on FedEx exercising its option under a lease with PTAA to add additional option areas to the initial premises. If FedEx exercises its option, PTAA would then be obligated, at its expense (and subject to a fair market land rental, to relocate the tenant facilities currently located within the option area (including air cargo buildings now located within one of the two apron areas), to rough grade the site, to provide any additional storm water runoff capacity that may be needed and to construct a taxiway stub to the option area. FedEx would be obligated to construct an additional aircraft apron on the option area; or a project of comparable cost approved by PTAA.



LEGEND

- EXISTING AIRPORT PROPERTY LINE
- FUTURE AIRFIELD PAVEMENT
- ULTIMATE AIRFIELD CAPABILITY
- EXISTING AIRFIELD PAVEMENT
- EXISTING AIRFIELD BUILDING
- EXISTING AIRPORT PROPERTY (3,940± ACRES)
- FUTURE LAND ACQUISITION (PHASE 1 – 243± ACRES)

CURRENT CAPITAL IMPROVEMENT PROGRAM

1. TAXIWAY E CONNECTOR BETWEEN J AND K
2. TAXIWAY D EXTENSION TO TAXIWAY H
3. REMOTE ARFF/COMMAND CENTER
4. FIS FACILITY
5. REPLACE ATCT

0–5 YEAR PLANNING PERIOD

1. LAND ACQUISITION PROGRAM (PHASE 1)
2. MISCELLANEOUS TERMINAL IMPROVEMENTS
3. RELOCATE AND UPGRADE ASR–9 (LOCATION TO BE DETERMINED)
4. SMGCS UPGRADE
5. RUNWAY 14/32 REHABILITATION
6. RELOCATE ASOS (LOCATION TO BE DETERMINED)
7. HIGH SPEED TAXIWAY TO RUNWAY 5R/23L

6–10 YEAR PLANNING PERIOD

1. LAND ACQUISITION PROGRAM (PHASE 1) CONTINUES
2. AIR CARGO BUILDINGS #2 & #3 AND RENTAL CAR DEMOLITION/SITE PREPARATION FOR FEDEX PHASE 2
3. AIR CARGO BUILDINGS #2 & #3 REPLACEMENT AS PART OF SITE PREPARATION FOR FEDEX PHASE 2
4. CAR RENTAL REPLACEMENT AND REMOTE MISCELLANEOUS PARKING AS PART OF SITE PREPARATION FOR FEDEX PHASE 2
5. RUNWAY 5R/23L EXTENSION PROGRAM (TO NORTHEAST)
6. RUNWAY 5R/23L GROUP VI UPGRADE
7. FENCE RELOCATIONS/REPLACEMENTS/UPGRADE
8. TERMINAL APRON PAVEMENT REPAIRS/REPLACEMENT

N

2000 0 2000

GRAPHIC SCALE IN FEET

PIEDMONT TRIAD INTERNATIONAL AIRPORT

Airport Master Plan Update

URS

PTAA PIEDMONT TRIAD AIRPORT AUTHORITY

PHASE 1 – RECOMMENDED CAPITAL IMPROVEMENT PROGRAM

FIGURE 8-1

J:\Greensboro Master Plan Update\MPU REPORT\Section 08 – Financial Plan\Figures\FIG 8-1.DWG 11/24/2010 13:44

8.5 PTAA FUNDING PLANS

This section considers the potential funding of the following development plans: (1) the Capital Improvement Program, (2) the Land Acquisition Program, and (3) the Short-Term and the Medium-Term Airport Master Plan Update projects. **Table 8-3** summarizes the funding sources for the development plans.

8.5.1 CAPITAL IMPROVEMENT PROGRAM

The CIP is being funded through a combination of AIP grants including an FAA Letter of Intent (LOI), North Carolina Department of Transportation (NCDOT) grants, local grants, proceeds of bonds issued under the Bond Order, and internally generated funds drawn from PTAA's General Fund.

8.5.1.1 AIP Grants

PTAA is eligible to receive grants-in-aid from the FAA under the Airport Improvement Program (AIP) for up to 95 percent of the allowable costs of eligible projects. AIP entitlement grants for PTI are annual amounts calculated based on the number of enplaned passengers and a legislated per passenger formula. AIP cargo entitlement grants are similar, but substantially lesser amounts, calculated based on the landed weight of all-cargo aircraft and a legislated per pound formula. AIP discretionary grants are awarded on the basis of the FAA's determination of priorities for projects at PTI in relation to funding priorities for the national airport system.

The FAA issues Letters of Intent to airports that meet applicable statutory requirements. An LOI represents the FAA's intention to provide AIP discretionary grants for multi-year capacity enhancement projects, subject to annual appropriations by Congress and availability of funds. As a condition of receiving an LOI, the FAA usually requires an airport to commit all AIP entitlement grants to the project over the life of the LOI. An airport that has received an LOI may proceed with the project without waiting for individual AIP grants. The airport is assured that the allowable costs related to the approved project remain eligible for reimbursement, subject to the payment schedule set forth in the LOI.

For purposes of this analysis, it was assumed that Congress will pass a reauthorization bill for the AIP program or extend the current authorization so that no lapse in AIP funding authority will occur during the forecast period, and that the FAA participation rate for eligible projects for small hubs such as PTI would stay at 95 percent.

TABLE 8-3
CAPITAL PROJECT FUNDING PLAN
PIEDMONT TRIAD AIRPORT AUTHORITY
(FOR THE FISCAL YEAR ENDING JUNE 30)

	Estimated Funding Sources						
	State	AIP Grants		PTAA		Other	
	Grants	Entitlement	Discretionary	Internal Funds	Future Bonds	Unspecified Sources	Total
Capital Improvement Program - In Progress							
Airport Expansion Project	$ 14,584,414	$ -	$ 4,370,637	$ 4,309,449	$ -	$ -	$ 23,264,500
PTAA Projects							
Taxiway E Connector Between J and K	-	-	1,710,000	90,000	-	-	1,800,000
Taxiway D Extension to Taxiway H	-	-	7,283,650	383,350	-	-	7,667,000
Land Acquisition	-	-	-	3,000,000	-	-	3,000,000
Land Improvements	-	-	-	2,000,000	-	-	2,000,000
Remote ARFF/Command Center/Vehicle	-	-	5,595,000	-	-	-	5,595,000
FIS Facility	-	-	2,375,000	125,000	-	-	2,500,000
Replace ATCT	-	-	25,650,000	1,350,000	-	-	27,000,000
Other Projects	-	-	538,897	3,753,363	-	-	4,292,260
Total Capital Improvement Program - In Progress	$ 14,584,414	$ -	$ 47,523,184	$ 15,011,162	$ -	$ -	$ 77,118,760
(0 -5 Years) Short-Term Airport Master Plan Projects							
Land Acquisition Program (Phase 1)	$ -	$ -		$ -	$ -	$ 13,000,000	$ 13,000,000
Miscellaneous Terminal Improvements	-	-	950,000	50,000	-	-	1,000,000
Noise Mitigation	-	-	9,500,000	500,000	-	-	10,000,000
Relocate and Upgrade ASR-9	-	4,766,124	6,633,876	600,000	-	-	12,000,000
SMGCS Update	-	-	7,600,000	400,000	-	-	8,000,000
Runway 14/32 Rehabilitation	-	-	3,040,000	160,000	-	-	3,200,000
Relocate ASOS	-	-	95,000	5,000	-	-	100,000
High Speed Taxiway to Runway 5R/23L	-	-	2,850,000	150,000	-	-	3,000,000
Total Short-Term Airport Master Plan Projects	$ -	$ 4,766,124	$ 30,668,876	$ 1,865,000	$ -	$ 13,000,000	$ 50,300,000
(6-10 Years) Medium-Term Airport Master Plan Projects							
Land Acquisition Program (Phase 1) Continues	$ -	$ -	$ -	$ -	$ -	$ 37,000,000	$ 37,000,000
Prep for Fedex Phase 2	-	-		25,000,000	-	-	25,000,000
Runway 5R/23L Extension Program (to Northeast)	1,000,000	9,603,233	28,396,767	1,000,000	-	-	40,000,000
Runway 5R/23L Group VI Upgrade	500,000	4,838,058	14,161,942	500,000	-	-	20,000,000
Fence Relocations/Replacements/Upgrade	50,000	-	1,900,000	50,000	-	-	2,000,000
Stormwater System Repairs/Replacement	125,000	-	4,750,000	125,000	-	-	5,000,000
Terminal Apron Pavement Repairs/Replacement	500,000	9,751,447	9,248,553	500,000	-	-	20,000,000
Total Medium-Term Airport Master Plan Projects	$ 2,175,000	$ 24,192,738	$ 58,457,262	$ 27,175,000	$ -	$ 37,000,000	$ 149,000,000
Grand Total	$ 16,759,414	$ 28,958,862	$ 136,649,322	$ 44,051,162	$ -	$ 50,000,000	$ 276,418,760

Source: Piedmont Triad Airport Authority; Jacobs Consultancy.
(a) A portion of the funding shown for Airport Expansion Project is reimbursement for historical cost.

On March 25, 2002, the FAA issued an LOI to PTAA for $108.6 million in AIP grants for the Runway Program. The total LOI amount was subsequently increased to $118.6 million consisting of $60 million in AIP discretionary grants and $58.6 million in AIP entitlement grants. The entitlement grants scheduled in the LOI are based on estimates of the entitlement funding that will be payable to PTAA in future years, which estimates will vary depending on the actual number of enplaned passengers.

The proceeds of the Series 2008A Bonds provided interim financing for a portion of the costs of the Runway Program. PTAA intends to use AIP grants under the LOI, to the extent received by PTAA in 2008 through 2014, to pay principal and interest on the Series 2008A Bonds as they become due, and to redeem portions of the Series 2008A Bonds prior to their maturity.

In addition, PTAA expects to receive $47.5 million in AIP discretionary grants from the FAA for RSA, taxiway, remote Aircraft Rescue and Firefighting Facility station and vehicle, FIS facility, replacement of the ATCT, and other eligible projects. Replacement of the ATCT is one of the largest CIP components with an estimated cost $27 million, with 95% anticipated to be funded from a discretionary grant when the project is undertaken.

8.5.1.2 NCDOT Grants

PTAA entered into a Reimbursement Agreement with NCDOT for up to $52.0 million of the cost to relocate Bryan Boulevard and expects to enter into an agreement with NCDOT to be reimbursed over a period of years for the HondaJet Project. NCDOT is expected to provide matching shares for AIP-eligible projects, including runway, taxiway, and noise mitigation, up to $500,000 annually. PTAA expects to receive $14.6 million NCDOT grants and reimbursements in FY 2010 and beyond.

8.5.1.3 Bond Proceeds

While some airports are able to issue general obligation bonds secured solely or primarily by a pledge of the full faith, credit, and taxing power of the sponsoring jurisdiction, it is assumed that, consistent with its enabling legislation, PTAA can and will only issue general airport revenue bonds under its Bond Order. Such bonds are secured by a pledge of PTAA's net receipts, and special facility revenue bonds.

PTAA had $154 million of airport revenue bonds outstanding under the Bond Order as of June 30, 2009 for the various series issued in 1999, 2001, 2004, 2005, and 2008. As of this date, there is no subordinated indebtedness outstanding.

Under the Bond Order, PTAA can also issue special facility revenue bonds to finance special purpose facilities provided, among other things, that the debt service on such bonds is not secured by or payable from PTAA's net receipts and that the operation and maintenance costs of such special purpose facilities do not constitute current expenses under the Bond Order.

PTAA last issued special facility revenues bonds in 1992 to finance the Cessna Aircraft Company Project. Pursuant to a lease between Cessna and PTAA, Cessna pays a basic hangar rent directly to the bond trustee in an amount sufficient to pay the debt service on the special purpose facility. Payment of debt service is guaranteed by a letter of credit issued on behalf of Cessna. PTAA, which was the conduit for the issuance of the bonds, has no obligation to pay or guarantee payment of the debt service. Additionally, Cessna is responsible for all costs to maintain and operate the hangar, and Cessna pays a land rent to PTAA, which constitutes Revenues of PTAA.

PTAA has funded a portion of the CIP with the proceeds of outstanding Bonds, but it does not expect to issue additional Bonds or special facility revenue bonds to fund the remaining costs of the CIP.

8.5.1.4 General Fund

After paying all obligations under the Bond Order, the remaining revenues, if any, represent discretionary cash flow and are deposited into Authority's General Fund for any legal Airport purpose. The ability of an airport to generate and accumulate discretionary cash flow is often a critical element of the financing plan for a major development program. The amount of money an airport can generate is often a function of the particular business arrangements negotiated with the airlines and other tenants and amount of traffic-related revenue from parking, rental car, and various in-terminal concessions. The application of internally generated cash surpluses to front-end planning, design, and land acquisition costs can reduce the financing costs associated with large airport development programs by deferring the need to issue debt and thereby reducing the amount of capitalized interest (the interest costs during construction that are usually paid from bond proceeds). Capitalized interest is often a significant portion of the total financing costs.

PTAA plans to use General Fund moneys to permanently fund $15 million of the CIP expenditures from FY 2010 to FY 2020.

PTAA would be responsible for costs of the CIP in excess of the costs that are covered by AIP, NCDOT and other local grants. This situation might arise if costs of the CIP increased, if the full amount of the protected grants is not forthcoming, or if promises to make a grant were not honored. Depending on the specifics of the situation, PTAA might reach into its General Fund to cover the additional costs or, alternatively, it might opt to issue additional bonds.

8.5.1.5 Passenger Facility Charges

Passenger Facility Charges (PFCs) are fees imposed on enplaned passengers by airport sponsors for the purpose of generating revenues for airport projects that are eligible; preserve or enhance capacity, safety, or security; reduce noise; or furnish opportunities for enhanced competition; and is adequately justified. PFCs were established by Title 49 U.S.C. §40117, which authorized airport sponsors to collect PFCs in the amount of $1.00 to $3.00 per enplaning originating and connecting passenger. AIR-21 increased the maximum PFC airport sponsors could collect to $4.50 per enplaning originating and connecting passenger.

According to the law, airport sponsors can apply to the Secretary for the right to levy a PFC, and the Secretary must approve or disapprove a substantially complete application within 120 days. Any PFC so approved is to be a separate charge printed on each passenger ticket and collected by the airlines. Passengers are limited to two such charges per one-way trip for a total of four on round trips. Revenues generated from PFCs collected in the amount of $1.00, $2.00, or $3.00 must meet the adequate justification provision and have certain prescribed uses, specifically:

- PFC-funded portions of capital costs cannot be included in the airline rate base, with the exception of terminal or other facilities used on an exclusive or preferential basis, in which case an airport must charge a rate for these facilities comparable to the rates for like facilities. Likewise, PFC revenues cannot be credited to the airlines in the calculation of airline rates, fees, and charges. Airport sponsors must give airlines written notice of proposed PFC-supported projects and meet with the airlines regarding the projects. While the airlines cannot veto the project, they can issue a "certificate of agreement or disagreement" expressing their support or disagreement with the project.

- PFC revenues can be used for the matching local share of an AIP project; to pay debt service on eligible projects but not operating and maintenance expenses of such projects.

- PFC revenues must be spent at the airport generating them or at another airport within the airport sponsor's system. The law preempts state or local laws preventing airports from imposing PFCs and overrides any airline agreement that may prohibit PFCs.

In order to impose a PFC of $4.00 or $4.50, the airports must show that the PFC funded projects make a significant contribution to: (a) improving the air safety and security, (b) increasing competition among air carriers, or (c) reducing the impact of aviation noise on people living near the airport. Moreover, the project cannot be paid for from AIP funds reasonably expected to be available.

In return for the right to assess PFCs in the amount of $1.00 to $3.00, large and medium-hub airports will forego up to 50 percent of their AIP entitlement funds. Large and medium-hub airports that collect a PFC of $4.00 or $4.50 must forgo 75 percent of their AIP entitlement funds. Such foregone entitlements are to be deposited into an AIP discretionary fund to be used for projects at small-hub, non-hub, and general aviation airports, and for capacity enhancement. Small-hub airports like PTI do not forgo any of their AIP entitlement funds.

PTAA does not currently impose a PFC, and no PFC revenue is reflected in this analysis.

8.5.1.6 Customer Facility Charges

A CFC is a charge established and levied by many airports on rental car companies or on the customers of rental car companies in order to pay for facilities used by the companies and their customers. Such facilities include, for example, quick-turn facilities, consolidated fuel facilities, consolidated rental car facilities, and other facilities specifically related to such facilities. A CFC is typically charged per rental car transaction (contract) or per rental car transaction day. The rental car companies collect, account for, and remit CFC revenues to airports. Airports use CFC revenues either on a Pay-As-You-Go (PAYGO) or leveraged basis to pay for the appropriate costs of “rental car” facilities.

PTAA does not currently impose a CFC, and no CFC revenue is reflected in this analysis.

8.5.2 LAND ACQUISITION PROGRAM

Land acquisition plans for future airport development are motivated by various factors such as the possibility of price appreciation, the possibility of encroachment by incompatible uses, and the possibility that the land might not be available for airport use in the future when it is needed. Land acquisition plans are constrained, however, by funding challenges that reflect the substantial uncertainty associated with such plans and the burden of funding an asset that is not immediately productive or reimbursable from AIP grants. It is reasonable to expect development proposals to change as the perceived need changes. It is also reasonable to expect PTAA's acquisition decisions to be responsive to changing circumstances; to act when the right combination of circumstances presents a feasible opportunity. For this reason, the analysis does not include a funding plan for the Land Acquisition Program. (In **Table 8-3**, funding of the $50 million for land acquisition is shown as coming from "Other Unspecified Sources".) The discussion below outlines some of the more salient issues affecting airport land acquisition for future development.

Land banking is the practice of acquiring land for airport development sooner than might be necessary in order to insure its future availability and to make the acquisition more economical or practical.

PTAA is motivated to acquire land in pursuit of its mission to serve the public's interest in air transportation. Hence, PTAA does not evaluate its land acquisition decisions solely in terms of return on investment. However, a property that produces or is capable of producing an income on a temporary basis can materially enhance the economics of an acquisition even though PTAA may find itself in a real estate market with competing properties seeking the same base of potential tenants. Indeed, banked land, because it is not AIP eligible until the airport development potential is realized, is often not feasible unless it is supported by income properties.

This section considers various funding and strategy options for PTAA including:

- AIP grants.
- Passenger Facility Charges.
- General Fund and Bond proceeds.
- Tenant, third parties and other sources.

8.5.2.1 AIP Grants

Land acquisition is AIP-eligible when it is necessary for current or future airport development. Even before the land is necessary for current or future airport development, an airport can expend its own funds to acquire property and subsequently apply for reimbursement through an AIP grant when the airport development potential is realized. It is generally best to minimize the time between actual acquisition of land and its subsequent development for airport purposes.

The FAA considers current airport development to be construction of an aeronautical project within 5 years of acquisition of the land. Land acquisition for current airport development is AIP eligible when it is necessary for: (a) airside development such as runways, taxiways, safety areas, ramps, and the adjacent land required by separation and clearance standards; (b) protection of approach areas required to convey a right of flight; (c) landside development such as hangars, equipment buildings, Fixed Base Operator (FBO) buildings, and other buildings needed in connection with the operation and maintenance of the airport but not including development of industrial or non-aeronautical commercial areas; (d) installation of an airport-owned navigation system or a relocation site for an ATCT; and, (e) right-of-way for drainage, sanitary sewers, storm water runoff, utility lines that are located outside the airport boundary.

The FAA considers future airport development to be construction of an aeronautical project between 5 and 20 years of acquiring the land. The FAA will not fund land acquisition for future airport development until the following conditions have been satisfied:

- There is a valid aeronautical need for the land.
- The site selected has been approved by the FAA.
- Airspace clearance for the site has been granted.
- There is an approved airport layout plan.
- Environmental concerns have been identified and addressed in accordance with *National Environmental Policy Act* (NEPA).

Although the FAA has the legal authority to fund land acquisition in anticipation of future needs, land banking is often a lower priority use of available AIP funding given that land purchase for Long-Term, future airport development has distant and less certain benefits. (Indeed, the national priority system used by the FAA in deciding how to distribute AIP discretionary funds does not rate the acquisition of land for future development as a high priority.) Also, FAA's existing grant assurances on airport land disposal may have the effect of acting as a bar to land banking. The FAA may reconsider this policy issue by examining (1) policy options to encourage local communities to adopt policies and practices that would facilitate the acquisition of land in anticipation of future airport needs, (2) changes to FAA land disposal requirements to aid in land banking efforts, and (3) whether Congress should be asked to increase funding to FAA in support of airport land banking initiatives. The analysis assumes no change in FAA policy during the forecast period.

The FAA allows the use of land purchase options by airports, although it is not a common practice. While land banking involves the actual acquisition of land, a land purchase option creates a right to acquire land usually at an established price for a period of time ranging from three months to several years. The cost of an option could be AIP-eligible as a project formulation cost if the option was exercised and the acquisition completed, although reimbursement would not occur until the land acquisition is approved for airport development in a grant agreement.

Land acquisition to insure land uses compatible with the noise level of the airport are also AIP-eligible under certain circumstances.

8.5.2.2 Passenger Facility Charges

Land acquisition is PFC-eligible in connection with aeronautical development projects that address and cost-effectively correct an airport capacity problem in the airfield, the terminal, or ground access areas. The land acquisition is justified based on the justification of the aeronautical development project.

8.5.2.3 General Fund and Bond Proceeds

Land acquisition could be funded on an interim basis, pending AIP reimbursement when its airport development potential is realized, using bond proceeds or available moneys in the General Fund; provided that such interim financing would not jeopardize the Long-Term financial health of PTAA or compromise its ability to undertake projects integral to its core airport business. There is the risk that the airport development potential fails to materialize as planned or materializes over a much longer time period than planned, in which case the "interim" funding may become Long-Term, if not permanent, funding without reimbursement from AIP grants.

Because of the carrying costs, PTAA would not likely issue revenue bonds to finance the acquisition of undeveloped land with no immediate and proven revenue stream. However, PTAA might, under certain circumstances, consider issuing bonds to acquire income property that produced an income on an interim bases like an office building. In such circumstances, PTAA possibly could issue airport revenue bonds on a senior or subordinate lien basis, subject to:

- Approval of the Local Government Commission.
- Satisfaction of the Additional Bonds Test and other covenants in the Bond Order.
- Internal comfort that such a financing would not jeopardize the Long-Term financial health of PTAA or compromise its ability to undertake projects integral to its core airport business.

Given the private business use of the improvements being acquired, any borrowing likely would be at a taxable rate, which is higher than the tax-exempt rate PTAA typically enjoys.

Under exceptional conditions, PTAA might possibly be able to issue special revenue bonds which are secured by and payable from a pledge of the net revenues of a single asset (Project) typically pursuant to a Long-Term lease without recourse to the general revenues of PTAA. Typically, multi-tenant Projects (e.g., consolidated rental car facilities or fuel systems) are more creditworthy and financeable than single-tenant Projects. In 2006, legal challenges brought by bankrupt tenants such as United Airlines challenged whether the underlying agreements were leases or disguised financing agreements, which is a critical distinction in bankruptcy proceedings with profound effects on the security. These legal challenges were disruptive to the market for special revenue bonds. The subsequent credit crisis was also disruptive. As a result, special revenue bond financing of single-tenant facilities have been less frequent. It should be noted that a special revenue bond transaction would also be subject to the approval of the Local Government Commission, satisfaction of PTAA bond covenants, and internal comfort that such a financing would not unduly jeopardize the name and credit reputation of PTAA if there was a default.

The cost to finance the Project likely would be slightly cheaper with general revenue bonds than special revenue bonds; however, risks to the core airport business during the Near-Term would also be substantially greater with general revenue bonds. To mitigate this risk and protect against dilution in debt service coverage, PTAA might seek to insure that the net revenues of the Project would not fall below 1.50x the annual debt service needed to finance the Project. To produce this level of debt service coverage, PTAA could only purchase income properties at a substantial discount.

8.5.2.4 Tenant, Third Parties and Other Sources

Tenants, third parties, and other sources can potentially support the economics of land acquisition either directly or indirectly.

A source of financing for certain elements of major airport development projects is direct tenant investment. This source is typically used for the finishing and equipping of terminal concession space, the construction of rental car service facilities, and the acquisition of depreciable equipment, such as loading bridges and baggage conveyors. As noted above, FedEx funded its cargo facilities and equipment at PTI using corporate resources. Tenant commitments to invest in facilities could help support the economics of land acquisition.

Public-Private Partnerships (PPPs) have the potential to play a meaningful role in developing land and facilities. In PPP arrangements, third-party developers bring private sources of capital to the funding of airport development projects. Such financing can be advantageous to an airport sponsor by (1) preserving the sponsor's bonding capacity for other public-use facilities, (2) offering specialized knowledge and professional management in property development, facility planning, and facility leasing, and (3) avoiding the coverage and reserve requirements of traditional airport revenue bonds. In PPP arrangements, airports have to consider whether to assume more risk in the early startup years of a project; to contribute equity to the financial structure of the project; consider regulatory and tax disincentives that might limit private development; and to confer long concession periods to allow for adequate rates of return. PPP arrangements can take many varied forms. PTAA's ability to participate in a PPP would depend on whether the arrangement complies with North Carolina law and the public purpose limitations imposed on public bodies in North Carolina.

The City of Greensboro and Guilford County have also been a participant in past developments at PTI including water and sewer investments to support the FedEx and HondaJet projects. Public investment typically occurs when state and local governments make direct financial contributions toward the cost of an airport project in recognition of future benefits such as job creation and additional tax revenues brought about by the economic development that follows. Investment by the public sector can be through grants from a general fund or dedicated aviation fund, or grants from the proceeds of economic development bonds issued by state or local governments supported by taxing authority.

8.5.3 Short-Term and Medium-Term Airport Master Plan Update Projects

Table 8-3 also shows projected funding of the Short-Term and Medium-Term Airport Master Plan Update projects.

The entitlement projections are based on the current statutory formula for allocating AIP grant funds and assume the current level of congressional authorization and appropriations. The discretionary grant levels are those additional funds necessary, in combination with General Fund moneys of PTAA that provide the local match share, to fund the remaining costs of the Short-Term and Medium-Term Airport Master Plan Update projects. As noted above, the funding of the Land Acquisition Program is assumed to come from "Other Unspecified Sources".

As discussed in Section 8.5.1.1, PTAA has agreed under the LOI to commit its AIP entitlement grants through FY 2014 to fund the Runway Program. Only then would future AIP entitlement grants be available to help fund the Short-Term and Medium-Term Airport Master Plan Update projects. Between 2015 and 2020, it is estimated that $29 million in AIP entitlement grants would be available for such purposes. PTAA would fund half of the 5 percent local AIP match from NCDOT grants and half from moneys in its General Fund. Total required funding from the PTAA is approximately $27 million and the General Fund is estimated to be sufficient for such purposes. Except for the Land Acquisition Program, as discussed above, all other funding requirements would have to be met from AIP discretionary grants. As described above, AIP discretionary grants are awarded on the basis of the FAA's determination of priorities for projects at PTI in relation to funding priorities for the national airport system. In the event the Authority's projects were not awarded AIP discretionary grant funding, then the Authority would defer them until such funding became available.

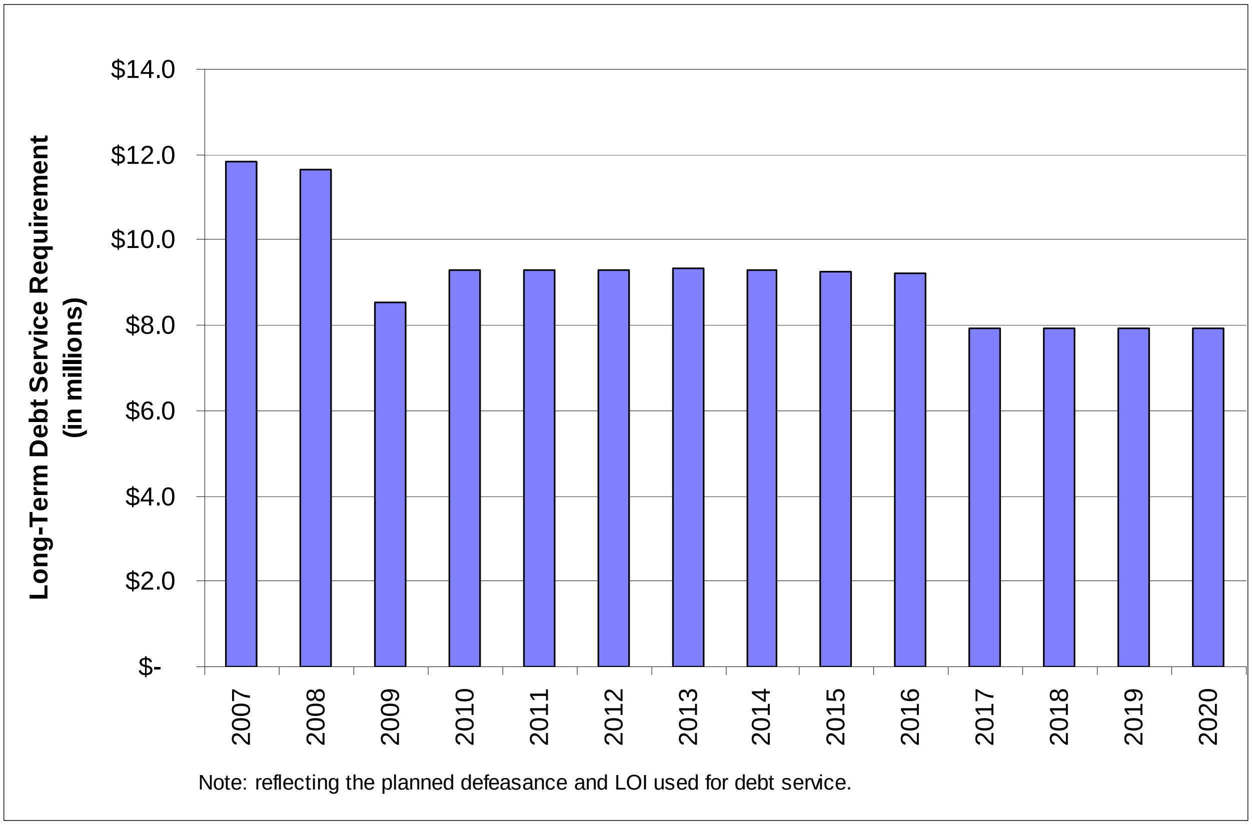
8.6 FINANCIAL ANALYSIS

Financial analysis evaluates the effect of the development plans and funding plans on debt service coverage, airline charges, and other financial metrics indicative of financial feasibility.

8.6.1 LONG-TERM DEBT SERVICE REQUIREMENT

Figure 8-2 shows the projected schedule of Long-Term Debt Service Requirements. As of July 1, 2009, PTAA had eight series of Outstanding Bonds: Series 1999A, Series 1999B, Series 2001A, Series 2001B, Series 2004A, Series 2005A, Series 2008A, and Series 2008B.

FIGURE 8-2
LONG-TERM DEBT SERVICE REQUIREMENT
PIEDMONT TRIAD AIRPORT AUTHORITY
(FOR THE FISCAL YEAR ENDING JUNE 30)



Source: Piedmont Triad Airport Authority; Jacobs Consultancy.

Pursuant to the Bond Order, Long-Term Debt Service Requirement means:

> "… for any period of twelve (12) consecutive calendar months for which such determination is made, the aggregate of the required deposits to be made in respect of principal and interest (whether or not separately stated) on Outstanding Long-Term Indebtedness during such period…"

In calculating the Long-Term Debt Service Requirement for purposes of the Rate Covenant (or the Additional Bonds Test), the Bond Order permits the following amounts, among others, to be excluded: (1) amounts payable from an account for capitalized interest, (2) the Qualified Escrow Fund, and (3) the future proceeds of grants as evidenced, for the purpose of the Additional Bonds Test, by a certificate from an Authorized Officer of PTAA.

PTAA intends to use $51.3 million of LOI receipts in 2008 through 2014 to pay a portion of the debt service (principal and interest) on the Series 2008A Bonds. Such future LOI receipts have been subtracted in the calculation of the Long-Term Debt Service Requirement based on the of projected LOI payments to PTAA.

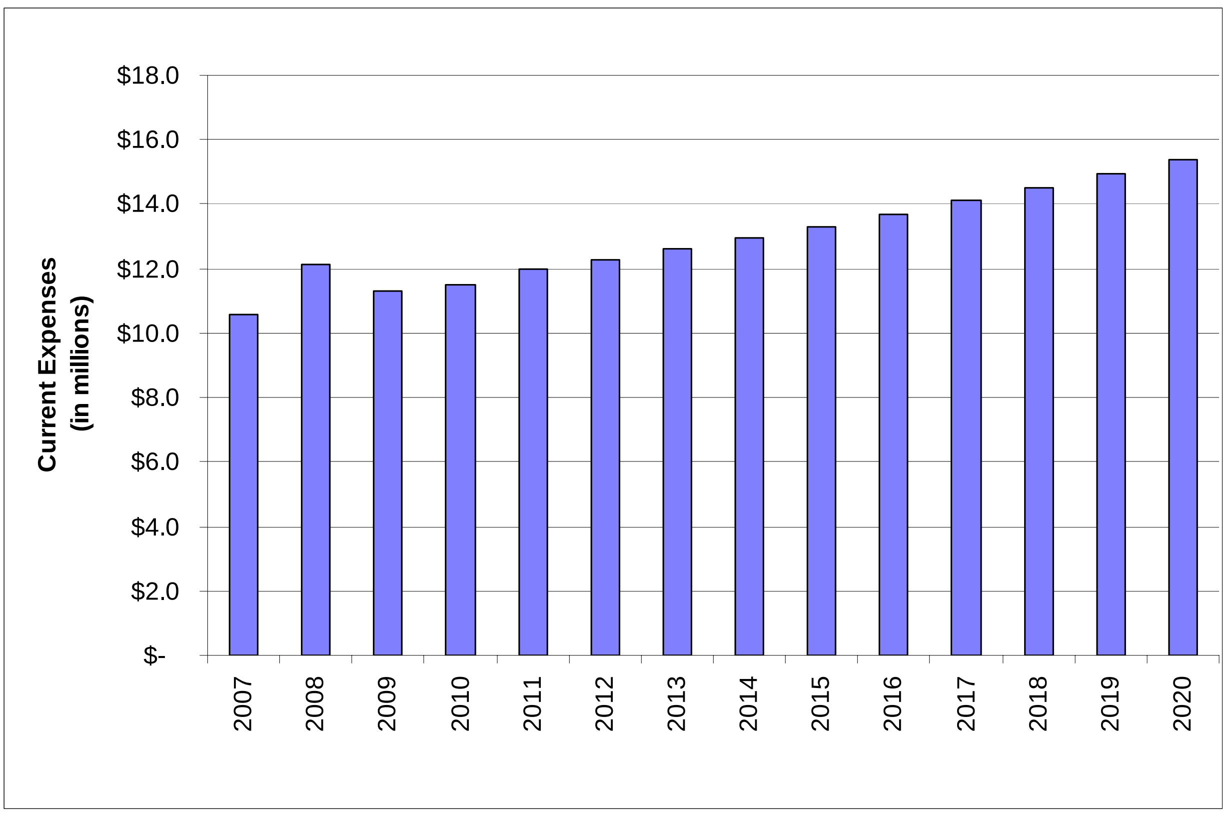
In addition, PTAA defeased a portion of the Series 2001A Bonds in FY 2008 using $10.1 million from General Fund, and it plans to defease another portion of the Series 2001A Bonds in FY 2012 using $8.7 million from General Fund. For the purposes of this analysis, the debt service reduction from the defeasance in FY 2012 is reflected in the calculation of the Long-Term Debt Service Requirement, assuming that the additional defeasance occurs as planned.

Annual debt service is projected to increase from $8.5 million in FY 2009 to $9.3 million in FY 2010 and remain at that level through FY 2016. After the maturity of the Series 2001A Bonds and the Series 2004A Bonds in FY 2016, debt service will moderate to about $8.0 million. After the maturity of the Series 1998B Bonds and the Series 2001B Bonds in FY 2021, annual debt service will decrease to $6.7 million and further to $4.8 million in FY 2025, providing more funding capacity for the Long-Term Airport Master Plan Update projects.

8.6.2 CURRENT EXPENSES

Figure 8-3 presents current expenses showing historical data for FY 2007 and FY 2008, estimated results for FY 2009, budgeted amount for FY 2010 and projected results for FY 2011 through FY 2020.

FIGURE 8-3
CURRENT EXPENSES
PIEDMONT TRIAD AIRPORT AUTHORITY
(FOR THE FISCAL YEAR ENDING JUNE 30)



Source: Piedmont Triad Airport Authority; Jacobs Consultancy.

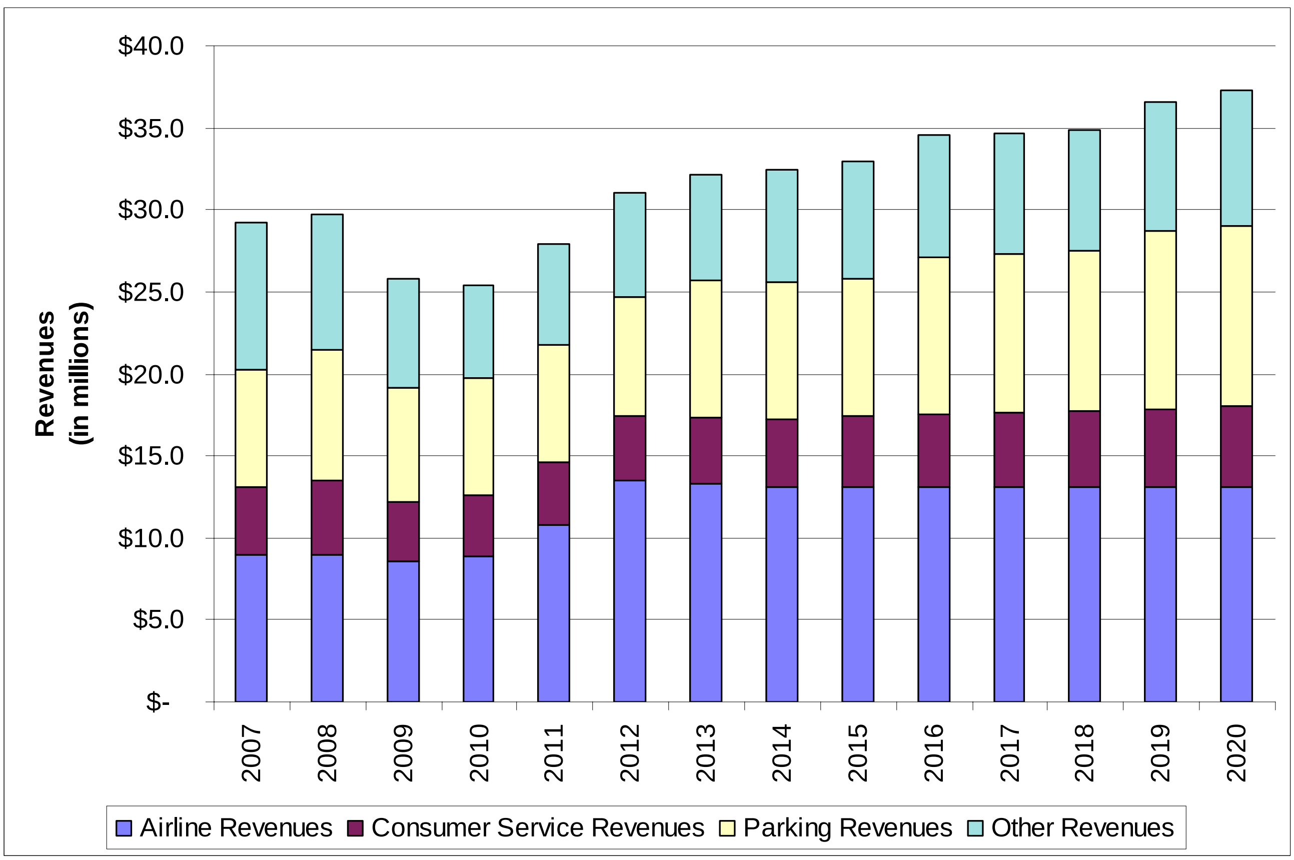
Current expenses increased from $10.6 million in FY 2007 to $12.1 million in FY 2008. In order to cope with the recent economic downturn and the decline in traffic, PTAA implemented a series of cost cutting strategies including a freeze on hiring and tighter controls over travel expenses and contractual services. Current expenses are estimated to decline to $11.3 million in FY 2009 and are budgeted at $11.5 million in FY 2010.

The base current expenses are projected to increase approximately 3 percent annually through FY 2020. In addition to the base current expenses, it is anticipated that starting in FY 2011 PTAA will incur an additional $100,000 of incremental operating expenses for the maintenance of new facilities.

8.6.3 REVENUES

Figure 8-4 presents revenues showing historical data for FY 2007 and FY 2008, estimated results for FY 2009, and projected results for FY 2010 through FY 2020.

FIGURE 8-4
REVENUES
PIEDMONT TRIAD AIRPORT AUTHORITY
(FOR THE FISCAL YEAR ENDING JUNE 30)



Source: Piedmont Triad Airport Authority; Jacobs Consultancy.

Revenues decreased from $29.2 million in FY 2007 to $25.8 million in FY 2009, due to a 21 percent decline in passenger traffic during the same time period and a $2.3 million decline in interest income earned, partially offset by the increase of parking revenues.

8.6.3.1 Airfield Area and Apron Area Revenues

In the Airfield Area, revenue from airline landing fees is the largest single source. Passenger airline landing fee revenue is projected to increase from $1.8 million in FY 2009 to $3.7 million in FY 2011 to $5.4 million in FY 2012. This increase primarily reflects the recovery of the Runway Program costs (mainly depreciation and imputed interest on investment), which are first reflected in the landing fee requirement starting in 2011. Also, projected increases in the operations of FedEx are expected to increase air carrier landed weight and thereby increase the proportion of Airfield Area costs that are charged to the air carriers.

8.6.3.2 Airline Terminal Space Rentals

Terminal Area rental requirements are calculated at least annually effective January 1 using a compensatory rate-making methodology, as is used for calculating landing fee requirements. Terminal rentals are projected to be stable in the future years. There will be an increase of allowable expenses to the terminal cost center, without major capital project planned for the terminal cost center.

8.6.3.3 Consumer Service Revenues

Consumer Service Revenues totaled $4.5 million in FY 2008, consisting of concession fees from rental car companies ($3,249,000), food, beverage, and gift operators ($924,000), advertising ($240,000), and other miscellaneous terminal concessions ($59,000). Consumer Service Revenues are budgeted at $3.2 million in FY 2010, reflecting continued decline in air traffic. The forecast of consumer service revenues is primarily driven by the growth in air traffic and a 3% adjustment for inflation in the future years.

8.6.3.4 Parking Revenues

The primary parking facility at PTI is a four-story, 2,000-space parking garage in front of the terminal building. An additional 2,000-space Long-Term surface parking lot is located adjacent to the terminal building. PTAA has an overflow lot with 450 spaces and constructed an additional surface parking lot with 2,000 spaces per an agreement with Skybus in FY 2008. The additional facility was not put in use after Skybus declared bankruptcy in FY 2008. Short-Term parking is provided at meters in front of the terminal building.

On July 1, 2008, PTAA increased the garage parking rate from $7.00 to $8.00 per day, increased the Long-Term surface parking rate from $5.00 to $6.00 per day, and the overflow lot rate from $3.75 to $4.00 per day. The rate increases partially offset the decline in the number of enplaned passengers in FY 2009. PTAA is expected to be able to meet parking demand through FY 2020 with its existing parking facilities. For the purpose of this Analysis, it was assumed the Authority would increase parking rates by $1 every three years.

8.6.3.5 Other Revenues and Non-Operating Revenues

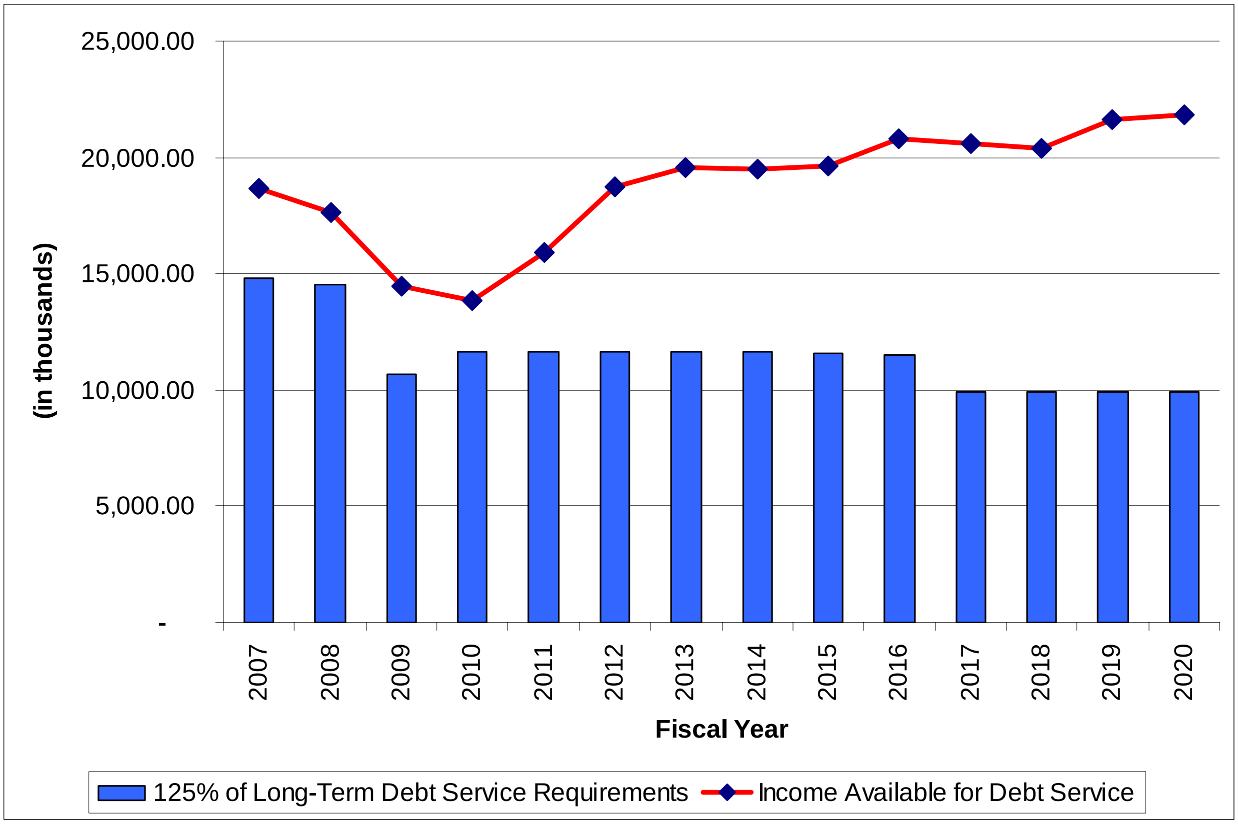
PTAA has four cargo buildings totaling approximately 163,000 square feet of cargo space. Air cargo revenues are expected to decline in FY 2010 after FedEx terminated its lease for the cargo building #3 after the completion of FedEx Mid-Atlantic Hub in May 2009. The decline in cargo building rentals is expected to be more than offset by the increase in hangar rental revenues, due to higher lease payments from Timco Aviation Services. According to the agreement between PTAA and Timco, rents from Timco were reduced from $1.1 million to $0.6 million annually for 3 years starting January 1, 2007, and are to increase to $1.38 million annually starting January 1, 2010. The increase in hangar rentals more than offset the decline in the cargo building rentals.

Other operation revenues include FBO rents, land and facility rents, valet parking revenues and other miscellaneous revenues. Other operations revenues are expected to remain relatively constant during the forecast period. PTAA also receives non-operating revenues including federal reimbursements for security costs and interest income, which is expected to decline as a result of declining balance in the General Fund.

8.6.3.6 Debt Service Coverage

During the forecast period, Revenues are projected to be sufficient to pay Current Expenses, and the remainder, as shown in **Figure 8-5**, Income available for debt service, is projected to be sufficient to cover Long-Term Debt Service Requirements by at least 1.25x, demonstrating compliance with the Rate Covenant.

FIGURE 8-5
RATE COVENANT COMPLIANCE
PIEDMONT TRIAD AIRPORT AUTHORITY
(FOR THE FISCAL YEAR ENDING JUNE 30)



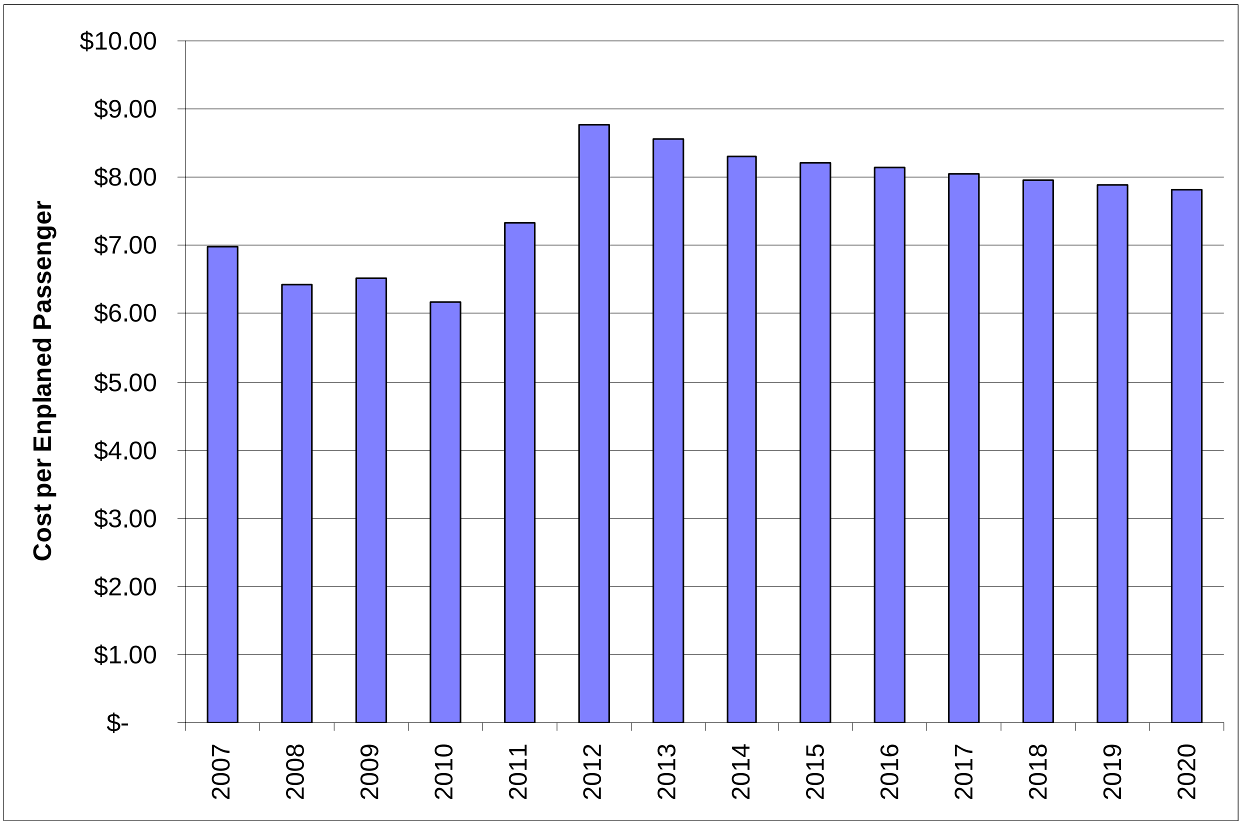
Source: Piedmont Triad Airport Authority; Jacobs Consultancy.

8.6.3.7 Cost per Enplaned Passenger

CPE reflects the landing fees and terminal rents paid by airlines, expressed in relation to enplaned passengers. It is a commonly used, albeit imperfect, measure of airline costs for operating at an airport and may vary significantly across airports due to their development cycle, the ratemaking methodology employed, who financed the facilities, and traffic trends. Airline payments to airports usually represent a relatively small percentage of an airline's overall cost structure.

CPE at PTI is expected to increase from $6.42 in FY 2008 to nearly $9.00 starting in FY 2012, primarily due to the increase in landing fee payments as a result of the Runway Program. Given the weak operating environment, airlines may ask PTAA to mitigate these increases. CPE is expected to decline slightly over time with reductions in depreciation and imputed interest combined with increases in air traffic. Passenger airline CPE is presented in **Figure 8-6**.

FIGURE 8-6
COST PER ENPLANED PASSENGER
PIEDMONT TRIAD INTERNATIONAL AIRPORT
(FOR THE FISCAL YEAR ENDING JUNE 30)



Source: Piedmont Triad Airport Authority; Jacobs Consultancy.

8.6.3.8 Conclusions

The analysis demonstrates that, given the various assumptions described herein including the funding assumptions for the Land Acquisition Program and for the Short-Term and Medium-Term Airport Master Plan Update projects, PTAA would be able to meet the required debt service coverage during the forecast period. Based on this criterion, the Airport Master Plan Update is financially feasible. With respect to airline charges as measured by CPE, it is the Runway Program not the projects in the Airport Master Plan Update that are driving Near-Term increases in CPE. Moreover, CPE stabilizes once the effects of the Runway Program are reflected in the landing fee. Thus, based on a CPE criterion, the Airport Master Plan Update itself is financially feasible. Finally, deposits to the General Fund during the forecast period are expected to exceed expenditures to fund capital projects. Thus, by this criterion, the Airport Master Plan Update is also financially feasible.

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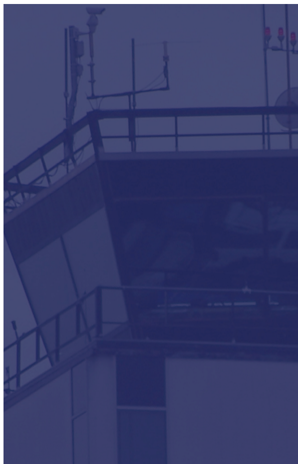

Airport Master Plan Update
and
Strategic Long-Range Visioning Plan

SECTION 9.0
AIRPORT LAYOUT PLAN SET DEVELOPMENT

Prepared By:
URS

In Association With:
JACOBS CONSULTANCY

r m a
Ron Miller & Associates

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

SECTION 9.0

AIRPORT LAYOUT PLAN SET DEVELOPMENT

9.1 INTRODUCTION

The Airport Layout Plan (ALP) depicts existing airport facilities and proposed developments as determined from the planners' review of the aviation activity forecasts, facility requirements, and alternatives analysis. The ALP serves as a set of technical planning drawings that (by their nature) are not intended to provide design engineering accuracy, but reflect the Long-Term development plan for the airport. Individual recommended airport development items such as runway coordinates, obstruction survey data and application of airport design standards comply with current FAA design standards and FAA recorded data. This section presents the ALP set of drawings for the Piedmont Triad International Airport (PTI).

FAA Order 5100.38, *Airport Improvement Program Handbook*, provides supplemental guidance for the preparation of an ALP. United States Code (USC) 47107(a) requires, in part, a current ALP approved by both the sponsor and FAA prior to the approval of an airport development project. USC 47107(a) (16) requires that the Airport Owner (Airport Sponsor) maintain an ALP that ensures the safety, utility and efficiency of the airport. Grant assurance number 29 requires that the sponsor keep the ALP up to date. As stated in Order 5100.38, an ALP remains current for a five-year period, or longer, unless major changes at the airport are made or planned.

An approved ALP is necessary for the airport to receive financial assistance under the terms of the *Airport and Airway Improvement Act of 1982* (AIP), as amended, and to be able to collect and use Passenger Facility Charge funds. An airport must keep its ALP current and follow that plan, since those are grant assurance requirements of the AIP and previous airport development programs, including the 1970 Airport Development Aid Program (ADAP) and Federal Aid Airports Program (FAAP) of 1946, as amended. While ALPs are not required for airports other than those developed with assistance under the aforementioned Federal programs, the same guidance can be applied to all airports.

The ALP drawing set developed as part of this Airport Master Plan Update, comprise a series of drawings which are based on the airport planning activates and recommendations as presented in Sections 1 through 8 of this Airport Master Plan Update. The ALP drawing sheets were developed as "full size" 30 inch by 42 inch electronic AutoCAD drawings for submittal to FAA for review and approval, but are presented on the following pages in 11 inch by 17 inch printed format. Upon receipt of FAA's conditional approval, ALP drawing set will enable the PTAA, FAA and NCDOT to program and plan airport improvements and protect navigable airspace.

The ALP set of drawings consists of 27 sheets that include the following:

ALP Cover Sheet

Sheet 1 of 27 – Airport Layout Drawing

Sheet 2 of 27 – Airport Layout Drawing Data

Sheet 3 of 27 – Airport Airspace Drawing (Horizontal/Conical Surfaces)

Sheet 4 of 27 – Airport Airspace Drawing (Outer Approach Surfaces)

Sheet 5 of 27 – Airport Airspace Drawing Obstacle Data Table

Sheet 6 of 27 – Inner Portion of the Approach Surface Drawing – Runway 5R

Sheet 7 of 27 – Inner Portion of the Approach Surface Drawing – Runway 23L

Sheet 8 of 27 – Inner Portion of the Approach Surface Drawing – Runway 5L

Sheet 9 of 27 – Inner Portion of the Approach Surface Drawing – Runway 23R

Sheet 10 of 27 – Inner Portion of the Approach Surface Drawing – Runway 14

Sheet 11 of 27 – Inner Portion of the Approach Surface Drawing – Runway 32

Sheet 12 of 27 – Departure Surface Drawing – Runway 5R/23L

Sheet 13 of 27 – One-Engine Inoperative Obstacle Identification Surface – Runway 5R

Sheet 14 of 27 – One-Engine Inoperative Obstacle Identification Surface – Runway 23L

Sheet 15 of 27 – Departure Surface Drawing – Runway 5L/23R

Sheet 16 of 27 – One-Engine Inoperative Obstacle Identification Surface – Runway 5L

Sheet 17 of 27 – One-Engine Inoperative Obstacle Identification Surface – Runway 23R

Sheet 18 of 27 – Departure Surface Drawing – Runway 14/32

Sheet 19 of 27 – One-Engine Inoperative Obstacle Identification Surface – Runway 14

Sheet 20 of 27 – One-Engine Inoperative Obstacle Identification Surface – Runway 32

Sheet 21 of 27 – Terminal Area Plan

Sheet 22 of 27 – Cargo Area Plan

Sheet 23 of 27 – General Aviation Building Area Plan

Sheet 24 of 27 – Building Area Plan (Southwest Quadrant)

Sheet 25 of 27 – Land Use/Surface Access Drawing

Sheet 26 of 27 – Airport Property Map

Sheet 27 of 27 – Airport Property Listing

9.2 ALP SHEETS DESCRIPTION

A description of each ALP set drawing is provided in the following paragraphs.

Airport Layout Drawing and Supporting Data (Sheets 1 & 2 of 27) – The Airport Layout Drawing (ALD) is the only drawing of the Airport Layout Plan (ALP) drawing set that is approved by signature of the Airport Owner and FAA at time of final submittal. The ALD depicts the following items: surrounding land features and roadways, existing and proposed airfield and aviation facilities, facility and building identification labels, Runway Protection Zones, safety-related setbacks, applicable FAA Declared Distance criteria, drawing-specific notes and graphical legends, FAA and Airport Owner approval blocks, FAA disclaimers and Construction Notification Requirements, and drawing revision blocks.

To more clearly present detailed graphical information on the ALD, a separate supporting Data was developed that presents the following items: Airport Data Table, Runway Data Table, Graphical Wind Rose and Drawing Revision block.

Airport Airspace Drawing (Sheets 3 through 5 of 27) – These drawings depict the overlying Civil Airport Imaginary Surfaces for the airport as prescribed by 14 CFR Part 77, *Objects Affecting Navigable Airspace*. The drawings depict selected portions of the entire overlying set of Imaginary Airspace Surfaces and the relative location of recorded natural or man-made objects that are located on or around the airport. The drawings depict the location of each surveyed object relative to the overlying Imaginary Airspace Surface and list its Above Mean Sea Level (MSL) height. Where applicable, penetrations of Imaginary Airspace Surfaces by the surveyed objects are listed and quantified with recommendations regarding proposed mitigating actions.

Inner Portion of the Approach Surface Drawing (Sheets 6 through 11 of 27) – These drawings depict plan and profile views of the inner portion of the approach surface for each runway as defined by 14 CFR Part 77, *Objects Affecting Navigable Airspace*. The drawings depict the location of each surveyed object relative to the overlying Imaginary Airspace Surface and list its MSL height. Where applicable, penetrations of Imaginary Airspace Surfaces by the surveyed objects are listed and quantified with recommendations regarding proposed mitigating actions.

Departure Surface Drawing (Sheets 12, 15 & 18 of 27) – These drawings contain plan and profile views of the Obstacle Clearance Surface (OCS) Departure Surfaces for each runway end. These requirements are prescribed in FAA AC 150/5300-13, *Airport Design, Appendix 2, Runway End Siting Requirements § 5, (1)*, and in FAA Order 8260.3B *United States Standards for Terminal Instrument Procedures (TERPS) Volume 4: Departure Procedure Construction*.

One-Engine Inoperative Obstacle Identification Surface (Sheets 13-14, 16-17 & 19-20 of 27) – These drawings contain the plan and profile view of the One-Engine Inoperative (OEI) Obstacle Identification Surfaces. These requirements are prescribed in FAA AC 150/5300-13, *Airport Design, Appendix 2, Runway End Siting Requirements § 5, (2)*, established for each runway end supporting air carrier operations.

Terminal Area Plan (Sheet 21 of 27) – This drawing presents a large-scale depiction of the passenger terminal area and illustrates future passenger terminal building expansion, apron expansion, and concourse development on the south side of the terminal. This drawing also reflects potential terminal area development north of the existing north concourse and future terminal parking facilities to the west of the terminal building.

Cargo Area Plan (Sheet 22 of 27) – This drawing presents a large-scale depiction of FedEx Mid-Atlantic Hub facility development. Specific to PTI, this drawing reflects the potential optional lease expansion by FedEx. This drawing illustrates the potential apron expansion accommodating the FedEx aircraft fleet, sort hub facility expansion, and future construction of the second cross-field taxiway and the future extension of Runway 23L and associated taxiways.

General Aviation Building Area Plan (Sheet 23 of 27) – This drawing presents a large-scale depiction of the existing general aviation area with future and Fixed Base Operator (FBO) terminal development. This drawing also depicts a large area for potential expansion of these facilities, the future Airport Traffic Control Tower development site, associated vehicle parking, and future extension of Taxiway J.

Building Area Plan (Sheet 24 of 27) – This drawing presents a large-scale depiction of the southwest side of the airport reserved for the future aviation-related development. This drawing also depicts future extension of Runways 14 and 5L and associated taxiways.

Land Use/Surface Access Drawing (Sheet 25 of 27) – This drawing depicts the land uses within and beyond the existing limits of airport-owned land. The drawings depicts potential changes to surface transportation infrastructure and the potential expansion of the airport beyond the typical 20-year planning period described in this Airport Master Plan Update and Strategic Long-Range Visioning Plan.

Airport Property Map and Ownership Property Listing (Sheets 26 & 27 of 27) – The airport Property Map depicts the existing and proposed airport property boundary, the tracts of land that were acquired to develop the airport, and the method of acquisition. This drawing is required for those airports that have acquired land with Federal funds or through an FAA-administered land transfer programs. These drawing sheets depict graphically and list textually airport property ownership information. The airport Property Map drawing depicts existing airport land and the anticipated limits of future land acquisition for conversion to aviation-related purposes. The Ownership Information Sheet lists historical property acquisition information by parcel, acreage and seller's name.

THE AIRPORT LAYOUT PLAN (ALP) DRAWING SET AS PRESENTED IN THIS DOCUMENT IS CURRENTLY UNDER REVIEW BY THE FEDERAL AVIATION ADMINISTRATION (FAA) AND SHOULD BE CONSIDERED TO REPRESENT A DRAFT VERSION. UPON RECEIPT OF THE FAA'S "CONDITIONAL APPROVAL" OF THE ALP DRAWING SET EACH DRAWING WILL BE ANNOTATED WITH THE WORD "FINAL" AND WILL BE MADE AVAILABLE IN 11" BY 17" PDF FORMAT FOR REFERENCE AND USE BY OTHERS.

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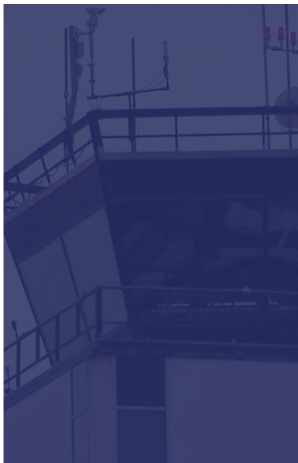

Airport Master Plan Update

and

Strategic Long-Range Visioning Plan

Appendix A
Acronyms

Prepared By:

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Ron Miller & Associates

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

APPENDIX A

Acronyms

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The following contains a list of acronyms and definitions that may be used in the Piedmont Triad International Airport Master Plan Update.

A

AC	Advisory Circular
ADAP	Airport Development Aid Program
ADO	Airport District Office
ADG	Aircraft Design Group
AFFF	Aqueous Film-Forming Foam
AGL	Aboveground Level
AIP	Airport Improvement Program
ALD	Airport Layout Drawing
ALP	Airport Layout Plan
ALSF-2	High Intensity Approach Lighting System with Sequenced Flashing Lights
ARC	Aircraft Reference Code
ARFF	Airport Rescue and Firefighting Facility
ARP	Airport Reference Point
ASDA	Accelerate-Stop Distance Available
ASOS	Automatic Surface Observation System
ASR-9	Airport Surveillance RADAR Model 9
ASV	Annual Service Volume
ATC	Air Traffic Control
ATCT	Airport Traffic Control Tower

C

CAT	Category
CatEx	Categorical Exclusion
CBD	Central Business District
CEO	Chief Executive Officer
CFC	Customer Facility Charge
CIP	Capital Improvement Plan
CL	Centerline
CPE	Cost per Enplaned Passenger
CRJ	Canadair Regional Jet
CSA	Combined Statistical Area

D

D-IV	Airplane Approach Speed D, Wingspan IV
dBA	Decibels A-weighted
DME	Distance Measuring Equipment
DNL	Day-Night Average Sound Level
DOT	Department of Transportation
DP	Departure Procedure
DTW	Dual Tandem Wheel Landing Gear
DW	Dual Wheel Landing Gear
DWQ	Division of Water Quality

E

EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency

F

FAA	Federal Aviation Administration
FAAP	Federal Aid Airports Program
FAR	Federal Aviation Regulations
FBO	Fixed Base Operator
FedEx	Federal Express
FIS	Federal Inspection Services
FONSI	Finding of No Significant Impact
FSDO	Flight Standards District Office
FY	Fiscal Year

G

GA	General Aviation
GAMA	General Aviation Manufacturers Association
GASB	Governmental Accounting Standards Board
GPS	Global Positioning Satellite (System)
GS	Glide Slope Indicator
GSE	Ground Service Equipment
GSO	Piedmont Triad International Airport (FAA Designation)
GTCC	Guilford Technical Community College

H

HIRL	High Intensity Runway Lights

I

IAP	Instrument Approach Procedures
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IM	Inner Marker
IMC	Instrument Meteorological Conditions

K

KTS	Knots (Nautical Miles per Hour)

L

LAHSO	Land and Hold Short Operations
LBS	Pounds
LCC	Low Cost Carrier
LDA	Landing Distance Available
LOC	Localizer
LOI	Letter of Intent

M

MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
MAP	Million Annual Passengers
MD-11	McDonnell-Douglas 11 Aircraft
MGTOW	Maximum Gross Take-Off Weight
MII	Majority-in-Interest
MITL	Medium Intensity Taxiway Lights
MM	Middle Marker
MPH	Miles per Hour
MPU	Master Plan Update
MRO	Maintenance, Repair, and Overhaul
MSA	Metropolitan Statistical Area
MSL	Mean Sea Level
M&R	Maintenance and Repair

N

N/A	Not Applicable
NAS	National Airspace System
NAVAID	Navigation Aid
NCP	Noise Compatibility Program
NDB	Non-Directional Beacon
NCDENR	North Carolina Department of Environmental and Natural Resources
NCDOT	North Carolina Department of Transportation
NCDWM	North Carolina Division of Waste Management
NEM	Noise Exposure Map
NEPA	National Environmental Policy Act
NextGen	Next Generation Air Transportation System
NM	Nautical Mile (6,076 feet)
NOAA	National Oceanic Atmospheric Administration
NPDES	Pollutant Discharge Elimination System

O

OC	Obstruction Chart
OEI	One-Engine Inoperative
OFA	Object Free Area
OFZ	Obstacle Free Zone
ORD	Overseas Replacement Depot
O&D	Origin/Destination

P

PAPI	Precision Approach Path Indicator
PART	Piedmont Authority for Regional Transportation
PAYGO	Pay-As-You-Go
PCPI	Per Capita Personal Income
PFC	Passenger Facility Charge
PPP	Public-Private Partnership
PTAA	Piedmont Triad Airport Authority
PTI	Piedmont Triad International Airport

R

RA	Radio Altimeter Required
REIL	Runway End Identification Lights
RJ	Regional Jet
RNAV	Area Navigation
ROD	Record of Decision
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RVR	Runway Visual Range

RVZ	Runway Visibility Zone
RWY	Runway
RW	Runway

S

SMGCS	Surface Movement Guidance and Control System
STAR	Standard Terminal Arrival Route
SUA	Special Use Airspace
SW	Single Wheel Landing Gear

T

TAF	Terminal Area Forecast
TBD	To be Determined
TDZL	Touchdown Zone Lights
TERPS	Terminal Instrument Procedures
TIMCO	Triad International Maintenance Company
TLOFA	Taxilane Object Free Area
TODA	Takeoff Distance Available
TORA	Take-off Run Available
TRACON	Terminal Radar Approach Control Facility
TOFA	Taxiway Object Free Area
T/W	Taxiway

U

UPS	United Parcel Service
US	United States
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USPS	U.S. Postal Service
UST	Underground Storage Tank

V

VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VHF	Very High Frequency
VLJ	Very Light Jet
VMC	Visual Meteorological Condition
VOR	VHF Omnidirectional Range

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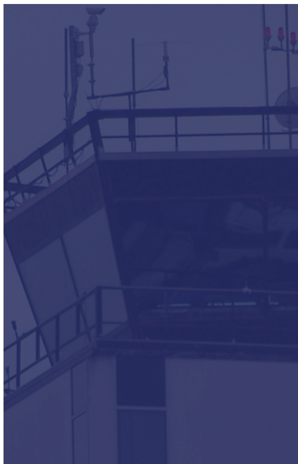

Airport Master Plan Update
and
Strategic Long-Range Visioning Plan

Appendix B
Airport History

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PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

APPENDIX B

Airport History

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AIRPORT HISTORY

What is now the Piedmont Triad International Airport originally began operation in 1927 under the management of the Tri-City Airport Commission. After selecting the 112 acres of land near the community of Friendship, the Commission petitioned to become a stop along the Congressionally-authorized airmail route from New York to New Orleans.

Greensboro and Guilford County jointly purchased the Friendship property from Paul C. and Helen G. Lindley, and christened it Lindley Field in May 1927. At that time, there were no runways, lights, hangars or passenger facilities. On October 14, 1927, as part of his cross-country tour celebrating the advances of aviation, Charles Lindbergh and his Spirit of St. Louis aircraft visited Lindley Field. The following year, regular mail service was established Pitcairn Aviation, Incorporated, was given the contract to fly the authorized airmail route that was recognized as the first designated airmail stop in North Carolina and the second official airmail route in the United States.

In 1935 the Lindley Field was closed by order of the US Department of Commerce because of two near crashes. The airport was reopened on May 17, 1937, with two new paved 2,500-foot runways and a passenger terminal. In time, on-airport facilities were developed and included a Pitcairn Aviation hangar, a City of Greensboro passenger station, a United States Government weather bureau and a Department of Commerce radio tower. On November 6, 1930, passenger service was inaugurated by Dixie Flying Service with a route to Washington, DC. Pitcairn Aviation took over the route under its new name Eastern Air Transport, which later became Eastern Air Lines.

In July, 1942, responsibility for the airport was given to the Greensboro-High Point Airport Authority, with appointed representatives from Greensboro, High Point, and the community of Sedgefield. Shortly thereafter, the US Army Air Corps requisitioned the airport and its facilities for war use. Airmail and passenger service was discontinued. Under the US Army Air Corps control, the airport was used as a hub for the Overseas Replacement Depot (ORD), a refueling station, and a training site for fighter and bomber pilots. During that period, the Army built a second hangar and an airport control tower. At the close of the war, civilian service resumed, though growth was moderate due to the success of nearby Smith Reynolds Airport in Winston-Salem. Other post-war airport improvements included the acquisition of additional acreage, development of a temporary passenger terminal, lengthening of both runways, and the installation of new taxiway and runway edge lights.

In 1958, the Greensboro-High Point Regional Airport (Later changed to Greensboro/High Point/Winston-Salem Regional Airport) opened its new passenger terminal. The terminal was constructed on the southwest side of the airfield replacing the temporary facility that had served the airport since the close of World War II. The new terminal was a modern glass paneled structure with a single enclosed pier, along which aircraft parked. At the time of the terminal's opening, Greensboro was served by Eastern, Piedmont, Delta and Capital (which later merged with United in 1961.)

By 1975, airport officials began to plan for construction of a new passenger terminal. Piedmont Airlines, which for years had served both PTI and Smith Reynolds Airport in nearby Winston-Salem, announced its intention to consolidate its operations at Greensboro Regional Airport.

Work on the new passenger terminal and concourse complex began in 1978 and was completed in October 1982. This allowed the Airport Authority to relocate the terminal facilities from the southwest side of the airfield, to a more centrally located position northwest of Runway 5/23 and centered within the current airfield operations area. In the same year, the airport's main runway was extended to a length of 10,000 feet. In the late 1982, the new air cargo facility was constructed having approximately 65,500 square feet that served multiple tenants, including the United States Postal Service. During that same period, Piedmont Airlines, the largest carrier serving the Triad, constructed a major maintenance facility at the airport. A year later, the Marriott opened a 299-room hotel on the airport.

In 1987 the airport was renamed Piedmont Triad International Airport. As a result of legislation, on January 1, 1988, the name "Regional Airport Authority" was changed to the "Piedmont Triad Airport Authority" (PTAA).

By the mid-1990s, Continental Airlines had developed a hub operation at the airport (its fifth largest), largely to support its new Continental Lite low-fare service. In 1995, Continental Airlines discontinued the Continental Lite program and closed the airline's Greensboro hub.

In 1998 FedEx selected the Piedmont Triad International Airport as its site for the development of Mid-Atlantic Sort Hub facility. On December 31, 2001, a favorable Record of Decision was issued by the FAA paving the way for the construction of a new parallel runway (Runway 5L/23R). In October of the following year, FedEx and the Piedmont Triad International Airport executed a lease in which FedEx agreed to construct and operate the sort hub facility by 2009. In 2004, construction began on the new parallel Runway 5L/23R and the associated parallel, connector and cross-field taxiway system.

In 2005, Delta Connection carrier Comair constructed a CRJ maintenance hangar at the airport employing nearly 60 mechanics. In 2006, Independence Air began service into Greensboro when the airline started up with service to Washington Dulles International Airport. Independence Air ceased operations in 2006. That same year, the airport completed major improvements to the terminal building including an expansion of the North Concourse, extensions at each end of the terminal building to accommodate updated security checkpoints and the installation of a state-of-the-art baggage system.

On February 9, 2007, Honda Aircraft Company, Inc. announced plans to establish its world headquarters at the airport. With the initial development of a 215,000 square foot headquarters offices and a research and development hangar, the company plans to manufacture its HondaJet (a Light Jet) within a future manufacturing facility that will be located adjacent to its new headquarters. Honda plans to begin delivery of the HondaJet in 2011.

In late May of 2007, Allegiant Air began service to Orlando Sanford International Airport and St. Petersburg-Clearwater International Airport. In November 2007 their service expanded.

In May 2007, Skybus Airlines began service to Port Columbus International Airport. At the close of 2007, Skybus Airlines announced that the airport would become its second base of operation serving as a "Focus Airport" with plans to expand service to nine cities in 2008. Skybus Airlines ceased operations in April 2008.

In 2009 FedEx Mid-Atlantic Sort Hub facility and Honda Aircraft Company, Inc. facility became operational.

In January 2010, the new parallel Runway 5L/23R and the associated parallel, connector and cross-field taxiway system was completed and became operational. A dedication ceremony was held later that year on June 12. In September, same year, the new remote ARFF/Command Center was constructed.

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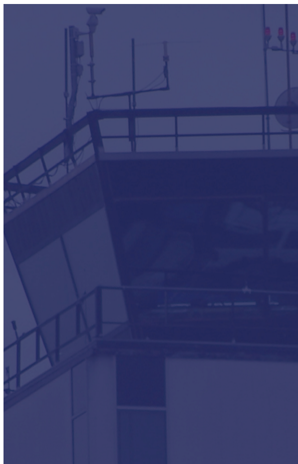

Airport Master Plan Update

and

Strategic Long-Range Visioning Plan

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Appendix C

Airport Building Facilities

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport

Greensboro, North Carolina

APPENDIX C

Airport Building Facilities

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AIRPORT BUILDING FACILITIES

The following pages identify on-airport buildings, hangars, and other facilities located throughout the airport. A summary of pertinent information is also provided that typically includes description of building type, year constructed, owner/tenant, approximate size, current use, visual condition, and additional informative comments. The corresponding drawing depicting the location of each building/structure is located in **Section 2.0**, *Existing Conditions* on **Figure 2-6**.

Building No: ***1***
Building Type: ***Terminal***
Year Constructed: ***1982***
Tenant: ***Various***
Approximate Size: ***400,000 sq. ft.***
Current Use: ***General Public***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***The Terminal has two pier concourses and 18 aircraft parking gates with loading bridges.***

Building No: ***2***
Building Type: ***Office/Maintenance***
Year Constructed: ***1986***
Tenant: ***Hertz***
Approximate Size: ***9,045 sq. ft.***
Current Use: ***Car Rental Office***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***3***
Building Type: ***Office/Storage***
Year Constructed: ***1998***
Tenant: ***Vacant***
Approximate Size: ***18,159 sq. ft.***
Current Use: ***Vacant***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***4***
Building Type: ***Office/Maintenance***
Year Constructed: ***1985***
Tenant: ***Alamo/National***
Approximate Size: ***4,547 sq. ft.***
Current Use: ***Car Rental Office***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***5***
Building Type: ***Office/Maintenance***
Year Constructed: ***1985***
Tenant: ***Avis Budget Group***
Approximate Size: ***4,294 sq. ft.***
Current Use: ***Car Rental Office***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***6***
Building Type: ***Office/Maintenance***
Year Constructed: ***1990***
Tenant: ***Enterprise***
Approximate Size: ***3,417 sq. ft.***
Current Use: ***Car Rental Office***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***7***
Building Type: ***Office***
Year Constructed: ***1982***
Tenant: ***Vacant***
Approximate Size: ***13,329 sq. ft.***
Current Use: ***Vacant***
Visual Condition: ***Good***
Photo Date Downloaded: ***11/20/08***
Photo Source: ***Microsoft Live Search Maps***
Comments: ***To be demolished.***

Building No: ***8***
Building Type: ***Air Cargo Building 2***
Year Constructed: ***1982***
Tenant: ***Various***
Approximate Size: ***112,679 sq. ft.***
Current Use: ***Cargo/Storage/Sorting***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***To be demolished.***

Building No: ***9***
Building Type: ***Air Cargo Building 3***
Year Constructed: ***1987***
Tenant: ***Various***
Approximate Size: ***64,329 sq. ft.***
Current Use: ***Cargo/Sorting***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***10 (FedEx Complex)***
Building Type: ***Warehouse/Office/Support***
Year Constructed: ***2009***
Tenant: ***FedEx***
Approximate Size: ***317,200 sq. ft. (Main Sort Building)***
Current Use: ***Administration/Storage/Sorting***
Visual Condition: ***Excellent***
Photo Date: ***06/30/09***
Photo Source: ***PTAA***
Comments: ***The entire FedEx complex has approximately 425,000 sq. ft. of building space.***

Building No: ***11***
Building Type: ***Administration Building/R&D/Support***
Year Constructed: ***2009***
Tenant: ***Honda Aircraft Company***
Approximate Size: ***350,000 sq. ft.***
Current Use: ***Production Facility***
Visual Condition: ***Excellent***
Photo Date: ***08/03/09***
Photo Source: ***PTAA***
Comments: ***The Honda Company will be manufacturing the HondaJet aircraft.***

Building No: ***12***
Building Type: ***Conventional Hangar***
Year Constructed: ***1990***
Tenant: ***Triad International Maintenance Company (TIMCO)***
Approximate Size: ***167,600 sq. ft.***
Current Use: ***Aircraft Maintenance (Typically large commercial aircraft)***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***13***
Building Type: ***Conventional Hangar***
Year Constructed: ***1990***
Tenant: ***TIMCO***
Approximate Size: ***92,580 sq. ft.***
Current Use: ***Aircraft Maintenance (Typically large commercial aircraft)***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***14***
Building Type: ***Conventional Hangar***
Year Constructed: ***1990***
Tenant: ***TIMCO***
Approximate Size: ***88,828 sq. ft.***
Current Use: ***Aircraft Maintenance (Typically large commercial aircraft)***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***15***
Building Type: ***Conventional Hangar***
Year Constructed: ***1990***
Tenant: ***TIMCO***
Approximate Size: ***162,143 sq. ft.***
Current Use: ***Aircraft Maintenance (Typically large commercial aircraft)***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***16***
Building Type: ***Corporate Hangar***
Year Constructed: ***1992***
Tenant: ***Cessna Citation Service Center***
Approximate Size: ***50,000 sq. ft.***
Current Use: ***Maintenance/Administration***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***17***
Building Type: ***Corporate Hangars***
Year Constructed: ***Unknown***
Tenant: ***Lincoln Financial/Jetstream Air, LLC***
Approximate Size: ***28,456 sq. ft.***
Current Use: ***Aircraft Storage/Office***
Visual Condition: ***Good***
Photo Date Downloaded: ***11/20/08***
Photo Source: ***Microsoft Live Search Maps***
Comments: ***N/A***

Building No: ***18***
Building Type: ***Corporate Hangar***
Year Constructed: ***Unknown***
Tenant: ***TradeWinds***
Approximate Size: ***12,232 sq. ft.***
Current Use: ***Storage***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***19***
Building Type: ***Conventional Hangar***
Year Constructed: ***1986***
Tenant: ***TradeWinds***
Approximate Size: ***35,500 sq. ft.***
Current Use: ***Cargo/Storage***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***20***
Building Type: ***Shed***
Year Constructed: ***Unknown***
Tenant: ***Federal Aviation Administration (FAA)***
Approximate Size: ***1,192 sq. ft.***
Current Use: ***Electrical/Equipment Building***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***21***
Building Type: ***Garage***
Year Constructed: ***2005***
Tenant: ***Piedmont Triad Airport Authority (PTAA) Maintenance***
Approximate Size: ***28,392 sq. ft.***
Current Use: ***Airport Maintenance Equipment***
Visual Condition: ***Excellent***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***22***
Building Type: ***Air Cargo Building 1***
Year Constructed: ***1964***
Tenant: ***Various***
Approximate Size: ***42,049 sq. ft.***
Current Use: ***Cargo/Equipment Storage***
Visual Condition: ***Fair***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***23***
Building Type: ***Corporate Hangar***
Year Constructed: ***2008***
Tenant: ***Koury Aviation***
Approximate Size: ***28,050 sq. ft.***
Current Use: ***Aircraft storage/Office***
Visual Condition: ***Excellent***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***24***
Building Type: ***Corporate***
Year Constructed: ***2006***
Tenant: ***Comair***
Approximate Size: ***41,000 sq. ft.***
Current Use: ***Aircraft Maintenance***
Visual Condition: ***Excellent***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***25***
Building Type: ***Storage***
Year Constructed: ***1975***
Tenant: ***Landmark Aviation***
Approximate Size: ***4,325 sq. ft.***
Current Use: ***Equipment Storage***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***26***
Building Type: ***Garage***
Year Constructed: ***1964***
Tenant: ***Airport Fire Station***
Approximate Size: ***6,486 sq. ft.***
Current Use: ***Vehicle/Equipment Storage***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***27***
Building Type: ***Office/Corporate***
Year Constructed: ***1990***
Tenant: ***Guilford Technical Community College (GTCC) Aviation Center***
Approximate Size: ***41,027 sq. ft.***
Current Use: ***Student Classroom/Maintenance***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***28***
Building Type: ***Storage***
Year Constructed: ***2000***
Tenant: ***Atlantic Aero***
Approximate Size: ***3,903 sq. ft.***
Current Use: ***Equipment Storage***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***29***
Building Type: ***T-Hangar***
Year Constructed: ***1988***
Tenant: ***Private***
Approximate Size: ***1,135 sq. ft.***
Current Use: ***Aircraft Storage***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***30***
Building Type: ***Fuel Farm/Storage Tanks***
Year Constructed: ***1991***
Tenant: ***Atlantic Aero***
Approximate Size: ***N/A***
Current Use: ***Aircraft Fuel Storage***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***The Fuel Farm consists of five aboveground storage tanks. Four 20,000-gallon tanks contain Jet-A. One 15,000-gallon tank contains AVGAS.***

Building No: ***31***
Building Type: ***Conventional Hangar***
Year Constructed: ***2001***
Tenant: ***Atlantic Aero***
Approximate Size: ***26,250 sq. ft.***
Current Use: ***Aircraft Storage/Maintenance***
Visual Condition: ***Good***
Photo Date Downloaded: ***11/20/08***
Photo Source: ***Microsoft Live Search Maps***
Comments: ***N/A***

Building No: ***32***
Building Type: ***Corporate Hangar***
Year Constructed: ***1993***
Tenant: ***Piedmont Chemical Industries***
Approximate Size: ***7,200 sq. ft.***
Current Use: ***Aircraft Storage***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***33***
Building Type: ***Corporate Hangar***
Year Constructed: ***1998***
Tenant: ***Atlantic Aero***
Approximate Size: ***6,877 sq. ft.***
Current Use: ***Aircraft Storage***
Visual Condition: ***Good***
Photo Date Downloaded: ***11/20/08***
Photo Source: ***Microsoft Live Search Maps***
Comments: ***N/A***

Building No: ***34***
Building Type: ***Corporate Hangar***
Year Constructed: ***2000***
Tenant: ***Atlantic Aero***
Approximate Size: ***7,060 sq. ft.***
Current Use: ***Aircraft Storage***
Visual Condition: ***Good***
Photo Date Downloaded: ***11/20/08***
Photo Source: ***Microsoft Live Search Maps***
Comments: ***N/A***

Building No: ***35***
Building Type: ***Corporate Hangars***
Year Constructed: ***1971***
Tenant: ***Atlantic Aero***
Approximate Size: ***26,016 sq. ft.***
Current Use: ***Aircraft Storage***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***36***
Building Type: ***Shade Hangars***
Year Constructed: ***1971***
Tenant: ***Atlantic Aero/Various***
Approximate Size: ***74,206 sq. ft.***
Current Use: ***Aircraft Storage***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***37***
Building Type: ***T-Hangar***
Year Constructed: ***1988***
Tenant: ***Private***
Approximate Size: ***2,327 sq. ft.***
Current Use: ***Aircraft Storage***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***38***
Building Type: ***Corporate Hangar***
Year Constructed: ***1992***
Tenant: ***Private***
Approximate Size: ***6,152 sq. ft.***
Current Use: ***Aircraft Storage***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***39***
Building Type: ***Fixed Base Operator (FBO) Office/Corporate Hangar***
Year Constructed: ***1971***
Tenant: ***Atlantic Aero***
Approximate Size: ***45,600 sq. ft.***
Current Use: ***Customer/Maintenance Services***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***40***
Building Type: ***Conventional Hangar***
Year Constructed: ***1991***
Tenant: ***Atlantic Aero***
Approximate Size: ***33,965 sq. ft.***
Current Use: ***Aircraft Maintenance***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***41***
Building Type: ***Office***
Year Constructed: ***1975***
Tenant: ***National Weather Station***
Approximate Size: ***4,347 sq. ft.***
Current Use: ***Administration/Office***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***42***
Building Type: ***T-Hangars (10-Unit Each)***
Year Constructed: ***Early 1970s***
Tenant: ***Landmark Aviation***
Approximate Size: ***34,680 sq. ft. (Each)***
Current Use: ***Aircraft Storage***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***Landmark Aviation has a total of three T-Hangars. Each T-Hangar provides 10 units. Each T-Hangar is approximately 11,560 sq. ft. in size.***

Building No: ***43***
Building Type: ***Bulk/Corporate Hangar***
Year Constructed: ***Early 1970s***
Tenant: ***Landmark Aviation***
Approximate Size: ***32,940 sq. ft.***
Current Use: ***Aircraft Storage***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***44***
Building Type: ***Fuel Farm/Storage Tanks***
Year Constructed: ***Early 1970s***
Tenant: ***Landmark Aviation***
Approximate Size: ***N/A***
Current Use: ***Aircraft Fuel Storage***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***The Fuel Farm consists of seven underground storage tanks. Two 30,000-gallon and two 20,000-gallon tanks contain Jet-A. One 10,000-gallon tank contains AVGAS. One 10,000-gallon tank and one 2,000-gallon tank contains auto gasoline.***

Building No: ***45***
Building Type: ***Corporate Hangar***
Year Constructed: ***Early 1970s***
Tenant: ***Landmark Aviation***
Approximate Size: ***19,237 sq. ft.***
Current Use: ***Aircraft Storage***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***46***
Building Type: ***FBO Office/Corporate Hangar***
Year Constructed: ***Early 1970s***
Tenant: ***Landmark Aviation***
Approximate Size: ***46,050 sq. ft.***
Current Use: ***Customer Service/Aircraft Maintenance***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***47***
Building Type: ***Corporate Hangars***
Year Constructed: ***1999***
Tenant: ***VF Corporation***
Approximate Size: ***32,455 sq. ft.***
Current Use: ***Aircraft Storage/Maintenance***
Visual Condition: ***Excellent***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***48***
Building Type: ***Corporate Office***
Year Constructed: ***2000***
Tenant: ***Federal Aviation Administration (FAA) Flight Standards District Office (FSDO)***
Approximate Size: ***17,875 sq. ft.***
Current Use: ***Office/Administration***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***49***
Building Type: ***Tower***
Year Constructed: ***1974***
Tenant: ***FAA Airport Traffic Control Tower***
Approximate Size: ***4,300 sq. ft.***
Current Use: ***Communication Center***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***The ATCT was commissioned in July of 1974. It has a height of 87 feet and 9 inches aboveground level, including the height of rail. The rail itself is 5 feet tall. The ATCT is operational 24 hours a day, 7 days a week.***

Building No: ***50A***
Building Type: ***Electrical Vault***
Year Constructed: ***1950s***
Tenant: ***PTAA***
Approximate Size: ***450 sq. ft.***
Current Use: ***Shelter***
Visual Condition: ***Fair***
Photo Date: ***08/03/09***
Photo Source: ***PTAA***
Comments: ***N/A***

Building No: ***50B***
Building Type: ***Electrical Vault***
Year Constructed: ***2009***
Tenant: ***PTAA***
Approximate Size: ***4,700 sq. ft.***
Current Use: ***Shelter***
Visual Condition: ***Excellent***
Photo Date: ***10/07/09***
Photo Source: ***PTAA***
Comments: ***N/A***

Building No: ***51***
Building Type: ***Hotel***
Year Constructed: ***1983***
Tenant: ***Marriott***
Approximate Size: ***68,060 sq. ft.***
Current Use: ***Hotel***
Visual Condition: ***Good***
Photo Date: ***12/14/07***
Photo Source: ***URS Corporation***
Comments: ***The Hotel consists of 298 rooms and one suite.***

Building No: ***52***
Building Type: ***Garage***
Year Constructed: ***1986***
Tenant: ***PTAA***
Approximate Size: ***213,277 sq. ft.***
Current Use: ***General Auto Parking***
Visual Condition: ***Good***
Photo Date: ***04/03/08***
Photo Source: ***URS Corporation***
Comments: ***N/A***

Building No: ***53***
Building Type: ***Garage/Office***
Year Constructed: ***2010***
Tenant: ***Remote ARFF/Command Center***
Approximate Size: ***20,400 sq. ft.***
Current Use: ***Vehicle/Equipment Storage/Administration***
Visual Condition: ***Excellent***
Photo Date: ***09/01/10***
Photo Source: ***PTAA***
Comments: ***The Remote ARFF/Command Center has 16,000 S.F. of space designated for ARFF purposes and 4,400 S.F. of space is designated for Command Center (communication purposes).***

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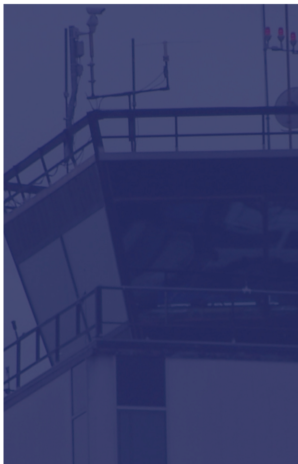

Airport Master Plan Update
and
Strategic Long-Range Visioning Plan

Appendix D
Airspace, Air Traffic Control, and Airport Obstructions Survey

Prepared By:
URS

In Association With:
JACOBS CONSULTANCY

r m a
Ron Miller & Associates

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

APPENDIX D

Airspace, Air Traffic Control, and Airport Obstructions Survey

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1.0 *AIRSPACE, AIR TRAFFIC CONTROL, AND AIRFIELD OPERATIONS*

The primary responsibility of Air Traffic Control (ATC) is to ensure a safe and orderly flow of aircraft between airports. To support this responsibility, Federal Aviation Administration (FAA) has divided the airspace overlying the United States (U.S.), referred to as the National Airspace System (NAS), into different jurisdictions or "classes" of airspace. Specific procedures and ATC services are established for each class of airspace designated as Class A, B, C, D, E, G, or Special Use Airspace (SUA). Procedures for each of these airspace designations are established in accordance with regulations and guidelines prescribed in the Federal Aviation Regulations (FAR) *Aeronautical Information Manual*, the *Air Traffic Controller Handbook* (FAA, Order 7110.65M), Other directives were published by the FAA in the form of Letters of Agreement, Notices, and Orders. To ensure that the airspace can be safely navigated, the FAA has established regulations and guidelines under FAR Part 77, *Objects Affecting Navigable Airspace* and Order 8260.3B, *U.S. Standard for Terminal Instrument Procedures* (TERPS). A brief description of these airspace matters, how they apply to ATC functions, and how aeronautical activities within designated airspace are conducted specific to Piedmont Triad International Airport (PTI) is provided in the following paragraphs.

1.1 *Class C Airspace*

Controlled airspace is designated as Class A, B, C, D, and E with each having different dimensions, purposes, requirements, and ATC services.

The airspace immediately above and surrounding PTI is classified as Class C that is typically established to serve most of the nation's air carrier airports. Aircraft operations within Class C airspace are subject to certain operating, pilot, and equipment rules. The configuration of Class C airspace is individually tailored for each airport and consists of a surface layer and two or elevated layers that are geographically configured to overlie airspace within, which all published instrument procedures established for the airport can safely occur.

The horizontal extent of Class C airspace surrounding PTI (or GSO as designated by the FAA) is depicted on **Figure D-1** and outlined as magenta colored boundary lines. The Class C airspace comprises a 5-nautical-mile (NM) radius core at the surface that extends upward to a height of 4,000 feet above the airport's field elevation. A second layer having a 10 NM radius shelf area extends outward from the center beginning at 1,200 feet extending upward to 4,000 feet above the airport elevation. The outer area radius of this layer is 20 NM. The outer area extends outward from the primary airport and extends from the lower limits of radar/radio coverage up to the ceiling of the approach control's delegated airspace, excluding the Class C Airspace and other airspace as appropriate.

1.2 *Local Airport Traffic Control Tower (ATCT) and Support Equipment*

<u>ATCT</u>

The ATCT was commissioned on July of 1974 and has an Above Ground Level (AGL) height of 87 feet 9 inches. The ATCT is located north of existing Landmark Aviation Fixed Base Operator (FBO) and adjacent to the FAA's Flight Standards District Office (FSDO) building. ATCT staff (Controllers) are responsible for separating and sequencing aircraft operating within the local airport traffic pattern, expediting arrivals and departures, separating aircraft on the ground, and providing clearance delivery and weather information to pilots.

Airport Surveillance RADAR – The airport is served by an Airport Surveillance RADAR Model 9 (ASR-9) to provide Terminal Radar Approach Control Facility (TRACON) and the ATC operators with an overall picture of what is going on within the airspace surrounding the terminal. The ASR-9 is located approximately 1,700 feet north of Runway 23R end.

The ASR-9 incorporates a supporting beacon system that identifies aircraft-specific information relayed from each aircraft's transponder system.

1.3 Terminal Flight Procedures

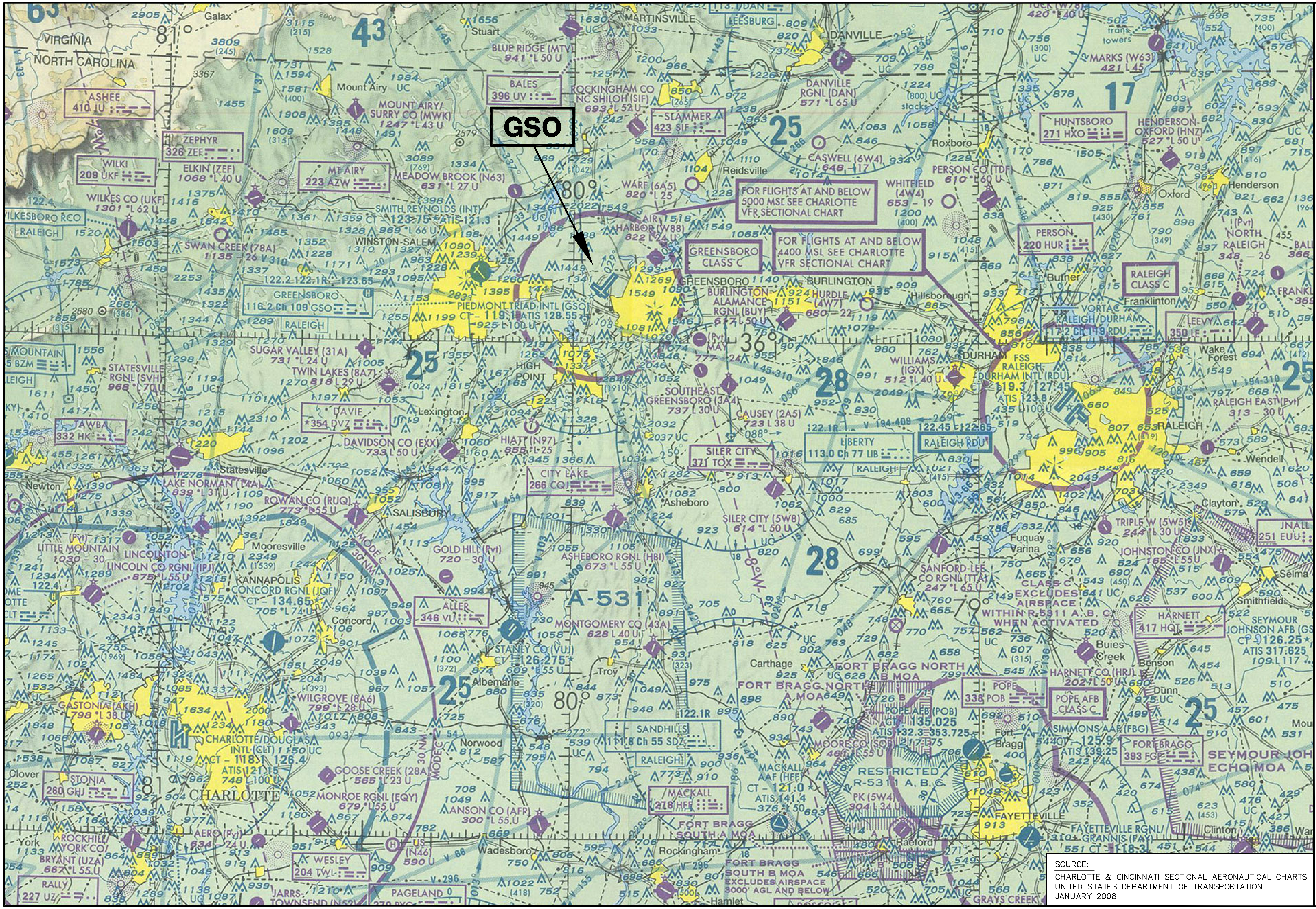
Within the terminal airspace surrounding PTI, a number of published flight procedures affect how the majority of aircraft when operative under Instrument Flight Rules (IFR). The published flight procedures specific to PTI (or GSO as designated by the FAA) are presented at the end of this Appendix. These procedures are described in the following paragraphs.

Departure Procedures (DPs) – The airport has two DPs that provide published information for pilots to transition from terminal airspace to the larger en route airspace structure. The primary reason a DP is designed and published is to provide obstacle clearance protection to aircraft in operating under IFR within Instrument Meteorological Conditions (IMC). A secondary reason, at busier airports, is to increase efficiency and reduce communication workload and departure delays. Two separate DPs are published for PTI: *Quaker Three*, and *Triad Six*.

Arrival Procedures – The airport has four Standard Terminal Arrival Routes (STARs) that serve to simplify clearance delivery procedures and facilitate transition between en route and instrument approach procedures. The STAR is published in graphical and text form to convey ATC information to pilots. Four separarate STARs are published for serving PTI: *Blocc One*, *Brook Two*, *Henby Two*, and *Smokn Three*.

Instrument Approach Procedures (IAPs) – The airport is served by IAPs that are navigational procedures specifically designed to provide horizontal and vertical navigational guidance to the approach ends of certain designated and equipped runways. These procedures are based on criteria contained in TERPS, take into account the interrelationship between airports, facilities, and the surrounding environment, terrain, obstacles, and overflight of noise-sensitive communities. Appropriate altitudes, courses, headings, distances, and other limitations are specified and, once approved, are published and distributed by government and commercial cartographers as Instrument Approach Charts.

There are two general categories of IAPs; precision and non-precision. A precision IAP provides both horizontal and vertical navigation guidance. A non-precision approach provides only horizontal navigation guidance. Eighteen separate IAPs are published for PTI:



SOURCE:
CHARLOTTE & CINCINNATI SECTIONAL AERONAUTICAL CHARTS
UNITED STATES DEPARTMENT OF TRANSPORTATION
JANUARY 2008

PIEDMONT TRIAD INTERNATIONAL AIRPORT
Airport Master Plan Update

SECTIONAL AERONAUTICAL CHART

FIGURE D-1

1. ILS RWY 5R (CAT II),
2. ILS or LOC RWY 5R,
3. RNAV (GPS) RWY 5R,
4. VOR RWY 5R,
5. ILS RWY 23L (CAT II),
6. ILS or LOC RWY 23L,
7. RNAV (GPS) RWY 23L,
8. VOR/DME RWY 23L,
9. ILS RWY 5L (CAT III),
10. ILS RWY 5L (CAT II),
11. ILS or LOC RWY 5L,
12. RNAV (GPS) RWY 5L,
13. ILS or LOC RWY 23R,
14. RNAV (GPS) RWY 23R,
15. ILS RWY 14,
16. RNAV (GPS) RWY 14,
17. NDB RWY 14, and
18. RNAV (GPS) RWY 32.

The IAPs minimums for each runway are provided in **Section 2.0**, *Existing Conditions* in **Tables 2-2 through 2-4**.

1.4 Airports in the Vicinity of the Airport

There are nine public-use airports that are located within a 25 NM radius of the airport. The name, associated three-letter designated identifier, relative heading and distance from PTI, and length of longest runway are presented in **Table 1**.

TABLE 1
SURROUNDING PUBLIC AIRPORTS WITHIN 25 NM

Airport	Identifier	Distance/ Heading	Longest Runway (Feet)
Air Harbor Airport	W88	8 nm / NE	R/W 09/27 2,460 x 65
Burlington-Alamance Regional Airport	KBUY	23 nm / E	R/W 06/24 5,000 x 100
Causey Airport	2A5	19 nm / SE	R/W 02/20 3,800 x 40
Davidson County Airport	KEXX	25 nm / SW	R/W 06/24 5,000 x 100
May Airport	80NC	13 nm / SE	R/W 09/27 2,400 x 30
Meadow Brook Field Airport	N63	16 nm / NW	R/W 16/34 2,725 x 30
Rockingham County NC Shiloh Airport	KSIF	21 nm / N	R/W 13/31 5,199 x 100
Smith Reynolds Airport	KINT	14 nm / W	R/W 15/33 6,655 x 150
Southeast Greensboro Airport	3A4	15 nm / SE	R/W 17/35 3,063 x 30

Source: Charlotte and Cincinnati Sectional Aeronautical Charts, January 2008.

1.5 Runway Protection Zones (RPZs) and Charted Obstructions to Navigable Airspace

Each runway has established areas of land use protection called RPZs that begin 200 feet beyond the end of the runway area usable for takeoff and landing. Each RPZ is trapezoidal in shape and is centered about the extended runway centerline. The RPZ dimension for a particular runway end is a function of the type of aircraft and approach visibility minimum associated with that runway end. As defined in FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, the intent and function of the RPZ is to enhance the protection of people and property on the ground by prohibiting or limiting certain land uses. Examples of land uses prohibited from the RPZ include residences, places of public assembly, fuel storage facilities, and man-made or natural environs that may serve to attract wildlife hazards. This is achieved through airport owner control over RPZs. Such control includes clearing (and maintaining clear) RPZ areas of incompatible objects and activities. Control is preferably exercised though the acquisition of sufficient property interest in the RPZ.

The outer-most portions of the RPZs for Runways 5L, 5R, and 14 extend beyond the airport property. **Table 2** provides the dimensional aspects of each RPZ.

TABLE 2
RPZ DIMENSIONS

Runway End	Length (Feet)	Inner Width (Feet)	Outer Width (Feet)
5R	2,500	1,000	1,750
23L	2,500	1,000	1,750
5L	2,500	1,000	1,750
23R	2,500	1,000	1,750
14	2,500	1,000	1,750
32	1,700	1,000	1,510

Source: URS Corporation, January 2008.

FAR Part 77, *Objects Affecting Navigable Airspace*, establishes standards regarding the identification of existing and proposed natural or man-made objects that may adversely affect navigable airspace. Navigable airspace is defined by imaginary surfaces that lie above and/or surround civil use airports. These include Approach Surfaces to each runway end, the Primary Surface that surrounds the runway, Transitional Surfaces, the Horizontal Surface, and the Conical Surface. The surfaces vary and are predicated upon the category of runway approach. **Table 3** depicts the Approach Category for each runway end and associated FAR Part 77 Inner Approach Surface slopes.

TABLE 3
RUNWAY FAR PART 77 INNER APPROACH SURFACE

Runway	Approach Category	Inner Approach Surface Slope
5R	Precision	50:1
23L	Precision	50:1
5L	Precision	50:1
23R	Precision	50:1
14	Precision	50:1
32	Non-Precision	34:1

Source: URS Corporation, January 2008.

1.6 Airport Obstructions Survey

Five separate airport obstructions information were used for PTI, as identified below:

1. NGS/NOAA Obstruction Survey GSO-06b.F77, 333rd Day of 2005;
2. Third Party ANAPC Obstruction Survey 349th Day of 2008 by Eric J. Moser, PLS;
3. FAA Digital Aeronautical Information, National Aeronautical Charting Office, Avn-500-Digital Obstacle File;
4. Tree Removal Information per LPA Group, August 26, 2009; and
5. NAVAID Geodetic/Elevation Information for Runway 5L/23R per Baker Corporation, May 26, 2009.

Obstructions on the airport identify objects that include NAVAIDs, towers, poles, buildings, and trees. All runway obstructions including the identification of each object, its geodetic coordinate and Mean Sea Level (MSL) elevation, are identified and included in this appendix.

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DEPARTURE PROCEDURES (DP)

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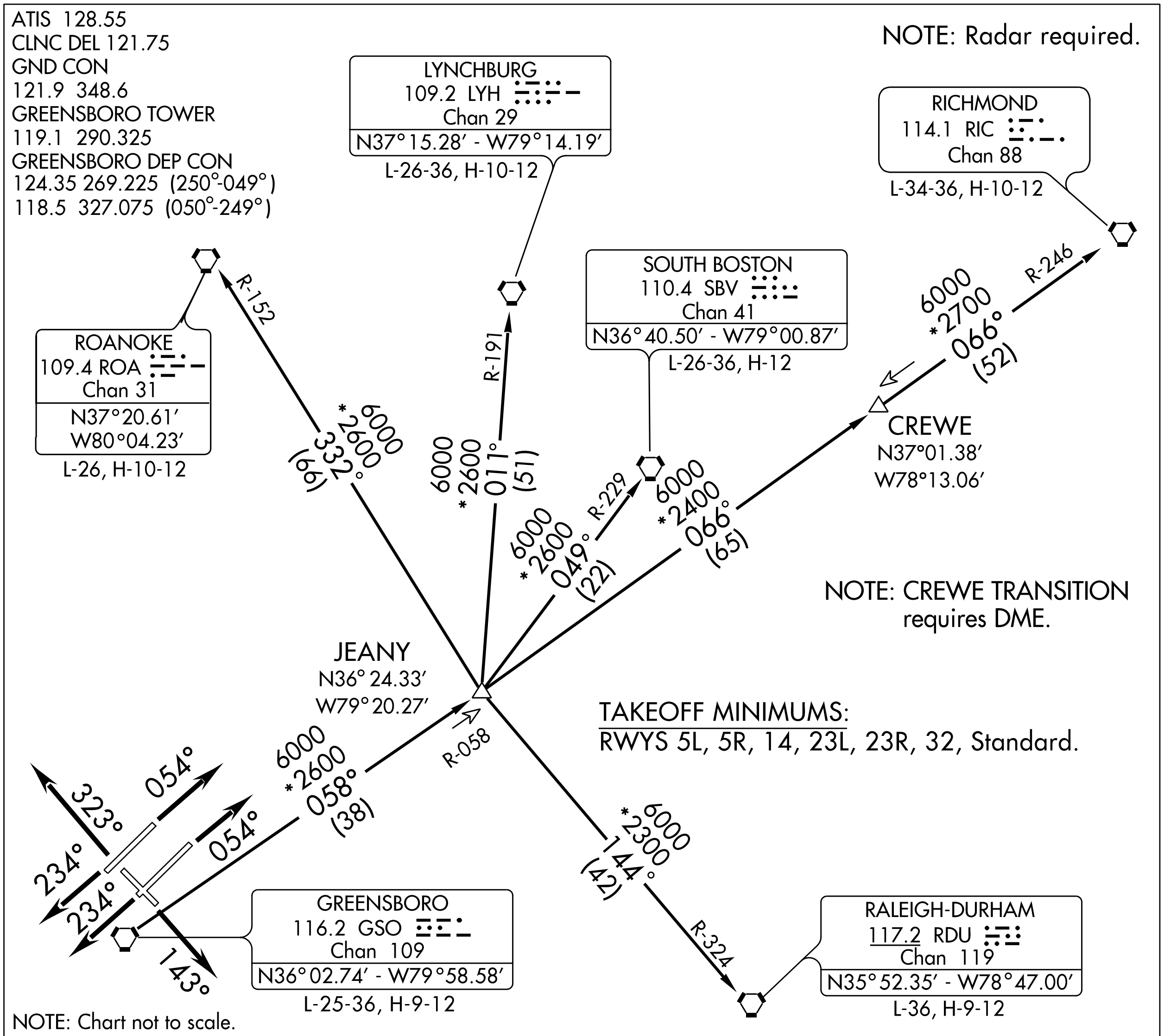
QUAKER THREE DEPARTURE

GREENSBORO/PIEDMONT TRIAD INTL (GSO)
GREENSBORO, NORTH CAROLINA



DEPARTURE ROUTE DESCRIPTION

TAKEOFF RWY 5R: Climb heading 054°. Thence....

TAKEOFF RWY 5L: Climb heading 054°. Thence....

TAKEOFF RWY 14: Climb heading 143°. Thence....

TAKEOFF RWY 23L: Climb heading 234°. Thence....

TAKEOFF RWY 23R: Climb heading 234°. Thence....

TAKEOFF RWY 32: Climb heading 323°. Thence....

TURBOJETS: Maintain 5000. TURBOPROP/PROP: Maintain 3000 or assigned altitude.

. . . . Expect vector to intercept assigned radial associated with issued transition. Proceed via the depicted radial to the transition fix then as filed. If no transition assigned, expect vector to appropriate fix. Expect filed altitude/flight level ten minutes after departure.

T

DEPARTURE ROUTE DESCRIPTION (CONTINUED)

RICHMOND TRANSITION (QUAK3.RIC): From over GSO VORTAC via GSO R-058 to JEANY INT then via GSO R-058 and RIC R-246 to CREWE DME fix. Then via RIC R-246 to RIC VORTAC.

LYNCHBURG TRANSITION (QUAK3.LYH): From over GSO VORTAC via GSO R-058 to JEANY INT then via LYH R-191 to LYH VORTAC.

RALEIGH-DURHAM TRANSITION (QUAK3.RDU): From over GSO VORTAC via GSO R-058 to JEANY INT then via RDU R-324 to RDU VORTAC.

ROANOKE TRANSITION (QUAK3.ROA): From over GSO VORTAC via GSO R-058 to JEANY INT then via ROA R-152 to ROA VORTAC.

SOUTH BOSTON TRANSITION (QUAK3.SBV): From over GSO VORTAC via GSO R-058 to JEANY INT then via SBV R-229 to SBV VORTAC.

TAKEOFF OBSTACLE NOTES:

RWY 5R: Terrain and trees beginning 3′ from DER, 499′ right of centerline, up to 102′ AGL/981′ MSL.
Trees 2751′ from DER, 1191′ left of centerline, 57′ AGL/966′ MSL.

RWY 5L: Trees beginning 1328′ from DER, 524′ left of centerline, up to 88′ AGL/912′ MSL.

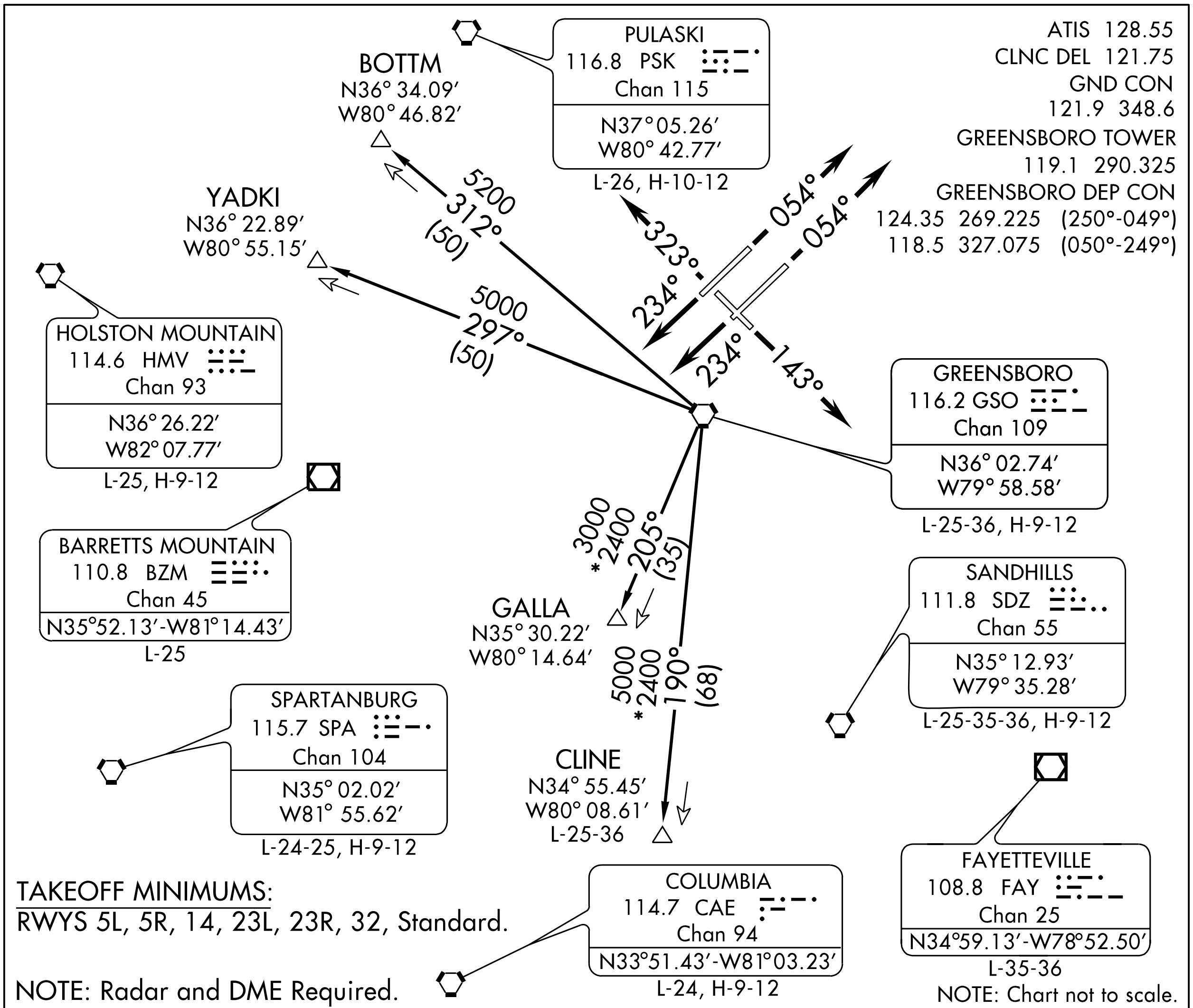
RWY 14: Pole and railroad signal beginning 937′ from DER, 604′ right of centerline, up to 51′ AGL/940′ MSL.

RWY 23R: Trees beginning 1195′ from DER, 191′ left of centerline, up to 100′ AGL/970′ MSL. Utility pole 170′ from DER, 540′ left of centerline, 33′ AGL/936′ MSL.
Trees beginning 1715′ from DER, 358′ right of centerline, up to 100′ AGL/967′ MSL.

RWY 23L: Trees beginning 834′ from DER, 719′ left of centerline, up to 65′ AGL/934′ MSL.

RWY 32: Trees beginning 1′ from DER, 289′ right of centerline, up to 90′ AGL/1019′ MSL.

SE-2, 14 JAN 2010 to 11 FEB 2010



TAKEOFF MINIMUMS:
RWYS 5L, 5R, 14, 23L, 23R, 32, Standard.

NOTE: Radar and DME Required.

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RWY 5R: Climb heading 054°. Thence....

TAKEOFF RWY 5L: Climb heading 054°. Thence....

TAKEOFF RWY 14: Climb heading 143°. Thence....

TAKEOFF RWY 23L: Climb heading 234°. Thence....

TAKEOFF RWY 23R: Climb heading 234°. Thence....

TAKEOFF RWY 32: Climb heading 323°. Thence....

Turbojets: Maintain 5000. Turboprop/Prop: Maintain 3000 or assigned altitude.

. . . . Expect vector to intercept assigned radial associated with the issued transition. Proceed via the depicted radial to the transition fix; thence as filed. If no transition assigned, expect vector to the appropriate fix. Expect filed altitude/flight level ten minutes after departure.

BOTTM TRANSITION (TRI6.BOTTM): From over GSO VORTAC via GSO R-312 to BOTTM.

CLINE TRANSITION (TRI6.CLINE): From over GSO VORTAC via GSO R-190 to CLINE.

GALLA TRANSITION (TRI6.GALLA): From over GSO VORTAC via GSO R-205 to GALLA.

YADKI TRANSITION (TRI6.YADKI): From over GSO VORTAC via GSO R-297 to YADKI.

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TAKEOFF OBSTACLE NOTES:

RWY 5R: Terrain and trees beginning 3' from DER, 499' right of centerline, up to 102' AGL/981' MSL.
Trees 2751' from DER, 1191' left of centerline, 57' AGL/966' MSL.

RWY 5L: Trees beginning 1328' from DER, 524' left of centerline, up to 88' AGL/912' MSL.

RWY 14: Pole and railroad signal beginning 937' from DER, 604' right of centerline, up to 51' AGL/940' MSL.

RWY 23R: Trees beginning 1195' from DER, 191' left of centerline, up to 100' AGL/970' MSL.
Utility pole 170' from DER, 540' left of centerline, 33' AGL/936' MSL.
Trees beginning 1715' from DER, 358' right of centerline, up to 100' AGL/967' MSL.

RWY 23L: Trees beginning 834' from DER, 719' left of centerline, up to 65' AGL/934' MSL.

RWY 32: Trees beginning 1' from DER, 289' right of centerline, up to 90' AGL/1019' MSL.

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ARRIVAL PROCEDURES (STAR)

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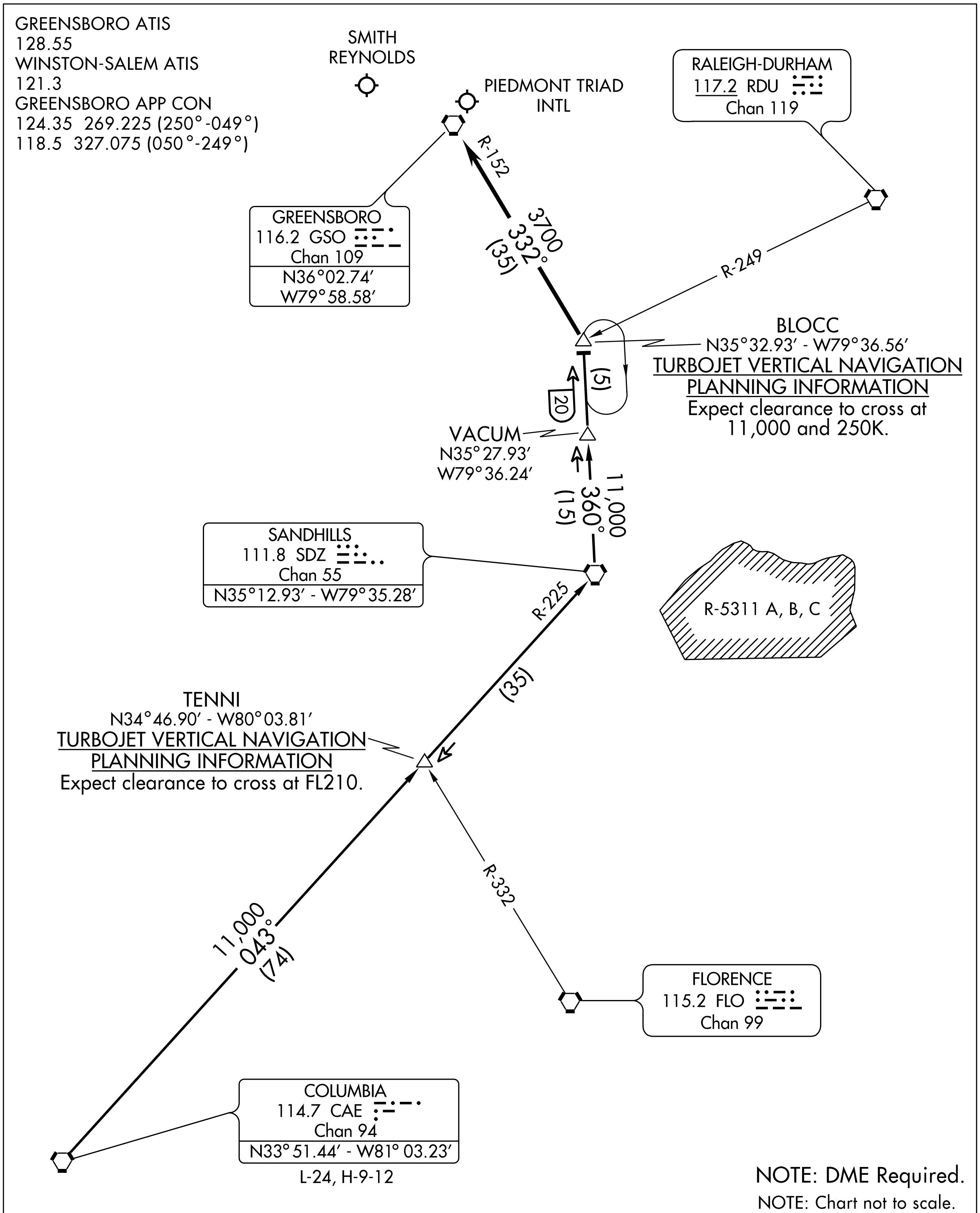
BLOCC ONE ARRIVAL (BLOCC.BLOCC1)

GREENSBORO, NORTH CAROLINA



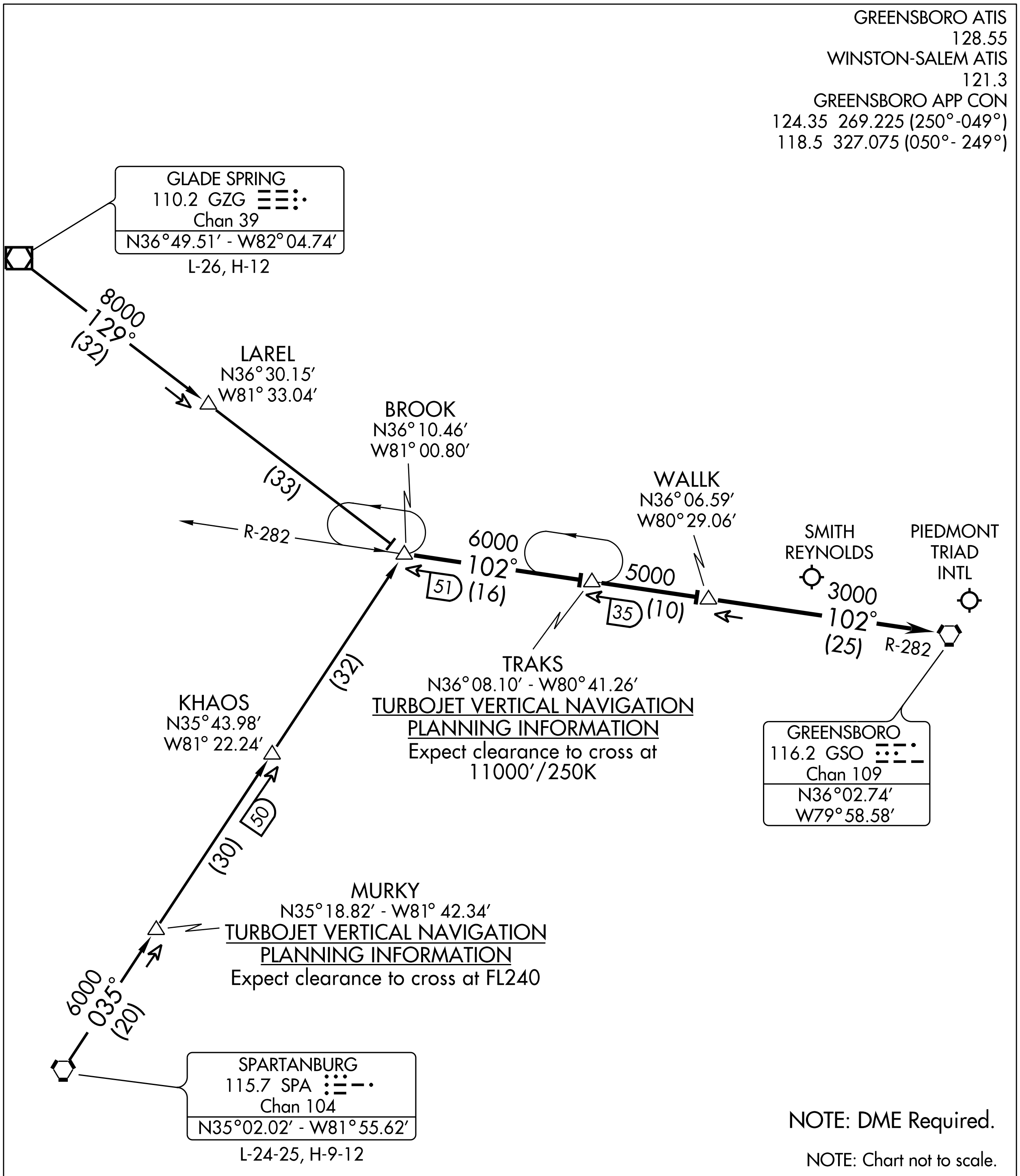
SE-2, 14 JAN 2010 to 11 FEB 2010

COLUMBIA TRANSITION (CAE.BLOCC1): From over CAE VORTAC via CAE R-043 and SDZ R-225 to SDZ VORTAC, then via SDZ R-360 to BLOCC INT. Thence. . . .

. . . .From over BLOCC INT via GSO R-152 to GSO VORTAC. Expect radar vectors to final approach course.

BROOK TWO ARRIVAL (BROOK.BROOK2)

GREENSBORO, NORTH CAROLINA

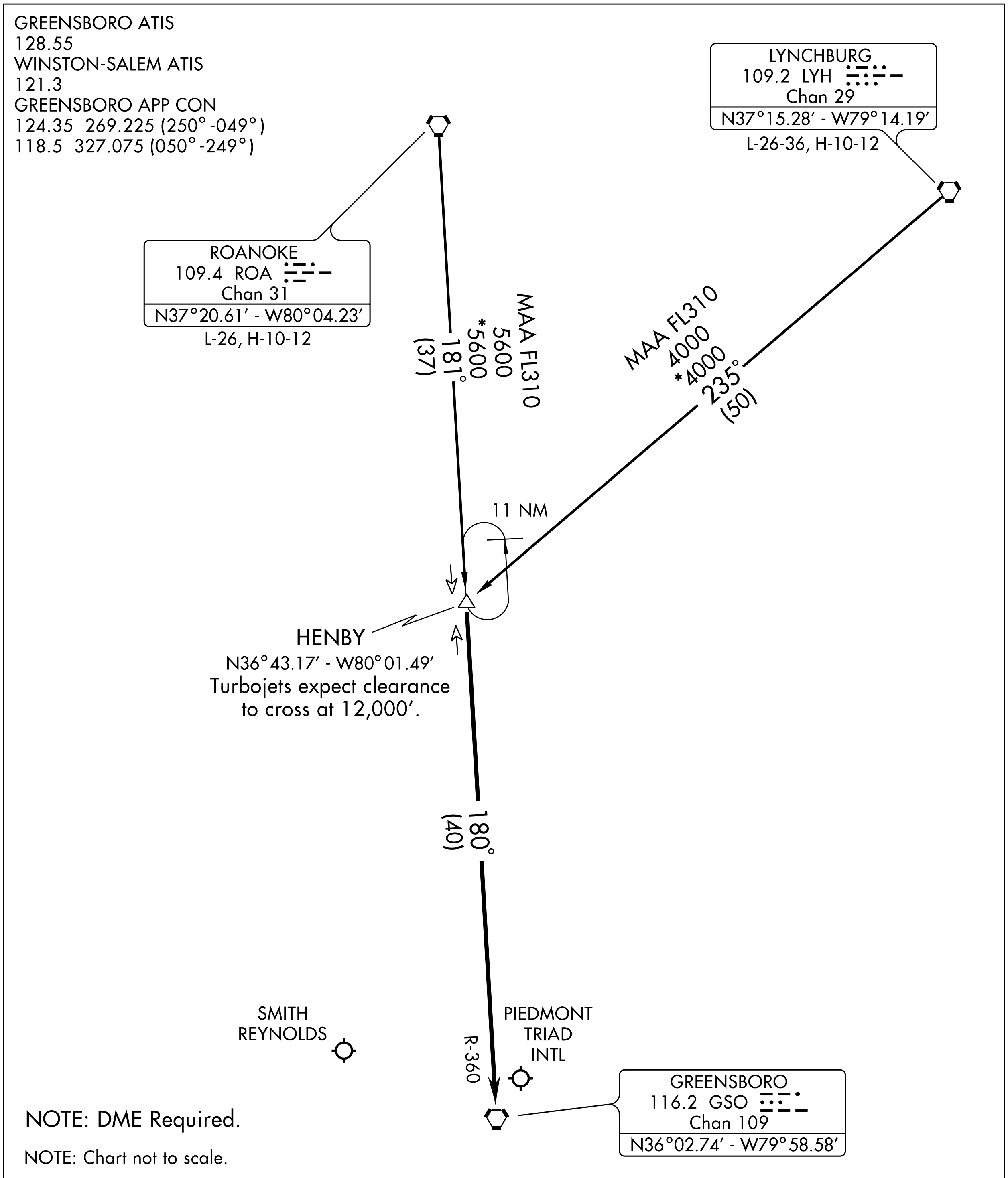


<u>GLADE SPRING TRANSITION (GZG.BROOK2):</u> From over GZG VOR/DME via GZG R-129 to BROOK INT. Thence. . . .
<u>SPARTANBURG TRANSITION (SPA.BROOK2):</u> From over SPA VORTAC via SPA R-035 to BROOK INT. Thence. . . .

. . . .From over BROOK INT via GSO R-282 to GSO VORTAC. Expect radar vectors to final approach course.

HENBY TWO ARRIVAL (HENBY.HENBY2)

GREENSBORO, NORTH CAROLINA



SE-2, 14 JAN 2010 to 11 FEB 2010

SE-2, 14 JAN 2010 to 11 FEB 2010

LYNCHBURG TRANSITION (LYH.HENBY2): From over LYH VORTAC via LYH R-235 to HENBY INT. Thence. . . .

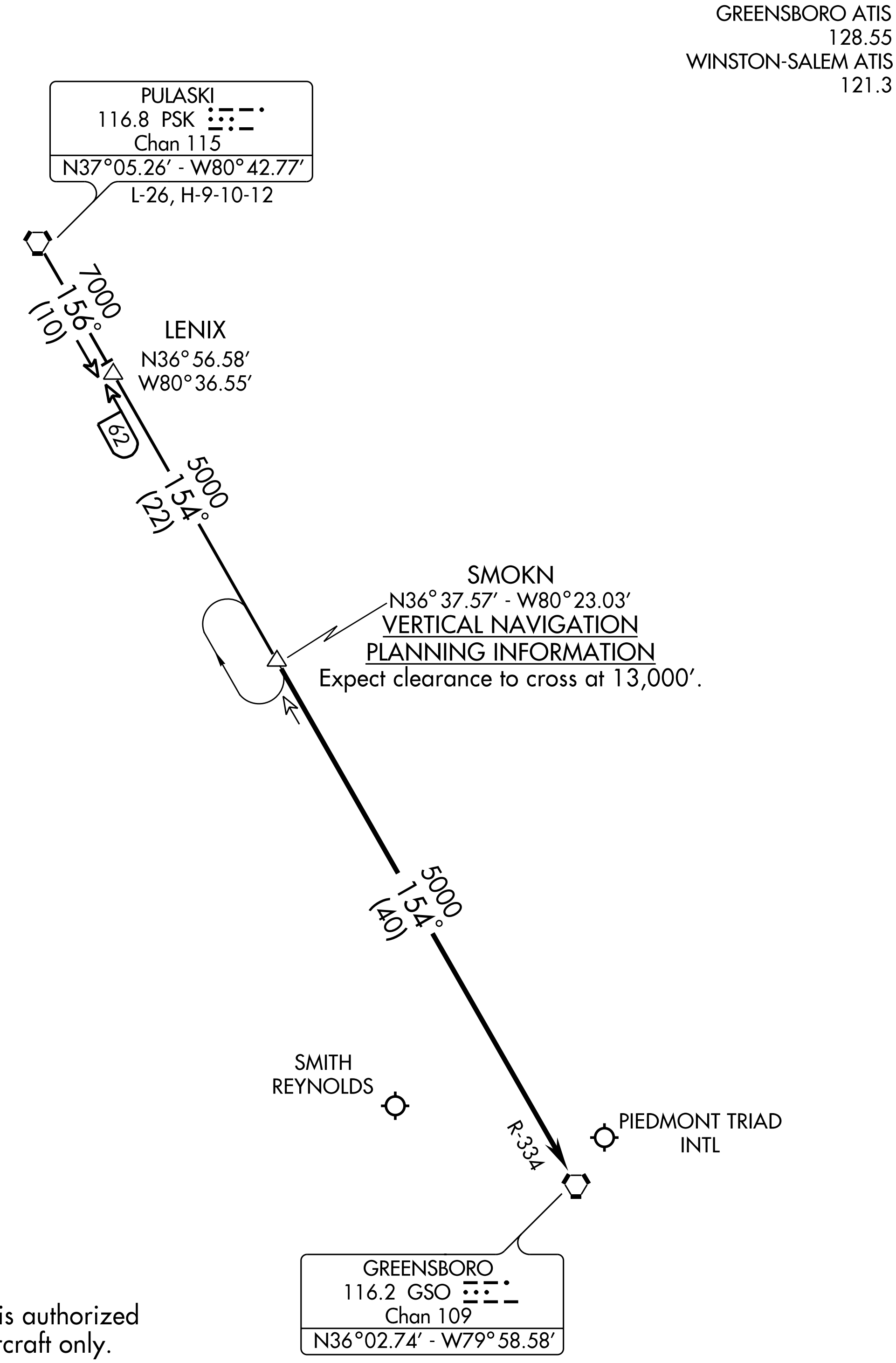
ROANOKE TRANSITION (ROA.HENBY2): From over ROA VORTAC via ROA R-181 to HENBY INT. Thence. . . .

. . . .From over HENBY INT via GSO R-360 to GSO VORTAC. Expect radar vectors to final approach course.

SMOKN THREE ARRIVAL (SMOKN.SMOKN3)

GREENSBORO, NORTH CAROLINA

SE-2, 14 JAN 2010 to 11 FEB 2010



NOTE: This procedure is authorized for propeller aircraft only.

NOTE: Chart not to scale.

PULASKI TRANSITION (PSK.SMOKN3): From over PSK VORTAC via PSK R-156 to LENIX INT. Thence via GSO R-334 to SMOKN INT. Thence....

. . . .From over SMOKN INT via GSO R-334 to GSO VORTAC. Expect radar vectors to final approach course.

SE-2, 14 JAN 2010 to 11 FEB 2010

INSTRUMENT APPROACH PROCEDURES (IAP)

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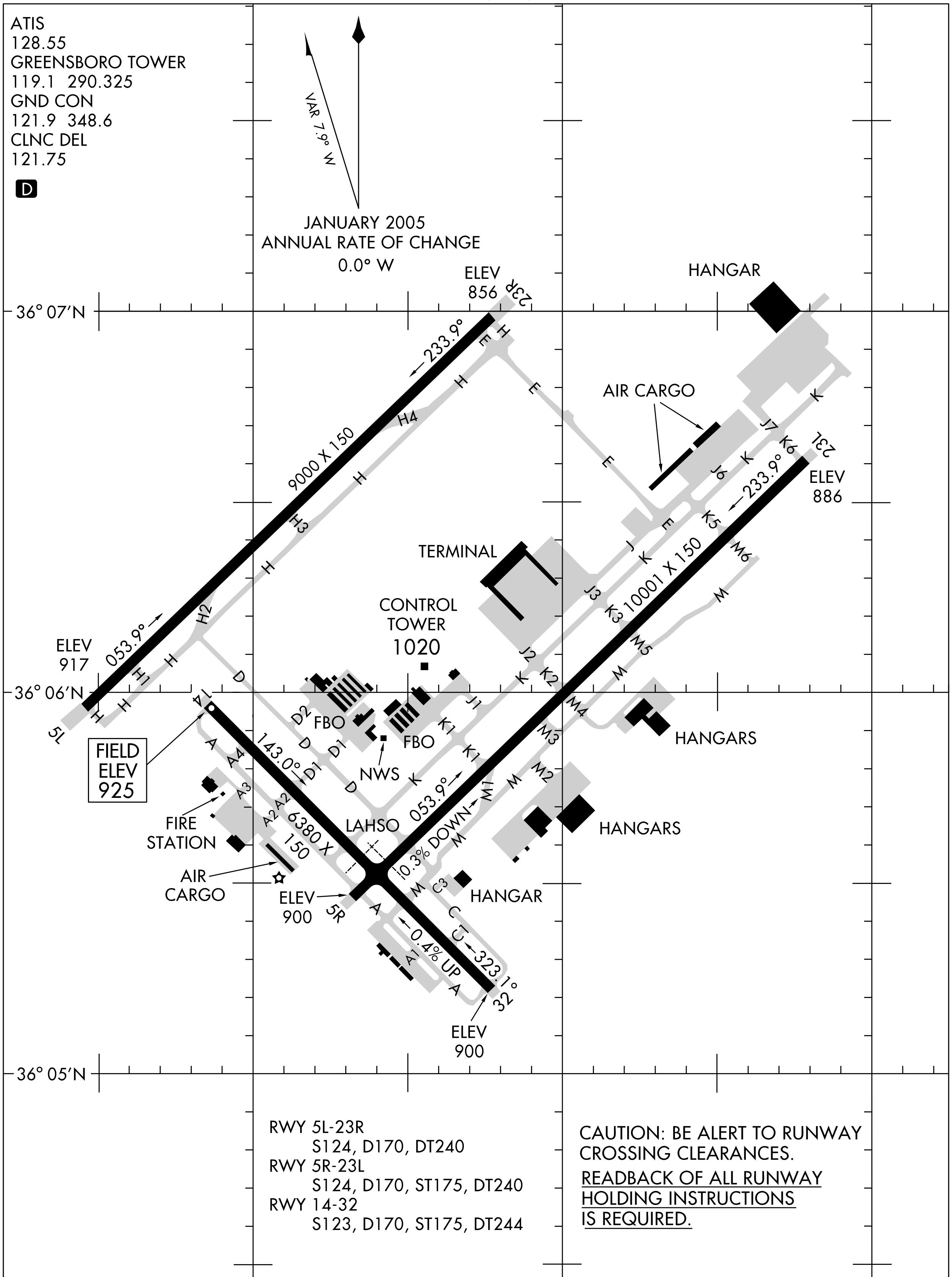
AIRPORT DIAGRAM

AL-178 (FAA)

GREENSBORO/ PIEDMONT TRIAD INTL (GSO)
GREENSBORO, NORTH CAROLINA

SE-2, 14 JAN 2010 to 11 FEB 2010



RWY 5L-23R
S124, D170, DT240
RWY 5R-23L
S124, D170, ST175, DT240
RWY 14-32
S123, D170, ST175, DT244

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
<u>READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.</u>

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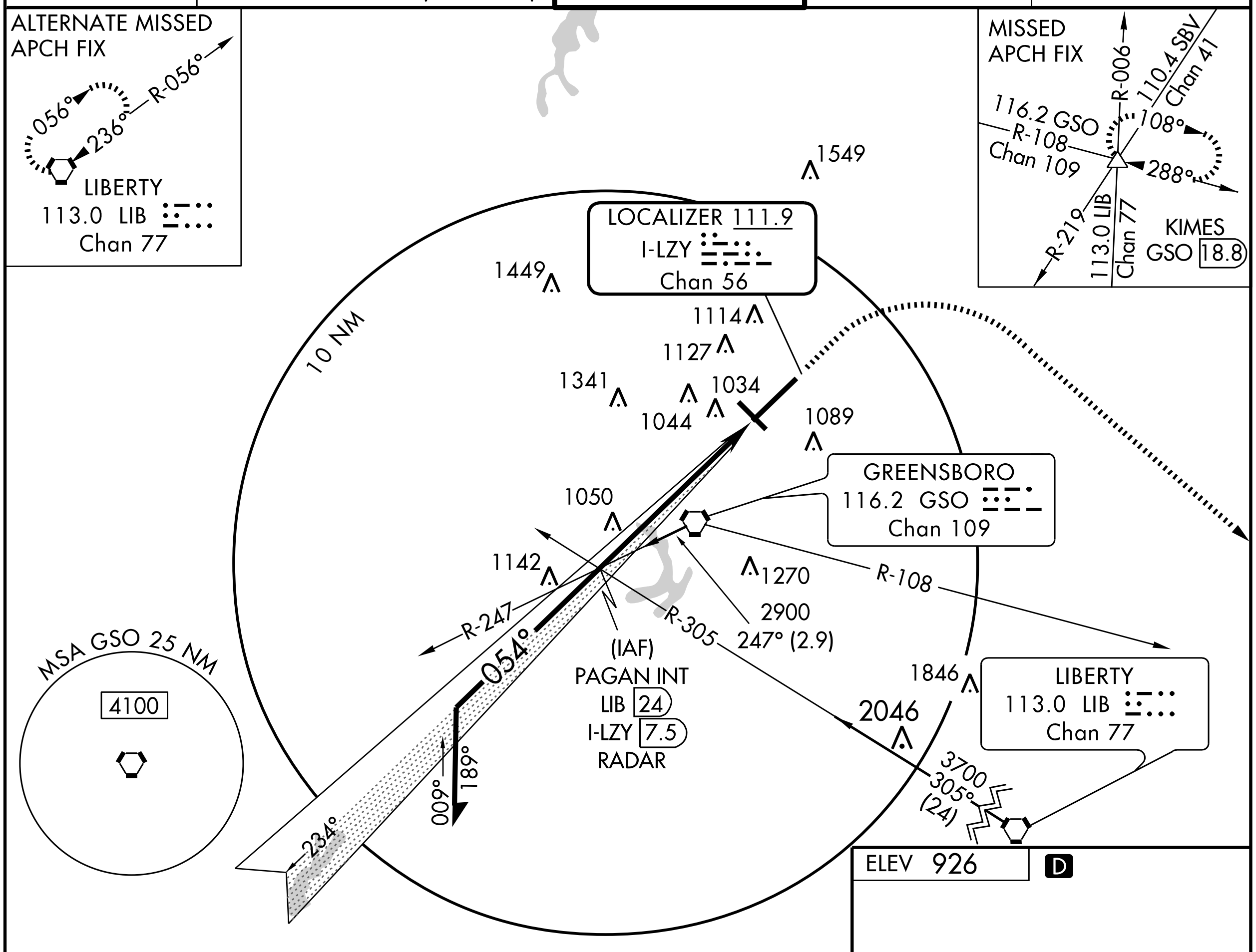
ILS RWY 5R (CAT II)

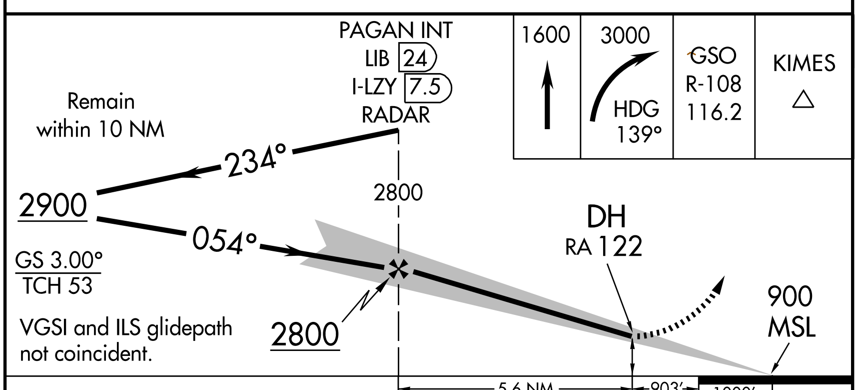
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

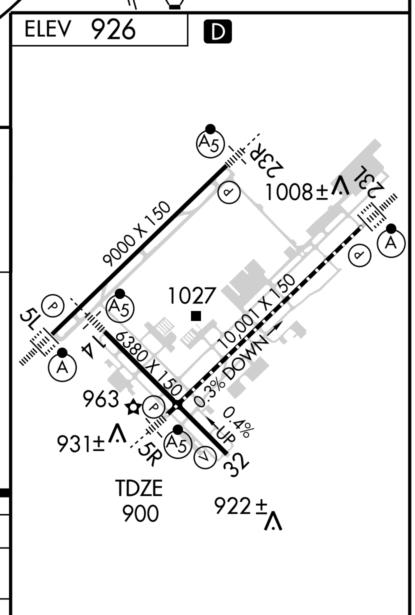
LOC/DME I-LZY	APP CRS	Rwy ldg	10001
111.9	**054°**	TDZE	**900**
Chan 56		Apt Elev	**926**

* RVR 1800 authorized with the use of FD or AP or HUD to DA. Procedure does not meet ICAO standard for ALSF/TDZ/CL lighting systems. Authorization to conduct this approach requires specific OPSSPEC approval or LOA for this runway.	MALSR	MISSED APPROACH: Climb to 1600 then climbing right turn to 3000 via heading 139° and GSO VORTAC R-108 to KIMES INT/ GSO 18.8 DME and hold.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	**124.35 269.225** (250°-049°) **118.5 327.075** (050°-249°)	**119.1 290.325**	**121.9 348.6**	**121.75**







CATEGORY	A	B	C	D
S-ILS 5R	RA 1000/12 100 DA 122			

CATEGORY II ILS - SPECIAL AIRCREW & AIRCRAFT CERTIFICATION REQUIRED

TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5R-23L and 5L-23R

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09351

ILS or LOC RWY 5R

GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

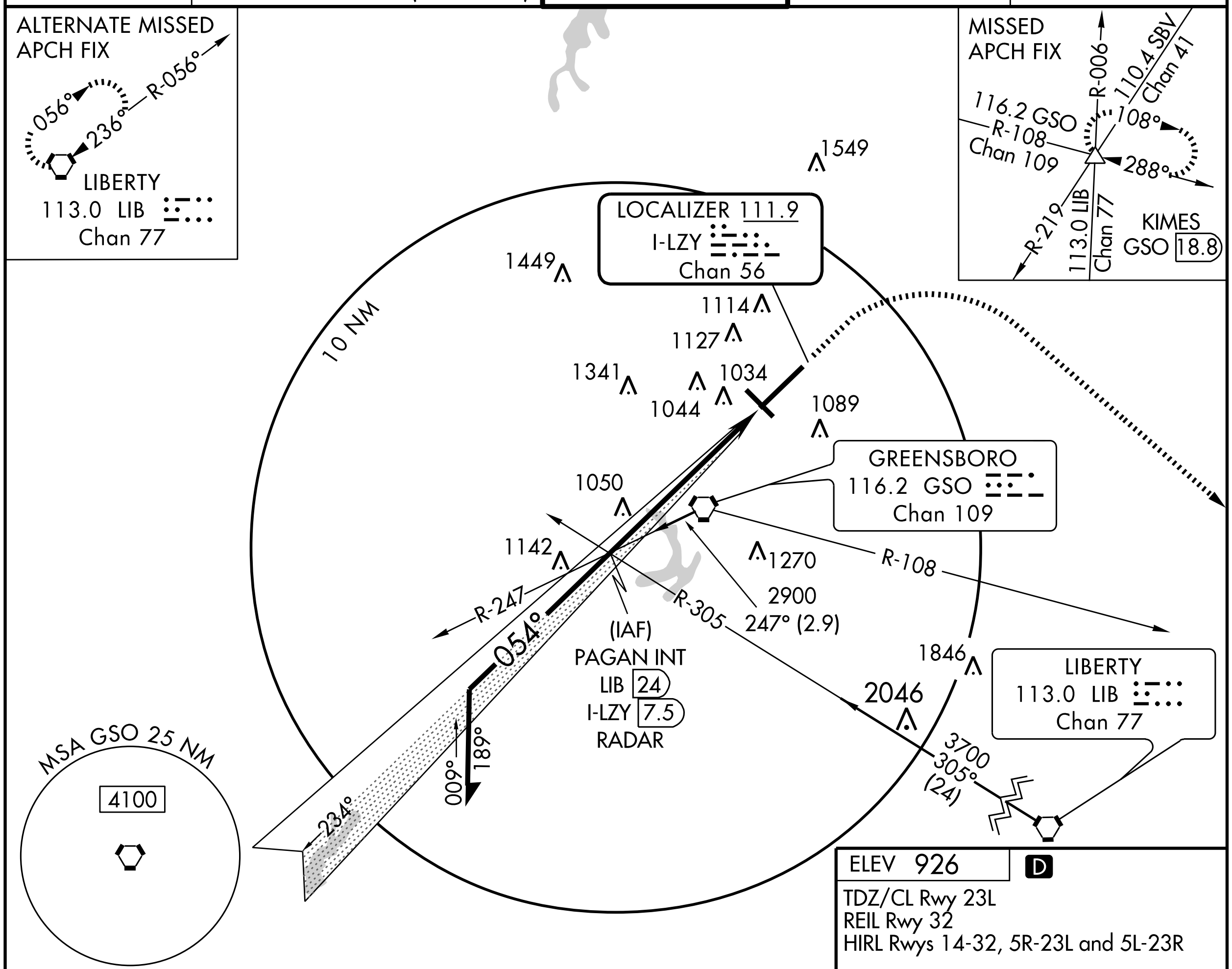
LOC/DME I-LZY	APP CRS	Rwy ldg	10001
111.9 Chan 56	**054°**	TDZE	**900**
		Apt Elev	**926**

*RVR 1800 authorized with the use of FD or AP or HUD to DA.

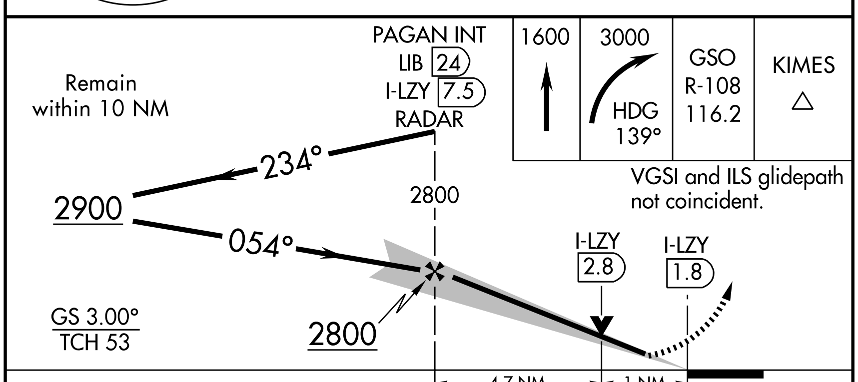
MALSR (A5)

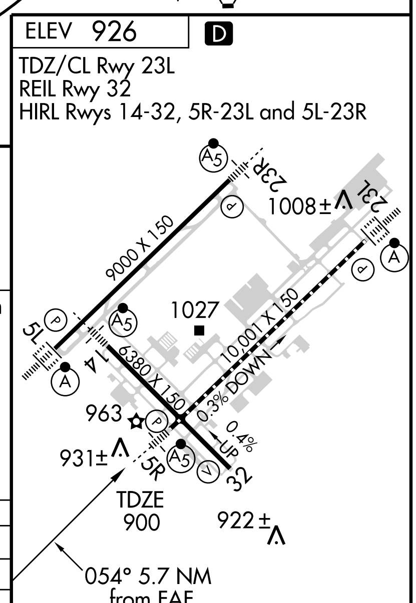
MISSED APPROACH: Climb to 1600 then climbing right turn to 3000 via heading 139° and GSO VORTAC R-108 to KIMES INT/GSO 18.8 DME and hold.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	**124.35 269.225** (250° -049°) **118.5 327.075** (050° -249°)	**119.1 290.325**	**121.9 348.6**	**121.75**



SE-2, 14 JAN 2010 to 11 FEB 2010





CATEGORY	A	B	C	D
S-ILS 5R	*1100/24 200 (200-½)			
S-LOC 5R	1300/24 400 (400-½)			1300/40 400 (400-¾)
CIRCLING	1440-1 514 (600-1)		1440-1½ 514 (600-1½)	1480-2 554 (600-2)

FAF to MAP 5.7 NM

Knots	60	90	120	150	180
Min:Sec	5:42	3:48	2:51	2:17	1:54

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WAAS CH **53610** **W05A**	APP CRS **052°**	Rwy ldg **10001** TDZE **900** Apt Elev **925**

RNAV (GPS) RWY 5R

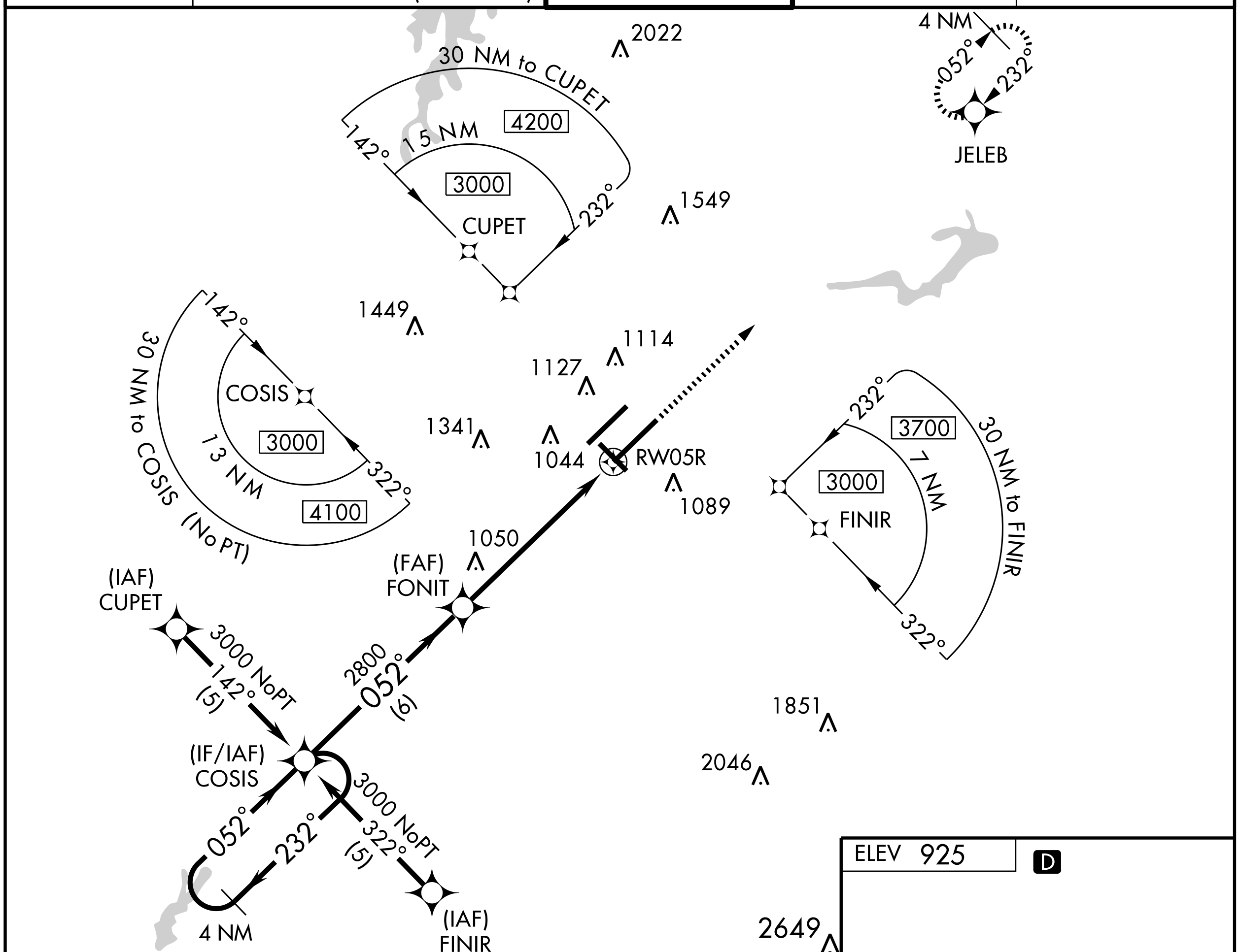
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

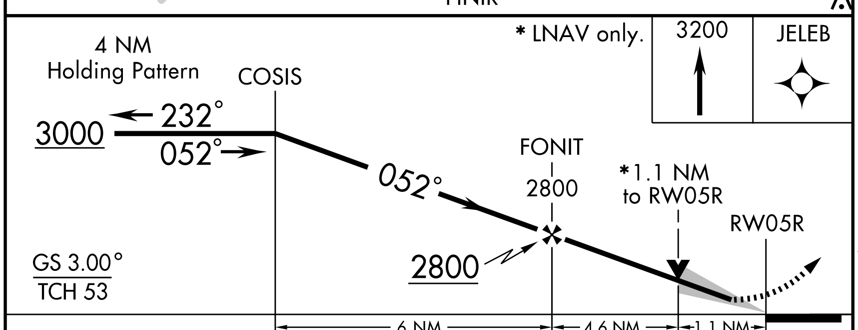
For inoperative MALSR, increase LNAV Cat. D visibility to RVR 6000. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -16°C (4°F) or above 47°C (116°F). DME/DME RNP-0.3 NA

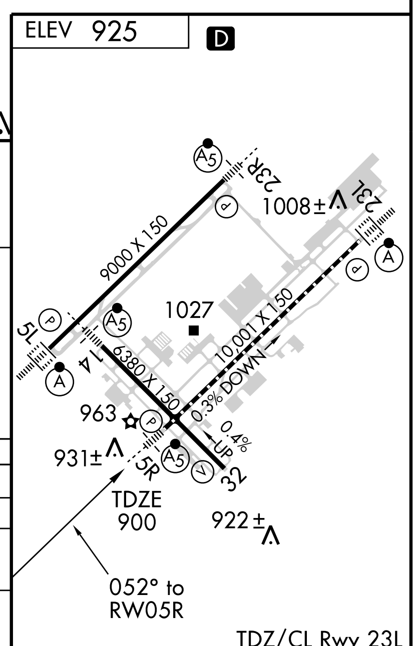
MALSR

MISSED APPROACH: Climb to 3200 direct JELEB and hold.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	**124.35 269.225** (250° -049°) **118.5 327.075** (050° -249°)	**119.1 290.325**	**121.9 348.6**	**121.75**







CATEGORY	A	B	C	D
LPV DA	1100/24 200 (200-½)			
LNAV/VNAV DA	1321/50 421 (400-1)			
LNAV MDA	1300/24 400 (400-½)			1300/50 400 (400-1)
CIRCLING	1340-1 415 (500-1)	1440-1 515 (600-1)	1440-1½ 515 (600-1½)	1480-2 555 (600-2)

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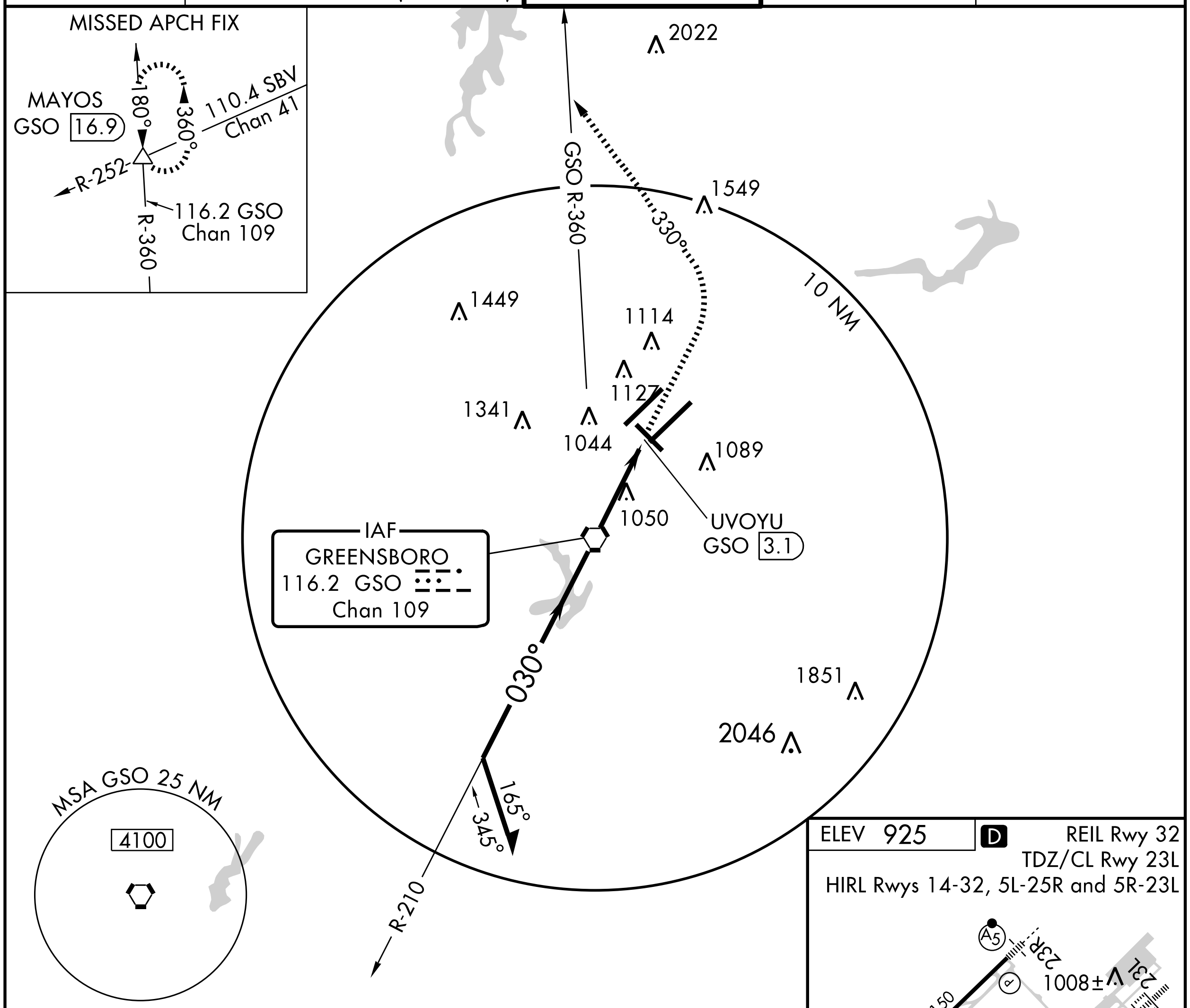
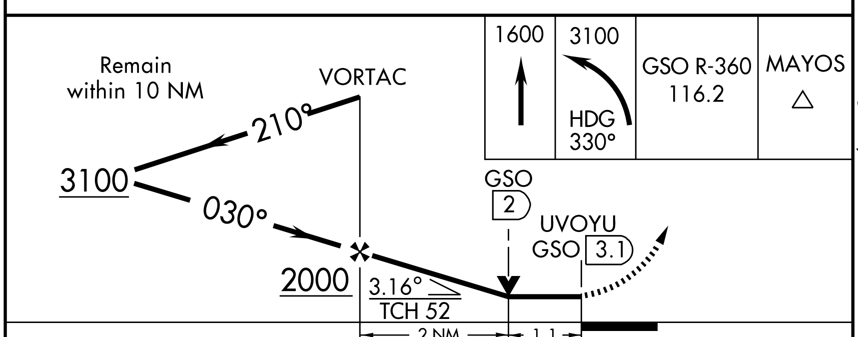
VORTAC GSO 116.2 Chan 109	APP CRS 030°	Rwy ldg 10001 TDZE 900 Apt Elev 925

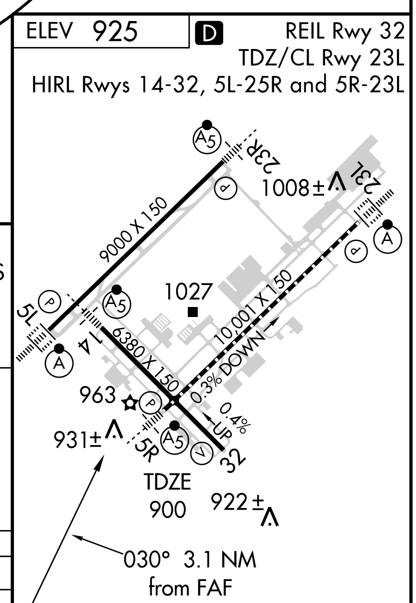
VOR RWY 5R
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

T Inoperative table does not apply to S-5R Cat. D.	MALSR (A5)	MISSED APPROACH: Climb to 1600 then climbing left turn to 3100 via heading 330° and GSO R-360 to MAYOS Int/GSO 16.9 DME and hold.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	124.35 269.225 (250° -049°) 118.5 327.075 (050° -249°)	119.1 290.325	121.9 348.6	121.75







CATEGORY	A	B	C	D
S-5R	1300/24 400 (400-½)			1300/60 400 (400-1¼)
CIRCLING	1340-1 415 (500-1)	1440-1 515 (600-1)	1440-1½ 515 (600-1½)	1480-2 555 (600-2)

FAF to MAP 3.1 NM

Knots	60	90	120	150	180
Min:Sec	3:06	2:04	1:33	1:14	1:02

SE-2, 14 JAN 2010 to 11 FEB 2010

SE-2, 14 JAN 2010 to 11 FEB 2010

LOC I-HIH	APP CRS	Rwy ldg	9601
109.3	232°	TDZE	889
		Apt Elev	925

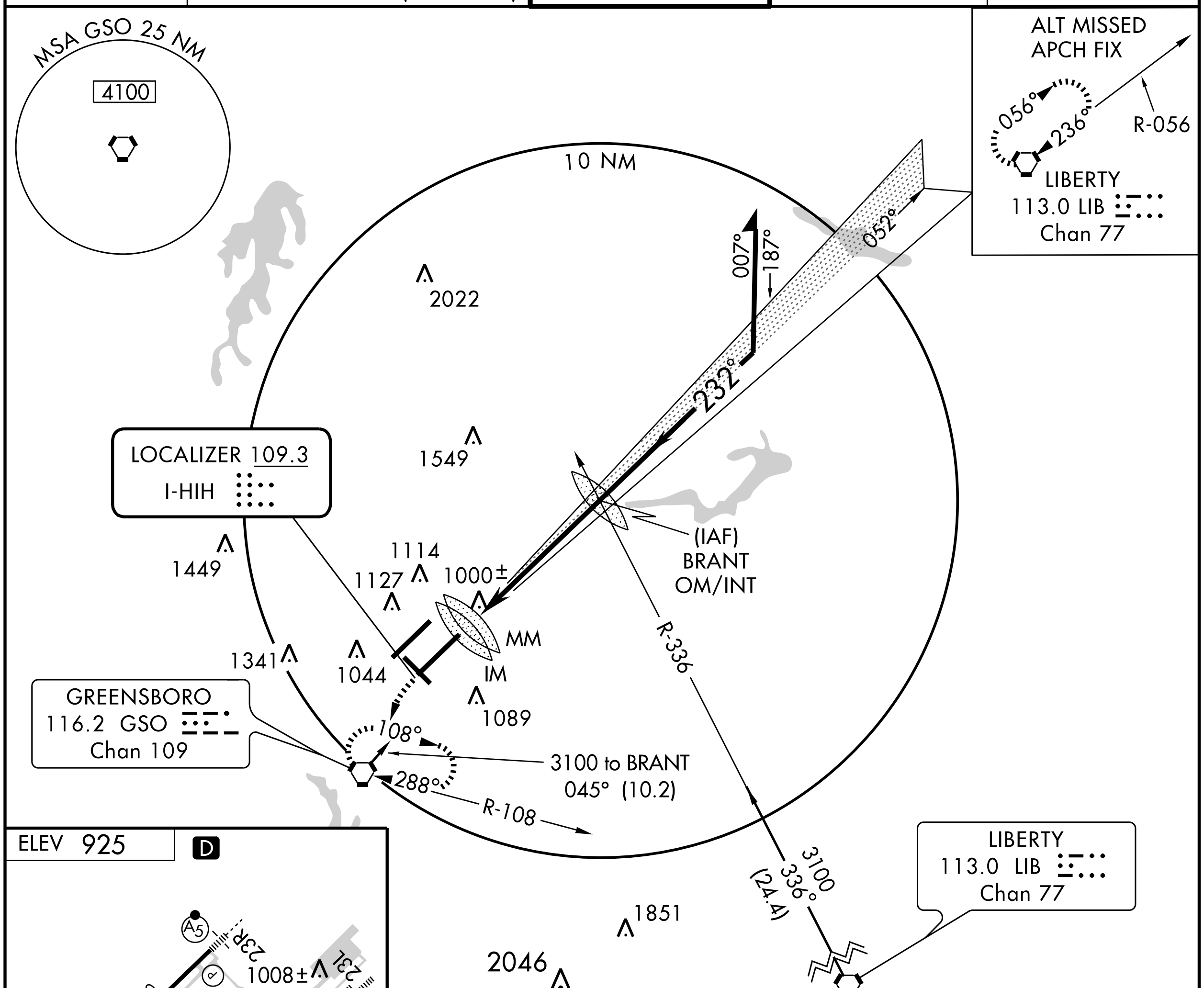
ILS RWY 23L (CAT II)

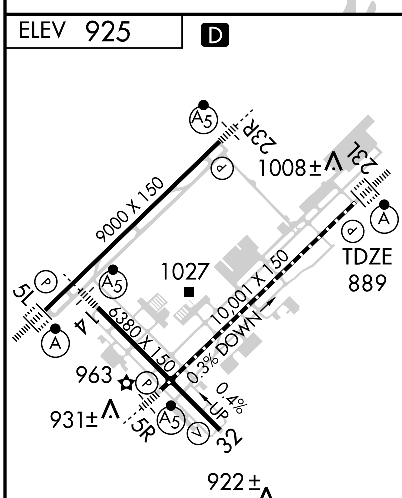
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

	ALSF-2	MISSED APPROACH: Climb to 1300 then climbing left turn to 3100 direct GSO VORTAC and hold, continue climb-in-hold to 3100.

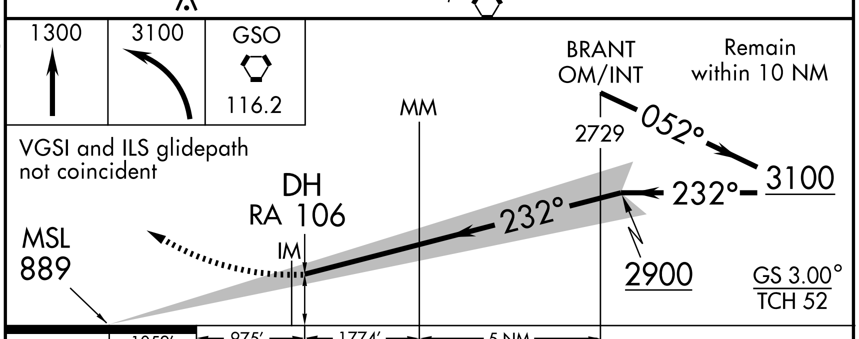
ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	124.35 269.225 (250° -049°) 118.5 327.075 (050° -249°)	119.1 290.325	121.9 348.6	121.75

SE-2, 14 JAN 2010 to 11 FEB 2010





TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5L-23R and 5R-23L



CATEGORY	A	B	C	D
S-ILS 23L	RA 106/12 100 DA 989			

CATEGORY II ILS - SPECIAL AIRCREW & AIRCRAFT CERTIFICATION REQUIRED

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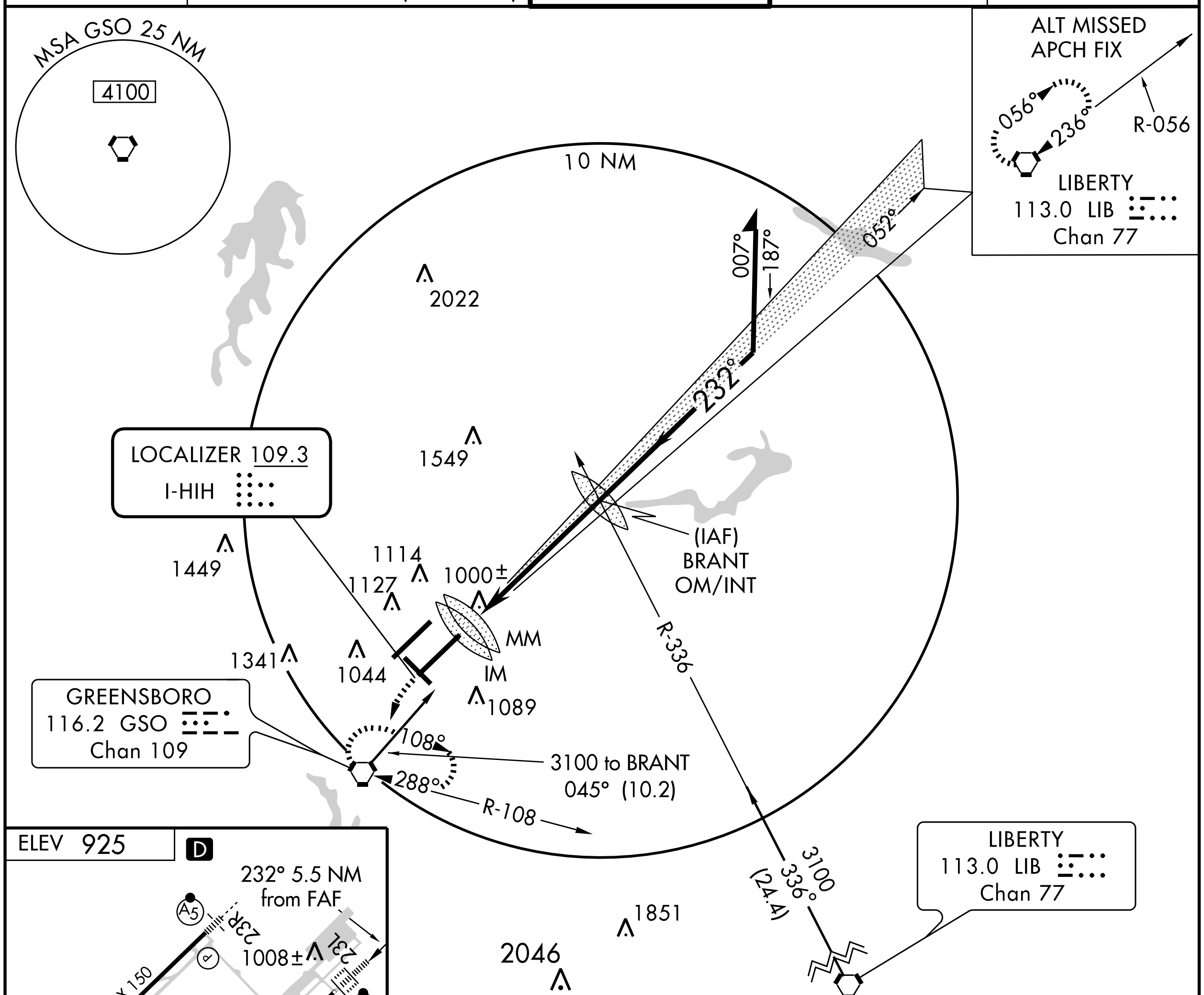
ILS or LOC RWY 23L

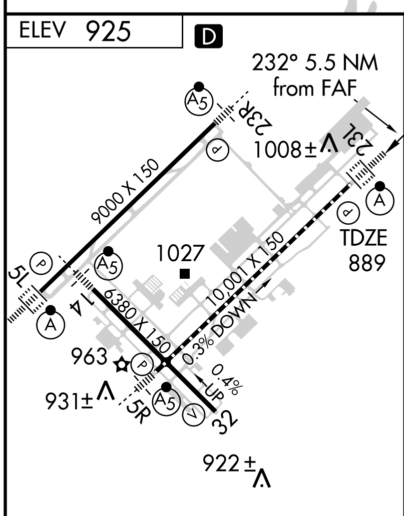
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

LOC I-HIH	APP CRS	Rwy ldg	9601
109.3	232°	TDZE	889
		Apt Elev	925

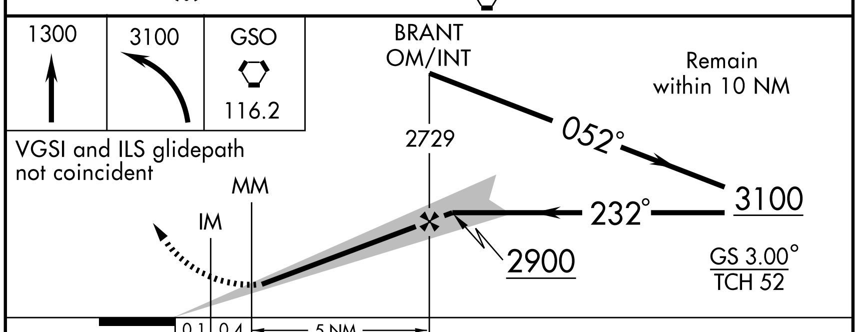
	ALSF-2	MISSED APPROACH: Climb to 1300 then climbing left turn to 3100 direct GSO VORTAC and hold, continue climb-in-hold to 3100.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	124.35 269.225 (250° -049°) 118.5 327.075 (050° -249°)	119.1 290.325	121.9 348.6	121.75





TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5L-23R and 5R-23L



CATEGORY	A	B	C	D
S-ILS 23L	1089/18 200 (200-½)			
S-LOC 23L	1260/24 371 (400-½)			1260/40 371 (400-¾)
CIRCLING	1340-1 415 (500-1)	1440-1 515 (600-1)	1440-1½ 515 (600-1½)	1480-2 555 (600-2)

FAF to MAP 5.5 NM

Knots	60	90	120	150	180
Min:Sec	5:30	3:40	2:45	2:12	1:50

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SE-2, 14 JAN 2010 to 11 FEB 2010

WAAS	APP CRS	Rwy ldg	9601
CH **97710**	**232°**	TDZE	**889**
W23A		Apt Elev	**925**

RNAV (GPS) RWY 23L

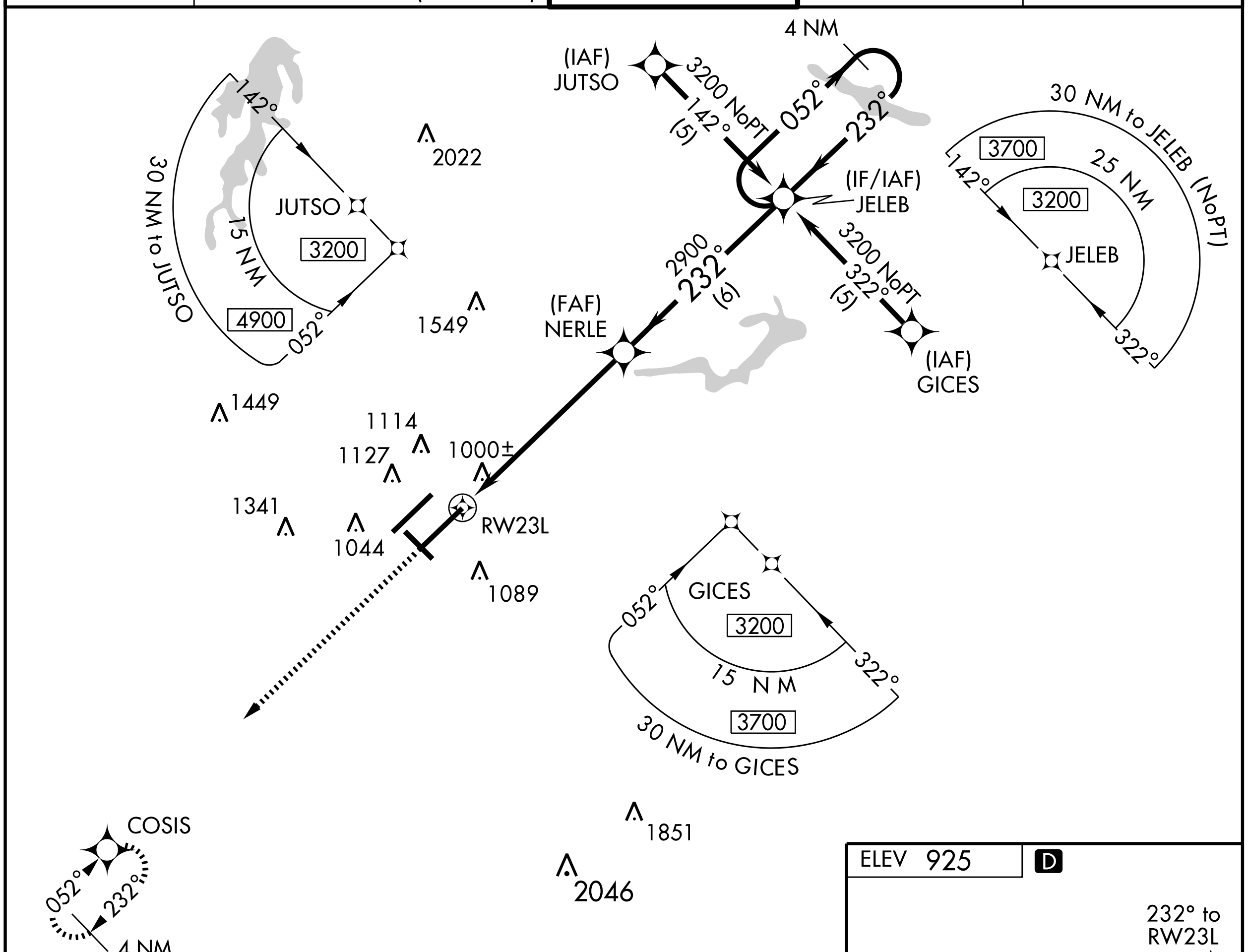
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

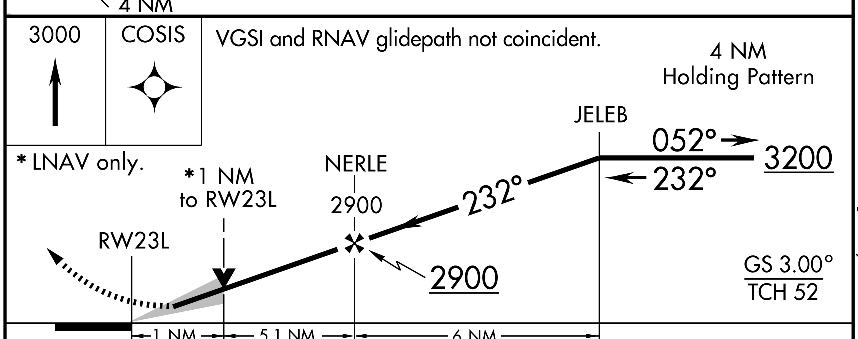
For inoperative ALSF, increase LNAV Cat. D visibility to RVR 6000. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -16°C (4°F) or above 47°C (116°F). DME/DME RNP-0.3 NA.

ALSF-2

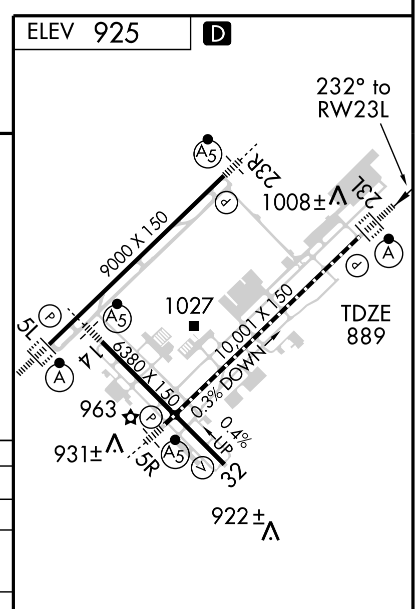
MISSED APPROACH: Climb to 3000 direct COSIS and hold.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	**124.35 269.225** (250° -049°) **118.5 327.075** (050° -249°)	**119.1 290.325**	**121.9 348.6**	**121.75**





CATEGORY	A	B	C	D
LPV DA	1089/24 200 (200-½)			
LNAV/ VNAV DA	1276/40 387 (400-¾)			
LNAV MDA	1260/24 371 (400-½)			1260/50 371 (400-1)
CIRCLING	1340-1 415 (500-1)	1440-1 515 (600-1)	1440-1½ 515 (600-1½)	1480-2 555 (600-2)



TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5L-23R and 5R-23L

SE-2, 14 JAN 2010 to 11 FEB 2010

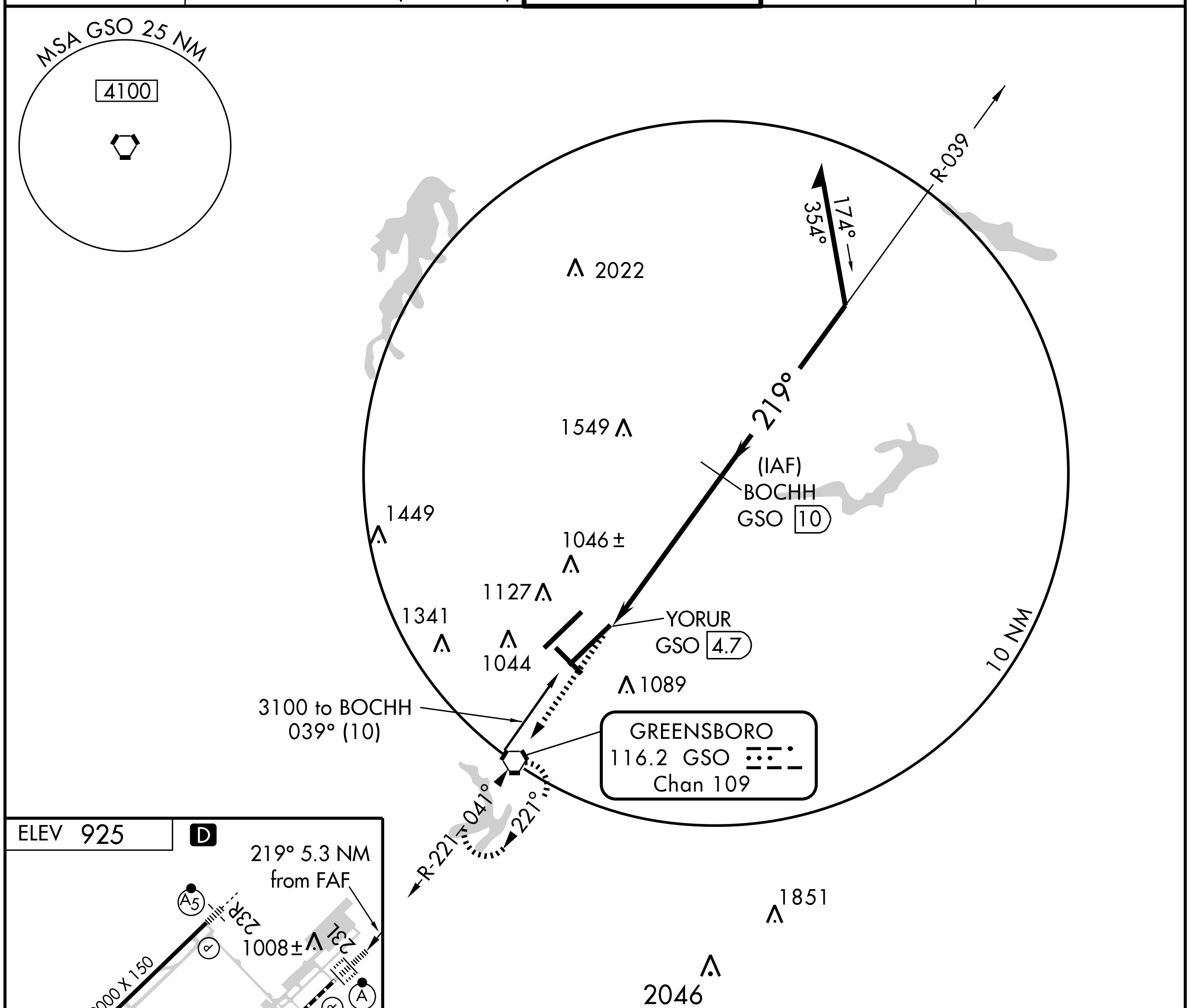
VORTAC GSO 116.2 Chan 109	APP CRS 219°	Rwy Idg 9601 TDZE 889 Apt Elev 925

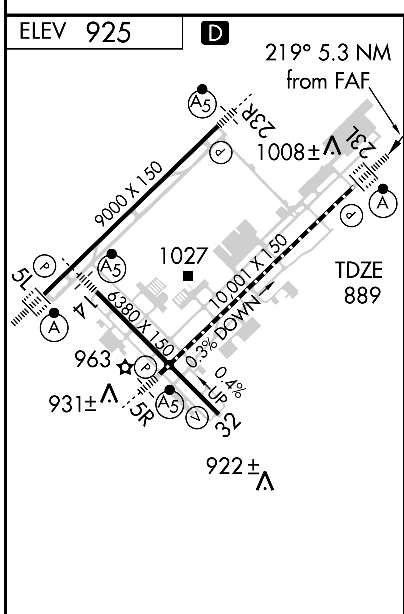
VOR/DME RWY 23L

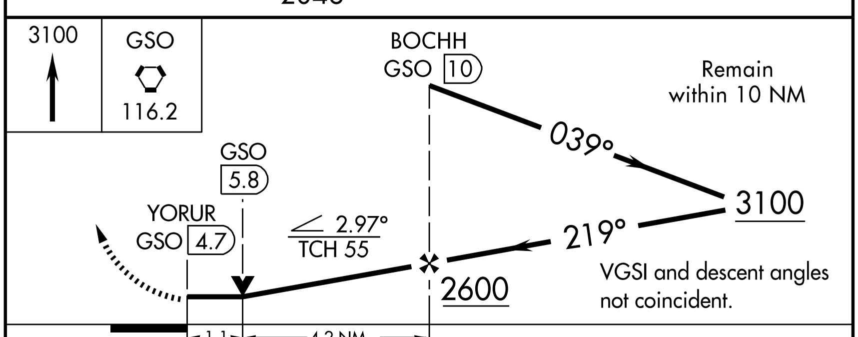
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

T For inoperative ALSF, increase S-23L Cat. D visibility to RVR 6000.	ALSF-2 (A)	MISSED APPROACH: Climb to 3100 direct GSO VORTAC and hold, continue climb-in-hold to 3100.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	124.35 269.225 (250° -049°) 118.5 327.075 (050° -249°)	119.1 290.325	121.9 348.6	121.75







CATEGORY	A	B	C	D
S-23L	1300/24 411 (400-½)		1300/40 411 (400-¾)	1300/50 411 (400-1)
CIRCLING	1340-1 415 (500-1)	1440-1 515 (600-1)	1440-1½ 515 (600-1½)	1480-2 555 (600-2)

TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5L-23R and 5R-23L

SE-2, 14 JAN 2010 to 11 FEB 2010

ILS RWY 5L (CAT III)

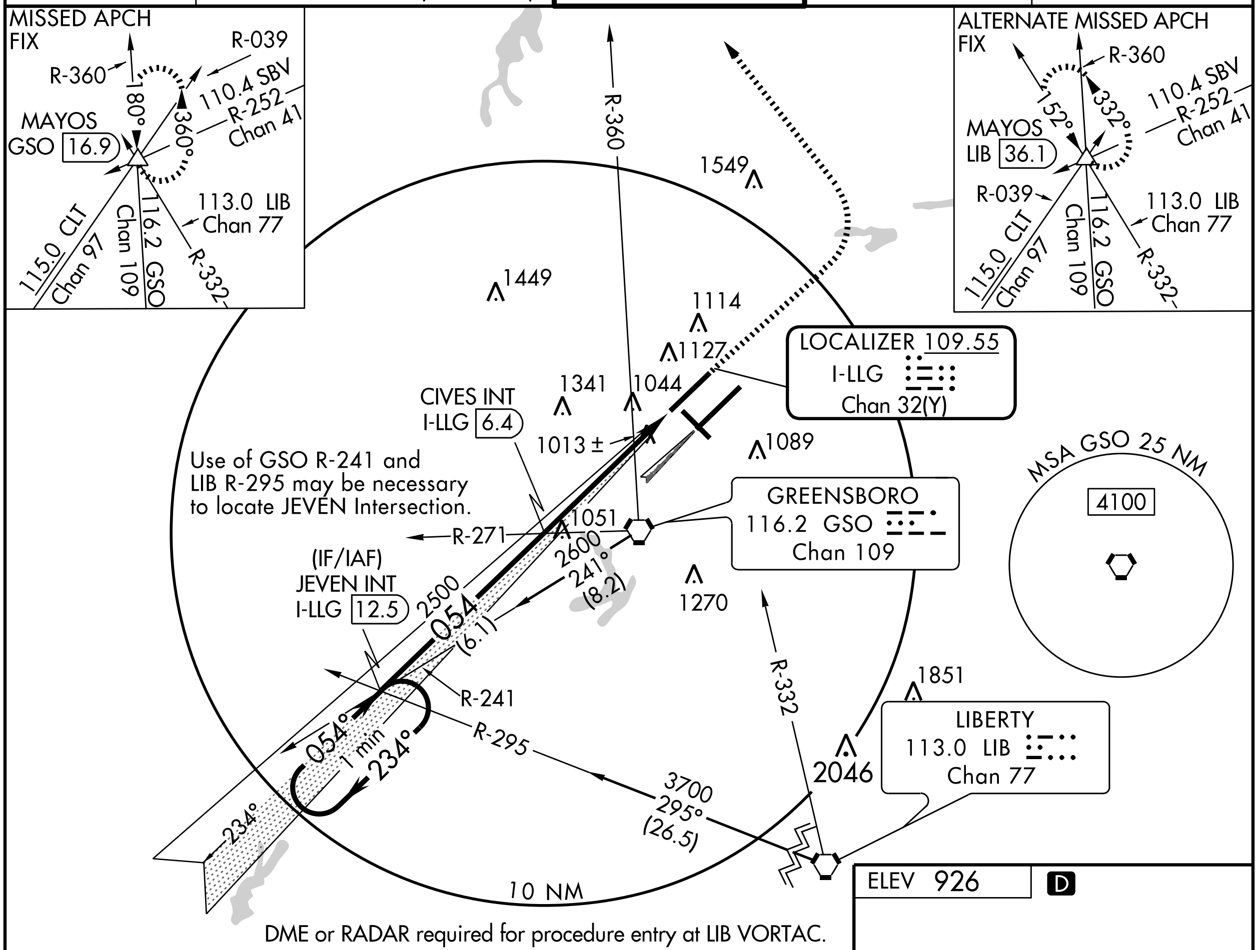
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

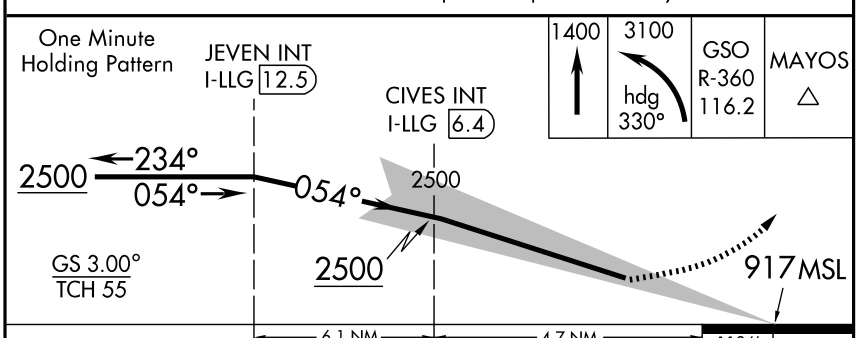
LOC/DME I-LLG	APP CRS	Rwy ldg	9000
109.55 Chan 32(Y)	054°	TDZE	917
		Apt Elev	926

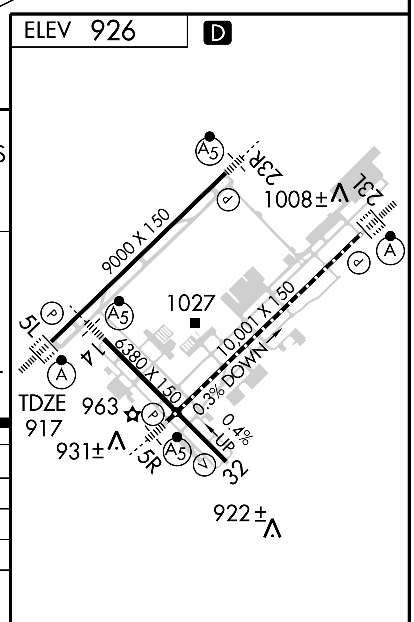
ALSF-2

MISSED APPROACH: Climb to 1400 then climbing left turn to 3100 via heading 330° and GSO VORTAC R-360 to MAYOS INT/GSO 16.9 DME and hold.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	124.35 269.225 (250°-049°) 118.5 327.075 (050°-249°)	119.1 290.325	121.9 348.6	121.75







CATEGORY	A	B	C	D
S-ILS-05L	CAT IIIa RVR 07			
S-ILS-05L	CAT IIIb RVR 06			
S-ILS-05L	CAT IIIc NA			

CATEGORY III ILS - SPECIAL AIRCREW & AIRCRAFT CERTIFICATION REQUIRED

TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5R-23L and 5L-23R

SE-2, 14 JAN 2010 to 11 FEB 2010

SE-2, 14 JAN 2010 to 11 FEB 2010

09351

ILS RWY 5L (CAT II)

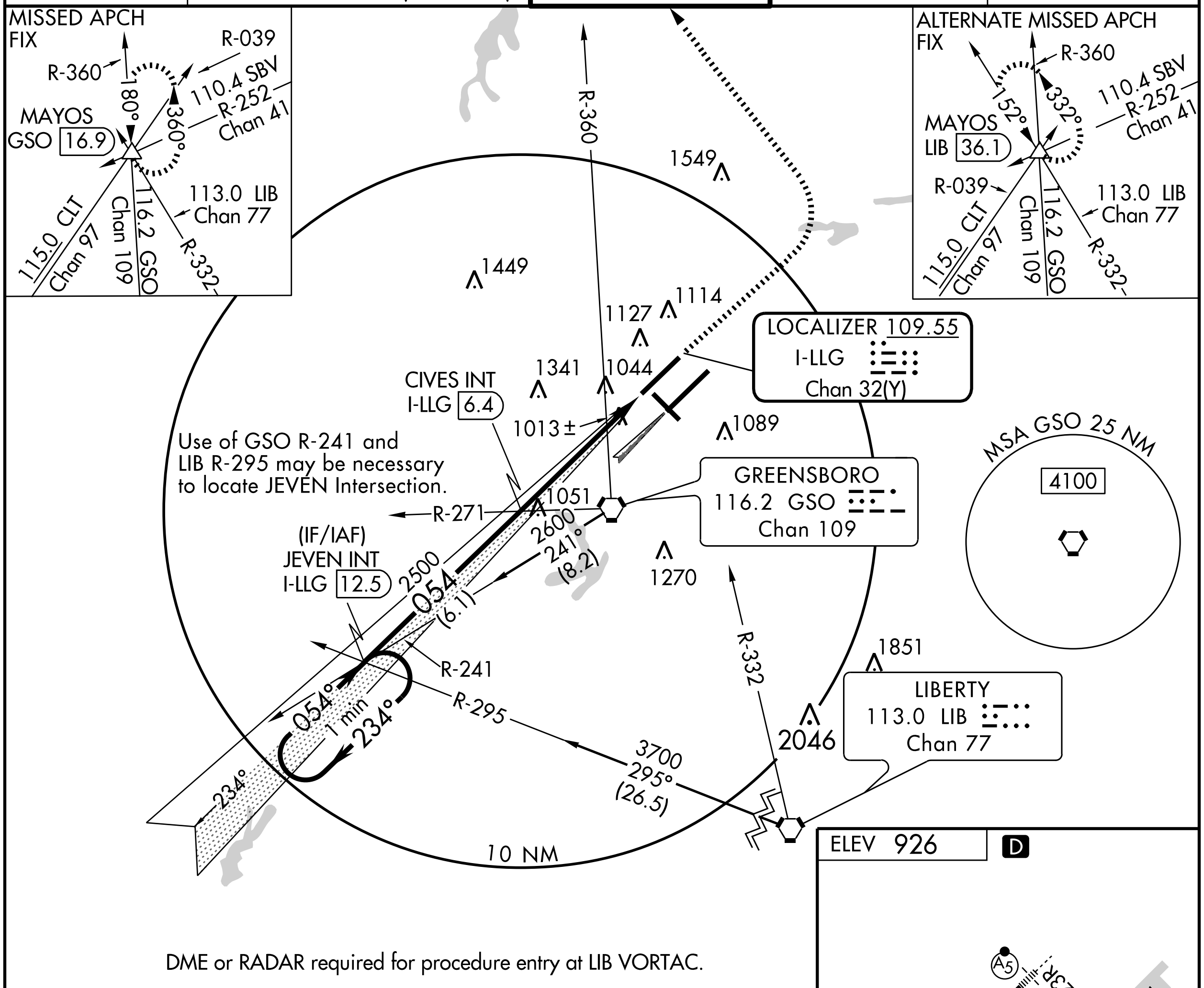
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

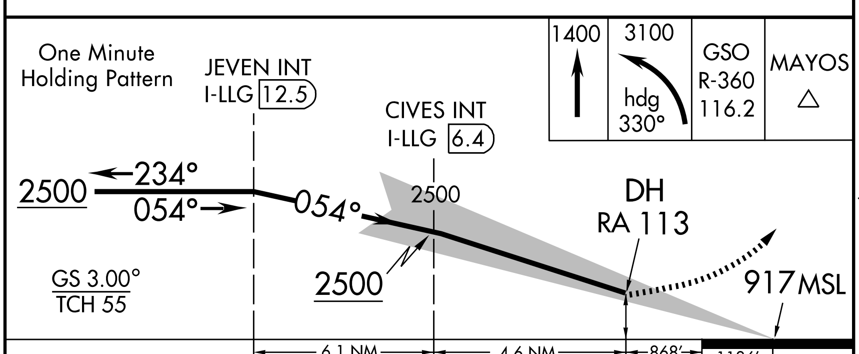
LOC/DME I-LLG 109.55 Chan 32 (Y)	APP CRS 054°	Rwy ldg 9000 TDZE 917 Apt Elev 926

ALSF-2

MISSED APPROACH: Climb to 1400 then climbing left turn to 3100 via heading 330° and GSO VORTAC R-360 to MAYOS INT/GSO 16.9 DME and hold.

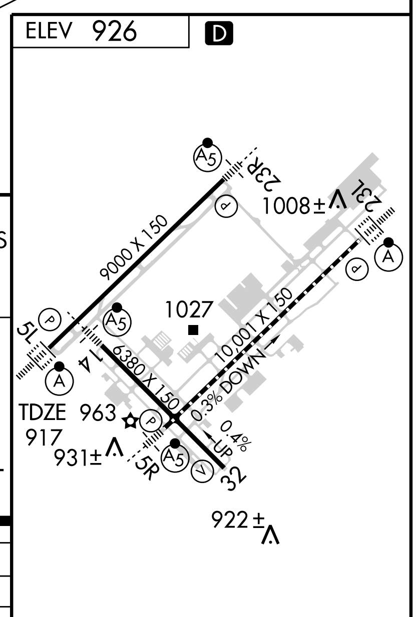
ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	124.35 269.225 (250°-049°) 118.5 327.075 (050°-249°)	119.1 290.325	121.9 348.6	121.75





CATEGORY	A	B	C	D
S-ILS-05L	RA 113/12 100 DA 1017			

CATEGORY II ILS - SPECIAL AIRCREW & AIRCRAFT CERTIFICATION REQUIRED



TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5R-23L and 5L-23R

SE-2, 14 JAN 2010 to 11 FEB 2010

SE-2, 14 JAN 2010 to 11 FEB 2010

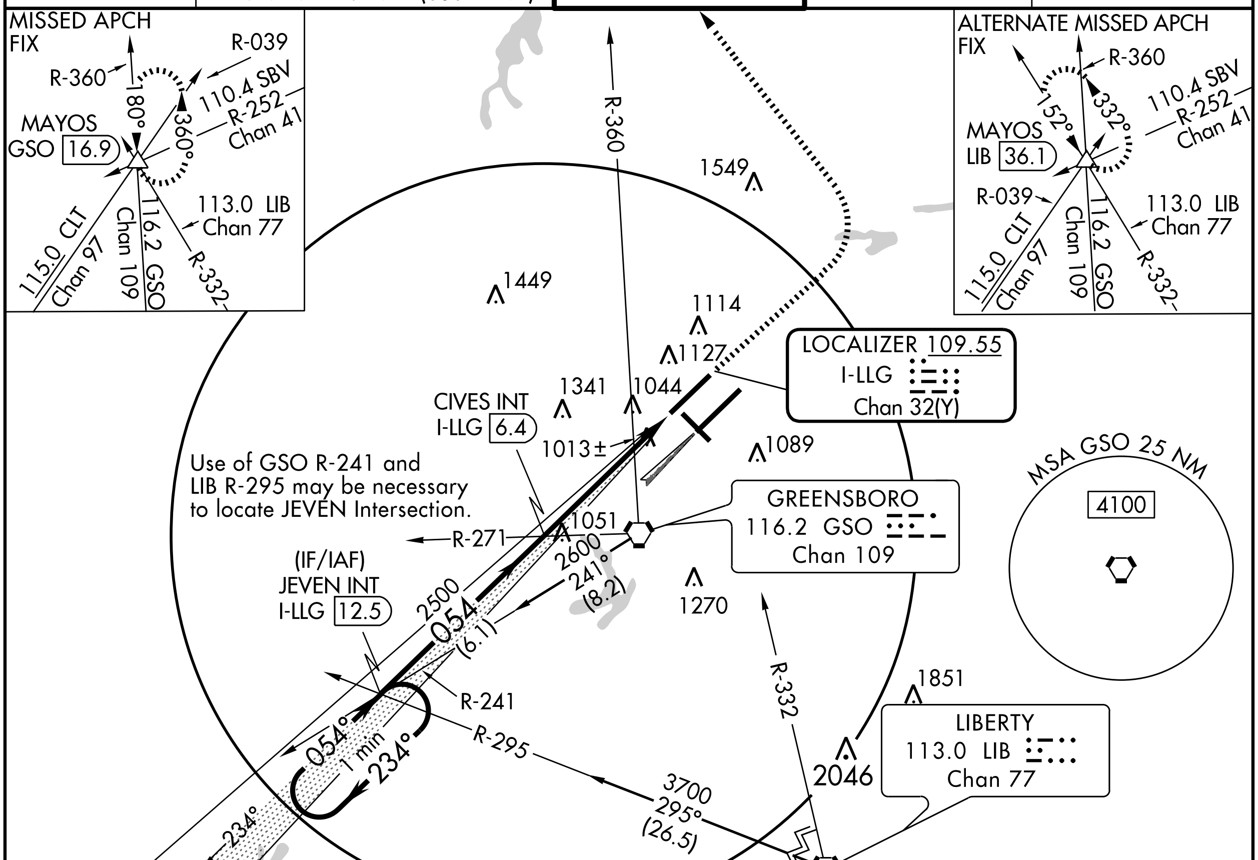
ILS or LOC RWY 5L

GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

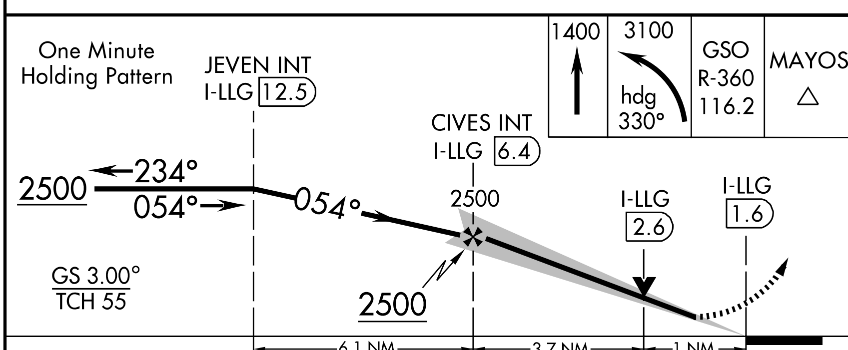
LOC/DME I-LLG 109.55 Chan 32(Y)	APP CRS 054°	Rwy ldg 9000 TDZE 917 Apt Elev 926

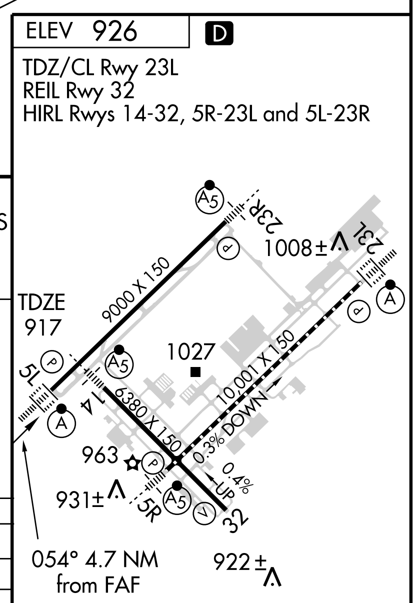
T	ALSF-2 (A)	MISSED APPROACH: Climb to 1400 then climbing left turn to 3100 via heading 330° and GSO VORTAC R-360 to MAYOS INT/GSO 16.9 DME and hold.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	124.35 269.225 (250°-049°) 118.5 327.075 (050°-249°)	119.1 290.325	121.9 348.6	121.75



DME or RADAR required for procedure entry at LIB VORTAC.





CATEGORY	A	B	C	D
S-ILS 5L	1117/18 200 (200-½)			
S-LOC 5L	1280/24 363 (400-½)			1280/40 363 (400-¾)
CIRCLING	1440-1 514 (600-1)		1440-1½ 514 (600-1½)	1480-2 554 (600-2)

FAF to MAP 4.7 NM

Knots	60	90	120	150	180
Min:Sec	4:42	3:08	2:21	1:53	1:34

SE-2, 14 JAN 2010 to 11 FEB 2010

RNAV (GPS) RWY 5L

GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

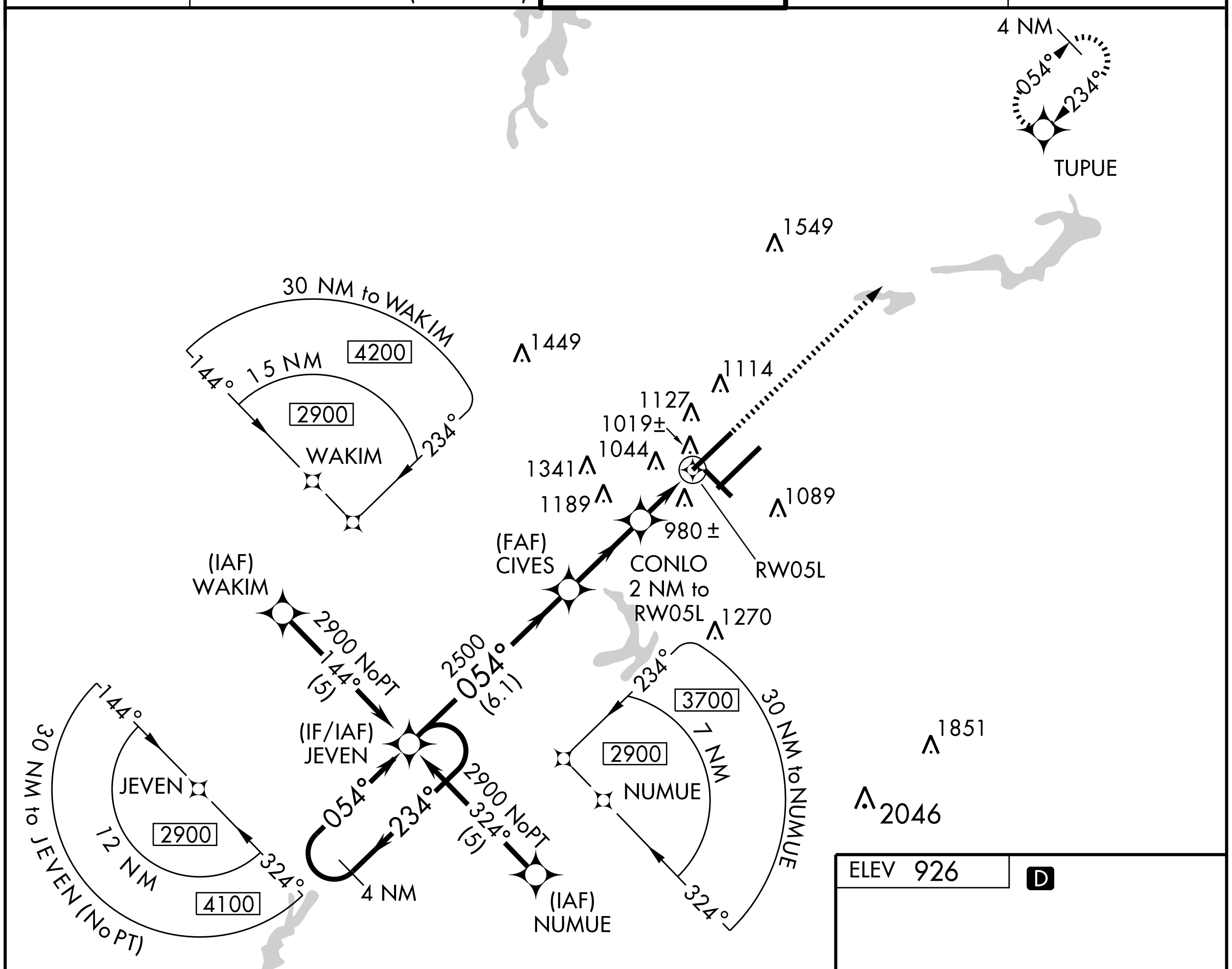
WAAS	APP CRS	Rwy ldg	9000
CH **86515**	**054°**	TDZE	917
W05B		Apt Elev	926

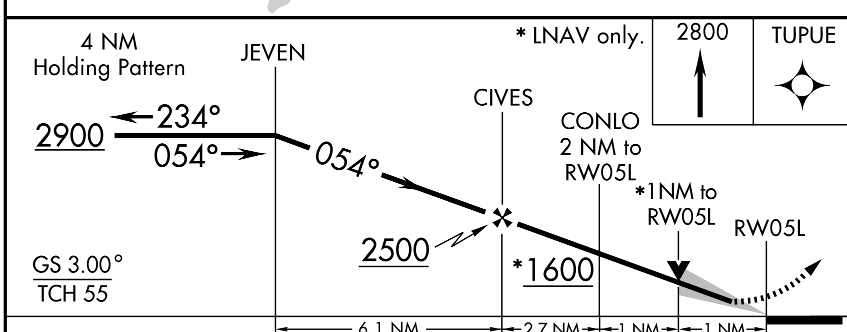
For inoperative ALSF, increase LNAV Cat. D visibility to RVR 6000. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -16°C (4°F) or above 47°C (116°F). DME/DME RNP-0.3 NA

ALSF-2

MISSED APPROACH: Climb to 2800 direct TUPUE and hold.

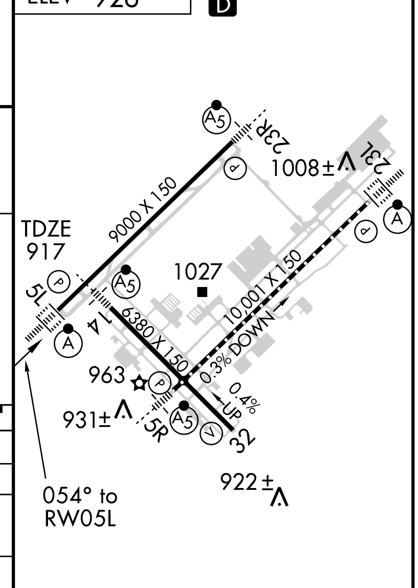
ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	**124.35 269.225** (250° -049°) **118.5 327.075** (050° -249°)	**119.1 290.325**	**121.9 348.6**	**121.75**





CATEGORY	A	B	C	D
LPV DA	1117/24 200 (200-½)			
LNAV/ VNAV DA	1367/50 450 (500-1)			
LNAV MDA	1300/24 383 (400-½)			1300/50 383 (400-1)
CIRCLING	1440-1 514 (600-1)		1440-1½ 514 (600-1½)	1480-2 554 (600-2)

ELEV 926



TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5R-23L and 5L-23R

SE-2, 14 JAN 2010 to 11 FEB 2010

ILS or LOC RWY 23R

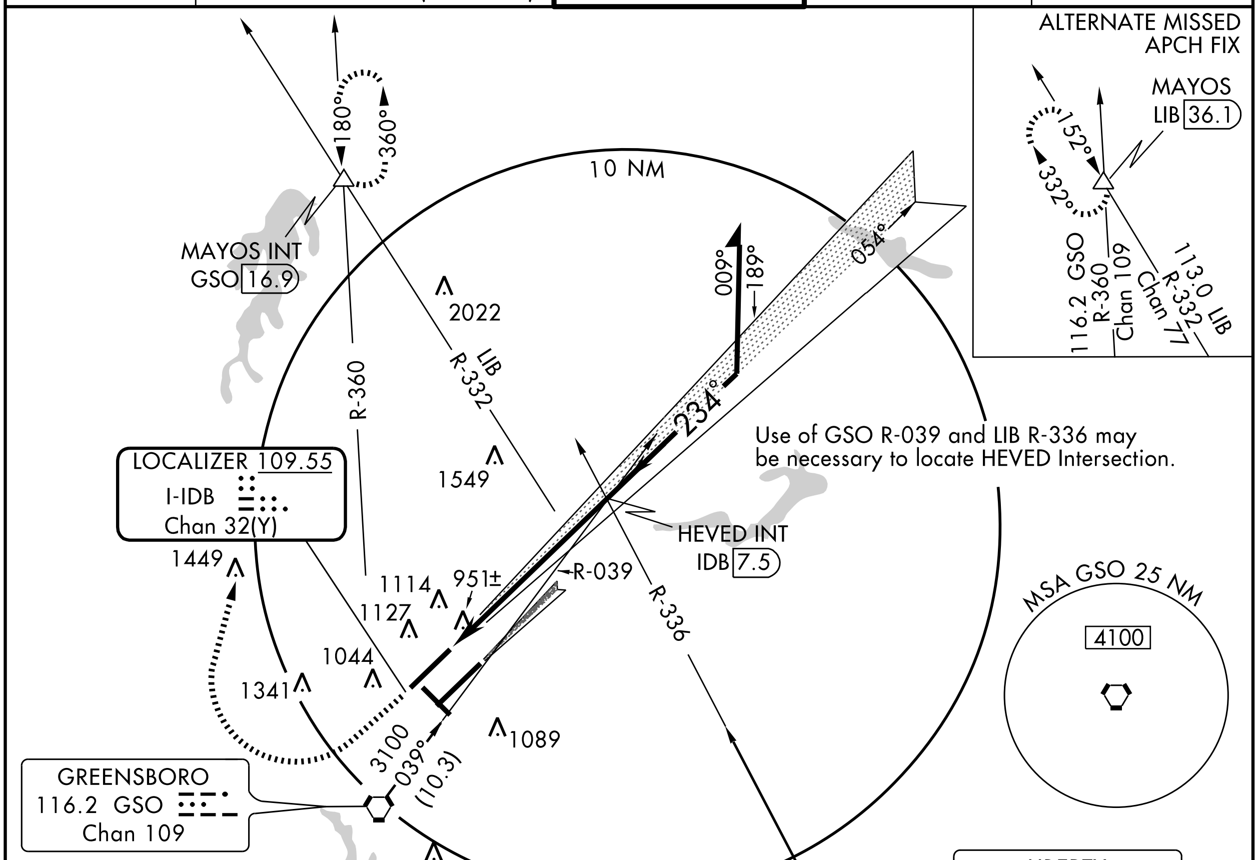
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

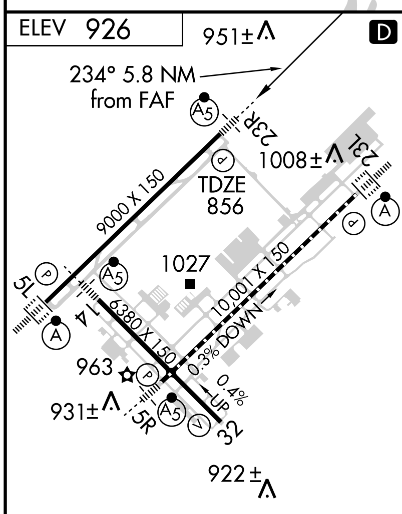
LOC/DME I-IDB	APP CRS	Rwy ldg / TDZE / Apt Elev	
109.55 Chan 32Y	234°	Rwy ldg	9000
		TDZE	856
		Apt Elev	926

MALSR

MISSED APPROACH: Climb to 1500 then climbing right turn to 3100 via heading 015° and GSO VORTAC R-360 to MAYOS INT/GSO 16.9 DME and hold.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	124.35 269.225 (250°-049°) 118.5 327.075 (050°-249°)	119.1 290.325	121.9 348.6	121.75

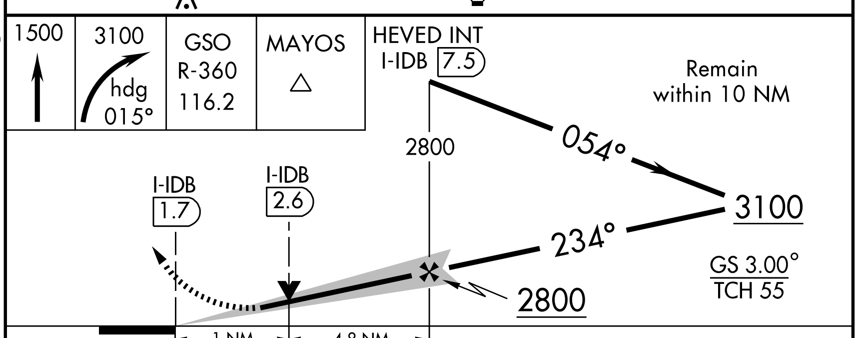




TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5R-23L and 5L-23R

FAF to MAP 5.8 NM					
Knots	60	90	120	150	180
Min:Sec	5:48	3:52	2:54	2:19	1:56

1500 | 3100 hdg 015° | GSO R-360 116.2 | MAYOS



CATEGORY	A	B	C	D
S-ILS 23R	1056/24 200 (200-½)			
S-LOC 23R	1220/24 364 (300-½)			1220/40 364 (300-¾)
CIRCLING	1440-1 514 (600-1)		1440-1½ 514 (600-1½)	1480-2 554 (700-2)

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SE-2, 14 JAN 2010 to 11 FEB 2010

RNAV (GPS) RWY 23R

GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

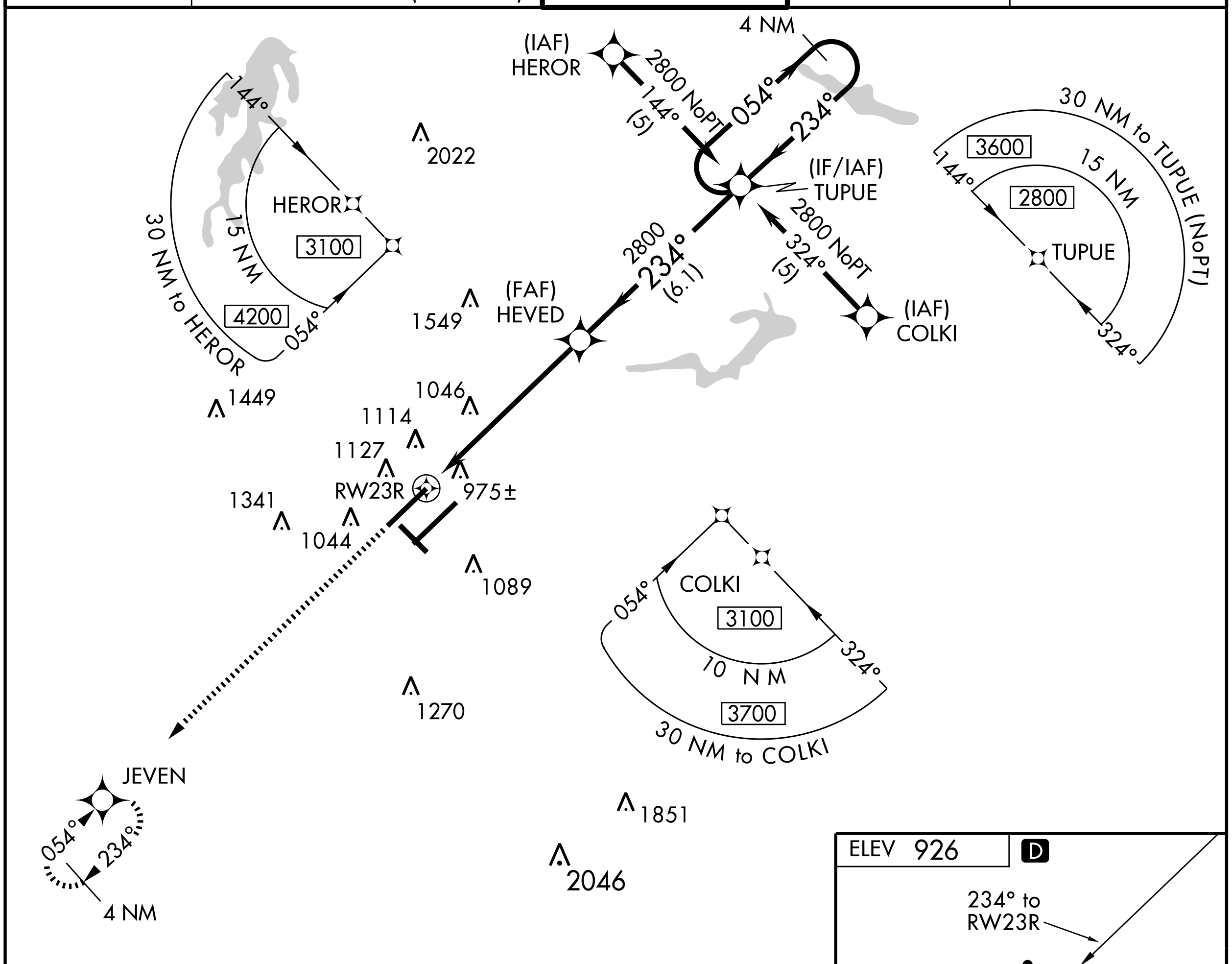
WAAS	APP CRS		
CH **90315** W23B	**234°**	Rwy ldg	**9000**
		TDZE	**856**
		Apt Elev	**926**

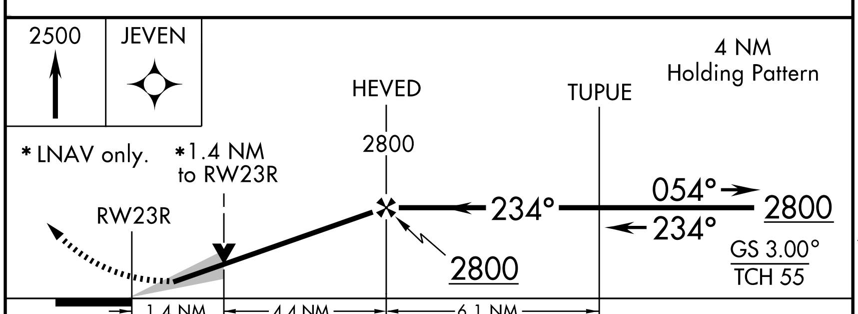
For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -16°C (4°F) or above 47°C (116°F). DME/DME RNP-0.3 NA.

MALSR

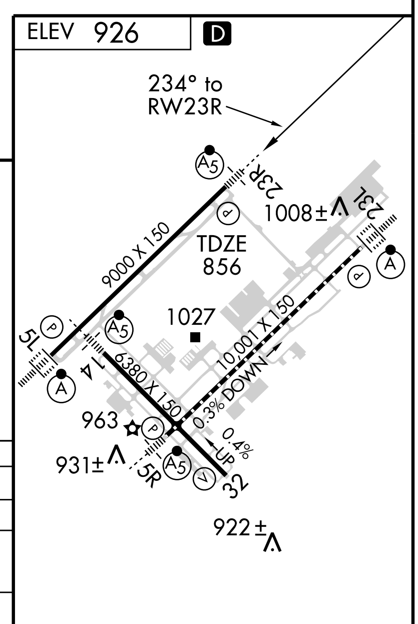
MISSED APPROACH: Climb to 2500 direct JEVEN and hold.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	**124.35 269.225** (250°-049°) **118.5 327.075** (050°-249°)	**119.1 290.325**	**121.9 348.6**	**121.75**





CATEGORY	A	B	C	D
LPV DA	1056/24 200 (200-½)			
LNAV/VNAV DA	1405-1½ 549 (500-1½)			
LNAV MDA	1340/24 484 (500-½)		1340/40 484 (500-¾)	1340/50 484 (500-1)
CIRCLING	1440-1 514 (600-1)		1440-1½ 514 (600-1½)	1480-2 554 (600-2)



TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5R-23L and 5L-23R

SE-2, 14 JAN 2010 to 11 FEB 2010

SE-2, 14 JAN 2010 to 11 FEB 2010

ILS RWY 14

GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

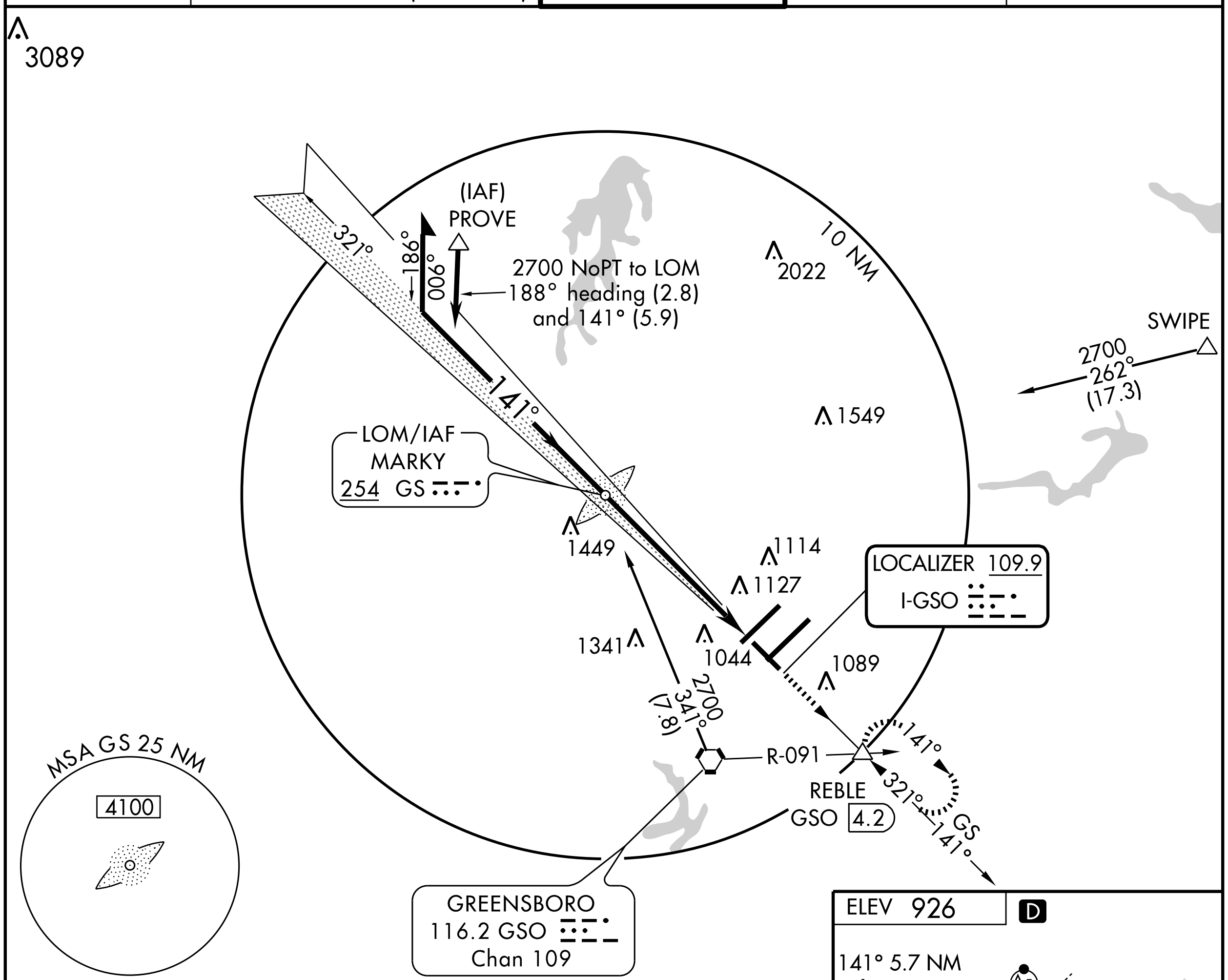
LOC I-GSO	APP CRS	Rwy ldg	6380
109.9	141°	TDZE	926
		Apt Elev	926

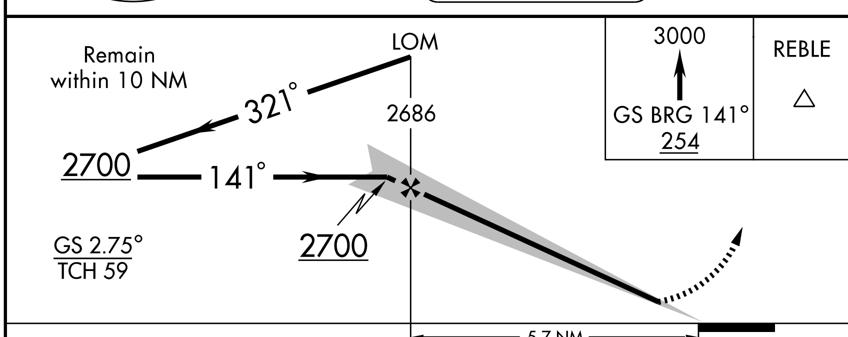
ADF OR RADAR REQUIRED

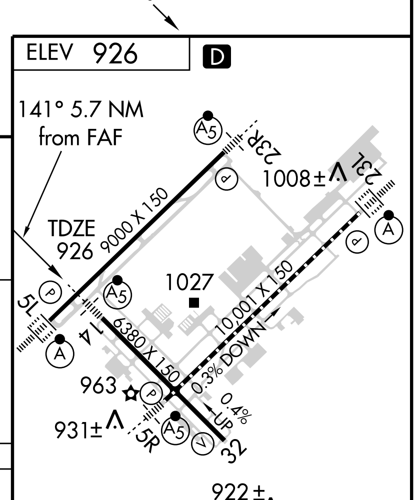
MALSR

MISSED APPROACH: Climb to 3000 via 141° bearing from GS LOM to REBLE Int and hold.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	124.35 269.225 (250° -049°) 118.5 327.075 (050° -249°)	119.1 290.325	121.9 348.6	121.75







CATEGORY	A	B	C	D
S-ILS 14	1126/24 200 (200-½)			
S-LOC 14	1360/24 434 (500-½)		1360/40 434 (500-¾)	1360/50 434 (500-1)
CIRCLING	1360-1 434 (500-1)	1480-1 554 (600-1)	1480-1½ 554 (600-1½)	1480-2 554 (600-2)

TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5L-23R and 5R-23L

FAF to MAP 5.7 NM

Knots	60	90	120	150	180
Min:Sec	5:42	3:48	2:51	2:17	1:54

SE-2, 14 JAN 2010 to 11 FEB 2010

APP CRS	Rwy ldg	6380
141°	TDZE	926
	Apt Elev	926

RNAV (GPS) RWY 14

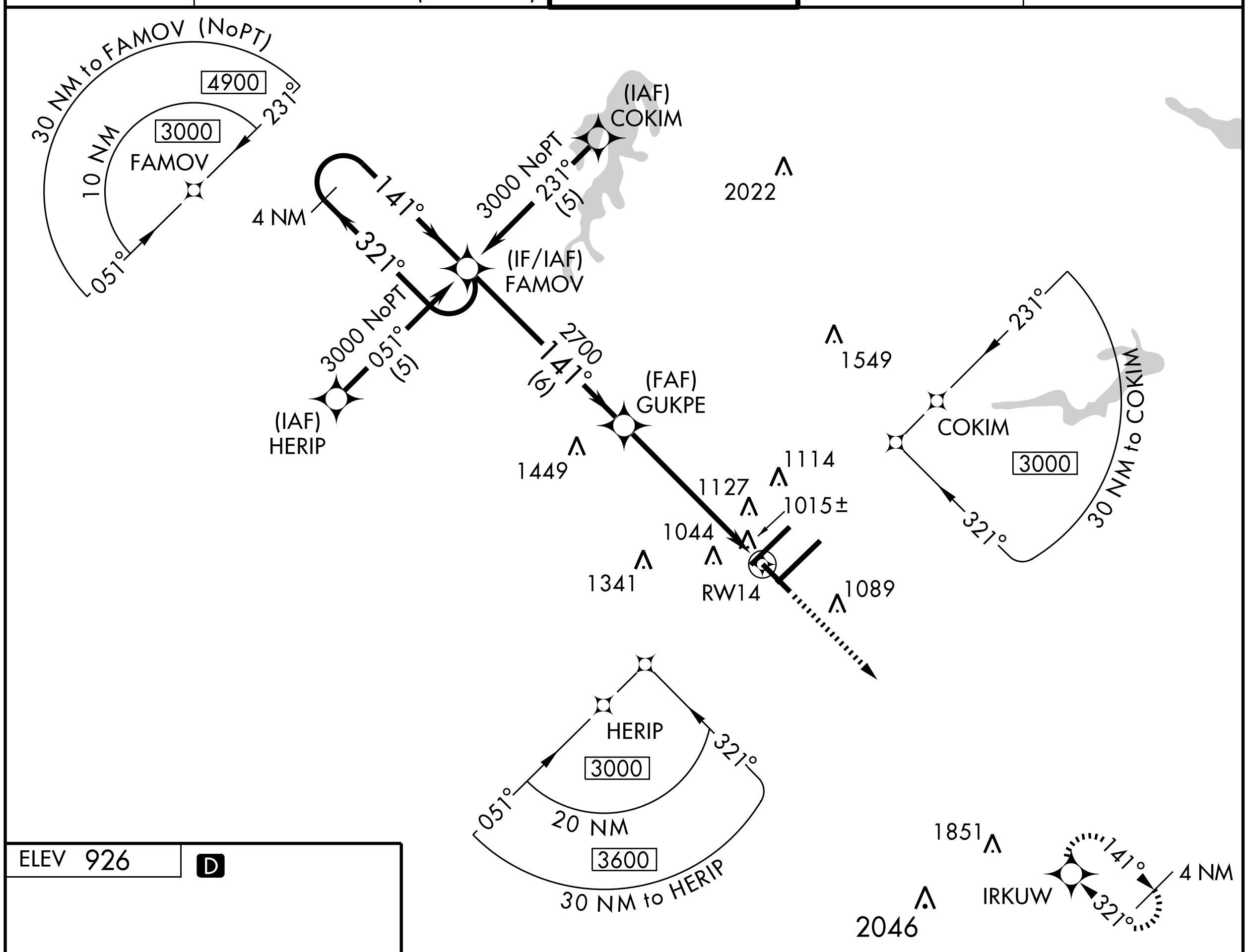
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

T A Baro-VNAV NA below -16°C (4°F). Baro-VNAV NA when using Winston-Salem altimeter setting. DME/DME RNP-0.3 NA. If local altimeter setting not received, use Winston-Salem altimeter setting and increase all DAs/MDAs 40 feet.

MALSR (A5)

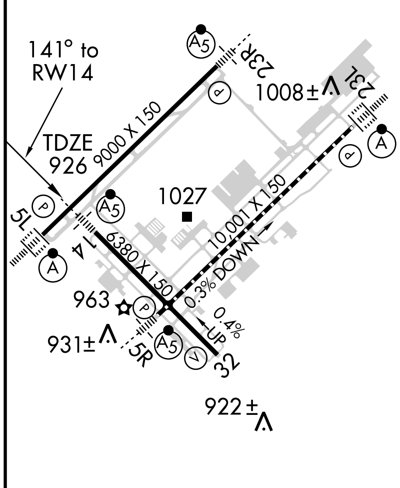
MISSED APPROACH: Climb to 3700 direct IRKUW and hold.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	124.35 269.225 (250° -049°) 118.5 327.075 (050° -249°)	119.1 290.325	121.9 348.6	121.75

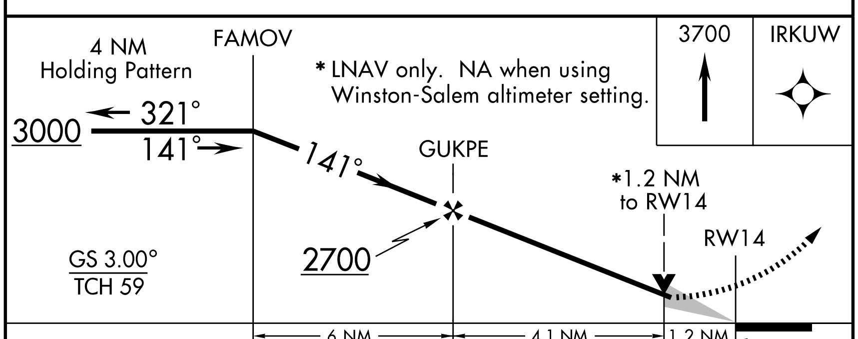


SE-2, 14 JAN 2010 to 11 FEB 2010

ELEV 926 D



TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5L-23R and 5R-23L



CATEGORY	A	B	C	D
LPV DA	NA			
LNAV/ VNAV DA	1320/40 394 (400-¾)			
LNAV MDA	1360/24 434 (500-½)		1360/40 434 (500-¾)	1360/50 434 (500-1)
CIRCLING	1360-1¼ 434 (500-1¼)	1440-1¼ 514 (600-1¼)	1440-1½ 514 (600-1½)	1480-2 554 (600-2)

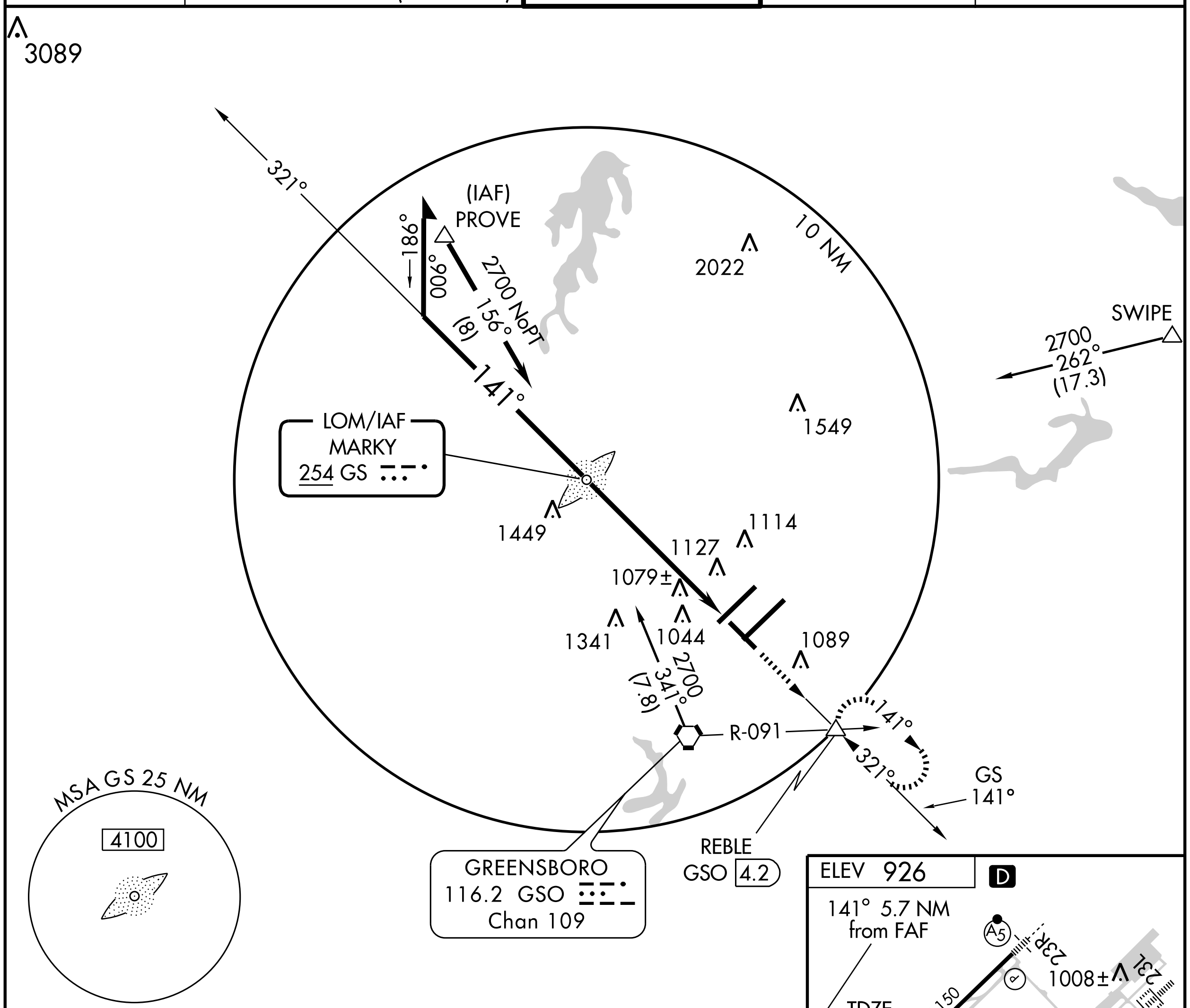
NDB RWY 14
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

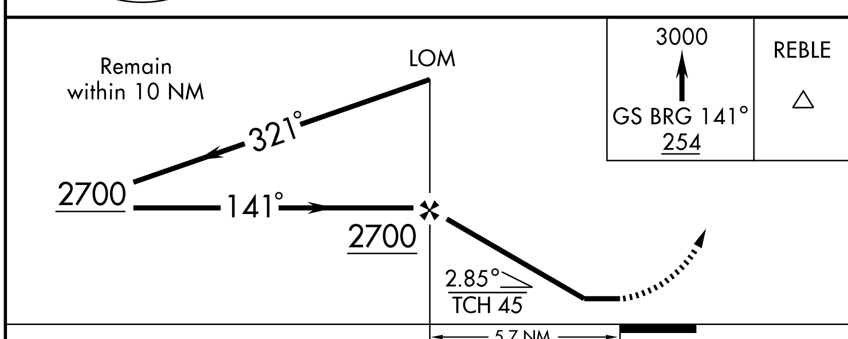
LOM GS	APP CRS	Rwy ldg / TDZE / Apt Elev
254	141°	Rwy ldg 6380 TDZE 926 Apt Elev 926

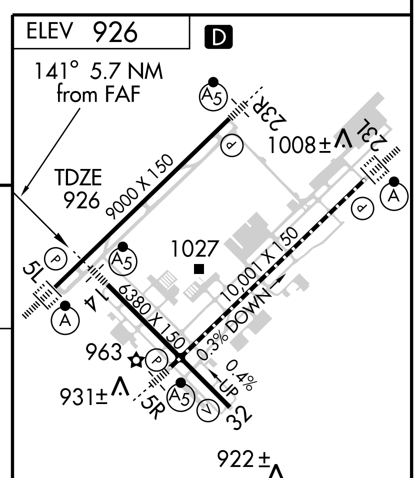
MALSR

MISSED APPROACH: Climb to 3000 via 141° bearing from GS LOM to REBLE Int and hold.

ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	124.35 269.225 (250° -049°) 118.5 327.075 (050° -249°)	119.1 290.325	121.9 348.6	121.75







CATEGORY	A	B	C	D
S-14	1440/40 514 (600-¾)		1440/50 514 (600-1)	1440-1½ 514 (600-1½)
CIRCLING	1440-1 514 (600-1)	1480-1 554 (600-1)	1480-1½ 554 (600-1½)	1480-2 554 (600-2)

TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5L-23R and 5R-23L

FAF to MAP 5.7 NM

Knots	60	90	120	150	180
Min:Sec	5:42	3:48	2:51	2:17	1:54

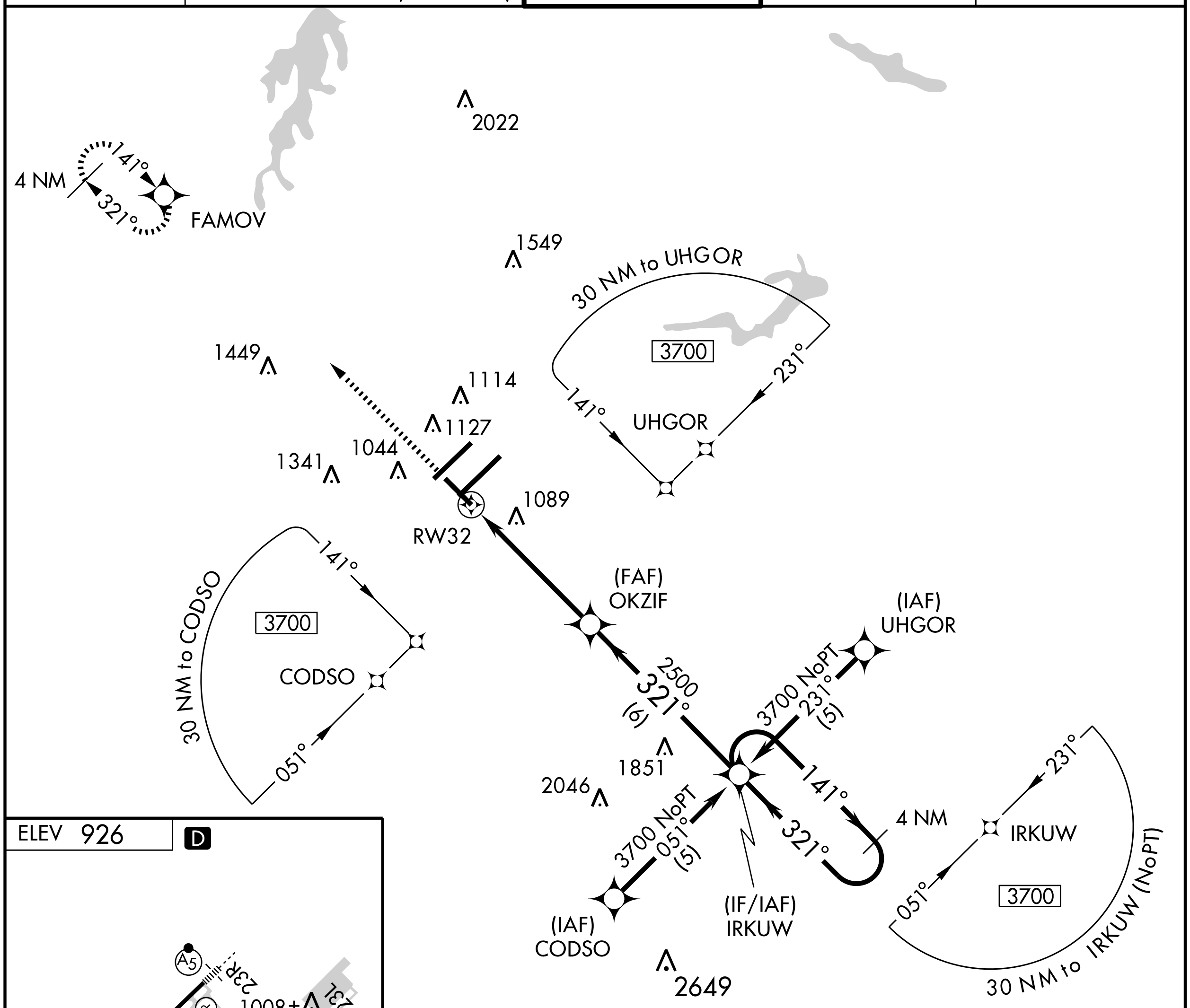
APP CRS	Rwy ldg	6380
321°	TDZE	902
	Apt Elev	926

RNAV (GPS) RWY 32

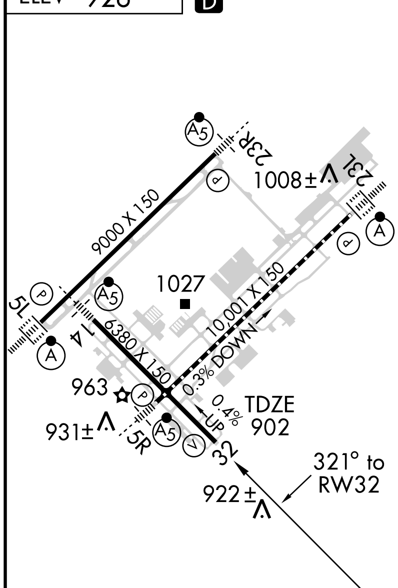
GREENSBORO/ PIEDMONT TRIAD INTL (GSO)

DME/DME RNP-0.3 NA. If local altimeter setting not received, use Winston-Salem altimeter setting and increase all MDAs 40 feet. VDP NA when using Winston-Salem altimeter setting.	MISSED APPROACH: Climb to 3000 direct FAMOV and hold.

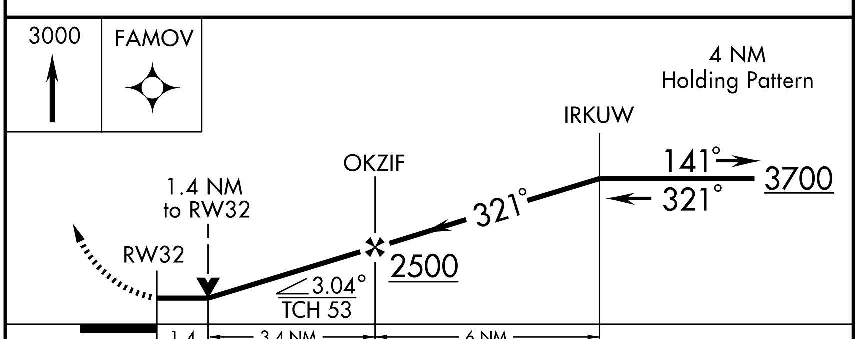
ATIS	GREENSBORO APP CON	GREENSBORO TOWER	GND CON	CLNC DEL
128.55	124.35 269.225 (250° -049°) 118.5 327.075 (050° -249°)	119.1 290.325	121.9 348.6	121.75



ELEV 926



TDZ/CL Rwy 23L
REIL Rwy 32
HIRL Rwys 14-32, 5L-23R and 5R-23L



CATEGORY	A	B	C	D
LNAV MDA	1400-1 498 (500-1)		1400-1¼ 498 (500-1¼)	1400-1½ 498 (500-1½)
CIRCLING	1400-1 474 (500-1)	1440-1 514 (600-1)	1440-1½ 514 (600-1½)	1480-2 554 (600-2)

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AIRPORT OBSTRUCTIONS SURVEY / INFORMATION

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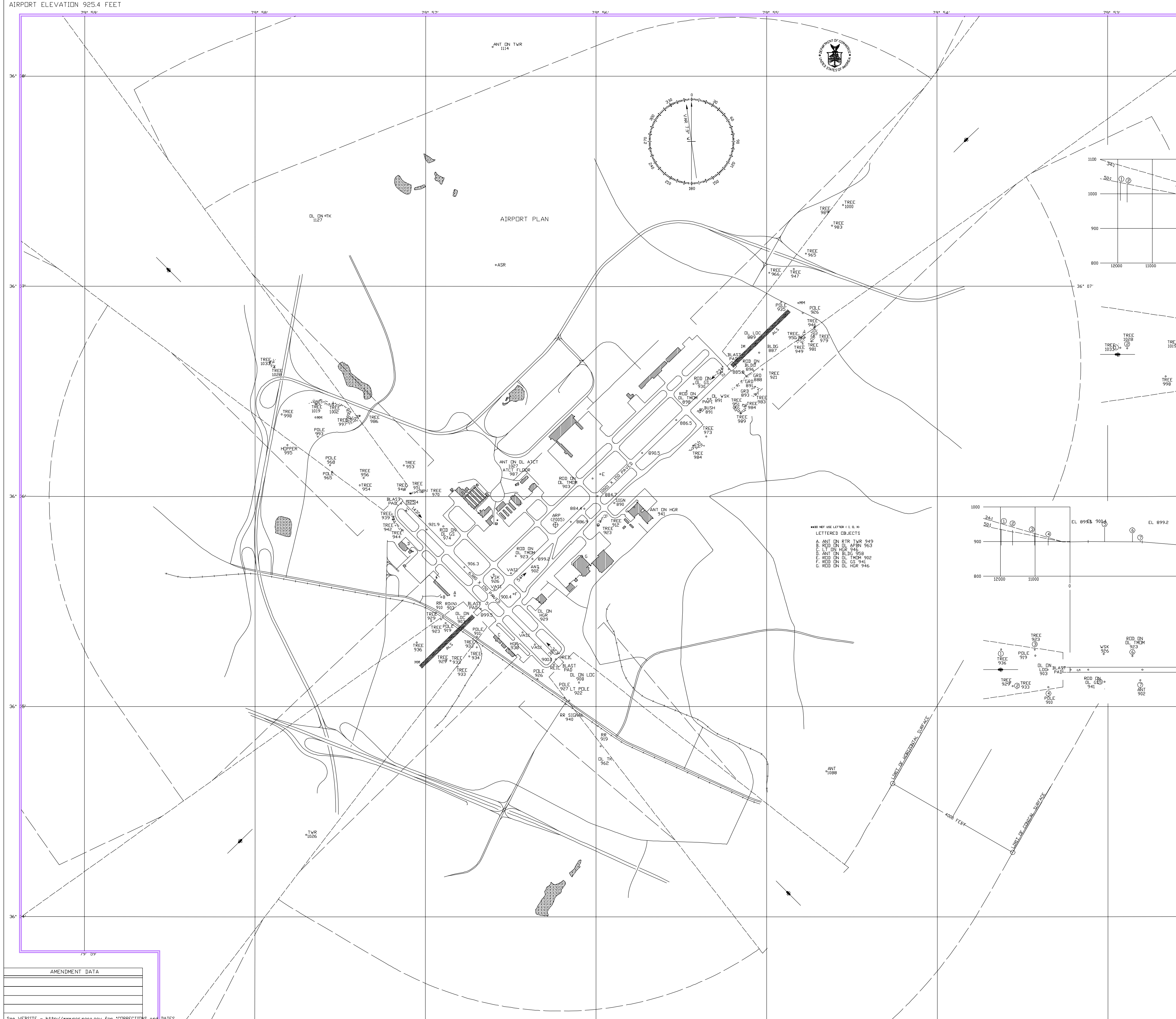
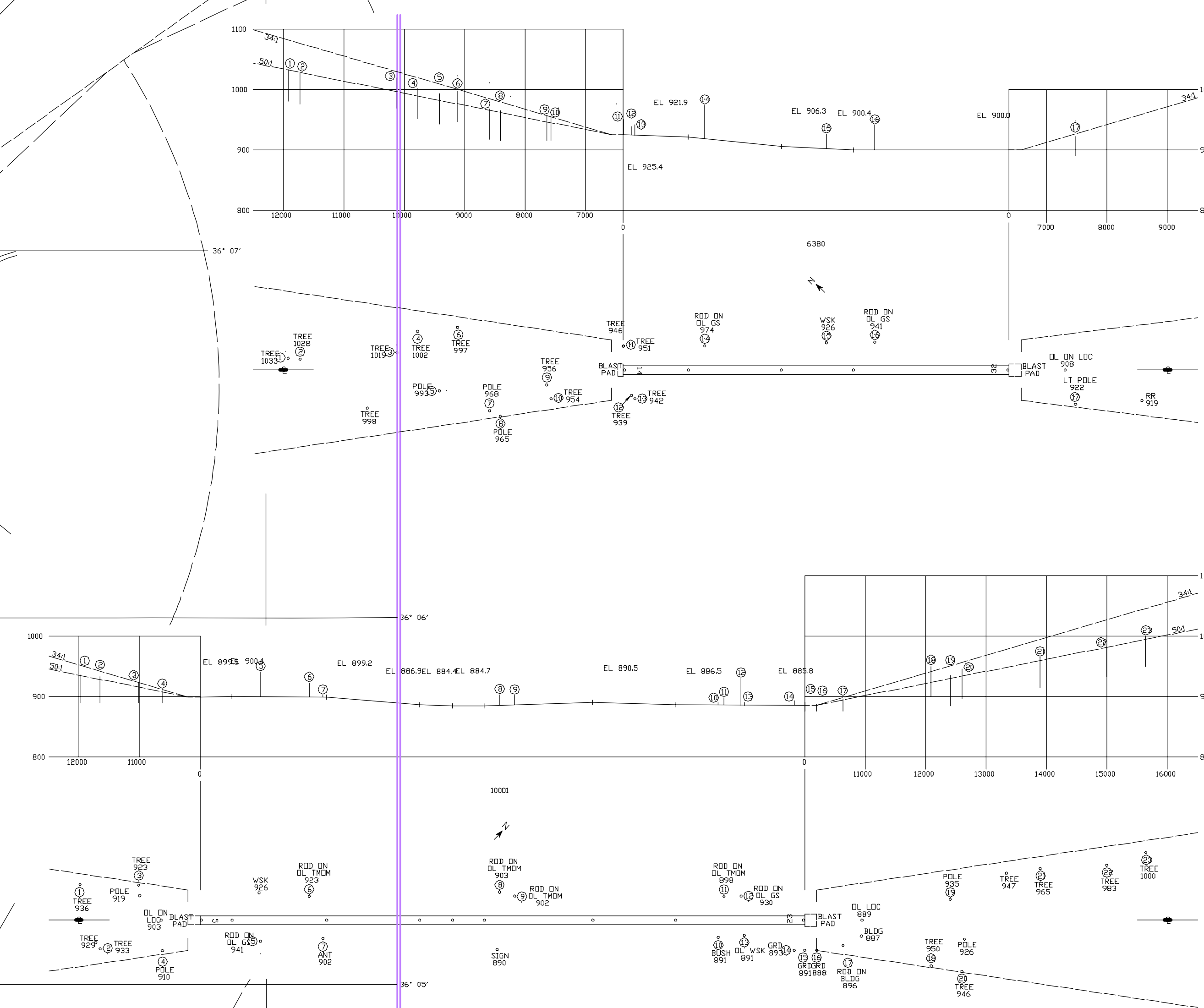
AIRPORT OBSTRUCTION CHART

PIEDMONT TRIAD INTERNATIONAL AIRPORT, GREENSBORO, NORTH CAROLINA

AIRPORT ELEVATION 925.4 FEET





LEGEND

- Airport Reference Point (ARP)
- Official Airport Elevation
- With elevation – object does not penetrate specified or supplemental surface; Without elevation – position only
- Object penetrates specified surface
- Wooded area penetrates specified surface
- Ground area penetrates specified surface
- Object penetrates supplemental surface only
- Wooded area penetrates supplemental surface only
- Ground area penetrates supplemental surface only
- Water
- S ...... Supplemental surface
- ( ) ...... Feet above ground level
- RD(I) ...... Interstate road
- RD(N) ...... Noninterstate road

NOTES

Fifteen feet added to noninterstate road elevations
Seventeen feet added to interstate road elevations
Twenty three feet added to railroad track elevations
Transitional surface slopes are 7:1 unless otherwise indicated
Obstructing area limits are approximate
See FAA NO. 405 for a complete set of abbreviations
Underlined elevations determined photogrammetrically with a vertical accuracy +/- 50 feet

AIRPORT OBSTRUCTION CHART

The Airport Obstruction Chart (AOC) depicts Federal Aviation Regulations Part 77 (FAR-77) surfaces, a representation of objects that penetrate these surfaces, aircraft movement and apron areas, navigational aids, prominent airport buildings, and a selection of roads and other planimetric detail in the airport vicinity, also included are tabulations of runway and other operational data.

AOC content, format, and accuracy conform to the standards specified in FAR-77, "Objects Affecting Navigable Airspace" and FAA NO. 405, "Standards for Aeronautical Surveys and Related Products."

HORIZONTAL SCALE..........1:12,000
HORIZONTAL DATUM.........North American Datum of 1983
VERTICAL DATUM ....North American Vertical Datum of 1988
PROJECTION .... Lambert Conformal Conic

TABULATED OPERATIONAL DATA

AIRPORT LOCATION POINT LAT. 36°06′ LONG. 79°57′

AIRPORT REFERENCE POINT LAT. 36°05′ 51.9″ LONG. 79°56′ 14.3″

RUNWAY	LATITUDE	LONGITUDE	TDZE	*GEODETIC AZIMUTH
5	36°05′ 27.8084″	79°56′ 40.7701″	900.4	45°59′ 16″
23	36°06′ 36.5133″	79°55′ 13.1174″	889.4	226°00′ 08″
14	36°05′ 58.1283″	79°57′ 08.8050″	925.4	135°08′ 50″
32	36°05′ 13.3998″	79°56′ 13.9854″	902.0	315°09′ 22″

*Geodetic azimuth reckoned clockwise from north

VERTICAL SCALE

AMENDMENT DATA

See WEBSITE – http://www.ngs.noaa.gov for "CORRECTIONS and DATES OF LATEST EDITIONS." PUBLISHED CHARTS are available through FAA, National Aeronautical Charting Office, Distribution Division AVN-530, Greenbelt, MD 20770. Telephone: (301) 436-8301.

DIMENSIONS AND ELEVATIONS ARE IN FEET

Surveyed and compiled by the National Ocean Service (NOS), U.S. Department of Commerce in accordance with specifications and standards of accuracy of the Federal Aviation Administration, Department of Transportation and NOS.

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National Oceanic and Atmospheric Administration
National Ocean Service

Airport Obstruction Chart data is available on the Internet in the Universal Data Delivery Format at http://www.ngs.noaa.gov/

STATUTE MILES
NAUTICAL MILES

PIEDMONT TRIAD INTERNATIONAL AIRPORT
GREENSBORO, NORTH CAROLINA

```
|GSO   |16758.A   |ASO |1.07|
|PIEDMONT TRIAD INTERNATIONAL AIRPORT                                  |3332005|
|GREENSBORO                               |NORTH CAROLINA                |
|NAD83    |5 CM      |          |NAVD88    |25 CM          |
|  7.9|3332005|
|  925.4|       |14+0    |3332005|
|  987.0|       |3332005|
| 360551.9| -795614.3|
@
|5    |P|3332005|
|Y|3332005|
| 360527.8084| -795640.7701| 455916|10001|150|3332005|
|  900.4|       |3332005|
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|    0|  899.5|       |3332005|
|  531|  900.4|       |3332005|
| 2094|  899.2|       |3332005|
| 3635|  886.9|       |3332005|
| 4178|  884.4|       |3332005|
| 4702|  884.7|       |3332005|
| 6496|  890.5|       |3332005|
| 7865|  886.5|       |3332005|
|10001|  885.8|       |3332005|
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|23   |P|3332005|
|Y|3332005|
| 360636.5133| -795513.1174|2260008|10001|150|3332005|
|  889.4|       |3332005|
|            |             |       |       |
|    0|  885.8|       |3332005|
| 2136|  886.5|       |3332005|
| 3505|  890.5|       |3332005|
| 5299|  884.7|       |3332005|
| 5824|  884.4|       |3332005|
| 6366|  886.9|       |3332005|
| 7907|  899.2|       |3332005|
| 9470|  900.4|       |3332005|
|10001|  899.5|       |3332005|
#
|14   |P|3332005|
|Y|3332005|
| 360558.1283| -795708.8050|1350850| 6380|150|3332005|
|  925.4|       |3332005|
|            |             |       |       |
|    0|  925.4|       |3332005|
| 1075|  921.9|       |3332005|
| 2610|  906.3|       |3332005|
| 3804|  900.4|       |3332005|
| 6380|  900.0|       |3332005|
#
|32   |P|3332005|
|Y|3332005|
| 360513.3998| -795613.9854|3150922| 6380|150|3332005|
|  902.0|       |3332005|
|            |             |       |       |
|    0|  900.0|       |3332005|
| 2576|  900.4|       |3332005|
| 3770|  906.3|       |3332005|
| 5305|  921.9|       |3332005|
| 6380|  925.4|       |3332005|
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@
|ASR    (GSO)                          | 360706.1275| -795635.2784|  924.0|       |       |       |3332005|
|GS     (5_LZY)                        | 360532.1878| -795629.0424|  896.9|       |       |       |3332005|
|GS     (5_LZY)  PP                    | 360534.6790| -795632.0076|  900.3|       |   350R|   1000|3332005|
|GS     (14_GSO)                       | 360551.4597| -795653.7599|  915.3|       |       |       |3332005|
|GS     (14_GSO) PP                    | 360548.6719| -795657.2130|  919.7|       |   400L|   1349|3332005|
|GS     (23_HIH)                       | 360632.1346| -795525.7204|  880.5|       |       |       |3332005|
|GS     (23_HIH) PP                    | 360629.2903| -795522.3355|  886.2|       |   400R|   1052|3332005|
|IM     (23_HIH)                       | 360642.6633| -795505.2609|       |       |       |    896|3332005|
|IM     (23_HIH) CLPT                  | 360642.6662| -795505.2644|       |       |     0L|    896|3332005|
|LOC    (5_LZY)                        | 360643.0338| -795504.7939|  881.7|       |       |    949|3332005|
|LOC    (14_GSO)                       | 360506.9003| -795606.0194|  900.7|       |       |    927|3332005|
|LOC    (23_HIH)                       | 360523.3997| -795646.4001|  887.9|       |       |    642|3332005|
|LOM    (14_GSO)                       | 361001.1324| -800208.2962|       |       |       |  34750|3332005|
|LOM    (14_GSO) CLPT                  | 361001.6254| -800207.6861|       |       |    71R|  34750|3332005|
|MM     (5_LZY)                        | 360512.1856| -795701.1338|       |       |       |   2300|3332005|
|MM     (5_LZY)  CLPT                  | 360512.0066| -795700.9207|       |       |    25L|   2300|3332005|
|MM     (14_GSO)                       | 360622.5707| -795738.7707|       |       |       |   3487|3332005|
|MM     (14_GSO) CLPT                  | 360622.5699| -795738.7717|       |       |     0L|   3487|3332005|
|MM     (23_HIH)                       | 360655.2757| -795448.8262|       |       |       |   2752|3332005|
|MM     (23_HIH) CLPT                  | 360655.4148| -795448.9918|       |       |    20L|   2752|3332005|
|OM     (5_LZY)                        | 360138.5883| -800132.3467|       |       |       |  33325|3332005|
|OM     (5_LZY)  CLPT                  | 360138.7480| -800132.5369|       |       |    22R|  33325|3332005|
|OM     (23_HIH)                       | 361022.6150| -795013.4303|       |       |       |  33572|3332005|
|OM     (23_HIH) CLPT                  | 361026.9796| -795018.6199|       |       |   613L|  33567|3332005|
|VORTAC (GSO)                          | 360244.4912| -795834.9505|  909.0|       |       |       |3332005|
#
|ALS    (5)                            |            |             |       |       |       |       |3332005|
|ALS    (23)                           |            |             |       |       |       |       |3332005|
|APBN                                  | 360531.2980| -795654.4638|       |       |       |       |3332005|
|PAPI   (23)                           |            |             |       |       |       |       |3332005|
|REIL   (32)                           |            |             |       |       |       |       |3332005|
|VASI   (5)                            |            |             |       |       |       |       |3332005|
|VASI   (32)                           |            |             |       |       |       |       |3332005|
#
@
|5   |PIR    |
|GRD                                | 360634.33| -795507.14|1A|  888|     |     |  -12|  -12|  -37|-10200|      |  499R|     2|3332005|
|GRD                                | 360632.98| -795508.86|1A|  891|     |     |   -9|   -9|  -34|-10005|      |  499R|     6|3332005|
|GRD                                | 360631.78| -795510.42|1A|  893|     |     |   -7|   -7|  -32| -9828|      |  498R|     7|3332005|
|OL WSK                             | 360627.86| -795519.75|1A|  891|     |     |   -9|   -9|  -34| -9002|      |  251R|     5|3332005|
|ROD ON OL GS                       | 360632.13| -795525.72|1A|  930|     |     |   30|   30|    5| -8950|      |  400L|    44|3332005|
|ROD ON OL TMOM                     | 360630.13| -795528.12|1A|  898|     |     |   -2|   -2|  -27| -8667|      |  391L|    12|3332005|
|BUSH                               | 360624.67| -795523.24|1A|  891|     |     |   -9|   -9|  -34| -8572|      |  284R|     4|3332005|
|ROD ON OL TMOM                     | 360606.39| -795558.51|1A|  902|     |     |    2|    2|  -23| -5205|      |  397L|    16|3332005|
|ROD ON OL TMOM                     | 360605.14| -795601.27|1A|  903|     |     |    3|    3|  -22| -4955|      |  463L|    17|3332005|
|SIGN                               | 360558.15| -795553.60|1A|  890|     |     |  -10|  -10|  -35| -4916|      |  483R|     5|3332005|
|ANT                                | 360539.63| -795620.35|1A|  902|     |     |    2|    2|  -23| -2036|      |  305R|     3|3332005|
|ROD ON OL TMOM                     | 360543.00| -795628.28|1A|  923|     |     |   23|   23|   -2| -1804|      |  393L|    24|3332005|
|ROD ON OL GS                       | 360532.19| -795629.04|1A|  941|     |     |   41|   41|   16| -1000|      |  350R|    41|3332005|
|WSK                                | 360537.72| -795636.04|1A|  926|     |     |   26|   26|    1|  -975|      |  451L|    26|3332005|
|POLE                               | 360519.94| -795641.94|1A|  910|     |     |   10|   10|  -15|   622|      |  506R|     2|3332005|
|OL ON LOC                          | 360523.40| -795646.40|1A|  903|     |     |    3|    3|  -22|   642|      |    0R|    -5|3332005|
|RD(N)                              | 360526.14| -795653.43|1A|  903|     |     |    3|    3|  -22|   864|      |* 601L|   -10|3332005|
|RR                                 | 360525.63| -795654.33|1A|  910|     |     |   10|   10|  -15|   954|      |* 615L|    -5|3332005|
|POLE                               | 360523.84| -795652.95|1A|  919|     |     |   19|   19|   -6|   998|      |  406L|     4|3332005|
|TREE                               | 360524.96| -795654.56|1A|  923|     |     |   23|   23|   -2|  1015|      |  579L|     8|3332005|
|TREE                               | 360511.42| -795648.75|1A|  933|     |     |   33|   33|    8|  1623|      |* 737R|     5|3332005|
|TREE                               | 360513.10| -795651.22|1A|  933|     |     |   33|   33|    8|  1650|      |  473R|     4|3332005|
|TREE                               | 360513.31| -795652.73|1A|  929|     |     |   29|   29|    4|  1725|      |  372R|    -1|3332005|
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|TREE                           | 360518.35| -795703.12|1A|  936|     |     |  36|  36|  11|  1984|     |  586L|    0|3332005|
|TWR                            | 360423.39| -795741.98|1A| 1026|     |     | 126| 126| 101|  8140|     | 1194R|  -32|3332005|
#
|23  |PIR    |
|WSK                            | 360537.72| -795636.04|1A|  926|     |     |  40|  37|   1| -9026|     |  451R|   26|3332005|
|ROD ON OL GS                   | 360532.19| -795629.04|1A|  941|     |     |  55|  52|  16| -9001|     |  350L|   41|3332005|
|ROD ON OL TMOM                 | 360543.00| -795628.28|1A|  923|     |     |  37|  34|  -2| -8197|     |  393R|   24|3332005|
|ANT                            | 360539.63| -795620.35|1A|  902|     |     |  16|  13| -23| -7965|     |  305L|    3|3332005|
|SIGN                           | 360558.15| -795553.60|1A|  890|     |     |   4|   1| -35| -5085|     |  483L|    5|3332005|
|ROD ON OL TMOM                 | 360605.14| -795601.27|1A|  903|     |     |  17|  14| -22| -5046|     |  463R|   17|3332005|
|ROD ON OL TMOM                 | 360606.39| -795558.51|1A|  902|     |     |  16|  13| -23| -4796|     |  397R|   16|3332005|
|BUSH                           | 360624.67| -795523.24|1A|  891|     |     |   5|   2| -34| -1429|     |  284L|    4|3332005|
|ROD ON OL TMOM                 | 360630.13| -795528.12|1A|  898|     |     |  12|   9| -27| -1334|     |  391R|   12|3332005|
|ROD ON OL GS                   | 360632.13| -795525.72|1A|  930|     |     |  44|  41|   5| -1052|     |  400R|   44|3332005|
|OL WSK                         | 360627.86| -795519.75|1A|  891|     |     |   5|   2| -34| -1000|     |  251L|    5|3332005|
|GRD                            | 360631.78| -795510.42|1A|  893|     |     |   7|   4| -32|  -173|     |  498L|    7|3332005|
|GRD                            | 360632.98| -795508.86|1A|  891|     |     |   5|   2| -34|     3|     |  499L|    6|3332005|
|GRD                            | 360634.33| -795507.14|1A|  888|     |     |   2|  -1| -37|   199|     |  499L|    2|3332005|
|ROD ON BLDG                    | 360637.90| -795504.02|1A|  896|     |     |  10|   7| -29|   634|     |  418L|    2|3332005|
|BLDG                           | 360641.09| -795502.64|1A|  887|     |     |   1|  -2| -38|   939|     |  264L|  -14|3332005|
|OL LOC                         | 360643.03| -795504.79|1A|  889|     |     |   3|   0| -36|   949|     |    0R|  -12|3332005|
|TREE                           | 360645.50| -795448.35|1A|  950|     |     |  64|  61|  25|  2093|     |  758L|   26|3332005|
|TREE                           | 360645.31| -795447.85|1A|  949|     |     |  63|  60|  24|  2109|     |* 800L|   25|3332005|
|POLE                           | 360655.50| -795454.90|1A|  935|     |     |  49|  46|  10|  2409|     |  343R|    5|3332005|
|TREE                           | 360648.34| -795443.14|1A|  946|     |     |  60|  57|  21|  2600|     |  848L|   12|3332005|
|POLE                           | 360652.42| -795447.29|1A|  926|     |     |  40|  37|   1|  2642|     |  315L|   -8|3332005|
|TREE                           | 360704.98| -795450.43|1A|  947|     |     |  61|  58|  22|  3339|     |  778R|   -1|3332005|
|TREE                           | 360709.35| -795446.20|1A|  965|     |     |  79|  76|  40|  3895|     |  855R|    6|3332005|
|TREE                           | 360717.32| -795436.98|1A|  983|     |     |  97|  94|  58|  4999|     |  909R|    1|3332005|
|TREE                           | 360721.31| -795438.17|1A|  989|     |     | 103| 100|  64|  5210|     |*1267R|    3|3332005|
|TREE                           | 360723.22| -795433.12|1A| 1000|     |     | 114| 111|  75|  5642|     | 1118R|    6|3332005|
#
|14  |PIR    |
|ROD ON OL GS                   | 360532.19| -795629.04|1A|  941|     |     |  16|  16|  16| -4161|     |  464L|   41|3332005|
|WSK                            | 360537.72| -795636.04|1A|  926|     |     |   1|   1|   1| -3359|     |  451L|   24|3332005|
|ROD ON OL GS                   | 360551.46| -795653.76|1A|  974|     |     |  49|  49|  49| -1349|     |  400L|   55|3332005|
|TREE                           | 360550.38| -795708.10|1A|  944|     |     |  19|  19|  19|  -597|     |* 512R|   20|3332005|
|TREE                           | 360553.47| -795711.25|1A|  942|     |     |  17|  17|  17|  -192|     |  475R|   17|3332005|
|TREE                           | 360554.23| -795711.29|1A|  939|     |     |  14|  14|  14|  -136|     |  423R|   14|3332005|
|TREE                           | 360600.87| -795705.32|1A|  951|     |     |  26|  26|  26|    -5|     |  398L|   26|3332005|
|TREE                           | 360600.89| -795705.42|1A|  946|     |     |  21|  21|  21|     2|     |  393L|   20|3332005|
|TREE                           | 360603.21| -795723.16|1A|  954|     |     |  29|  29|  29|  1195|     |  473R|    8|3332005|
|TREE                           | 360605.31| -795721.82|1A|  956|     |     |  31|  31|  31|  1268|     |  245R|   10|3332005|
|POLE                           | 360607.04| -795732.91|1A|  965|     |     |  40|  40|  40|  2034|     |  767R|    3|3332005|
|POLE                           | 360608.94| -795733.61|1A|  968|     |     |  43|  43|  43|  2211|     |  672R|    2|3332005|
|TREE                           | 360622.23| -795726.29|1A|  997|     |     |  72|  72|  72|  2740|     |  702L|   20|3332005|
|POLE                           | 360617.07| -795737.92|1A|  993|     |     |  68|  68|  68|  3043|     |  343R|   11|3332005|
|TREE                           | 360626.47| -795732.52|1A| 1002|     |     |  77|  77|  77|  3404|     |  642L|   13|3332005|
|TREE                           | 360626.40| -795738.48|1A| 1019|     |     |  94|  94|  94|  3745|     |  290L|   23|3332005|
|TREE                           | 360623.43| -795750.66|1A|  998|     |     |  73|  73|  73|  4237|     |  630R|   -8|3332005|
|TREE                           | 360636.87| -795753.20|1A| 1028|     |     | 103| 103| 103|  5347|     |  181L|    0|3332005|
|TREE                           | 360638.35| -795754.79|1A| 1033|     |     | 108| 108| 108|  5545|     |  194L|    1|3332005|
#
|32  |C      |
|TREE                           | 360600.89| -795705.42|1A|  946|     |     |  46|  44|  21| -6382|     |  393R|   20|3332005|
|TREE                           | 360600.87| -795705.32|1A|  951|     |     |  51|  49|  26| -6375|     |  398R|   26|3332005|
|TREE                           | 360554.23| -795711.29|1A|  939|     |     |  39|  37|  14| -6244|     |  423L|   14|3332005|
|TREE                           | 360553.47| -795711.25|1A|  942|     |     |  42|  40|  17| -6188|     |  475L|   17|3332005|
|TREE                           | 360550.38| -795708.10|1A|  944|     |     |  44|  42|  19| -5783|     |* 512L|   20|3332005|
|ROD ON OL GS                   | 360551.46| -795653.76|1A|  974|     |     |  74|  72|  49| -5031|     |  400R|   55|3332005|
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|WSK                            | 360537.72| -795636.04|1A|  926|     |     |   26|   24|    1| -3021|      |  451R|   24|3332005|
|ROD ON OL GS                   | 360532.19| -795629.04|1A|  941|     |     |   41|   39|   16| -2219|      |  464R|   41|3332005|
|OL ON LOC                      | 360506.90| -795606.02|1A|  908|     |     |    8|    6|  -17|   927|      |    0R|  -13|3332005|
|POLE                           | 360502.61| -795611.15|1A|  927|     |     |   27|   25|    2|   938|      |* 605L|    5|3332005|
|LT POLE                        | 360501.73| -795609.45|1A|  922|     |     |   22|   20|   -3|  1100|      |  568L|   -4|3332005|
|RR                             | 360454.48| -795559.44|1A|  919|     |     |   19|   17|   -6|  2199|      |  503L|  -40|3332005|
|OL TK                          | 360448.68| -795558.43|1A|  962|     |     |   62|   60|   37|  2672|      |* 857L|  -11|3332005|
#
|ARP |HCT    |
|ROD ON OL HGR                  | 360542.69| -795604.88|1A|  946|     |     |   21|14813| 1210|   -11|3332005|
|TREE                           | 360551.66| -795559.29|1A|  923|     |     |   -2| 9901| 1232|    20|3332005|
|TREE                           | 360552.88| -795558.47|1A|  912|     |     |  -13| 9331| 1303|    15|3332005|
|ANT ON OL ATCT                 | 360603.23| -795628.18|1A| 1027|     |     |  102|32304| 1616|   -48|3332005|
|OL ON HGR                      | 360529.84| -795619.98|1A|  929|     |     |    4|19942| 2279|   -17|3332005|
|ANT ON HGR                     | 360556.95| -795546.67|1A|  941|     |     |   16| 8512| 2324|   -12|3332005|
|ANT ON RTR TWR                 | 360531.67| -795649.79|1A|  949|     |     |   24|24248| 3559|     8|3332005|
|LT ON HGR                      | 360519.48| -795634.36|1A|  946|     |     |   21|21434| 3669|    10|3332005|
|HGR                            | 360516.36| -795630.49|1A|  938|     |     |   13|20811| 3832|     2|3332005|
|ROD ON OL APBN                 | 360531.30| -795654.46|1A|  963|     |     |   38|24536| 3900|   -12|3332005|
|TREE                           | 360601.43| -795701.25|1A|  970|     |     |   45|29157| 3972|    20|3332005|
|RD(N)                          | 360526.14| -795653.43|1A|  903|     |     |  -22|23851| 4135|   -10|3332005|
|TREE                           | 360516.96| -795641.99|1A|  933|     |     |    8|22039| 4201|     3|3332005|
|RR                             | 360525.63| -795654.33|1A|  910|     |     |  -15|23856| 4225|    -5|3332005|
|ANT ON BLDG                    | 360544.56| -795705.10|1A|  958|     |     |   33|26748| 4235|     2|3332005|
|TREE                           | 360550.38| -795708.10|1A|  944|     |     |   19|27554| 4418|    19|3332005|
|POLE                           | 360507.90| -795620.62|1A|  926|     |     |    1|19433| 4480|   -13|3332005|
|TREE                           | 360514.36| -795644.60|1A|  934|     |     |    9|22107| 4539|    -1|3332005|
|TREE                           | 360524.41| -795658.04|1A|  929|     |     |    4|24008| 4541|    -3|3332005|
|TREE                           | 360614.52| -795525.83|1A|  984|     |     |   59| 6759| 4589|    44|3332005|
|TREE                           | 360608.89| -795707.66|1A|  953|     |     |   28|29919| 4704|   -19|3332005|
|TREE                           | 360511.42| -795648.75|1A|  933|     |     |    8|22232| 4975|     2|3332005|
|POLE                           | 360502.61| -795611.15|1A|  927|     |     |    2|18455| 4992|     3|3332005|
|TREE                           | 360617.16| -795521.23|1A|  973|     |     |   48| 6730| 5049|    23|3332005|
|RR SIGNAL                      | 360500.68| -795610.69|1A|  940|     |     |   15|18437| 5188|    -1|3332005|
|TREE                           | 360625.43| -795511.03|1A|  951|     |     |   26| 6445| 6201|     4|3332005|
|TREE                           | 360623.77| -795509.17|1A|  989|     |     |   64| 6648| 6241|    10|3332005|
|TREE                           | 360623.05| -795723.17|1A|  986|     |     |   61|30702| 6470|     1|3332005|
|TREE                           | 360625.81| -795507.38|1A|  984|     |     |   59| 6555| 6475|    11|3332005|
|OL TK                          | 360448.68| -795558.43|1A|  962|     |     |   37|17623| 6524|   -18|3332005|
|TREE                           | 360629.13| -795503.87|1A|  983|     |     |   58| 6448| 6898|    17|3332005|
|TREE                           | 360636.26| -795501.51|1A|  921|     |     |   -4| 6059| 7471|    10|3332005|
|HOPPER                         | 360614.67| -795748.66|1A|  995|     |     |   70|29428| 8079|   -17|3332005|
|TREE                           | 360645.31| -795447.85|1A|  949|     |     |   24| 6036| 8916|    23|3332005|
|TREE                           | 360644.30| -795444.22|1A|  981|     |     |   56| 6215| 9096|    15|3332005|
|TREE                           | 360645.73| -795443.37|1A|  979|     |     |   54| 6147| 9237|    22|3332005|
|TREE                           | 360703.89| -795459.09|1A|  966|     |     |   41| 4811| 9544|   -15|3332005|
|ANT                            | 360441.54| -795439.02|1A| 1088|     |     |  163|14011|10573|    13|3332005|
|OL ON TK                       | 360720.16| -795735.29|1A| 1127|     |     |  202|33114|11128|    52|3332005|
|TREE                           | 360721.31| -795438.17|1A|  989|     |     |   64| 4859|12000|     1|3332005|
|ANT ON TWR                     | 360808.36| -795636.44|1A| 1114|     |     |  189|   24|13919|   -15|3332005|
@
||Additional Information:                                                                                    |
|THIS DATA WAS COLLECTED IN ACCORDANCE WITH FAA NO. 405 AIRPORT OBSTRUCTION CHART SURVEY SPECIFICATIONS.      |
|                                                                                                            |
|                                                                                                            |
|NATIONAL GEODETIC SURVEY                                                                                    |
EOF
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|GSO   |16758.A   |ASO |1.07|
|PIEDMONT TRIAD INTERNATIONAL AIRPORT                                 |3492008|
|GREENSBORO                              |NORTH CAROLINA                |
|NAD83     |5 CM      |          |NAVD88    |25 CM          |
| 07.3|3492008|
|  925.6|       |14+0    |3492008|
|  987.6|       |3492008|
| 360607.8| -765625.3|
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|5L   |P|3492008|
|Y|3492008|
| 360557.3200| -795732.5800| 455850| 9000|150|3492008|
|  916.5|       |3492008|
|            |             |       |       |
|    0|  916.5|       |3492008|
| 9000|  855.6|       |3492008|
#
|23R  |P|3492008|
|Y|3492008|
| 360659.1600| -795613.7000|2255936| 9000|150|3492008|
|  855.6|       |3492008|
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| 9000|  916.5|       |3492008|
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|ALS   (5L)                      | 360550.1400| -795740.9700|  901.2|       |       |      |3492008|
|ALS   (5L)                      | 360550.2900| -795741.1400|  901.2|       |       |      |3492008|
|ALS   (5L)                      | 360550.4500| -795741.3300|  901.4|       |       |      |3492008|
|ALS   (5L)                      | 360550.6000| -795741.5200|  901.4|       |       |      |3492008|
|ALS   (5L)                      | 360550.7500| -795741.6900|  901.3|       |       |      |3492008|
|ALS   (5L)                      | 360550.7200| -795741.9300|  901.3|       |       |      |3492008|
|ALS   (5L)                      | 360550.6300| -795742.0400|  900.6|       |       |      |3492008|
|ALS   (5L)                      | 360549.9500| -795741.0100|  901.1|       |       |      |3492008|
|ALS   (5L)                      | 360549.8600| -795741.1200|  901.3|       |       |      |3492008|
|ALS   (5L)                      | 360551.1300| -795740.4500|  903.5|       |       |      |3492008|
|ALS   (5L)                      | 360551.4200| -795740.8000|  902.3|       |       |      |3492008|
|ALS   (5L)                      | 360550.8400| -795740.1100|  902.3|       |       |      |3492008|
|ALS   (5L)                      | 360551.8200| -795739.5800|  905.1|       |       |      |3492008|
|ALS   (5L)                      | 360552.2200| -795738.3500|  905.4|       |       |      |3492008|
|ALS   (5L)                      | 360552.5100| -795738.7000|  906.8|       |       |      |3492008|
|ALS   (5L)                      | 360552.8000| -795739.0500|  905.5|       |       |      |3492008|
|ALS   (5L)                      | 360551.5200| -795739.2300|  903.8|       |       |      |3492008|
|ALS   (5L)                      | 360552.1100| -795739.9300|  903.7|       |       |      |3492008|
|ALS   (5L)                      | 360550.1200| -795742.5300|  890.9|       |       |      |3492008|
|ALS   (5L)                      | 360550.0800| -795742.7600|  890.9|       |       |      |3492008|
|ALS   (5L)                      | 360552.9000| -795737.4800|  906.9|       |       |      |3492008|
|ALS   (5L)                      | 360553.1900| -795737.8300|  907.9|       |       |      |3492008|
|ALS   (5L)                      | 360553.4800| -795738.1700|  907.4|       |       |      |3492008|
|ALS   (5L)                      | 360554.1700| -795737.3000|  908.5|       |       |      |3492008|
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|ALS   (5L)                        | 360554.8100| -795736.4800|  910.0|       |       |      |3492008|
|ALS   (5L)                        | 360554.2300| -795735.7900|  910.0|       |       |      |3492008|
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@
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|TREE                           | 360733.26| -795601.88|1A|  959|     |   68|     |     |     |     |     |     |     |3492008|
|TREE                           | 360727.35| -795605.98|1A|  930|     |   51|     |     |     |     |     |     |     |3492008|
|TREE                           | 360729.59| -795603.91|1A|  946|     |   50|     |     |     |     |     |     |     |3492008|
|TREE                           | 360728.77| -795605.10|1A|  924|     |   35|     |     |     |     |     |     |     |3492008|
|TREE                           | 360729.58| -795605.80|1A|  938|     |   48|     |     |     |     |     |     |     |3492008|
|TREE                           | 360729.06| -795606.99|1A|  927|     |   44|     |     |     |     |     |     |     |3492008|
|TREE                           | 360727.89| -795604.65|1A|  932|     |   50|     |     |     |     |     |     |     |3492008|
|TREE                           | 360726.21| -795605.03|1A|  917|     |   53|     |     |     |     |     |     |     |3492008|
|TREE                           | 360729.07| -795602.62|1A|  934|     |   47|     |     |     |     |     |     |     |3492008|
|TREE                           | 360728.20| -795603.47|1A|  929|     |   47|     |     |     |     |     |     |     |3492008|
|TREE                           | 360728.66| -795601.77|1A|  923|     |   50|     |     |     |     |     |     |     |3492008|
|TREE                           | 360727.84| -795602.58|1A|  920|     |   50|     |     |     |     |     |     |     |3492008|
|TREE                           | 360726.96| -795600.26|1A|  921|     |   63|     |     |     |     |     |     |     |3492008|
|TREE                           | 360727.45| -795600.01|1A|  923|     |   64|     |     |     |     |     |     |     |3492008|
|TREE                           | 360727.78| -795558.97|1A|  927|     |   54|     |     |     |     |     |     |     |3492008|
|TREE                           | 360727.79| -795557.63|1A|  922|     |   48|     |     |     |     |     |     |     |3492008|
|TREE                           | 360727.17| -795558.53|1A|  915|     |   43|     |     |     |     |     |     |     |3492008|
|TREE                           | 360728.31| -795556.86|1A|  916|     |   42|     |     |     |     |     |     |     |3492008|
|TREE                           | 360729.25| -795559.09|1A|  930|     |   59|     |     |     |     |     |     |     |3492008|
|TREE                           | 360730.36| -795601.00|1A|  934|     |   52|     |     |     |     |     |     |     |3492008|
|TREE                           | 360729.21| -795601.19|1A|  931|     |   56|     |     |     |     |     |     |     |3492008|
|TREE                           | 360730.47| -795602.59|1A|  941|     |   48|     |     |     |     |     |     |     |3492008|
|TREE                           | 360731.34| -795603.36|1A|  940|     |   43|     |     |     |     |     |     |     |3492008|
|TREE                           | 360731.77| -795603.58|1A|  936|     |   42|     |     |     |     |     |     |     |3492008|
|TREE                           | 360730.46| -795604.41|1A|  933|     |   36|     |     |     |     |     |     |     |3492008|
|TREE                           | 360730.60| -795604.09|1A|  937|     |   40|     |     |     |     |     |     |     |3492008|
|TREE                           | 360730.96| -795604.36|1A|  938|     |   40|     |     |     |     |     |     |     |3492008|
|TREE                           | 360731.50| -795604.72|1A|  929|     |   31|     |     |     |     |     |     |     |3492008|
|TREE                           | 360730.14| -795605.44|1A|  934|     |   39|     |     |     |     |     |     |     |3492008|
|TREE                           | 360728.80| -795604.53|1A|  925|     |   34|     |     |     |     |     |     |     |3492008|
|TREE                           | 360727.63| -795604.42|1A|  932|     |   53|     |     |     |     |     |     |     |3492008|
|TREE                           | 360726.82| -795604.30|1A|  911|     |   43|     |     |     |     |     |     |     |3492008|
|TREE                           | 360726.48| -795607.29|1A|  925|     |   64|     |     |     |     |     |     |     |3492008|
|TREE                           | 360726.56| -795607.81|1A|  921|     |   59|     |     |     |     |     |     |     |3492008|
|TREE                           | 360726.82| -795607.44|1A|  921|     |   53|     |     |     |     |     |     |     |3492008|
|TREE                           | 360725.82| -795606.96|1A|  922|     |   67|     |     |     |     |     |     |     |3492008|
|TREE                           | 360726.12| -795604.01|1A|  909|     |   49|     |     |     |     |     |     |     |3492008|
|TREE                           | 360726.52| -795559.56|1A|  914|     |   44|     |     |     |     |     |     |     |3492008|
|SIGN                           | 360726.31| -795557.26|1A|  914|     |   33|     |     |     |     |     |     |     |3492008|
|TREE                           | 360733.18| -795548.77|1A|  948|     |   83|     |     |     |     |     |     |     |3492008|
|TREE                           | 360733.75| -795548.43|1A|  948|     |   87|     |     |     |     |     |     |     |3492008|
|TREE                           | 360734.59| -795551.71|1A|  944|     |   44|     |     |     |     |     |     |     |3492008|
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TREE	360733.80	-795556.59	1A	938		40								3492008
TREE	360753.16	-795559.23	1A	939		45								3492008
TREE	360735.89	-795559.56	1A	943		48								3492008
TREE	360737.06	-795600.19	1A	945		49								3492008
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TREE	360733.69	-795555.80	1A	933		34								3492008
TREE	360731.22	-795553.26	1A	938		66								3492008
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TREE	360733.44	-795549.24	1A	946		75								3492008
TREE	360734.67	-795550.86	1A	943		51								3492008
TREE	360734.69	-795554.33	1A	946		42								3492008
TREE	360735.26	-795555.06	1A	943		37								3492008
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TREE	360734.70	-795558.49	1A	938		44								3492008
TREE	360733.94	-795558.56	1A	929		37								3492008
TREE	360732.81	-795601.15	1A	955		68								3492008
TREE	360730.70	-795558.68	1A	926		45								3492008
TREE	360733.54	-795557.68	1A	933		41								3492008
TREE	360734.19	-795601.70	1A	940		51								3492008
TREE	360734.74	-795601.84	1A	937		49								3492008
TREE	360734.01	-795602.42	1A	935		47								3492008
TREE	360733.74	-795602.08	1A	939		52								3492008
TREE	360734.03	-795603.46	1A	938		51								3492008
TREE	360734.28	-795602.93	1A	932		44								3492008
TREE	360734.83	-795602.53	1A	946		58								3492008
TREE	360733.58	-795554.28	1A	936		38								3492008
TREE	360734.13	-795553.80	1A	939		37								3492008
BLDG	360736.12	-795553.51	1A	936		31								3492008
TREE	360736.23	-795550.71	1A	946		50								3492008
TREE	360736.47	-795550.94	1A	944		46								3492008
TREE	360733.22	-795547.97	1A	951		97								3492008
LT POLE	360702.28	-795540.42	1A	918		53								3492008
LT POLE	360704.49	-795537.60	1A	916		53								3492008
LT POLE	360703.42	-795536.33	1A	917		52								3492008
TREE	360655.15	-795559.00	1A	869		67								3492008
TREE	360654.92	-795559.93	1A	872		65								3492008
TREE	360654.77	-795600.44	1A	860		52								3492008
TREE	360653.77	-795601.10	1A	857		51								3492008
BLDG	360706.41	-795634.72	1A	938		13								3492008
GRD	360706.26	-795622.17	1A	875		0								3492008
GRD	360705.34	-795618.51	1A	869		0								3492008
GRD	360705.50	-795619.33	1A	868		0								3492008
GRD	360706.93	-795620.38	1A	882		0								3492008
GRD	360706.18	-795616.91	1A	876		0								3492008

GRD	360706.58	-795618.53	1A	874		0								3492008
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GRD	360709.68	-795619.89	1A	888		0								3492008
GRD	360708.37	-795618.19	1A	885		0								3492008
GRD	360710.06	-795613.55	1A	880		0								3492008
GRD	360710.48	-795619.22	1A	880		0								3492008
GRD	360709.63	-795619.03	1A	873		0								3492008
GRD	360707.88	-795619.42	1A	882		0								3492008
GRD	360708.56	-795620.56	1A	884		0								3492008
GRD	360707.99	-795620.96	1A	877		0								3492008
GRD	360710.30	-795613.21	1A	876		0								3492008
GRD	360708.69	-795615.97	1A	868		0								3492008
GRD	360709.28	-795617.35	1A	869		0								3492008
TREE	360726.85	-795607.85	1A	919		54								3492008
TREE	360726.80	-795605.96	1A	920		47								3492008
TREE	360726.65	-795606.34	1A	917		47								3492008
TREE	360729.33	-795606.41	1A	937		49								3492008
TREE	360731.88	-795601.73	1A	939		48								3492008
TREE	360730.97	-795602.52	1A	939		44								3492008
TREE	360731.31	-795602.15	1A	948		54								3492008
TREE	360730.63	-795600.74	1A	926		48								3492008
TREE	360732.02	-795602.29	1A	946		54								3492008
TREE	360732.54	-795601.90	1A	941		51								3492008
TREE	360732.76	-795603.84	1A	939		43								3492008
TREE	360732.48	-795603.70	1A	932		36								3492008
TREE	360736.31	-795559.79	1A	940		45								3492008
TREE	360735.55	-795602.34	1A	937		49								3492008
TREE	360730.05	-795602.29	1A	935		46								3492008
BLDG	360731.03	-795605.35	1A	915		25								3492008
UTILITY POLE	360730.51	-795604.78	1A	922		24								3492008
TREE	360730.02	-795604.18	1A	931		34								3492008
ANT	360729.26	-795603.93	1A	918		23								3492008
TREE	360743.35	-795555.82	1A	951		88								3492008

#

5L	PIR													
TWR	360535.00	-795751.00	1B	1025		150								3492008
ANT	360459.00	-795749.00	1B	980		105								3492008
WATER TWR	360720.00	-795735.00	1B	1123		175								3492008
TWR	360808.00	-795636.00	1B	1110		194								3492008
TWR	360233.00	-800108.00	1A	1051		175								3492008
CELL TWR	360535.50	-795751.20	1B	1032		163								3492008
CELL TWR	360052.70	-800346.29	1B	1112		253								3492008
TWR	360905.60	-795449.20	1B	1039		207								3492008
TWR	360903.15	-795443.16	1B	1041		207								3492008
TWR	360904.80	-795447.26	1B	1036		206								3492008
TWR	360904.00	-795445.20	1B	1043		208								3492008
TWR	360901.37	-795444.40	1B	1039		208								3492008
TREE	360545.16	-795734.27	1A	948		62								3492008
TREE	360545.95	-795734.91	1A	937		51								3492008
TREE	360544.71	-795734.37	1A	941		54								3492008
TREE	360544.31	-795737.35	1A	960		90								3492008

TREE	360543.82	-795737.41	1A	960		68								3492008
TREE	360543.57	-795738.43	1A	964		95								3492008
TREE	360543.39	-795738.48	1A	969		81								3492008
TREE	360543.33	-795738.73	1A	970		82								3492008
TREE	360543.63	-795738.83	1A	958		70								3492008
TREE	360543.88	-795738.89	1A	967		79								3492008
TREE	360543.70	-795739.22	1A	963		76								3492008
TREE	360543.55	-795739.34	1A	964		78								3492008
TREE	360543.42	-795739.35	1A	959		74								3492008
TREE	360543.09	-795739.65	1A	948		70								3492008
TREE	360542.88	-795739.74	1A	949		71								3492008
TREE	360543.04	-795739.87	1A	960		81								3492008
TREE	360543.43	-795739.65	1A	957		82								3492008
TREE	360543.54	-795739.69	1A	959		79								3492008
TREE	360543.70	-795739.70	1A	958		78								3492008
TREE	360543.81	-795739.73	1A	955		75								3492008
TREE	360543.86	-795739.83	1A	964		83								3492008
TREE	360544.04	-795739.77	1A	956		76								3492008
TREE	360544.11	-795739.65	1A	955		74								3492008
TREE	360544.26	-795739.61	1A	963		80								3492008
TREE	360544.23	-795739.44	1A	960		74								3492008
TREE	360544.09	-795739.31	1A	946		64								3492008
TREE	360544.41	-795740.82	1A	949		67								3492008
TREE	360545.14	-795741.91	1A	948		64								3492008
TREE	360547.14	-795752.09	1A	966		99								3492008
TREE	360545.10	-795751.83	1A	964		89								3492008
TREE	360545.74	-795745.75	1A	946		59								3492008
TREE	360545.53	-795744.26	1A	956		76								3492008
TREE	360545.32	-795743.10	1A	966		78								3492008
TREE	360546.95	-795752.38	1A	966		99								3492008
TREE	360546.46	-795752.72	1A	967		100								3492008
TREE	360548.96	-795751.72	1A	964		100								3492008
TREE	360548.97	-795751.70	1A	961		83								3492008
TREE	360548.87	-795751.51	1A	956		80								3492008
TREE	360547.73	-795752.26	1A	969		102								3492008
TREE	360547.78	-795752.53	1A	962		92								3492008
TREE	360710.57	-795556.11	1A	889		80								3492008
TREE	360710.59	-795556.16	1A	895		84								3492008
TREE	360709.71	-795555.66	1A	898		81								3492008
TREE	360712.34	-795601.44	1A	894		85								3492008
TREE	360714.52	-795558.54	1A	899		96								3492008
TREE	360714.54	-795557.70	1A	894		90								3492008
TREE	360715.90	-795559.19	1A	892		86								3492008
TREE	360717.30	-795600.22	1A	906		99								3492008
TREE	360717.40	-795600.25	1A	906		99								3492008
TREE	360717.47	-795600.18	1A	902		95								3492008
TREE	360717.45	-795559.89	1A	908		98								3492008
TREE	360722.92	-795557.91	1A	916		74								3492008
TREE	360722.65	-795558.90	1A	914		73								3492008
TREE	360712.20	-795606.26	1A	897		74								3492008
TREE	360712.19	-795606.38	1A	883		60								3492008

TREE	360712.09	-795606.47	1A	902		77								3492008
TREE	360712.63	-795606.45	1A	906		90								3492008
TREE	360713.49	-795606.81	1A	903		84								3492008
TREE	360713.41	-795607.38	1A	912		88								3492008
TREE	360713.19	-795607.89	1A	898		72								3492008
TREE	360712.36	-795607.87	1A	883		53								3492008
TREE	360548.08	-795756.78	1A	901		42								3492008
TREE	360542.40	-795756.20	1A	890		7								3492008
BLDG	360521.54	-795903.02	1A	987		65								3492008
TWR	360706.15	-795635.30	1A	999		70								3492008
SIGN	360710.48	-795552.59	1A	858		30								3492008
SIGN	360709.90	-795551.71	1A	883		25								3492008
SIGN	360725.96	-795557.11	1A	905		27								3492008
BLDG	360641.95	-795740.34	1A	987		74								3492008
BLDG	360637.31	-795723.37	1A	975		66								3492008
TWR	360232.64	-800117.64	1A	1048		179								3492008
TREE	360717.69	-795505.16	1A	975		102								3492008
TREE	360717.56	-795503.60	1A	972		115								3492008
BLDG	360507.12	-795818.61	1A	1013		85								3492008
TREE	360549.12	-795727.14	1A	939		42								3492008
TREE	360549.11	-795725.71	1A	951		55								3492008
TREE	360550.10	-795727.25	1A	942		43								3492008
TREE	360545.76	-795727.35	1A	939		51								3492008
TREE	360549.06	-795728.07	1A	948		52								3492008
TREE	360551.34	-795727.62	1A	932		32								3492008
TREE	360551.05	-795730.33	1A	946		45								3492008
TREE	360550.16	-795730.49	1A	931		34								3492008
TREE	360550.72	-795730.38	1A	936		38								3492008
TREE	360549.21	-795730.38	1A	936		43								3492008
TREE	360549.17	-795730.57	1A	935		42								3492008
TREE	360549.17	-795729.97	1A	932		36								3492008
TREE	360547.74	-795728.99	1A	934		44								3492008
TREE	360547.39	-795728.19	1A	968		88								3492008
TREE	360543.74	-795733.33	1A	962		82								3492008
TREE	360541.87	-795732.35	1A	946		76								3492008
TREE	360542.02	-795731.39	1A	951		78								3492008
TREE	360544.42	-795730.00	1A	937		57								3492008
TREE	360540.96	-795730.29	1A	959		86								3492008
TREE	360541.77	-795729.87	1A	942		66								3492008
TREE	360541.80	-795730.35	1A	945		70								3492008
TREE	360547.41	-795726.19	1A	955		63								3492008
TREE	360548.15	-795727.56	1A	936		40								3492008
TREE	360548.14	-795727.44	1A	934		39								3492008
UTILITY POLE	360547.29	-795727.62	1A	937		44								3492008
UTILITY POLE	360551.56	-795727.56	1A	937		35								3492008
TREE	360550.51	-795727.36	1A	929		31								3492008
UTILITY POLE	360549.95	-795728.62	1A	934		35								3492008
UTILITY POLE	360552.30	-795729.50	1A	936		33								3492008
BLDG	360552.33	-795730.58	1A	914		12								3492008
BLDG	360550.35	-795729.39	1A	918		20								3492008
TREE	360547.59	-795730.84	1A	935		48								3492008

TREE	360547.35	-795729.39	1A	921		33								3492008
TREE	360546.08	-795731.05	1A	934		50								3492008
TREE	360545.62	-795732.93	1A	944		58								3492008
TREE	360543.23	-795737.63	1A	943		55								3492008
TREE	360542.98	-795733.48	1A	942		62								3492008
TREE	360542.86	-795731.96	1A	952		75								3492008
TREE	360602.68	-795743.22	1A	952		43								3492008
TREE	360603.22	-795743.04	1A	949		38								3492008
TREE	360603.61	-795742.94	1A	951		40								3492008
TREE	360602.10	-795743.28	1A	969		61								3492008
TREE	360601.35	-795743.24	1A	947		40								3492008
TREE	360603.03	-795743.03	1A	954		44								3492008
TREE	360603.88	-795743.04	1A	956		45								3492008
TREE	360601.29	-795744.74	1A	952		36								3492008
TREE	360601.60	-795746.99	1A	950		32								3492008
TREE	360602.00	-795748.06	1A	944		27								3492008
TREE	360602.22	-795748.50	1A	946		29								3492008
LT POLE	360600.41	-795747.26	1A	946		40								3492008
LT POLE	360559.62	-795745.61	1A	940		34								3492008
LT POLE	360600.31	-795745.23	1A	930		24								3492008
LT POLE	360559.22	-795743.69	1A	939		37								3492008
LT POLE	360601.20	-795746.98	1A	934		24								3492008
LT POLE	360601.06	-795748.97	1A	941		36								3492008
LT POLE	360602.01	-795747.84	1A	942		39								3492008
LT POLE	360600.46	-795749.78	1A	941		38								3492008
LT POLE	360600.24	-795748.30	1A	942		37								3492008
LT POLE	360558.56	-795747.87	1A	939		38								3492008
LT POLE	360558.81	-795749.41	1A	940		38								3492008
LT POLE	360559.04	-795750.91	1A	937		41								3492008
LT POLE	360557.02	-795748.17	1A	935		37								3492008
LT POLE	360557.24	-795749.76	1A	934		34								3492008
LT POLE	360557.42	-795751.19	1A	935		38								3492008
LT POLE	360555.25	-795748.61	1A	931		37								3492008
BLDG	360559.97	-795753.38	1A	932		34								3492008
TREE	360600.34	-795750.89	1A	934		32								3492008
TREE	360600.60	-795750.76	1A	932		31								3492008
TREE	360600.80	-795750.50	1A	930		31								3492008
TREE	360554.81	-795744.86	1A	929		34								3492008
TREE	360554.88	-795746.02	1A	929		36								3492008
TREE	360554.36	-795745.03	1A	928		34								3492008
TREE	360554.86	-795747.06	1A	924		32								3492008
TREE	360554.61	-795745.08	1A	925		30								3492008
TREE	360556.11	-795744.43	1A	925		28								3492008
TREE	360601.18	-795743.16	1A	948		41								3492008
TREE	360601.44	-795743.36	1A	954		47								3492008
LT POLE	360600.66	-795743.35	1A	930		25								3492008
TREE	360553.01	-795754.95	1A	945		58								3492008
TREE	360551.97	-795754.46	1A	943		56								3492008
TREE	360550.77	-795754.09	1A	940		55								3492008
TREE	360548.79	-795751.08	1A	943		66								3492008
TREE	360548.86	-795751.45	1A	948		75								3492008

TREE	360547.85	-795751.84	1A	945		80								3492008
TREE	360554.32	-795753.45	1A	933		40								3492008
BLDG	360558.67	-795752.50	1A	925		27								3492008

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ADDITIONAL INFORMATION

SURVEY TYPE IS ANAPC. SURVEYOR: ERIC J. MOSER, PLS LICENSE NO: NCPLS L-4697 SUBMITTED: 4/15/2009 9:56:14 AM (V3.7)

TASK OF THIS SURVEY IS FOR OEP OR SPECIAL TYPE SURVEY ONLY. THE VGA, VGRPS, AND VGAS SURFACES ARE PROVIDED FOR.

EOF

RUNWAY 5L (CAT II/III)

RUNWAY 5L THRESHOLD	
Proposed Elevation	916.50
Station	45+00
Offset	0
Northing	856,399.54
Easting	1,716,667.14
Latitude	36° 05' 57.32"
Longitude	79° 57' 32.58"

RUNWAY 5L GLIDESLOPE ANTENNA	
Equipment Type	MK-20
Glideslope Angle	3°
Centerline ABEAM Elevation	909.27
TCH	55'
Approach End TH Elevation	916.50
Approach End TH to ABEAM	910
Ground Elevation	902.77
Offset	410' LT
Station	56+86
Northing	857,512.99
Easting	1,717,245.87
Latitude	36° 06' 08.39"
Longitude	79° 57' 25.66"

RUNWAY 5L ABEAM OF GLIDESLOPE ANTENNA	
Elevation	909.27
Station	56+86
Northing	857,216.29
Easting	1,717,527.09
Latitude	36° 06' 05.48"
Longitude	79° 57' 22.20"

RUNWAY 5L LOCALIZER	
Course Latitude	36° 05' 57.32"
Course Longitude	79° 57' 32.58"
Northing	863,301.02
Easting	1,723,948.39
Ground Elevation	844.00
Antenna Top Elevation	850.00
Station	145+32.30
Offset	0.00
RW Length: Stop to Approach	9,000
Distance: LOC to TH Stop End	1,032
Array/ RW 5L Threshold: Distance	10,032.30
Array/Shelter: Distance	301.76

RUNWAY 5L INNER MARKER	
Latitude	36° 05' 51.41"
Longitude	79° 57' 40.11"
Northing	855,807.92
Easting	1,716,042.97
Station	36+40
Offset	0
Ground Elevation	904.10

RUNWAY 5L FAR FIELD MONITOR	
Latitude	36° 05' 51.36"
Longitude	79° 57' 40.20"
Northing	855,801.92
Easting	1,716,035.66
Station	36+30
Offset	0
Ground Elevation	903.94

RUNWAY 5L DME	
Antenna Latitude	36° 07' 07.54"
Antenna Longitude	79° 56' 07.83"
Northing	863,433.45
Easting	1,723,688.29
Station	144+35
Offset	275'
Ground Elevation	837.5
Antenna Elevation	844

RUNWAY 5R PAPI LHA#1	
Elevation	907.20
Station	59+86
Offset	125' LT
Northing	857,513.51
Easting	1,717,658.68
Latitude	36° 06' 08.44"
Longitude	79° 57' 20.63"

RUNWAY 5L ABEAM TO PAPI LHA#1	
Centerline ABEAM Elevation	907.20
Station	59+86
Offset	0.0'
Northing	857,421.71
Easting	1,717,745.56
Latitude	36° 06' 07.54"
Longitude	79° 57' 19.56"

RUNWAY 5L TOUCHDOWN RVR	
Station	57+30
Offset	430' LT
Northing	857,557.36
Easting	1,717,263.61
Latitude	36° 06' 08.83"
Longitude	79° 57' 25.45"

RUNWAY 5L MIDPOINT RVR	
Station	92+00
Offset	430' LT
Northing	859,945.53
Easting	1,719,780.80
Latitude	36° 06' 32.69"
Longitude	79° 56' 55.05"

RUNWAY 5L ROLLOUT RVR	
Station	124+50
Offset	430' LT
Northing	862,180.23
Easting	1,722,140.86
Latitude	36° 06' 55.01"
Longitude	79° 56' 26.55"

RUNWAY 23R (CAT I)

RUNWAY 23R THRESHOLD	
Proposed Elevation	855.59
Station	135+00
Offset	0
Northing	856,399.54
Easting	1,716,667.14
Latitude	36° 06' 59.16"
Longitude	79° 56' 13.70"

RUNWAY 23R GLIDESLOPE ANTENNA	
Equipment Type	
Glideslope Angle	3°
Centerline ABEAM Elevation	857.61
TCH	55
Approach End TH Elevation	855.59
Approach End TH to ABEAM	846.9
Ground Elevation	848.90
Offset	410' RT
Station	124+88
Northing	862,192.60
Easting	1,722,182.55
Latitude	36° 06' 55.13"
Longitude	79° 56' 26.04"

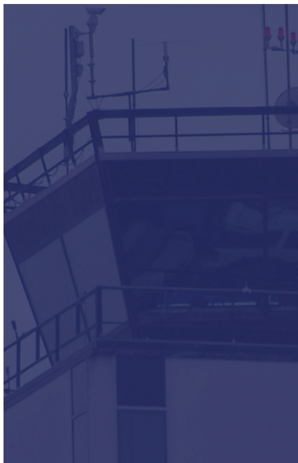
RUNWAY 23R LOCALIZER	
Course Latitude	36° 05' 50.32"
Course Longitude	79° 57' 41.51"
Northing	855,698.23
Easting	1,715,927.25
Ground Elevation	901.00
Platform Top Elevation	911.00
Antenna Top Elevation	917.00
Station	34+80.55
Offset	0.00
RW Length: Stop to Approach	9,000
Distance: LOC to TH Stop End	1,019.45
Array/ RW 23R Threshold: Distance	10,019.45
Array/Shelter: Distance	254.10

RUNWAY 23R ABEAM TO GLIDESLOPE ANTENNA	
Elevation	857.61
Station	124+88
Northing	861,894.65
Easting	1,722,464.64
Latitude	36° 06' 52.21"
Longitude	79° 56' 22.57"

RUNWAY 23R DME	
Antenna Latitude	36° 05' 51.95"
Antenna Longitude	79° 57' 43.72"
Northing	855,865.13
Easting	1,715,747.15
Station	34+65
Offset	245' LT
Ground Elevation	
Antenna Elevation	

RUNWAY 23R PAPI LHA#1	
Elevation	858.21
Station	121+88
Offset	125' RT
Northing	861,597.71
Easting	1,722,333.06
Latitude	36° 06' 49.26"
Longitude	79° 56' 24.14"

RUNWAY 23R ABEAM TO PAPI LHA#1	
Elevation	858.21
Station	121+88
Northing	861,686.49
Easting	1,722,245.02
Latitude	36° 06' 50.13"
Longitude	79° 56' 25.22"



Airport Master Plan Update

and

Strategic Long-Range Visioning Plan

Appendix E

Forecast of Aviation Activity and Record of Transmittal to FAA

Prepared By:

URS

In Association With:

JACOBS CONSULTANCY

r m a

Ron Miller & Associates

PTAA

PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport

Greensboro, North Carolina

APPENDIX E

Forecast of Aviation Activity and Record of Transmittal to FAA

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FORECAST OF AVIATION ACTIVITY

1.1 INTRODUCTION

Jacobs Consultancy was retained by URS Corporation to update the traffic forecasts that were prepared in conjunction with the 1995 Airport Master Plan for Piedmont Triad International Airport (PTI).

This forecast of aviation activity at PTI involves predicting the Longer-Term impact on air traffic of current trends, including a major downturn in the U.S. economy, continuing service reductions and phasing out of most mainline jet operations at PTI by the network carriers, increasing traffic leakage to neighboring Charlotte-Douglas International Airport (CLT) and Raleigh-Durham International Airport (RDU), and the Airport's loss of service by Low-Cost Carriers (LCCs) AirTran and Skybus Airlines in September 2004 and April 2008, respectively. These factors have had a significant impact on air traffic at PTI in recent years and they have implications for the Airport's Longer-Term outlook.

This document is organized in eleven sections. Section 1.2 defines the air service region. Section 1.3 contains an overview of the demographic and economic trends that have influenced, and will continue to influence, air travel demand at the Airport. Section 1.4 documents air service, air traffic, and air cargo trends over the past decade.

Section 1.5 discusses key economic and industry trends and presents the rationale underlying the three passenger forecast scenarios. Section 1.6 presents the enplaned passenger and passenger flight operations forecasts through to 2030. It describes the methodology used to develop the forecasts and compares the forecasts with those developed by others. Sections 1.7 through 1.9 present forecasts of cargo tonnage, General Aviation (GA) activity, and total aircraft operations, respectively.

Section 1.10 presents further forecasts that were derived from the passenger and operations forecasts. A breakdown of the operations forecast by aircraft group is provided for passenger and all-cargo flights. Section 1.10 also lays out peak-month and peak-hour forecasts for passengers and passenger flight operations.

When developing aviation activity forecasts at the master planning level, the Federal Aviation Administration (FAA) is responsible for the review and approval of those forecasts. The FAA reviews each airport sponsor's aviation activity forecast to ensure that the forecast is based upon reasonable planning assumptions, uses current data, and is developed using appropriate forecast methods. After a thorough review of the forecast, FAA then determines if the forecast is consistent with the most current FAA-developed Terminal Area Forecast (TAF). For all classes of airports, forecast for total enplanement, based aircraft and total aircraft operations are considered consistent with the TAF if they meet the following criterion:

- Forecasts differ by less than 10 percent in the five year forecast period, and 15 percent of the 10-year forecast period.

Following this prescribed forecast review and approval process, the draft Aviation Activity Forecast was transmitted to the FAA's Airports District Office in Atlanta, Georgia on November 24, 2008. Subsequent to this transmittal and prior to the FAA's full review of the draft forecast, the annual update of the FAA's TAF was published in December 2008. Because the TAF passenger emplacements, based aircraft and total operations forecasts for PTI were revised as part of that TAF update, a subsequent revision of Table 1-28, *Comparison of Airport Planning and TAF Forecasts* was transmitted to the FAA for review and consideration on January 14, 2009. The summary of the aviation activity forecast developed for this Airport Master Plan Update and comparison of the forecast and that of the FAA's December 2008 TAF are presented in Section 1.11.

On May 11, 2009, the FAA formerly approved the submitted draft aviation activity forecast through the planning year 2022. The record of transmittal to and subsequent approval from the FAA's Atlanta Airports District Office are provided at the end of this report.

1.2 AIR SERVICE REGION

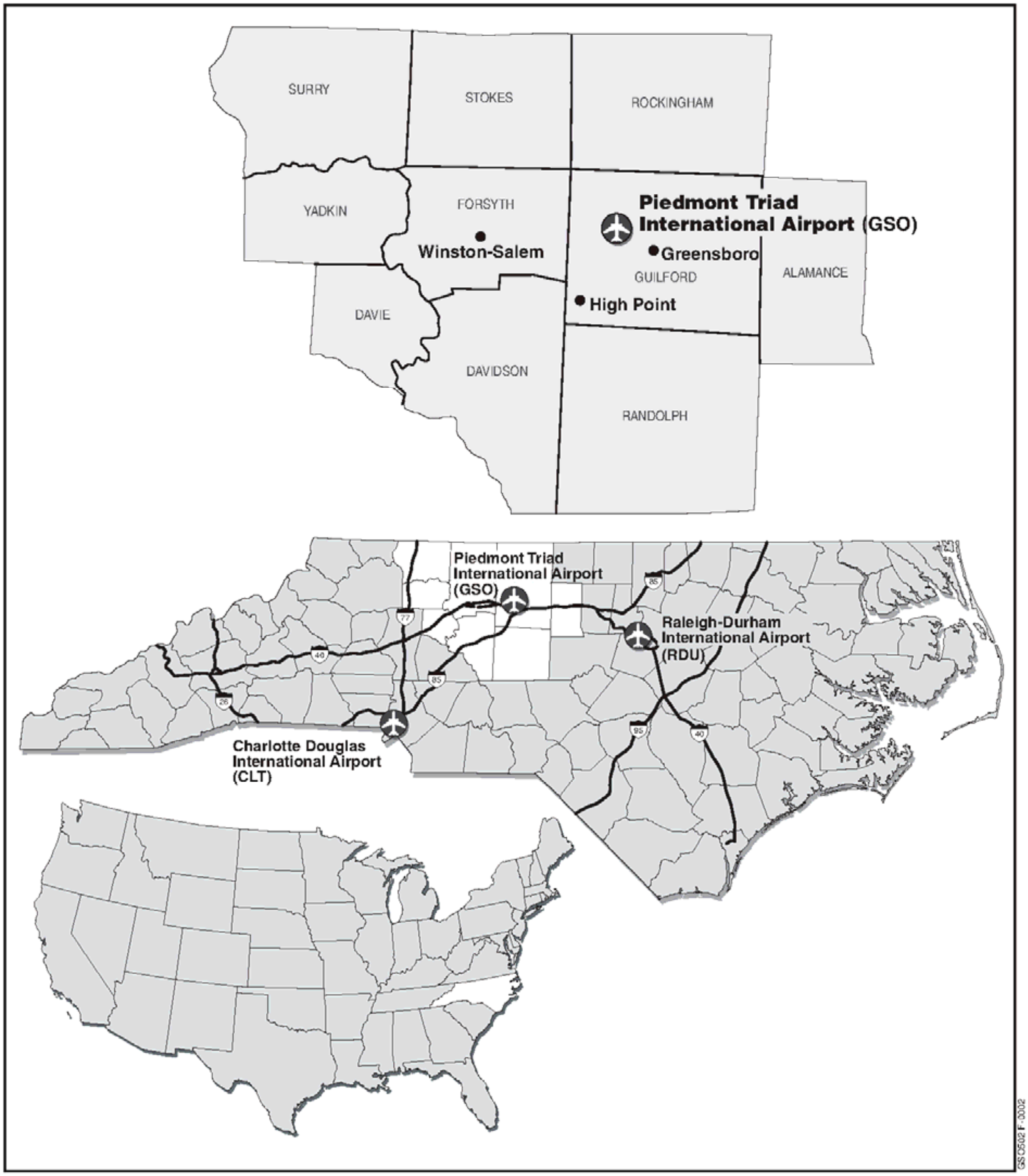
The air service region for PTI is essentially the area within roughly a 50-mile radius of the Airport, due to the presence of competing airports serving neighboring metropolitan areas. In the following discussion, statistical data derived from the Greensboro—Winston-Salem—High Point Combined Statistical Area (the CSA or Greensboro CSA), as defined by the U.S. Office of Management and Budget, is used for comparative purposes. The CSA comprises the North Carolina counties of Alamance, Davidson, Davie, Forsyth, Guilford, Randolph, Rockingham, Stokes, Surry and Yadkin (see **Figure 1-1**).

In addition to comparing demographic and economic trends in the CSA to those in North Carolina and in the nation, this section of the report makes comparisons to trends exhibited in the two major metropolitan areas adjacent to the CSA: the 13-county Charlotte-Gastonia-Salisbury Combined Statistical Area (Charlotte CSA) to the southwest, and the 8-county Raleigh-Durham-Cary Combined Statistical Area (Raleigh-Durham CSA) to the east.

The limits to an airport's service region are generally determined by the driving distance and travel time to other nearby commercial service airports, as well as the availability, price, and quality of airline service at those other airports. There are two major competing airports located within a modest drive for residents of and visitors to the Greensboro CSA. The first is CLT, serving the Charlotte CSA, located approximately 100 miles southwest of the Airport. US Airways maintains a sizable connecting hub at CLT, and CLT is served by two LCCs (AirTran and JetBlue). The second airport is RDU, serving the Raleigh-Durham CSA, located approximately 80 miles to the east of the Airport. Three LCCs (Southwest, JetBlue, and AirTran) accounted for 25% of all enplaned passengers at RDU in 2007.

The Greensboro CSA's demographic and economic profile provides the basis for demand for air passenger and cargo service, and changes in this profile affect the level of passenger traffic at PTI. For example, the amount and type of business activity in the CSA affects the level of business travel to and from the Airport, and the level of per capita personal income in the CSA affects the level of discretionary travel from Airport.

FIGURE 1-1
GREENSBORO—WINSTON-SALEM—HIGH POINT COMBINED STATISTICAL AREA



1.3 FACTORS AFFECTING AVIATION DEMAND

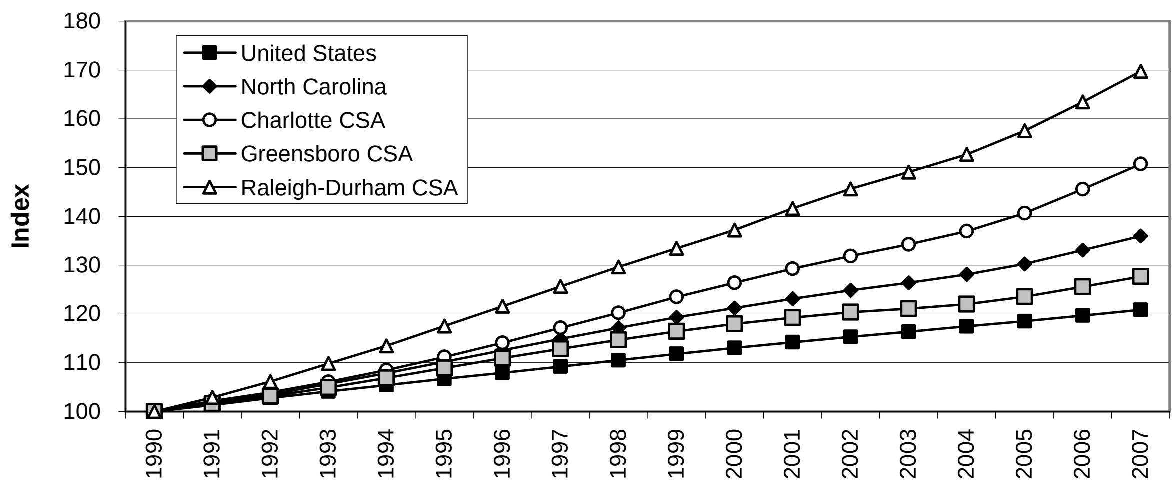
1.3.1 DEMOGRAPHIC TRENDS

1.3.1.1 Population

Based on population estimates by the U.S. Bureau of the Census, North Carolina was the 10th largest state in the nation in 2007 and it ranked 9th in the rate of population growth between 2000 and 2007. In 2007, the Greensboro CSA was the third most populous in the State.

In terms of population growth, the Greensboro CSA grew faster than the nation, but slower than the State, between 1990 and 2007 (see **Figure 1-2**). Population growth in the Raleigh-Durham CSA and the Charlotte CSA, on the other hand, significantly exceeded the State's rate of growth over the same period. Since 2003, the pace of population growth in the Raleigh-Durham CSA and the Charlotte CSA has accelerated relative to historical rates, while the pace of population growth in the Greensboro CSA has declined relative to its historical rate.

FIGURE 1-2
COMPARATIVE INDEX OF POPULATION TRENDS
(1990=100)



Compound Annual Growth Rate:	1990-2000	2000-2003	2003-2007
United States	1.2%	1.0%	0.9%
North Carolina	1.9	1.4	1.8
Charlotte CSA	2.4	2.0	2.9
Greensboro CSA	1.7	0.9	1.3
Raleigh-Durham CSA	3.2	2.8	3.3

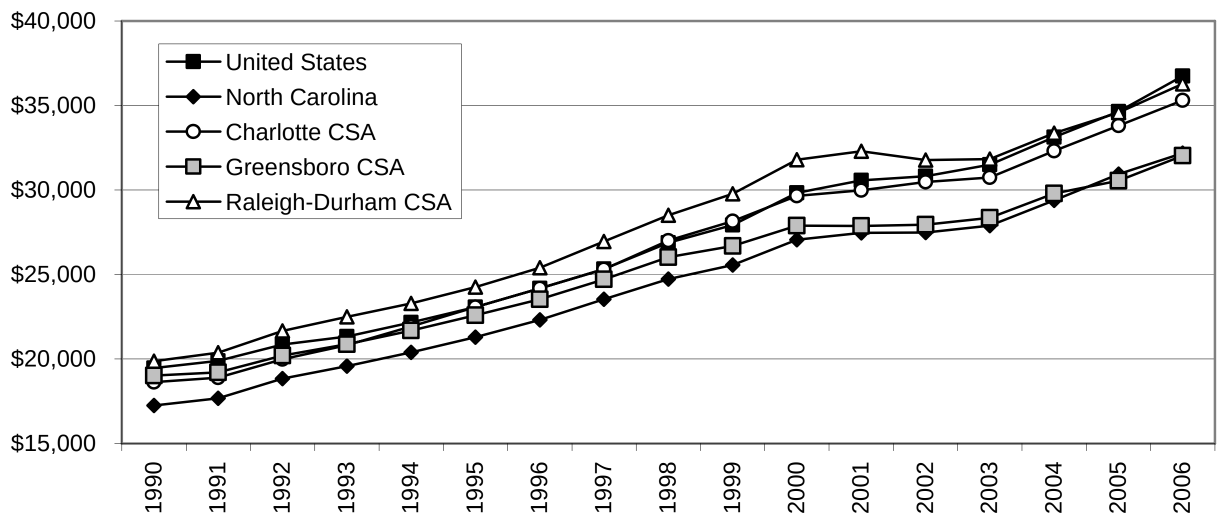
Source: U.S. Department of Commerce, Bureau of the Census website, accessed March 20, 2008.

1.3.1.2 Income

Trends in the growth of Per Capita Personal Income (PCPI) in the CSA are significant factors underlying locally-originating demand for air transportation. Growth of income results, in part, from the expansion of economic activity which is attributed to, among other things, increased output from existing firms and the creation of new jobs by new businesses. Growth in business activity leads to greater discretionary income for individuals, which in turn correlates positively with demand for airline travel.

Since 1990, North Carolina PCPI has been lower than that of the nation (see **Figure 1-3**). Of the three CSAs, the Greensboro CSA has the lowest level of PCPI. By 2006, PCPI in the Greensboro CSA approximated the level in the state of North Carolina, while PCPI in the Raleigh-Durham and Charlotte CSAs approximated the higher national average.

FIGURE 1-3
PER CAPITA PERSONAL INCOME



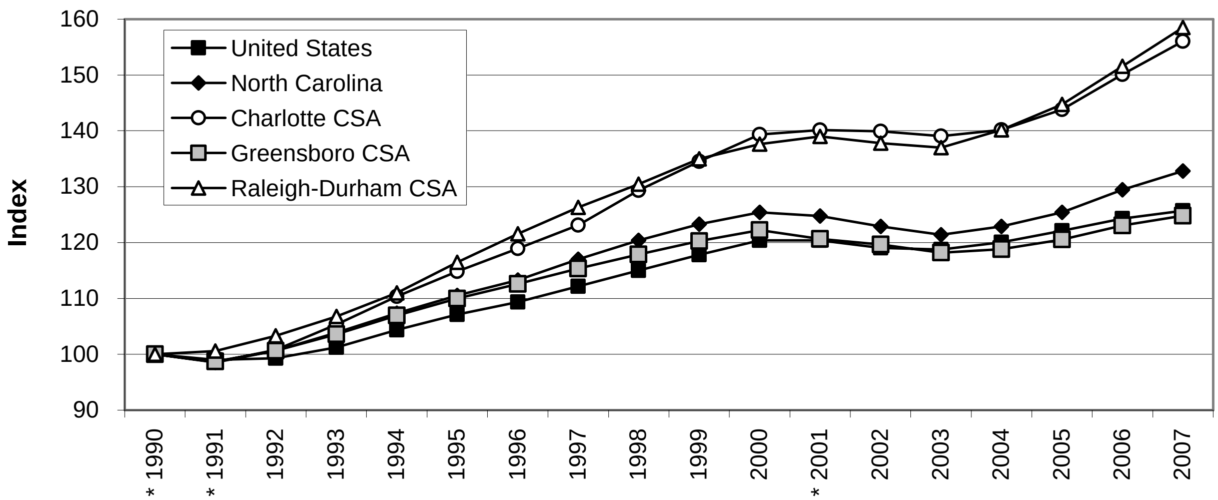
Compound Annual Growth Rate:	1990-2000	2000-2003	2003-2006
United States	4.4%	1.8%	5.3%
North Carolina	4.6	1.0	4.9
Charlotte CSA	4.7	1.2	4.7
Greensboro CSA	3.9	0.6	4.1
Raleigh-Durham CSA	4.8	0.0	4.5

Source: U.S. Department of Commerce, Bureau of Economic Analysis website, accessed October 13, 2008.
Notes: n.c.=not calculated.

1.3.1.3 Economic Trends

Employment growth in the Greensboro CSA mirrored statewide employment growth in the early- and mid-1990s, but then slowed somewhat, generally resembling the similar but slightly lower national pattern thereafter (see **Figure 1-4**). By contrast, employment growth in the Raleigh-Durham and Charlotte CSAs has significantly exceeded employment growth for the United States, North Carolina, and the Greensboro CSA since 1990.

FIGURE 1-4
COMPARATIVE INDEX OF TOTAL NON-AGRICULTURAL EMPLOYMENT
(1990=100)



Compound Annual Growth Rate:	1990-2000	2000-2003	2003-2007
United States	1.9%	-0.5%	1.4%
North Carolina	2.3	-1.1	2.3
Charlotte CSA	3.4	-0.1	2.9
Greensboro CSA	2.0	-1.1	1.4
Raleigh-Durham CSA	3.2	-0.2	3.7

Source: U.S. Department of Labor, Bureau of Labor Statistics website, accessed March 21, 2008.
Note: *Indicates national recession during all or part of year, according to the National Bureau of Economic Research.

Over the 10 years from 1997 to 2007, growth in non-agricultural employment in the Greensboro CSA lagged growth rates for the nation, North Carolina, and the Raleigh-Durham and Charlotte CSAs (see **Table 1-1**). Employment growth rates in the Charlotte and Raleigh-Durham CSAs have been double those of North Carolina and the nation over the past 10 years.

The Greensboro CSA has the highest percentage of employment in the manufacturing sector—the one sector in decline in all areas—of any of the five geographical areas. Even after a 29% decline over the past 10 years, manufacturing employment in the Greensboro CSA still accounted for 16% of total CSA employment in 2007. On the other hand, the Greensboro CSA has the highest proportion of education and health services employment, the nation's most rapidly growing sector of employment.

The employment mix of each of the two neighboring CSAs differs from that of the Greensboro CSA. The Charlotte CSA has a higher employment concentration in professional and business services and in finance. The Raleigh-Durham CSA, home of the State capital, accommodates a large government sector, as well as a relatively high concentration of professional and business services employment.

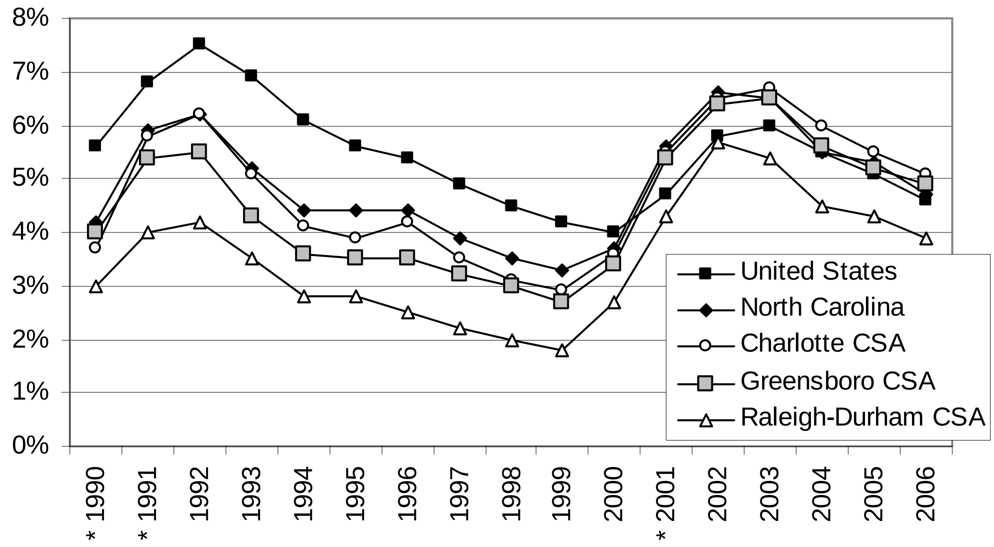
TABLE 1-1
AVERAGE ANNUAL NON-AGRICULTURAL EMPLOYMENT GROWTH 1997-2007
AND EMPLOYMENT SHARE BY INDUSTRY 2007

Industry	Compound Annual Growth Rate 1997-2007					2007 Percent of Total				
	United States	North Carolina	CLT CSA	PTI CSA	RDU CSA	United States	North Carolina	CLT CSA	PTI CSA	RDU CSA
Trade, Transportation, Utilities	0.7%	0.9%	1.9%	**0.2%**	1.4%	19.3%	18.8%	20.9%	**19.7%**	16.0%
Manufacturing	-2.2	-3.9	-3.2	**-3.3**	-1.2	10.1	13.0	9.5	**15.8**	9.2
Education & Health Services	2.7	4.3	4.6	**3.9**	5.4	13.3	12.4	9.0	**15.3**	12.9
Professional/Business Services	2.3	3.4	3.5	**1.8**	2.7	13.1	12.1	15.5	**12.4**	15.6
Government	1.2	1.9	2.9	**2.3**	2.2	16.1	16.8	12.2	**11.5**	18.5
Leisure & Hospitality	2.0	2.9	4.0	**2.8**	3.3	9.8	9.5	9.8	**9.0**	8.5
Financial Activities	1.5	2.2	5.2	**1.4**	3.5	6.0	5.1	9.1	**5.8**	4.8
Nat. Resources, Mining, Construction	2.6	2.1	3.2	**1.0**	3.4	6.1	6.3	7.0	**5.2**	6.3
Other Services	1.3	3.5	4.2	**3.8**	2.7	4.0	4.4	4.5	**3.9**	5.5
Information	-0.2	1.5	0.8	**-2.1**	-0.1	2.2	1.8	2.6	**1.4**	2.6
TOTAL	1.1%	1.3%	2.4%	**0.8%**	2.3%	100.0%	100.0%	100.0%	**100.0%**	100.0%

Source: U.S. Department of Labor, Bureau of Labor Statistics website, accessed March 21, 2008.
Note: CLT CSA=Charlotte CSA; PTI CSA=Greensboro CSA; RDU CSA=Raleigh-Durham CSA.

Expansion of the Greensboro CSA economy from 1990 through 2000 is reflected, in part, through its unemployment rate, which remained below the national and State unemployment rates (see **Figure 1-5**). During the three years following 2000, unemployment in the CSA and the State equaled or exceeded the national rate. The Greensboro CSA has historically had an unemployment rate that was slightly below the rate in the Charlotte GSA and significantly higher than the rate in the Raleigh-Durham CSA.

FIGURE 1-5
CIVILIAN UNEMPLOYMENT RATE



Source: U.S. Department of Labor, Bureau of Labor Statistics website, accessed March 20, 2008.
Notes: *Indicates national recession during all or part of year, according to the National Bureau of Economic Research.

Eight of the 20 largest private-sector employers in the Greensboro CSA (based on the number of employees in the CSA) are in the Fortune 500 list of largest U.S. companies ranked on revenues (see **Table 1-2**). The largest CSA employers make up a diverse industry base that includes education and health services, manufacturing, and financial services.

Wake Forest University Health Sciences and North Carolina Baptist Hospital together constitute the largest private-sector employer in the CSA with about 11,400 employees. The North Carolina Baptist Hospital, comprising 100 buildings on 290 acres, operates various facilities and satellite clinics throughout the CSA.

In 1998, Federal Express chose PTI as the location for its fifth major U.S. air cargo hub serving primarily the eastern United States. Construction of the cargo hub is divided into two phases, with the first phase of construction completed in June 2009 and the optional second phase to be undertaken at the discretion of Federal Express. Federal Express is expected to hire 750 workers (full and part-time) when its first phase of operations gets underway and another 750 upon a second phase of operations for a potential total of 1,500 employees (full and part-time).

HondaJet's recently-completed headquarters and research and development facility are located at the Airport. The company also intends to construct a production plant for "light jets" at PTI by late 2009. HondaJet plans to begin delivering aircraft to customers in 2011.

TABLE 1-2
MAJOR PRIVATE-SECTOR EMPLOYERS IN THE GREENSBORO CSA
(RANKED BY NUMBER OF EMPLOYEES)

Company	Employment	Type of Business
Wake Forest University/Baptist Medical Center	11,398	Health & Medical Care; Medical School
Wal-Mart *	9,695	Retail
Novant Health Inc.	8,843	Health Care
Moses Cone Health System	7,437	Health Care
Reynolds American Inc. *	3,800	Cigarette Manufacturing
Hanes Brands	3,500	Apparel
Wachovia Corp. *	3,500	Banking
Klaussner Furniture Industries Inc.	3,375	Furniture Manufacturing
Laboratory Corp. of America	3,300	Laboratory Testing
Unifi Inc.	2,400	Textiles
High Point Regional Health System	2,395	Health Care
VF Corp. *	2,338	Branded Apparel
American Express *	2,280	Financial Services; Credit Card Operations
BB&T Corp. *	2,242	Banking
AT&T *	2,000	Telecommunications
Bank of America *	1,800	Banking
Wake Forest University	1,780	Higher Education
Alamance Regional Medical Center	1,754	Health Care
Lorillard Inc.	1,750	Cigarette Manufacturing
Thomas Built Buses	1,600	School Bus Manufacturing

Source: Piedmont Triad Partnership website, accessed March 21, 2008; from data provided by Triad Business Journal.
Note: * Listed in 2007 Fortune 500 list of largest U.S. companies (based upon 2006 revenues).

Convention and exhibition facilities in the city of High Point, which is known as "The Home Furniture Capital of the World," include approximately 10 million square feet of space used exclusively for the High Point International Home Furnishings Market, typically held in April and October of each year. Exhibitors, representing over 3,000 manufacturers, draw 80,000 visitors from all 50 states and 110 foreign countries to this seven-day event. The High Point Market is the State's largest economic event and contributes approximately $1.1 billion to the Greensboro CSA's economy. In spite of growing competition from furnishings shows in Las Vegas and Shanghai, China, attendance in April 2008 was only slightly lower (82,100 versus 85,700) than attendance in April 2007. The smaller semiannual Las Vegas Furniture Market typically attracts attendance in the order of 50,000.

1.3.1.4 Economic Outlook

The Near-Term economic outlook for North Carolina and the Greensboro CSA is "downbeat", according to the Department of Agricultural and Resource Economics at North Carolina State University. Like the nation, North Carolina has experienced the effects of the residential housing crisis in recent years, with a growing excess supply of housing coupled with an impact on housing prices. North Carolina experienced the largest rainfall deficit in its recorded history in 2007, and sizable agricultural losses negatively affected other sectors of the State economy. The current recession has resulted in severe unemployment.

The Near-Term economic outlook for the Greensboro CSA is slightly dimmer than for the State, with the exception of an anticipated less-precipitous decline in housing permits relative to 2007. Over the Longer-Term, however, the CSA is expected to continue its shift away from an economy traditionally based on tobacco, furniture, and textiles, toward sectors such as high-tech manufacturing and biotechnology.

In terms of population, the U.S. Bureau of the Census projects North Carolina's population growth (1.3% per year, on average) to exceed the nation's growth rate (0.8% per year) from 2007 to 2030. North Carolina is projected to be the 7th largest state by 2030, up from the 10th largest in 2007. The North Carolina Office of State Budget and Management projects population in the Greensboro CSA to grow 1.0% per year, on average, from 2007 to 2030, faster than the nation but more slowly than North Carolina as a whole.

In terms of both PCPI and employment, Woods & Poole Economics anticipates growth in the Greensboro CSA from 2007 to 2030 at rates slightly below projected national and statewide growth rates.

1.4 HISTORICAL AVIATION ACTIVITY

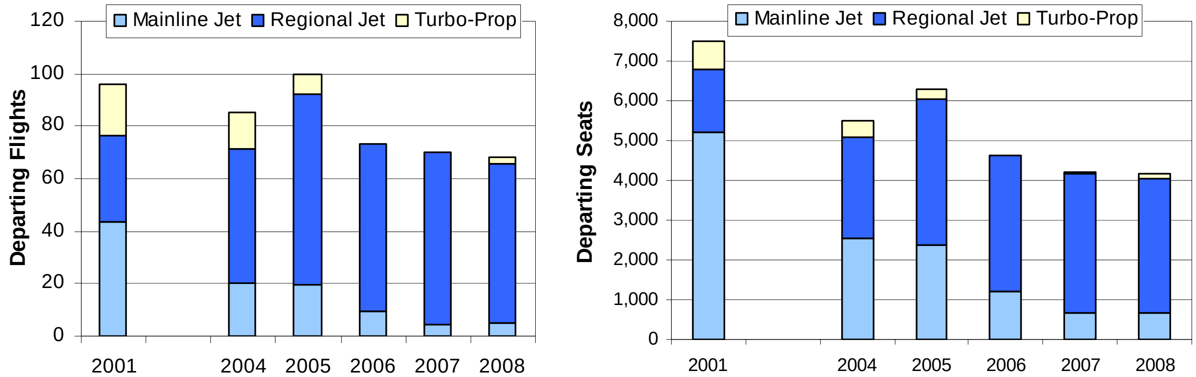
PTI is designated as a small hub by the FAA, categorized with airports that account for between 0.05% and 0.25% of total revenue passengers enplaned in the United States. US Airways and Delta, together with their code-sharing affiliates, accounted for 30.0% and 27.4%, respectively, of total passengers enplaned at PTI during 2007. No other airline accounted for more than 13% of total enplanements at the Airport.

1.4.1 SCHEDULED PASSENGER SERVICE TRENDS

Passenger flights from PTI serve primarily short-haul U.S. destinations, and PTI is a "spoke" on many carriers' route networks. No carrier operated a hub at PTI in May 2008. The only low-cost carrier providing service at PTI in May 2008, Allegiant, began operations at PTI in May 2007. In recent years, network airlines have reduced their seat offering at PTI by using regional jets to replace mainline jet service while maintaining the scope and frequency of their service.

Between May 2001 and May 2008, the number of average daily flight departures at PTI declined from 96 to 68. A significant increase in regional jet flights (from 32 to 61) was more than offset by a decline in mainline jet flights (from 44 to 5) and turboprop flights (from 20 to 2) at PTI (see **Figure 1-6**). Over the same period, seats on scheduled departing flights declined 44.3%, with regional jet capacity increasing 116.1% and mainline jet and turboprop capacity declining 87.6% and 78.5%, respectively. As a result, the average number of seats per flight at PTI declined from 78 seats in May 2001 to 61 seats in May 2008.

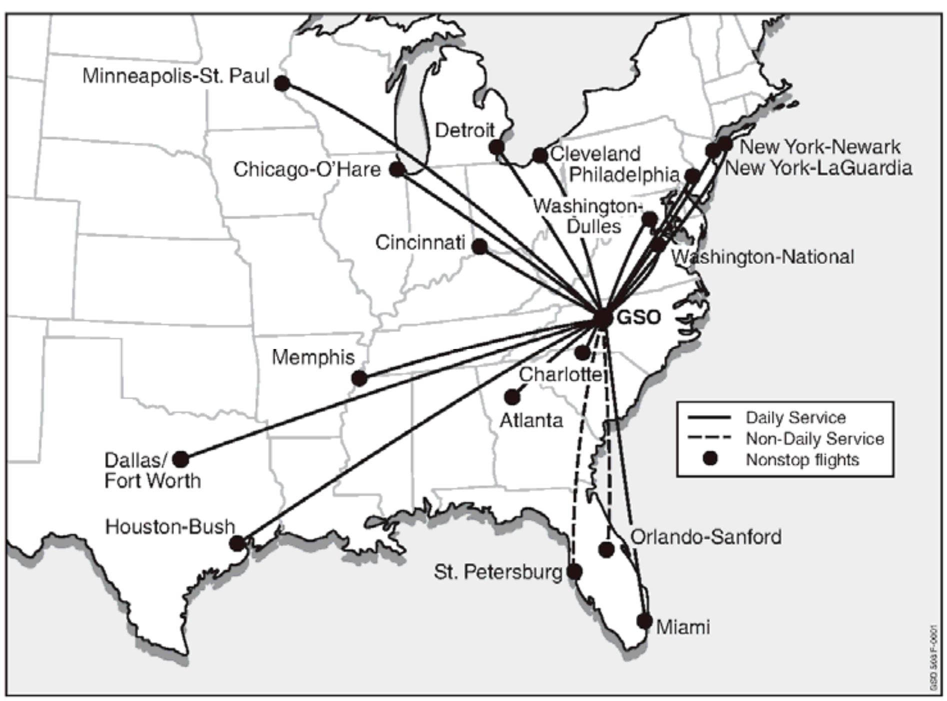
FIGURE 1-6
AVERAGE DAILY SCHEDULED DEPARTING FLIGHTS AND SEATS
(AN AVERAGE DAY IN THE FIRST WEEK OF MAY)



Source: Official Airline Guide and Skybus Airlines website.

Figure 1-7 shows the routes on which scheduled nonstop round-trip passenger air service was available at PTI in May 2008. Most of the destinations are located in the eastern half of the United States within 600 miles of the Airport. Nonstop service was offered on some longer-haul routes, including Miami, Dallas/Ft. Worth, Houston, and Minneapolis-St. Paul.

FIGURE 1-7
SCHEDULED NONSTOP ROUND-TRIP PASSENGER SERVICE
(FOR THE FIRST WEEK OF MAY 2008)



Source: *Official Airline Guide*.

In the first week of May 2008, 13 of the Airport's top 20 city-pair markets were served nonstop from the Airport, up from 10 in May 2001 (see **Table 1-3**). However, the total number of departing seats declined 44% over the 7-year period.

TABLE 1-3
WEEKLY SCHEDULED DEPARTING FLIGHTS AND SEATS
TO THE TOP 20 DOMESTIC O&D MARKETS
(FOR THE FIRST WEEK OF MAY)

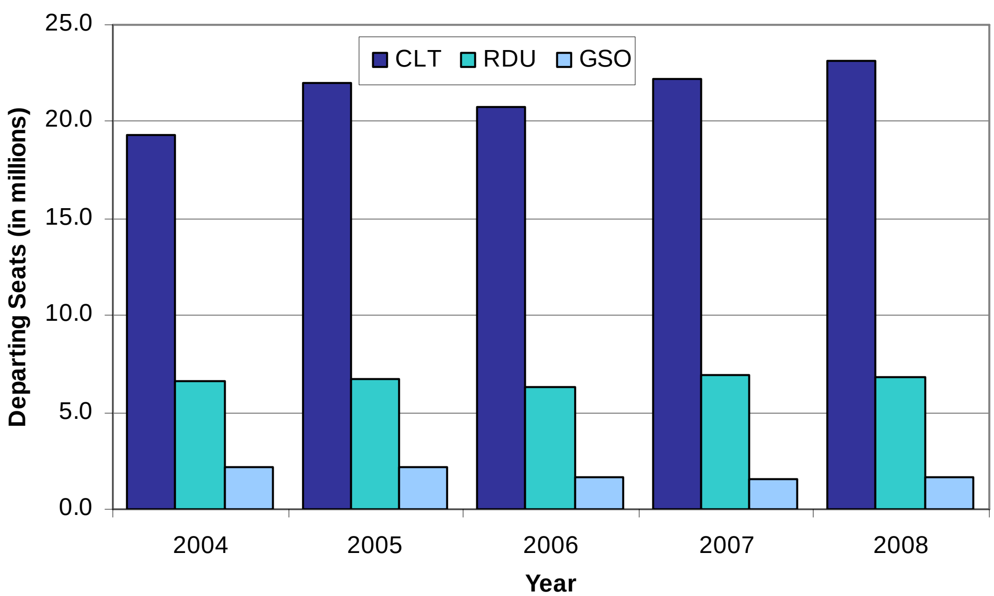
		2001			2008		
	City Market	Carriers	Nonstop		Carriers	Nonstop	
Rank[1]	*Airport*	Serving[2]	Flights	Seats	Serving[2]	Flights	Seats
1	New York		96	6,840		86	4,638
	LaGuardia	*AA,DL,US*	*71*	*4,054*	*DL,US*	*55*	*2,938*
	Newark	*CO*	*25*	*2,786*	*CO*	*31*	*1,700*
	Kennedy	-	-	-	-	-	-
2	Chicago[3]	AA,UA	41	3,687	UA	32	2,602
3	Wash. DC/Baltimore[4]	UA,US	99	3,656	UA,US	49	2,451
4	Philadelphia	US	28	3,339	US	42	2,276
5	Atlanta	DL,FL	90	11,830	DL	51	3,886
6	Dallas/Ft. Worth[5]	AA,DL	35	2,268	AA	21	1,590
7	Los Angeles[6]	-	-	-	-	-	-
8	Orlando[7]	DL	21	1,050	G4	4	600
9	Las Vegas	-	-	-	-	-	-
10	Boston	US	19	950	DL	1	50
11	Detroit	NW	25	2,500	NW	27	1,350
12	Houston[8]	CO	14	1,468	CO	21	1,050
13	San Francisco[9]	-	-	-	-	-	-
14	Memphis	-	-	-	NW	21	1,050
15	Columbus	-	-	-	-	-	-
16	Minneapolis/St. Paul	-	-	-	NW	7	350
17	Denver	-	-	-	-	-	-
18	Tampa	-	-	-	-	-	-
19	Ft. Lauderdale	-	-	-	-	-	-
20	Miami	-	-	-	AA	7	308
		Total—Top 20 Markets	468	37,588		369	22,201
		All Other Markets	202	14,884		108	7,036
		Total—All Markets	670	52,472		477	29,237
		Average Seats per Flight	*78*			*61*	

Source: *Official Airline Guide*.
Notes: 1. Ranked by domestic outbound O&D passengers for the 12 months ended September 30, 2007.
2. Airlines operating scheduled passenger service. Affiliated code-sharing carriers are included with their major airliners partners and are not counted separately.
3. Market includes O'Hare and Midway airports.
4. Market includes Reagan, Dulles, and Baltimore airports.
5. Market includes Dallas/Ft. Worth Airport and Love Field.
6. Market includes Los Angeles, Burbank, Long Beach, Ontario, and Orange County airports.
7. Market includes Orlando and Sanford airports.
8. Market includes Bush and Hobby airports.
9. Market includes San Francisco, San Jose, and Oakland airports.
Legend: AA=American; CO=Continental; DL=Delta; FL=AirTran; G4=Allegiant; NW=Northwest; UA=United; US=US Airways.

US Airways, together with its affiliated commuter carriers, accounted for 33% of all scheduled flight departures at PTI and provided service to four of the 19 cities served nonstop from PTI. Delta and its affiliated commuter carriers accounted for 20% of the total flights and provided nonstop service to four cities. Competing nonstop services were offered on only two routes (to New York and Washington DC) during the first week of May 2008, down from five routes in May 2001.

Due primarily to US Airways' hubbing activity, CLT accounts for nearly three-quarters (73.2%) of all scheduled departing seats offered from the central North Carolina airports (see **Figure 1-8**). This proportion has increased from 68.9% in 2004, with share gained from both PTI and RDU. While the number of departing seats offered at RDU increased in absolute terms between 2004 and 2008, that airport's share of the regional total fell from 23.4% in 2004 to 21.5% in 2008. The number of seats offered at PTI declined between 2004 and 2008, both in absolute terms and in terms of its share (falling from 7.7% to 5.4%) of the regional total.

FIGURE 1-8
SCHEDULED DEPARTING SEATS
CHARLOTTE DOUGLAS, RALEIGH-DURHAM, AND PIEDMONT TRIAD INTERNATIONAL AIRPORTS
(CALENDAR YEARS; SEATS IN MILLIONS)

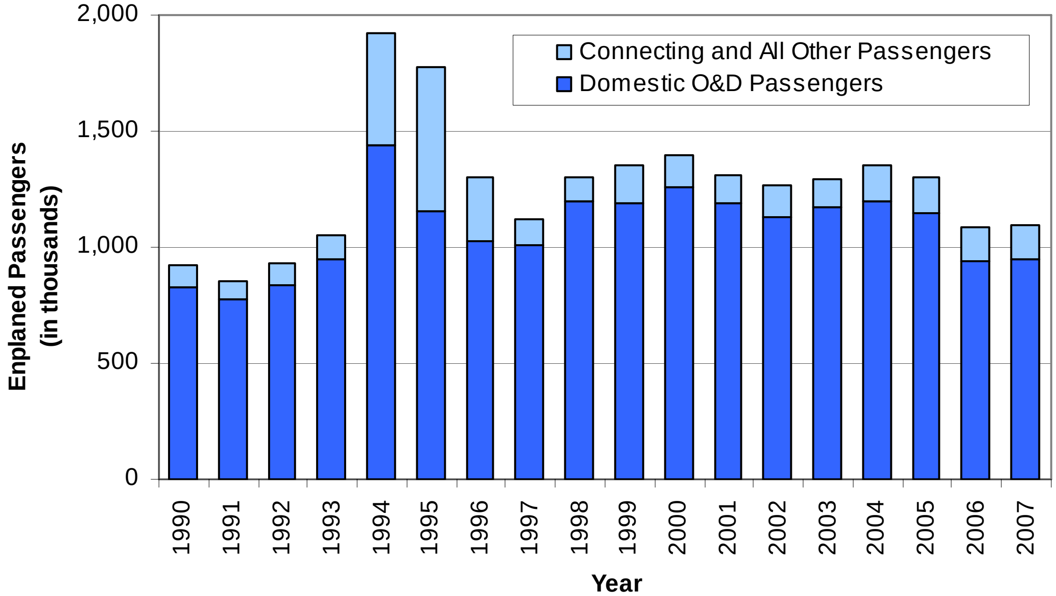


Source: *Official Airline Guide* and Skybus Airlines website.

1.4.2 ENPLANED PASSENGER TRENDS

PTI relies on a large base of domestic Origin and Destination (O&D) passengers. Connecting passenger traffic has accounted for a small share of total traffic except in the mid-1990s when Continental's low-fare service, Continental Lite (CALite), operated at PTI (see **Figure 1-9**).

FIGURE 1-9
HISTORICAL ANNUAL ENPLANED PASSENGERS
(CALENDAR YEARS)



Sources: U.S. DOT, *Air Passenger Origin Destination Survey*, reconciled to Schedules T100 and 298C T1; Piedmont Triad Airport Authority.

Table 1-4 presents trends in enplaned passengers at PTI from 1990 to 2007, by traffic segment. Trends in total enplanements at PTI generally mirror trends in domestic O&D enplanements.

TABLE 1-4
ASSESSMENT OF ENPLANED PASSENGER TRENDS, BY TRAFFIC SEGMENT
(CALENDAR YEARS; PERCENTAGES REPRESENT COMPOUND ANNUAL GROWTH IN THE PERIODS NOTED)

Year	Domestic O&D					International O&D		Dom. Connecting		Total Enplanements					
	Psgrs.	Trends				Psgrs.	Trend	Psgrs.	Trend	Psgrs.	Trends				
1990	825,549	1990-92 1.5% Slow Growth				38,900	1990-2007 4.6% Relatively Strong Growth	59,880	1990-2007 -1.3% No Growth	924,329	1990-92 0.5% Min. Growth				1990-2007 1.0% Slow Growth
1991	773,470					29,440		51,590		854,500					
1992	850,607		1992-98 5.8% Strong Growth			36,009		46,175		932,791		1992-98 5.8% Strong Growth			
1993	950,747					42,777		56,980		1,050,504					
1994	1,452,968					50,670		419,780		1,923,418					
1995	1,140,505					56,787		575,045		1,772,337					
1996	1,015,912					57,080		226,510		1,299,502					
1997	1,012,988					62,634		44,365		1,119,987					
1998	1,190,292			1998-2005 -0.8% Virtually Flat		71,961		42,725		1,304,978			1998-2005 0.0% Flat		
1999	1,224,893					81,294		45,435		1,351,622					
2000	1,260,249					85,027		51,490		1,396,766					
2001	1,189,870					77,218		42,665		1,309,753					
2002	1,134,893					78,189		50,190		1,263,272					
2003	1,166,657					77,527		52,785		1,296,969					
2004	1,206,729					86,577		62,640		1,355,946					
2005	1,126,787				2005-07 -7.7% Decline	93,631		80,800		1,301,218				2005-07 -8.4% Decline	
2006	937,283					92,262		54,025		1,083,570					
2007	959,486					83,596		48,090		1,091,172					

Source: U.S. DOT, *Air Passenger Origin-Destination Survey*, reconciled to Schedules T100 and 298C T1; U.S. DOT, SchedulesT100 and 298C T1; Piedmont Triad Airport Authority.

Note: International O&D traffic includes passengers on scheduled and non-scheduled (i.e. charter) flights. Virtually all of these passengers boarded domestic flights at the airport and connected with international flights at other U.S. gateway airports.

In recent years, PTI has experienced a significant decline in enplanements. Between 2004 and 2007, the number of enplaned passengers declined 19.5% while the number of departing seats (capacity) at PTI declined 27.6% and airfares paid at PTI increased 15.7% on average. Passenger traffic declined to a lesser extent than capacity due to an increase in the percentage of seats on departing flights that were occupied (load factor).

Several developments accounted for the decline in traffic and the increase in airfares paid at PTI. One such development occurred in September 2004 when AirTran, then the Airport's only low-cost carrier, ceased service at the Airport, thereby reducing fare competition. AirTran had served PTI since June 1996 and cited difficulty attracting sufficient business traffic for its Atlanta flights in the face of increasing competition from Delta.

Subsequently, Delta and Northwest, both of which were in bankruptcy from the fall of 2005 to the spring of 2007, restructured their service networks and reduced capacity significantly at the Airport. Between the summer of 2005 and the summer of 2006, for example, Delta's capacity at PTI declined 40.7% and Northwest's capacity declined 36.4%. While these cuts were substantial, they were not out of line with capacity reductions made by those airlines at some other small-hub airports in the southern United States. For example, capacity reductions of similar magnitude were made by Delta in Lexington, KY, and Tallahassee, FL, and by Northwest in Richmond, VA, and Fayetteville, AR.

During the 2004-to-2007 period, as well, US Airways increased its domestic capacity at its Charlotte hub by 12.7%. When US Airways emerged from bankruptcy in September 2005, it merged with America West, a low-cost carrier; US Airways' average one-way airfare paid at CLT declined slightly over the period. Additionally, AirTran initiated service at CLT in 2005, followed by JetBlue in 2006.

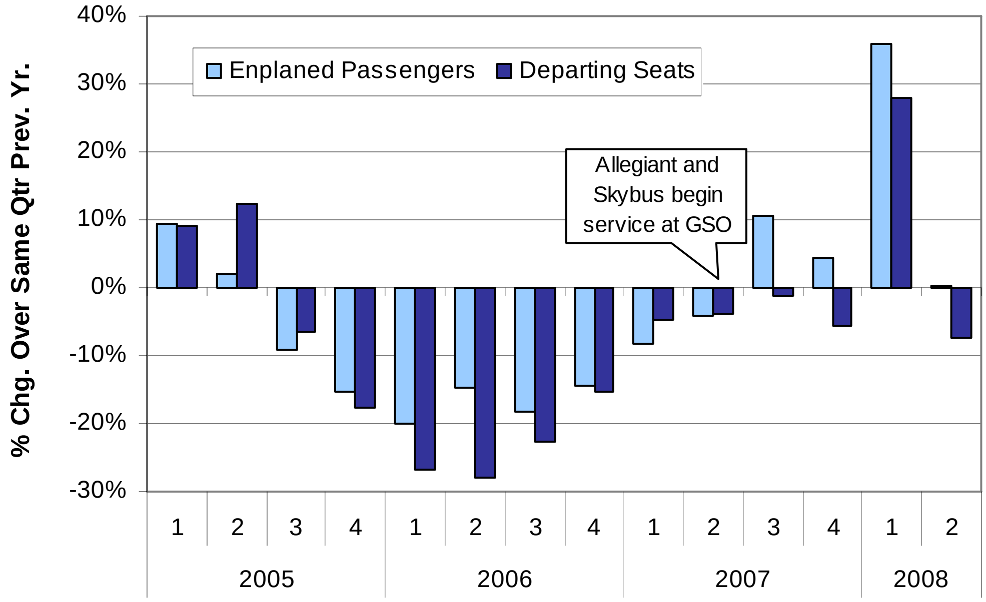
As the attractiveness of increased service offerings and lower airfares available at CLT increased, particularly for the budget-conscious traveler, PTI experienced erosion of its traffic. As a result of changes in the traffic mix—likely becoming more heavily weighted by higher-fare business travelers—average one-way airfares paid at PTI increased from $140 in 2004 to $162 in 2007. While average fares at PTI were $37 less than at CLT in 2004, they were roughly equivalent in 2007.

According to a September 2007 study by Sabre Airline Solutions, passenger leakage from the Airport's primary catchment area increased from 38% in 2005 to 50% in 2007. In other words, one of every two passengers for whom PTI is the more convenient airport chose to fly from either CLT or RDU instead.

PTI has traditionally experienced load factors in the 60% to 70% range, significantly lower than the industry average which is in the mid- to high-70% range. This results partly from the high proportion of regional jet operations at the Airport; regional affiliate airlines often operate more frequent feeder-service flights than they otherwise might, due to capacity-purchase agreements with their legacy airline partners. Airlines with lower load factors typically charge higher fares in order to cover their costs.

In the third quarter of 2007, following eight consecutive quarters of year-over-year traffic declines, PTI experienced a year-over-year increase (up 10.6%) in enplaned passengers (see **Figure 1-10**). Even excluding the enplaned passengers carried by the Airport's two low-cost carriers, Skybus and Allegiant, PTI experienced traffic growth of 3.5%. Enplaned passenger levels were up 4.5% year-over-year in the fourth quarter of 2007. Average one-way domestic airfares were down 10.8% and 6.0% in the third and fourth quarters of 2007, respectively, relative to the corresponding quarters of 2006. However, after the termination of low-fare Skybus service in early April 2008, traffic fell substantially.

FIGURE 1-10
YEAR-OVER-YEAR PERCENT QUARTERLY CHANGES
IN ENPLANED PASSENGERS AND DEPARTING SEATS
(CALENDAR YEARS)

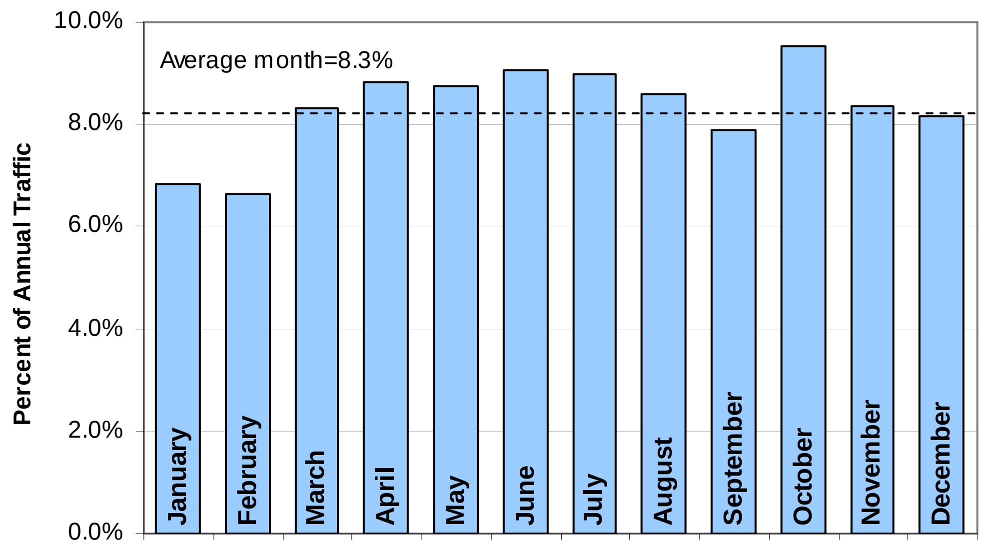


Note: Skybus did not report to the U.S. DOT after February 2008. Flights schedules from the Skybus website have been used to estimate scheduled departing seats for March and April 2008.
Sources: Enplaned Passengers—Piedmont Triad Airport Authority.
Departing Seats—U.S. DOT, Schedule T100; Skybus website accessed March 28, 2008.

1.4.3 SEASONALITY OF PASSENGER TRAFFIC

Passenger traffic at PTI is relatively stable throughout the year, with a pronounced peak in enplaned passengers occurring in October (see **Figure 1-11**). This peak coincides with the High Point Market, the world's largest furniture industry trade show, held in the autumn in the CSA. The spring High Point Market has been held alternately in March and April in the past, somewhat diluting its impact in **Figure 1-11**. Otherwise, above-average passenger traffic tends to occur in April though August, and below-average passenger traffic tends to occur in January and February.

FIGURE 1-11
MONTHLY VARIATION OF ENPLANED PASSENGERS
(CALENDAR YEARS 2003-2007)



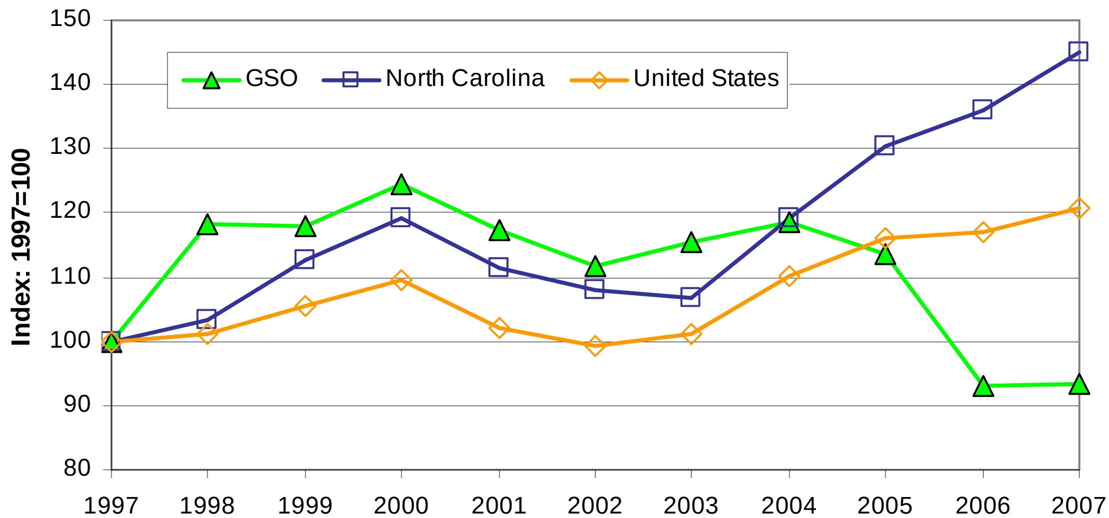
Source: Piedmont Triad Airport Authority.
Note: Based on 5-year monthly average, from January 2003 through December 2007.

1.4.4 DOMESTIC O&D PASSENGER TRENDS

One of PTI's key strengths is a large proportion of domestic O&D passengers. Most of the passengers using PTI either originate or terminate their journeys there. Domestic O&D passengers accounted for 87% of total passengers enplaned at PTI in 2007. International O&D passengers, i.e., those passengers who boarded a domestic flight at PTI and connected to an international flight at another U.S. gateway airport, and to a lesser degree, domestic connecting passengers, accounted for the remaining 13%.

From 1997 to 2004, domestic outbound O&D traffic growth at PTI followed the same general pattern as in the state of North Carolina and the nation overall (see **Figure 1-12**). All experienced growth until 2000, then a decline in 2001 and 2002, largely as a result of the U.S. economic recession and the aftermath of the September 11, 2001 terrorist attacks, followed by recovery in the two years thereafter. In 2005, however, the patterns diverged. Domestic outbound O&D enplanements increased 21.6% in the state of North Carolina between 2004 and 2007, while growth was 9.4% at the national level. Domestic outbound O&D traffic at PTI, on the other hand, declined 21.4% due, in part, to capacity pullbacks and increasing levels of passenger leakage to CLT and RDU.

FIGURE 1-12
INDEX OF DOMESTIC OUTBOUND O&D PASSENGERS
PIEDMONT TRIAD INTERNATIONAL AIRPORT, ALL NORTH CAROLINA AIRPORTS, AND ALL U.S. AIRPORTS
(CALENDAR YEARS)



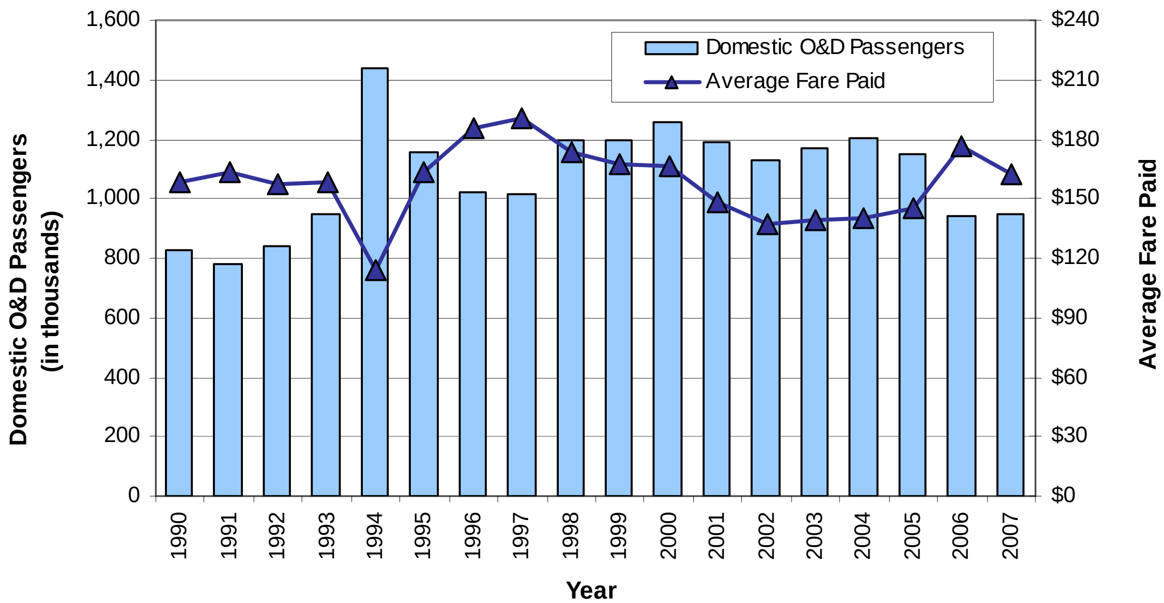
Source: U.S. DOT, *Air Passenger Origin-Destination Survey*, reconciled to Schedules T100 and 298C T1.

In general, there tends to be an inverse relationship between fare levels and passenger traffic at the Airport, with the notable exceptions that occurred in 2001 and 2002 (see **Figure 1-13**). Domestic outbound O&D traffic at PTI peaked in 1994 at approximately 1.4 million passengers, following Continental's introduction of its CALite low-fare service in October 1993. However, Continental discontinued its CALite service at PTI in July 1995, resulting in a sharp decline in domestic outbound O&D traffic and sharp increases in average fares paid at PTI in 1995 and 1996.

Between 1996 and 2000 (essentially, the period between the termination of CALite service and the 2001 recession and the events of September 2001), domestic O&D traffic at PTI grew at an average annual rate of 5.4%.

Between 2000 and 2002, domestic O&D passenger traffic at PTI declined 10.1% as a result of weakened demand for air travel, stemming from the economic recession and the aftermath of the September 2001 terrorist attacks. The decline in domestic O&D traffic was accompanied by a 17.8% reduction in the average domestic one-way airfare paid over the same period, as airlines provided more discounted seats in a bid to stimulate traffic.

FIGURE 1-13
OUTBOUND DOMESTIC O&D PASSENGERS AND AVERAGE ONE-WAY FARE PAID (CALENDAR YEARS)



Source: U.S. DOT, *Air Passenger Origin-Destination Survey*, reconciled to Schedules T100 and 298C T1.
Note: Average one-way fares are net of all taxes, fees, and PFCs.

Between 2002 and 2005, both domestic O&D traffic and the average fare paid at PTI showed slight increases. In 2006, domestic O&D enplanements dropped 18.1%, concurrent with a 21.2% increase in the average fare paid. In 2007, domestic O&D enplanements stabilized (up 0.4%), while the average fare paid declined 7.9%, due in part to the effect of Skybus and Allegiant, both LCCs, beginning service at PTI in May 2007.

Between 1997 and 2007, the level of domestic O&D traffic in the Airport's top 20 domestic O&D markets was virtually unchanged (down 0.3%) (see **Table 1-5**). Over the same period, O&D passenger traffic in the smaller domestic markets declined 15.8%. While individual markets have shown a mixed record of traffic increases and declines, the New York market (including LaGuardia, Kennedy, and Newark airports) remained the Airport's largest O&D market, accounting for about 12% of all domestic outbound O&D passengers at PTI in 2007. The second-ranking market (Chicago) accounted for less than 5% of the total.

Over the ten-year period, domestic O&D traffic to Las Vegas and Memphis showed particularly strong growth. The level of domestic O&D traffic to Columbus, OH increased almost six-fold between 2006 and 2007, driven by the low fares of now-defunct Skybus. Domestic O&D enplaned passengers to Orlando and Atlanta, on the other hand, declined by 54.3% and 47.6%, respectively, between 1997 and 2007, coincident with the loss of AirTran service and increasingly competitive service offerings from CLT and RDU to those destinations.

TABLE 1-5
TOP 20 DOMESTIC O&D PASSENGER CITY MARKETS
(CALENDAR YEARS; RANKED ON 2007; PASSENGERS IN THOUSANDS)

Rank	City Market *Airport*	Domestic Outbound O&D Passengers 1997	2002	2006	2007	AAG 1997-2002	AAG 2002-2006	% Chg. 2006-2007	Market as % of 2007 Total
1	New York	126.5	134.1	113.7	112.6	1.2%	-4.0%	-1.0%	11.9%
	LaGuardia	*66.8*	*96.3*	*71.9*	*74.3*	*7.6*	*-7.0*	*3.3*	*7.9*
	Newark	*59.2*	*37.1*	*40.6*	*37.1*	*-8.9*	*2.3*	*-8.6*	*3.9*
	Kennedy	*0.5*	*0.7*	*1.1*	*1.2*	*7.3*	*12.1*	*2.7*	*0.1*
2	Chicago[1]	39.1	41.4	40.0	40.6	1.1	-0.9	1.6	4.3
3	Wash. DC/Baltimore[2]	40.5	42.1	40.2	39.6	0.8	-1.1	-1.6	4.2
4	Philadelphia	27.8	40.6	37.6	37.8	7.8	-1.9	0.5	4.0
5	Atlanta	63.4	111.0	44.9	33.2	11.9	-20.2	-26.1	3.5
6	Dallas/Ft. Worth[3]	26.2	48.2	31.0	31.9	13.0	-10.5	3.0	3.4
7	Los Angeles[4]	26.6	27.3	34.0	30.8	0.5	5.6	-9.5	3.3
8	Columbus	5.9	6.3	4.8	28.5	1.2	-6.3	490.9	3.0
9	Las Vegas	13.5	13.7	24.7	28.2	0.4	15.8	14.2	3.0
10	Orlando	59.8	59.0	31.8	27.4	-0.3	-14.3	-14.0	2.9
11	Boston	28.0	34.9	24.5	22.0	4.5	-8.5	-10.3	2.3
12	Detroit	18.7	21.2	21.2	21.9	2.5	0.1	3.2	2.3
13	Houston[5]	22.6	22.3	23.1	21.7	-0.3	0.8	-5.8	2.3
14	Memphis	8.8	17.1	16.5	21.1	14.2	-0.9	27.8	2.2
15	San Francisco[6]	21.0	14.3	22.6	20.6	-7.4	12.0	-8.9	2.2
16	Minneapolis/St. Paul	11.8	16.2	16.3	17.9	6.5	0.0	10.3	1.9
17	Denver	14.9	14.7	16.1	17.5	-0.3	2.3	8.6	1.8
18	Ft. Lauderdale	13.3	25.1	16.0	15.4	13.5	-10.7	-3.6	1.6
19	Tampa	19.0	29.6	16.5	14.5	9.3	-13.6	-12.3	1.5
20	Phoenix	10.9	8.0	10.4	13.8	-5.8	6.7	32.2	1.5
	Total—Top 20 Markets	598.4	727.2	585.8	596.8	4.0%	-5.3%	1.9%	63.1%
	All Other Markets	414.0	405.0	355.9	348.4	-0.4	-3.2	-2.1	36.9
	Total—All Markets	1,012.3	1,132.2	941.7	945.1	2.3%	-4.5%	0.4%	100.0%

Source: U.S. DOT, *Air Passenger Origin-Destination Survey*, reconciled to Schedules T100 and 298C T1.
Notes: 1. Market includes O'Hare and Midway airports.
2. Market includes Reagan, Dulles, and Baltimore airports.
3. Market includes Dallas/Ft. Worth Airport and Love Field.
4. Market includes Los Angeles, Burbank, Long Beach, Ontario, and Orange County airports.
5. Market includes Bush and Hobby airports.
6. Market includes San Francisco, San Jose, and Oakland airports.

1.4.5 PASSENGER LEAKAGE AND COMPETING AIRPORTS

The decline in O&D traffic at PTI between 2005 and 2007 was largely attributable to significant capacity cutbacks at PTI by Delta and US Airways, termination of AirTran's low-fare service at PTI, increasing low-fare service at CLT and RDU, and the loss of travelers attracted by better service and lower fares offered at the other two airports.

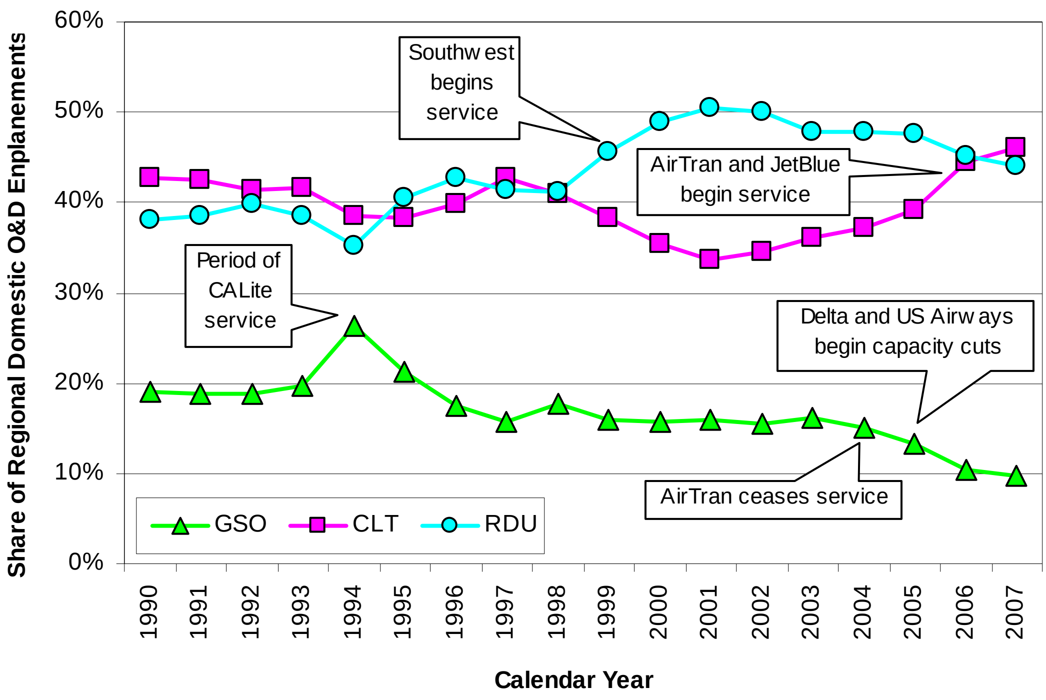
From 1990 through 2007, the number of domestic O&D passengers at PTI increased 0.8% per year on average, compared to a 5.7% average annual increase for RDU, a 5.3% average annual increase for

CLT, and a 4.8% average annual increase for the region as a whole. PTI accounted for 9.8% of the region's domestic O&D passenger market in 2007, down from 19.1% in 1990 (see **Figure 1-14**).

The Airport's share of regional domestic O&D traffic averaged 16.3% during the relatively stable 1996-2003 period at PTI. Relative to this average, the Airport's current market share of 9.8% indicates a 40% loss of market share to the other two regional airports. Assuming that PTI had been subject to a minimal degree of leakage to CLT and RDU during the 1990s, the finding of a 40% loss in regional market share is roughly consistent with the September 2007 leakage study by Sabre Airline Solutions which estimated a diversion rate of 50%. That is, one of every two passengers for whom PTI is the more convenient airport chose to use a flight at either CLT or RDU instead.

CLT and RDU each accommodated about 40% of total regional domestic O&D passengers until the initiation of service by Southwest at RDU in 1999 spurred an increase in passenger market share at that airport. In the most recent 2 years, CLT's market share increased significantly following a) the initiation of service by AirTran and JetBlue and b) increased fare discounting after the US Airways/America West merger.

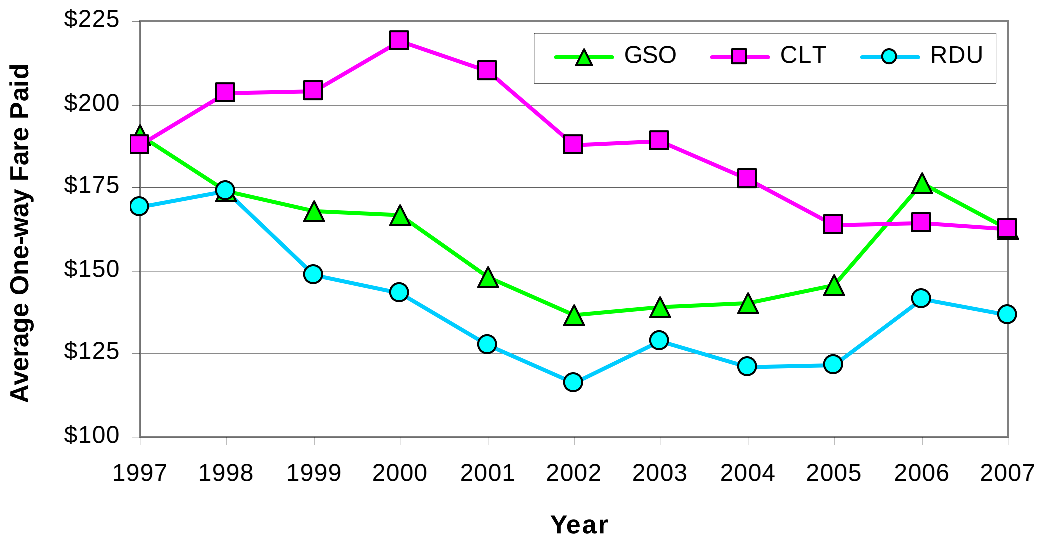
FIGURE 1-14
SHARES OF REGIONAL DOMESTIC O&D ENPLANED PASSENGERS
PIEDMONT TRIAD, RALEIGH-DURHAM, AND CHARLOTTE DOUGLAS INTERNATIONAL AIRPORTS
(CALENDAR YEARS)



Source: U.S. DOT, *Air Passenger Origin-Destination Survey*, reconciled to Schedules T100 and 298C T1.

Trends in average domestic O&D airfares paid at PTI, CLT, and RDU help to explain shifts in the share of regional domestic O&D traffic among the three airports. For instance, the decline in average domestic O&D airfares paid at CLT from 2000 to 2007 coincided with an increase in that airport's share of regional domestic O&D passengers over that period (see **Figure 1-15**). Conversely, declines in shares of domestic O&D passengers at both PTI and RDU between 2005 and 2007 likely resulted largely from the loss of lower-fare passengers to CLT.

FIGURE 1-15
AVERAGE DOMESTIC O&D FARE PAID
PIEDMONT TRIAD, RALEIGH-DURHAM, AND CHARLOTTE DOUGLAS INTERNATIONAL AIRPORTS
(CALENDAR YEARS)



Source: U.S. DOT, Air Passenger Origin-Destination Survey, reconciled to Schedules T100 and 298C T1.
Note: Average one-way fares are net of all taxes, fees, and PFCs.

1.4.6 PASSENGER CARRIER CONCENTRATION

In 2007, US Airways and its affiliated carriers comprised the largest carrier group at PTI in terms of enplaned passengers. In 1997, the US Airways group of carriers accounted for 36.4% of total enplanements (see **Table 1-6**). By 2007, US Airways accounted for 30.0% of enplanements at the Airport, still the largest carrier group at PTI but by a slimmer margin.

Delta and its affiliated commuter airlines ranked second in terms of enplanements in 2007, accounting for 27.4% of total enplanements at the Airport, roughly the same share as ten years before. From 2002 to 2006, Delta and it affiliates were the largest carrier group at the Airport, but US Airways regained that status in 2007.

Third-ranking United accounted for 12.3% of total passengers enplaned in 2007, followed by Continental (9.1%), Northwest (8.7%), and American (7.6%). No other carrier enplaned more than 3% of total passengers in 2007.

TABLE 1-6
CARRIER MARKET SHARES OF ENPLANED PASSENGERS
(CALENDAR YEARS; RANKED ON 2007; PASSENGERS IN THOUSANDS)

Rank	Carrier Group *Operator*	1997	2002	2003	2004	2005	2006	2007	Eight Months Ended August 2007	Eight Months Ended August 2008
1	US Airways	407.8	441.9	385.4	393.6	329.8	317.8	327.6	213.7	229.6
	US Airways	*362.2*	*254.5*	*171.0*	*148.4*	*76.0*	*1.5*	*0.4*	*0.1*	-
	US Airways Exp.	*45.5*	*187.4*	*214.4*	*245.2*	*253.8*	*316.3*	*327.2*	*213.5*	*229.6*
2	Delta	301.7	466.3	500.7	525.6	497.3	338.1	299.1	202.0	169.7
	Delta	*264.5*	*315.0*	*328.2*	*327.2*	*264.1*	*153.1*	*93.6*	*71.8*	*43.5*
	Delta Connection	*37.2*	*151.3*	*172.5*	*198.4*	*233.2*	*184.9*	*205.5*	*130.2*	*126.2*
3	United	85.7	90.5	105.6	120.9	145.7	150.8	134.2	92.0	77.0
	United	*66.2*	*48.2*	*52.5*	*54.1*	*50.9*	*49.8*	*26.5*	*16.2*	*23.0*
	United Express	*19.5*	*42.3*	*53.0*	*66.8*	*94.9*	*101.0*	*107.6*	*75.7*	*54.0*
4	Continental	138.4	77.2	83.0	87.6	92.3	101.4	98.9	65.1	71.9
	Continental	*138.4*	*4.3*	*17.3*	*3.8*	*2.7*	*2.1*	*2.9*	*0.9*	*0.5*
	Continental Connection	-	*72.9*	*65.6*	*83.8*	*89.6*	*99.3*	*96.0*	*64.2*	*71.4*
5	Northwest	43.0	62.7	92.9	98.1	106.3	86.6	95.3	63.1	69.8
6	American	46.3	43.9	41.8	39.5	59.0	81.6	82.9	57.5	43.9
	American	*46.3*	*43.9*	-		*7.4*	*23.5*	*25.9*	*14.4*	*10.5*
	American Eagle	-	-	*41.8*	*39.5*	*51.6*	*58.1*	*57.0*	*43.0*	*33.4*
7	Skybus	-	-	-	-	-	-	25.1	11.1	86.6
8	Allegiant	-	-	-	-	-	-	20.9	9.5	34.7
9	Independence Air	-	-	-	37.1	63.8	-	-	-	-
10	AirTran	34.2	71.7	79.4	45.9	-	-	-	-	-
11	Air Canada	-	1.7	-	-	-	-	-	-	-
12	Eastwind	51.9	-	-	-	-	-	-	-	-
13	Charter Carriers	11.1	7.3	8.0	7.6	7.1	7.3	7.2	5.1	4.0
	Grand Total	**1,120.0**	**1,263.3**	**1,296.6**	**1,355.9**	**1,301.2**	**1,083.6**	**1,091.2**	**718.9**	**787.1**
1	US Airways	36.4%	35.0%	29.7%	29.0%	25.3%	29.3%	30.0%	29.7%	29.2%
2	Delta	26.9	36.9	38.6	38.8	38.2	31.2	27.4	28.1	21.6
3	United	7.7	7.2	8.1	8.9	11.2	13.9	12.3	12.8	9.8
4	Continental	12.4	6.1	6.4	6.5	7.1	9.4	9.1	9.1	9.1
5	Northwest	3.8	5.0	7.2	7.2	8.2	8.0	8.7	8.8	8.9
6	American	4.1	3.5	3.2	2.9	4.5	7.5	7.6	8.0	5.6
7	Skybus	0.0	0.0	0.0	0.0	0.0	0.0	2.3	1.5	11.0
8	Allegiant	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.3	4.4
9	Independence Air	0.0	0.0	0.0	2.7	4.9	0.0	0.0	0.0	0.0
10	AirTran	3.1	5.7	6.1	3.4	0.0	0.0	0.0	0.0	0.0
11	Air Canada	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Eastwind	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Charter Carriers	1.0	0.6	0.6	0.6	0.5	0.7	0.7	0.7	0.5
	Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Piedmont Triad Airport Authority.
Note: Columns may not add to totals shown because of rounding.

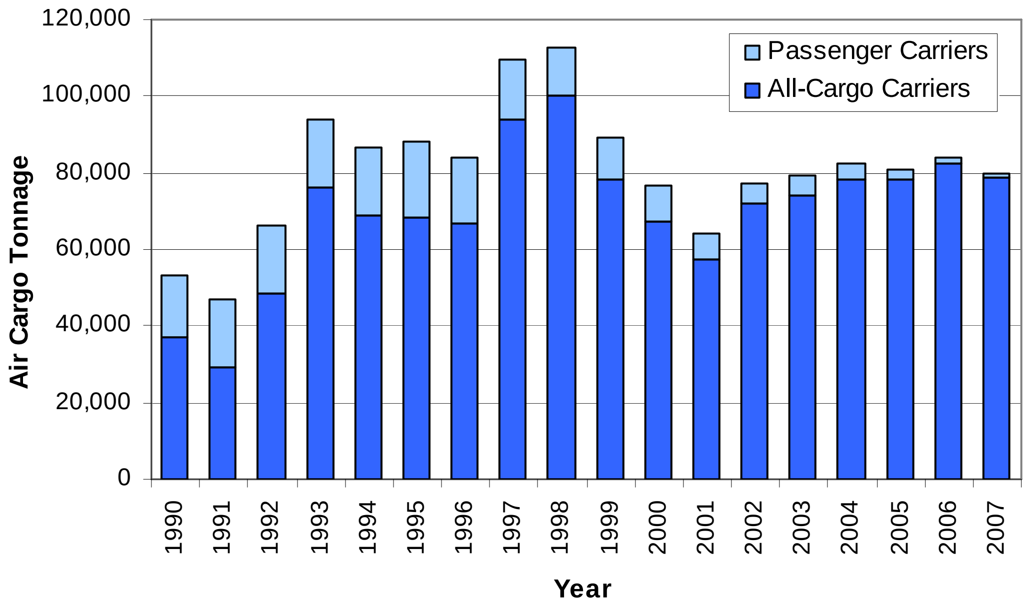
In the first eight months of 2008, enplanements at PTI increased 9.5% over the corresponding period of 2007. Virtually the entire increase can be attributed to Skybus and Allegiant, both of which began operations at PTI in May 2007. The two airlines accounted for 11.0% and 4.4% shares, respectively, of the Airport's total enplanements in the first eight months of 2008. However, Skybus abruptly terminated all operations system-wide on April 5, 2008.

1.4.7 *AIR CARGO TRENDS*

After more than doubling between 1990 and 1998, air cargo tonnage at PTI declined by nearly one-third by 2000 (see **Figure 1-16**). There has been little growth at PTI since 2000; cargo tonnage in 2007 was only 3.6% above the 2000 level. Cargo tonnage increased modestly (up 2.3% per year, on average) from 2000 to 2007, but dropped 91.0% for the passenger carriers (belly cargo) over the same period, due primarily to the shift from mainline aircraft to regional jets with limited belly cargo carrying capacity.

Approximately 99% of all cargo tonnage at PTI in 2007 was handled by all-cargo carriers, compared to about 69% in 1990. FedEx accounted for 60.2% of the total. Tradewinds, the second-ranking carrier, accounted for 17.8%, down significantly from 43.6% in 1990. A significant increase in cargo tonnage is expected at PTI when FedEx begins full operation of its new hub.

FIGURE 1-16
TRENDS IN TOTAL AIR CARGO, BY CARRIER TYPE
(CALENDAR YEARS; FREIGHT AND MAIL IN TONS)



Source: Piedmont Triad Airport Authority.
Note: Data represent sum of enplaned and deplaned freight and mail.

1.4.8 AIRCRAFT OPERATIONS TRENDS

In 2007, passenger carrier flight operations accounted for the largest share of total flight operations at PTI (48.5%), followed by general aviation operations (38.8%), other commercial operations[1] (7.1%), all-cargo operations (4.7%), and military flights (0.9%) (see **Table 1-7**).

Total flights at PTI in 2007 were down 22.6% from their 2000 peak and down 17.1% in the period from 2005 to 2007. The fall from the 2000 peak was largely attributable to declines in operations by general aviation. Passenger carrier operations were virtually the same in 2007 as in 1998, while all-cargo carrier operations fell by nearly half and general aviation operations fell by nearly one-third.

TABLE 1-7
AIRCRAFT OPERATIONS TRENDS
(CALENDAR YEARS)

Year	Commercial Air Carrier				General Aviation	Military	Total Aircraft Operations	% Change from Prev. Year
	Psgr. Carriers	All-Cargo Carriers	Other Comm.	Total				
1998	51,774	9,704	6,010	67,488	59,382	1,158	128,028	
1999	54,986	9,192	4,722	68,900	63,699	799	133,398	4.2%
2000	57,570	8,418	5,227	71,215	66,442	984	138,641	3.9
2001	59,128	6,378	5,785	71,291	60,661	1,260	133,212	-3.9
2002	53,624	5,552	6,328	65,504	55,019	1,817	122,340	-8.2
2003	58,654	5,566	6,333	70,553	48,152	833	119,538	-2.3
2004	65,646	5,434	5,838	76,918	49,790	1,224	127,932	7.0
2005	66,610	4,944	6,956	78,510	49,572	1,337	129,419	1.2
2006	52,004	5,538	8,167	65,709	46,628	958	113,295	-12.5
2007	52,004	5,090	7,596	64,690	41,638	926	107,254	-5.3
Compound Annual Growth Rate (CAGR)								
1998-2001	4.5%	-13.1%	-1.3%	1.8%	0.7%	2.9%	1.3%	
2001-2007	-2.1	-3.7	4.6	-1.6	-6.1	-5.0	-3.5	
1998-2007	0.0	-6.9	2.6	-0.5	-3.9	-2.5	-1.9	

Source: Piedmont Triad Airport Authority.
Note: Sum of landings and takeoffs.

1.5 PASSENGER FORECAST SCENARIOS

This subsection briefly discusses some current industry trends, describes the rationale underlying the base forecast and two scenarios developed for this Airport Master Plan Update, and provided the key assumptions made in each case.

[1] Other commercial operations include flight activity to and from maintenance facilities at the Airport, helicopter operations, flights transiting the Airport's airspace, and "touch-and-go" operations, among others.

1.5.1 INDUSTRY TRENDS

Key industry trends that will affect future air traffic levels at PTI include:

Aviation Security: Since the terrorist attacks of September 11, 2001, the federal government has mandated security measures to guard against future attacks and to alleviate concerns about the safety of commercial airline travel. These measures, sometimes in combination with inadequate security staffing, have resulted in longer wait times for travelers. The more stringent security measures and longer wait times, together dubbed the “hassle factor”, have already had the effect of deterring some travel, diverting some short-haul air travel to surface travel modes, and dampening travel demand for overseas travelers. Travel substitutes, such as video- and Internet conferencing, are increasingly cost-effective for business travelers. Moreover, alternative air transportation services are also improving; travelers can also use chartered aircraft, corporate jets, fractionally owned aircraft, and Very Light Jets (VLJs) as alternatives to commercial airline service.

Economic and Market Conditions: The demand for air travel is affected by actual or potential changes in international, national, regional, and local demographic and economic conditions, including economic output, population, levels of disposable income, inflation, interest rates, exchange rates, and other factors. Sustained future increases in passenger traffic depend on economic growth and stable and peaceful market conditions. The U.S. economy slowed in 2007, following a surge in global energy prices, some reining in of consumer purchasing power, a correction in the housing market, and problems in the home mortgage and consumer credit markets. A severe economic recession began in 2008. Economic stagnation generally has a dampening effect on air travel demand, both business and leisure. Population growth in the CSA through 2030 is projected to exceed national population growth rates, but lag North Carolina growth rates. Growth in employment and PCPI in the CSA is projected to approximate national and North Carolina growth rates.

Oil and Aviation Fuel Prices: The price of aviation fuel is a major factor affecting airline operating economics as fuel currently represents the largest item of expense for most airlines. Record fuel prices have been a major contributor to recent airline industry losses; in June 2008, average jet fuel prices spiked to more than $160 per barrel, greater than five times the level in June 2003. While fuel costs have declined since then, they continue to exhibit volatility, as demonstrated by the dramatic swings in oil prices experienced in September and October 2008. Future levels of fuel prices are highly uncertain and, even at current levels, pose a burden to airlines which will affect not only airline costs but also air service, airfares, and passenger numbers.

U.S. Airline Industry Financial Condition: Airline service levels are, among other things, related to the financial condition of the airline industry and individual airlines. Although the network airlines (the large, pre-deregulation hub-and-spoke carriers) generally reported profits during 2007, a precipitous rise in fuel prices caused many airlines to report losses in the first half of 2008, while others entered bankruptcy protection or failed. In March and April 2008, Aloha, ATA, and Skybus ceased operations. Also in April 2008, Frontier Airlines filed for Chapter 11 protection. The network airlines’ highly leveraged financial condition leaves them particularly vulnerable. The LCCs, too, are vulnerable to high fuel prices. Southwest remained insulated to an extent due to fuel hedging agreements, but that advantage eroded as its agreements gradually expired. LCCs are finding that most of the larger markets are now served, and each is increasingly finding that it is competing not only against the network airlines, but also against other LCCs. Financial losses, arising from high fuel costs and the current economic downturn, may cause one or more airlines to retrench, seek bankruptcy protection, discontinue marginal operations, consolidate, or liquidate.

U.S. Airline Industry Consolidation and Alliances: In response to competitive and financial pressures, consolidation of the U.S. airline industry has occurred. In September 2005, US Airways and America West merged. In April 2008, Delta and Northwest announced their intention to merge. At a joint news conference in June 2008, United and Continental announced code-share and other cooperative plans as well as plans for Continental to join the Star Alliance in 2009. Mergers or alliances, which are subject to various regulatory, shareholder, labor, and other approvals, can change airline service patterns, particularly at the connecting hub airports of the merging airlines.

1.5.2 UNDERLYING RATIONALE

Consideration of the likely future effect of these industry trends, as well as the preceding discussion of demographic, economic, air service, and air traffic trends, provides the underlying rationale of the traffic forecasts. On balance, the relevant factors suggest that passenger traffic growth at PTI is unlikely to be robust.

Factors that support modest traffic growth at PTI include:

- Population and employment in the CSA are expected to grow at roughly the same rates as for the United States overall, but at less than the corresponding rates of increase for the Charlotte CSA and the Raleigh-Durham CSA.
- Per capita personal income in the CSA is increasing, but at a lower rate than in the Charlotte CSA and the Raleigh-Durham CSA.
- Allegiant has identified, and acted upon, a niche opportunity to serve the Airport.

There are two factors that could be positive, but which have a high degree of uncertainty attached to them:

- The Aerotropolis concept, if it is implemented in the CSA and proves successful, could stimulate economic growth over the Longer-Term.
- At some point, one or more LCCs or other niche carriers might discern a business opportunity at PTI and launch service.

Many factors could inhibit traffic growth at the Airport, however, including the following:

- PTI's geographical location, within a 90-minute drive of two major competing airports, means that its market can be served by airlines serving those other airports—without the cost of mounting separate operations at PTI.
- The operational decisions of the six network airlines indicate that they regard PTI as a secondary airport in their respective systems. They have shifted the vast majority of

service between their hubs and PTI to their affiliated carriers, presumably because they can utilize their own assets more profitably elsewhere.

- Published airline schedules indicate significant and widespread airline capacity reductions at most U.S. airports in the fall of 2008 and the winter of 2009. in announcing the cuts, many airlines cited record-high fuel prices and weak demand related to the troubled economy. .

- In April 2008, Delta and Northwest announced that they had reached a merger agreement. In September 2008, the airlines received FAA approval of their plan to transition to a single operating certificate. Industry consolidation could lead to further reductions in service, higher airfares, and reduced passenger traffic volumes at PTI.

- The network airlines have generally maintained their levels of mainline jet service at CLT and RDU. To the extent that this continues, or even if they expand mainline service at one or both of the airports, it strengthens the attraction for passengers originating in, and destined for, the Greensboro CSA and could continue to siphon traffic away from the Airport.

- The combination of the continuing high price of jet fuel and the predominance of less-fuel-efficient 50-seat regional jets at PTI means that, unless yields improve, some of those flights could prove unprofitable and possibly be withdrawn.

- Several large LCCs have established service at CLT and RDU; those carriers have been free to serve PTI but have not done so to date.

1.5.3 FORECAST ASSUMPTIONS

Given the current uncertainties in the airline traffic forecasting environment, particularly as it relates to PTI, various factors could cause enplanements at PTI to be higher or lower than those presented in the Base Case forecast. For this reason, Negative-growth and High-growth scenarios were developed to bracket the Base Case forecast, representing a likely range of variation in traffic levels that could occur through 2030. Specific assumptions underlying the Base Case forecast, and the Negative-growth and High-growth scenarios, are listed below.

Base Case Passenger Forecast

The Base Case forecast is predicated on a number of assumptions, with the primary ones being:

- The CSA economy will grow modestly. The Aerotropolis concept, currently being discussed by the local community, will either not be implemented or, if it is implemented, will not have a material effect on airline passenger traffic during the forecast period.

- The network airlines will continue to serve PTI, primarily through their affiliated carriers, using smaller-gauge aircraft than mainline jet equipment.

- The prevailing high jet fuel costs will continue.

- High fuel costs will prompt the affiliated carriers to replace many of their flights operated using 50-seat regional jets with service operated using more efficient turboprop aircraft or larger regional jets.

- Given that PTI tends to experience load factors that are lower than the industry average, rising load factors will mitigate some of the capacity pullbacks.

- PTI will accommodate various ‘niche’ carriers (such as Allegiant) throughout the forecast period, but it will not attract a major LCC operator.

- There will be some consolidation in the U.S. airline industry over the forecast period, but there will also be the creation of new airlines. These events will mean both service gains and losses for PTI which, in net traffic terms, will not affect the Long-Term rate of passenger growth at the Airport.

- The degree of traffic leakage to CLT and RDU (currently 50% for the Airport’s Primary Catchment area) will not increase appreciably through the forecast period.

Given these assumptions, the Long-Term historical rate of traffic growth at PTI (i.e., 1.0% per year from 1990 to 2007) is used as a reasonable Base Case forecast rate of traffic growth through 2030.

Negative-Growth Forecast Scenario

There are a number of events that could occur over the forecast period that would inhibit the growth envisioned in the Base Case forecast, including the following:

- The CSA economy might underperform its historical rate of growth.

- One or more of the network airlines could decide to discontinue service at the Airport.

- One or more of the network airlines could cease to exist due to a merger or failure.

- In a high fuel cost environment, the airlines serving PTI could decide that operating at low load factors is unacceptable, and they might take corrective action, i.e., reduce capacity.

- Airline service could continue to improve at CLT and RDU, resulting in greater competition for PTI and an increase in the level of traffic leakage from the Airport’s Primary Catchment area..

While it is not anticipated that all of the above events would occur, one or more such events could rob PTI of any growth over the forecast period. For this reason, a negative-growth scenario was selected. For the purpose of the Airport Master Plan, a 2% per year traffic decline, the same rate of traffic decline experienced at PTI from 1998 to 2007, was selected for the Negative Growth Scenario.

High-Growth Forecast Scenario

Similarly, there are a number of events that could occur over the forecast period that would cause traffic growth at PTI to exceed the levels envisioned in the Base Case forecast, including the following:

- The CSA economy might outperform historical trends. Implementation of the Aerotropolis concept might have a materially positive effect on airline passenger traffic during the forecast period.

- One or more of the network airlines could decide to increase their service at the Airport, including possibly an increase in service using mainline jet aircraft.

- As the major LCCs achieve greater market penetration at larger U.S. airports, one or more of them could decide to launch service at the Airport.

- Highway access to CLT or RDU, or both, could become more difficult, lengthening the driving time required and encouraging more airline travelers to consider use of PTI.

- Geo-political dynamics could shift, resulting in lower energy prices, or aircraft manufacturers could develop alternate fuel technologies that would reduce the airlines' dependence on high-priced oil-based fuel. Among other outcomes, such events could make the operation of smaller jet aircraft more feasible.

Again, while it is not anticipated that all of the above events would occur, one or more such events could boost growth significantly over the forecast period. The resulting rate of growth is difficult to predict. For the purpose of this Airport Master Plan Update, the FAA's current forecast growth rate for U.S. domestic airline passenger traffic (2.7% per year) was selected as the upper bound for the traffic growth forecast.

1.5.4 ECONOMIC RECESSION

There has been a substantial decline in passenger traffic at PTI during the current economic recession. It is not possible at this time to anticipate how long this decline will persist and therefore it has not been taken into account the long-range forecasts included in this appendix.

1.6 FORECASTS OF PASSENGERS AND PASSENGER FLIGHTS

The passenger forecasts presented in this section were based on the preceding service and traffic analyses.

1.6.1 ENPLANED PASSENGERS

Table 1-8 presents the Base Case passenger forecast, along with the Negative-growth and High-growth passenger forecasts which bracket the likely range in variation of traffic levels that could occur through 2030. The degree of future uncertainty is reflected in the relatively wide spread between the Negative-growth and High-growth scenarios—a difference of 1.2 million enplaned passengers in 2030.

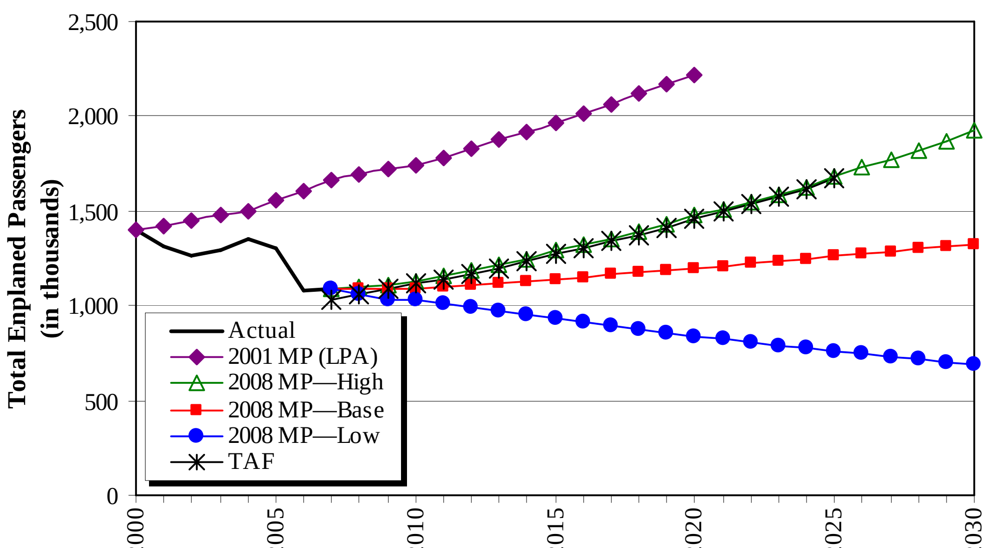
TABLE 1-8
COMPARISON OF HIGH, BASE, AND LOW PASSENGER FORECASTS
(CALENDAR YEARS; PASSENGERS IN THOUSANDS)

Year	Total Enplaned Passengers			Period	Compound Annual Growth Rate		
	High	Base	Low		High	Base	Low
2006	1,084	1,084	1,084				
2007	1,091	1,091	1,091	2006-07	0.7%	0.7%	0.7%
2008	1,150	1,150	1,150	2007-08	5.4	5.4	5.4
2009	1,100	1,075	1,050	2008-09	-4.3	-6.5	-8.7
2010	1,130	1,086	1,029	2009-2010	2.7	1.0	-2.0
2015	1,291	1,141	930	2010-15	2.7	1.0	-2.0
2020	1,475	1,199	841	2015-20	2.7	1.0	-2.0
2025	1,685	1,260	760	2020-25	2.7	1.0	-2.0
2030	1,925	1,324	687	2025-30	2.7	1.0	-2.0
				2007-2030	2.5	0.8	-2.0

Sources: Piedmont Triad Airport Authority; Jacobs Consultancy, Inc.

The three passenger forecasts are presented graphically in **Figure 1-17**, along with a comparison to the Airport Master Plan forecast, completed in 2001 by LPA, and the FAA Terminal Area Forecast issued in December 2007.

FIGURE 1-17
COMPARISON OF PASSENGER FORECASTS
(CALENDAR YEARS)



Sources: Piedmont Triad Airport Authority; FAA, TAF: Jacobs Consultancy, Inc.
Note: The 2001 LPA Group Airport Master Plan Forecast used forecast years 2004, 2009, 2014, 2019. Interim years were extrapolated.

1.6.2 PASSENGER FLIGHT OPERATIONS

Passenger flight operations were derived from the Base Case passenger forecast. It was assumed that load factors would remain at 72% throughout the forecast period, given that flights at PTI have historically operated at lower load factors than the national average. Additionally, it was assumed that average seats per flight would increase gradually over the forecast period, given that small Regional Jets (RJs) are expected to be replaced to a greater extent with both larger RJs and large turboprops than with small turboprops.. As a result, passenger flight operations are forecast to increase at a slightly lower rate (0.3%, on average, between 2007 and 2030) than the 0.8% per year rate of increase forecast for enplaned passengers (see **Table 1-9**).

TABLE 1-9
DERIVATION OF PASSENGER FLIGHT OPERATIONS - BASE FORECAST
(CALENDAR YEARS; PASSENGERS AND SEATS IN THOUSANDS)

	Actual		Forecast				
	2006	2007	2010	2015	2020	2025	2030
Total Enplanements ('000)	1,084	1,091	1,086	1,141	1,199	1,260	1,324
Load Factor	67.8%	70.9%	72.0%	72.0%	72.0%	72.0%	72.0%
Seats ('000)	1,599	1,538	1,510	1,580	1,670	1,750	1,840
Average Seats per Flight	62	60	62	64	66	67	68
Passenger Flight Departures	26,002	25,501	24,400	24,700	25,300	26,100	27,100
Passenger Flight Operations	52,004	51,002	48,800	49,400	50,600	52,200	54,200

Sources: Piedmont Triad Airport Authority; U.S. DOT, Schedule T100; Jacobs Consultancy, Inc.

1.7 AIR CARGO

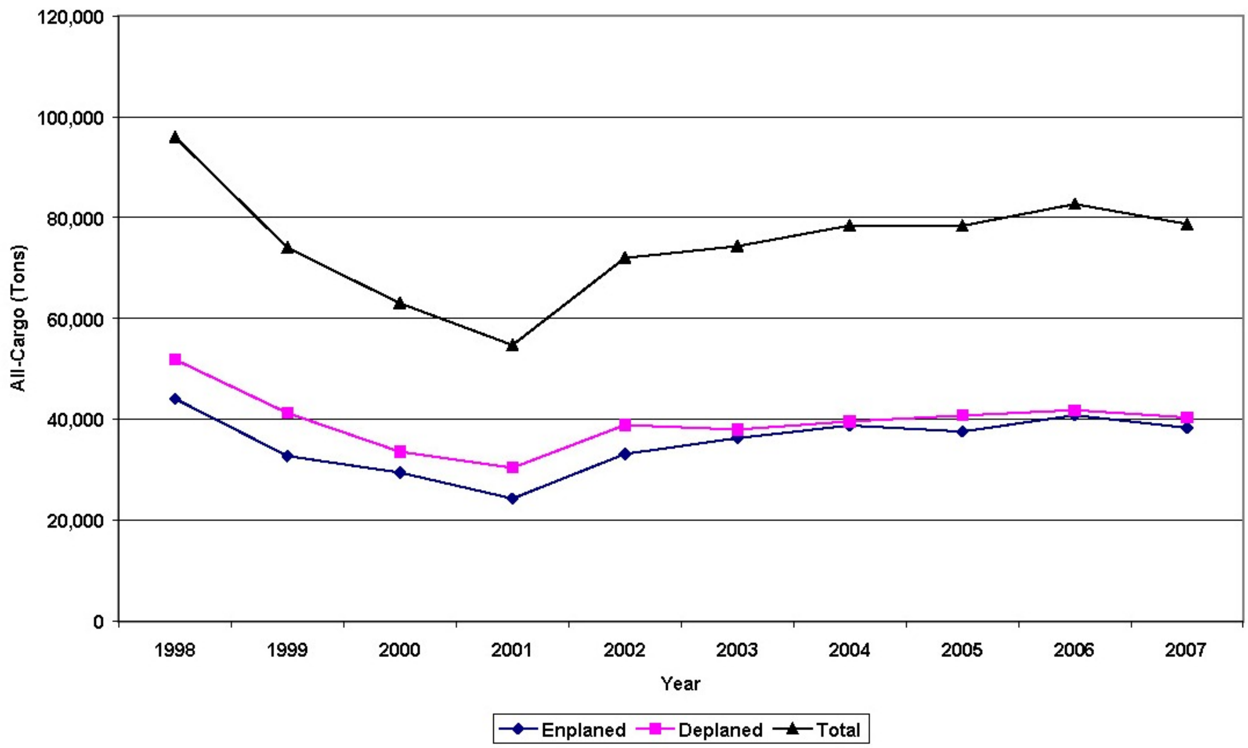
Air cargo at PTI is comprised of three segments: all-cargo, belly freight and mail. All-cargo consists of dedicated freighter operations such as FedEx, Tradewinds, UPS and DHL. Belly freight consists of cargo carried in the belly holds of scheduled passenger airline operations. Mail consists of US Postal Service (USPS) mail also carried in the belly holds of scheduled passenger airline operations. The following sections summarize historical volumes of air cargo at PTI and provide projections of future cargo volumes. The forecast also provides a projection of cargo operations.

1.7.1 HISTORICAL CARGO ACTIVITY

1.7.1.1 All-Cargo

Historical volumes of all-cargo belly freight at PTI for 1996 through 2007 are presented in **Figure 1-18**. Historical all-cargo volumes decreased in 2000 and 2001 as a result of a recession and the events following the terrorism acts that occurred on September 11, 2001. Since 2001, all-cargo volumes at PTI grew slightly during 2002 and 2003, but have been nearly flat since 2004. The chart reveals that all-cargo accounts for the vast majority of cargo handled at the airport.

FIGURE 1-18
HISTORICAL ALL-CARGO TONNAGE
(1998-2007)



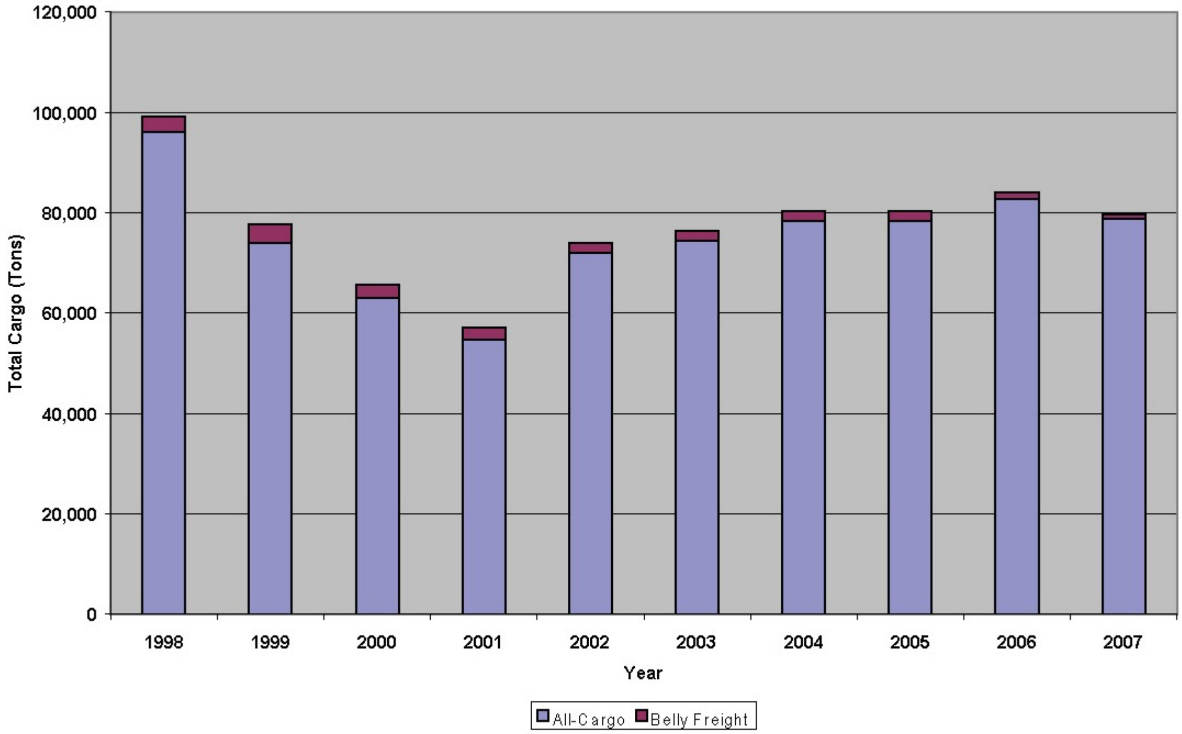
Source: Piedmont Triad International Airport, compiled by URS Corporation, 2008.

The number and cargo carrying capacity of all-cargo airlines providing service at PTI has varied over the years. However, most of the major express carriers such as Federal Express, UPS, Airborne and DHL have served the airport for numerous years. In addition, Mountain Air Cargo which flies smaller commuter aircraft under contract for FedEx has operated at PTI for many years. More recently "Air Cargo Carriers" which operates Shorts 330 and 360 aircraft has operated at PTI.

1.7.1.2 Belly Freight

Historical volumes of belly freight at PTI from 1998 through 2007 are also depicted in **Figure 1-19**. As the figure indicates, belly-freight has experienced a near continuous decline at PTI since 1999 and now accounts for only 1 percent of cargo at PTI. This is a result of several factors. First, there has been a significant shift in the fleet mix at PTI from air carrier to regional jet aircraft that have limited cargo capacity and consequently, do not have the ability to accommodate freight which previously flew on air carrier aircraft operating at the airport. Second, there were restrictions placed on the type of cargo that could be carried on passenger aircraft following the events of September 11, 2001. Third, there has been a growing trend for air cargo to be shipped on the "express" carriers, such as FedEx and UPS that offer door to door service as opposed to the use of freight forwarders that, in turn, contract with airlines.

FIGURE 1-19
HISTORICAL ALL-CARGO AND BELLY FREIGHT TONNAGE
(1998-2007)



Source: Piedmont Triad International Airport, compiled by URS Corporation, 2008.

1.7.1.3 Mail

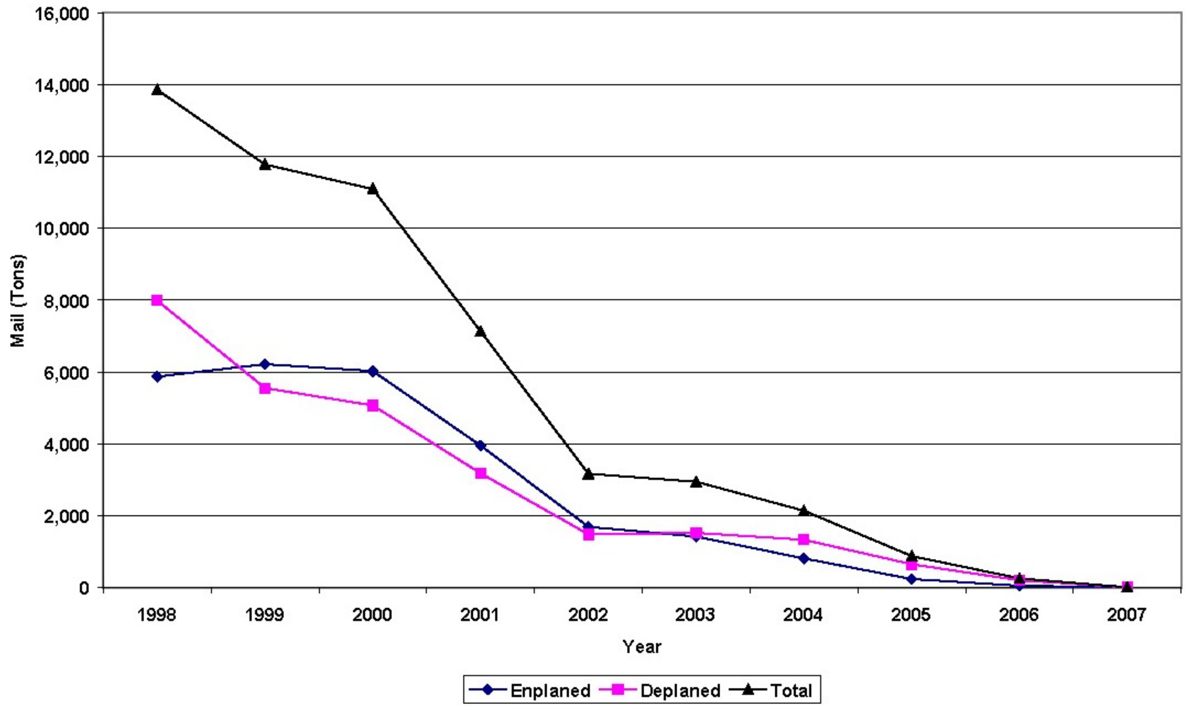
Historical volumes of mail at PTI from 2003 through 2007 are listed in **Table 1-10 and Figure 1-20** both indicating that mail has experienced a dramatic decline since 2000. It should be noted that this decrease is not unique to PTI. Several factors are responsible for this decrease. First, a restriction was placed on mail weighing more than 16 ounces following the events of September 11, 2001. Second, the US Postal Service contracted with cargo carriers to begin transporting mail that previously flew on scheduled passenger airlines. Third, as noted in the previous section, the change in fleet mix to regional jets from air carrier aircraft limits the amount of mail that can be flown into PTI. As a result of these factors, mail at PTI has been reduced to insignificant volumes in recent years

TABLE 1-10
HISTORICAL MAIL (TONS)
(2003 TO 2007)

Year	Enplaned	Deplaned	Total
2003	1,421	1,522	2,942
2004	806	1,329	2,135
2005	232	643	876
2006	51	198	249
2007	3	5	8

Source: Piedmont Triad International Airport, compiled by URS Corporation, 2008.

FIGURE 1-20
HISTORICAL MAIL TONNAGE
(1998-2007)



Source: Piedmont Triad International Airport, compiled by URS Corporation, 2008.

1.7.1.4 All-Cargo Operations

Historical all-cargo operations, by size of aircraft, are shown in **Table 1-11**. The small category includes commuter size aircraft, such as the Shorts 330 and 360, the Fokker F-27 and the ATR-42. The large category includes a variety of narrow-body and wide-body air carrier aircraft. This includes aircraft up to the Boeing 747.

TABLE 1-11
HISTORICAL AIR CARGO AIRCRAFT OPERATIONS
(2003 TO 2007)

Year	Small	Large	Total
2003	1,002	4,564	5,566
2004	1,026	4,408	5,434
2005	1,036	3,908	4,944
2006	1,666	3,872	5,538
2007	1,890	3,200	5,090

Source: Piedmont Triad International Airport, compiled by URS Corporation, 2008.

1.7.2 *FORECASTS OF CARGO ACTIVITY*

1.7.2.1 All-Cargo

The all-cargo segment at PTI will experience major growth as the hub operation gets underway at the new FedEx sort facility. This facility will change the nature of the FedEx operation at PTI from a spoke city that sends and receives cargo for the Piedmont-Triad region to a hub facility that receives cargo from numerous cities, sorts the cargo and then distributes the cargo to its destination cities.

The FedEx sort facility and site are designed to accommodate a future expansion of their operations. Consequently, future cargo volumes for FedEx's operation and Mountain Air Cargo (which primarily handles small FedEx markets) will be accommodated at the hub facility. Therefore, this forecast examines all-cargo volumes for all other all-cargo carriers at PTI.

Boeing and Airbus forecast the US domestic air cargo industry to grow at a rate of approximately 2.9% to 3.3%, respectively, during the next twenty years. By averaging these two growth rates a projection of 3.1% is derived. **Table 1-12** presents a forecast of all-cargo volumes (less FedEx and Mountain Air) at PTI based upon an average growth rate of 3.1%.

TABLE 1-12
FORECAST OF ALL-CARGO NON-FEDEX/MOUNTAIN AIR (TONS) AT PTI
(2007 TO 2030)

Year	Enplaned All-Cargo	Deplaned All-Cargo	Total All-Cargo
2007	12,551	14,531	27,082
2010	13,755	15,925	29,680
2015	16,023	18,551	34,574
2020	18,666	21,610	40,276
2025	21,744	25,174	46,918
2030	25,330	29,325	54,655

Source: URS Corporation, 2008.
Note: Forecast does not include FedEx or Mountain Air tonnage that is not yet available.

Total all-cargo volumes for carriers other than FedEx and Mountain Air Cargo are projected to increase to more than 54 thousand tons from their 2007 level of just over 27 thousand tons; an increase of 102%. This forecast assumes that all-cargo operations by existing carriers continue in their current form. If another carrier were to establish a hub operation similar to FedEx, all-cargo volumes could be significantly higher.

1.7.2.2 Belly-Freight

The forecast of belly-freight is based upon the forecast of passenger aircraft operations and, specifically, the types of aircraft that are anticipated for future schedule passenger service. The forecast indicates no growth in scheduled passenger service with air carrier aircraft. However, growth is anticipated in the commuter segment by turboprop aircraft that do not have any significant cargo capabilities. Consequently, it is likely that future belly freight will continue to decline from the volumes experienced during 2007. Such a decline is consistent with Long-Term trends over the past decade. However, for facility planning purposes, which is the primary focus of this study, existing levels of belly freight (slightly less than 900 tons) have been assumed to continue into the future.

1.7.2.3 Mail

As a result of the factors previously described and recent continuation and extension of the US Postal Service's contract with cargo carriers, future mail volumes by passenger airlines at PTI are not anticipated to be significant and consequently were not forecasted.

1.7.2.4 Cargo Operations

A forecast of all-cargo operations was generated for FedEx and all other all-cargo operators. An estimate of aircraft operations by FedEx with the operation of the new hub facility was previously obtained for studies relating to the Environmental Impact Statement for Runway 5L/23R.

Information from that study indicates that airport operations by FedEx would increase from their 2007 level of 1,696 to an annual level of 12,350 in the first phase of the hub operation. FedEx aircraft operations are projected to increase again to an annual level of 32,760 with an expansion of the hub facility.

Aircraft operations by all-cargo operators other than FedEx were forecasted using a multi-step process that calculated historical ratios of cargo handled per operation and then applied adjusted ratios to the forecasted volumes of all-cargo. Recent ratios of tons of cargo handled per operation have been in the 15 ton range and have been fairly stable in recent years. Therefore, this ratio was used in the forecast. **Table 1-13** presents the resulting forecast of all-cargo operations.

TABLE 1-13
FORECAST OF ALL-CARGO AIRCRAFT OPERATIONS AT PTI

Year	FedEx and Mountain Air Cargo	Other All-Cargo	Total All-Cargo
2007	3,116	1,974	5,090
2010	12,350	1,979	14,329
2015	32,760	2,305	35,065
2020	32,760	2,685	35,445
2025	32,760	3,128	35,888
2030	32,760	3,644	36,404

Source: URS Corporation, 2008.
Note: FedEx operations based in estimates in the EIS and Part 150 Study.

1.8 GENERAL AVIATION

General aviation includes all segments of aviation activity other than commercial aviation and military aviation. Typical general aviation activities include personal and business flying, corporate aviation, medical aviation, agricultural aviation and law enforcement. General aviation operations are conducted by a wide range of aircraft including single-engine and multi-engine piston aircraft, turboprops, jets and rotorcraft.

This section provides an overview of historical general aviation activity at PTI, a discussion of general trends in the general aviation sector and a discussion of local factors that could influence future general aviation activity at PTI. It concludes with a forecast of general aviation activity for PTI.

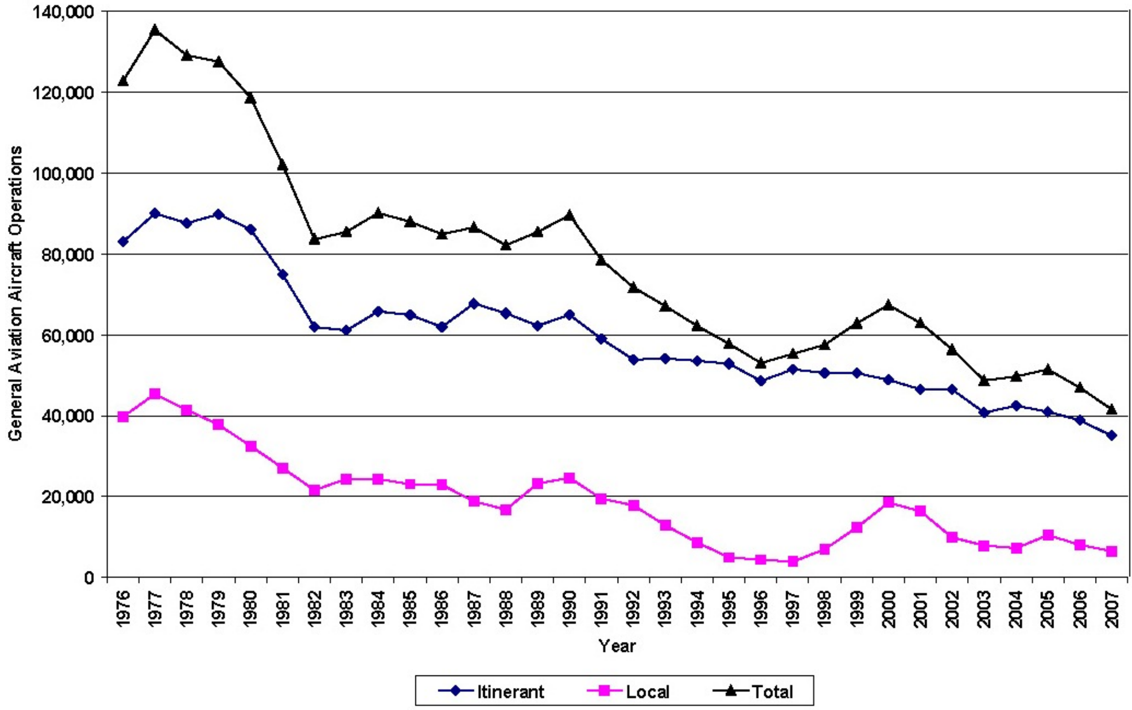
1.8.1 HISTORICAL ACTIVITY

1.8.1.1 Historical General Aviation Operations

General aviation operations are recorded by the local Airport Traffic Control Tower as *local* or *itinerant*. Local operations consist primarily of arrivals and departures performed by aircraft that remain in the airport traffic pattern and are usually associated with flight training activity. Itinerant operations are arrivals and departures to and from other airports that are performed by local or transient aircraft.

Figure 1-21 presents historical local, itinerant and total general aviation operations at PTI from 1976 through 2007. The figure indicates that general operations at PTI have been declining since the late 1970's. This decline reflects a nationwide trend resulting from the increased cost of acquiring general aviation aircraft, as well as increased ownership and operational costs. While some stabilization has occurred in the realm of aircraft acquisition costs as a result of legislation that controlled manufacturer liability expenses, ownership and operational costs continue to be challenging, especially with recent increased in the cost of fuel. In addition, the number of student and active private pilots in the United States has continued to decline in recent years. This is a contributing factor to the decrease of local operations, which occur primarily for flight training purposes.

FIGURE 1-21
HISTORICAL GENERAL AVIATION OPERATIONS
(1976-2007)



Source: FAA APO Terminal Area Forecast, December 2007.

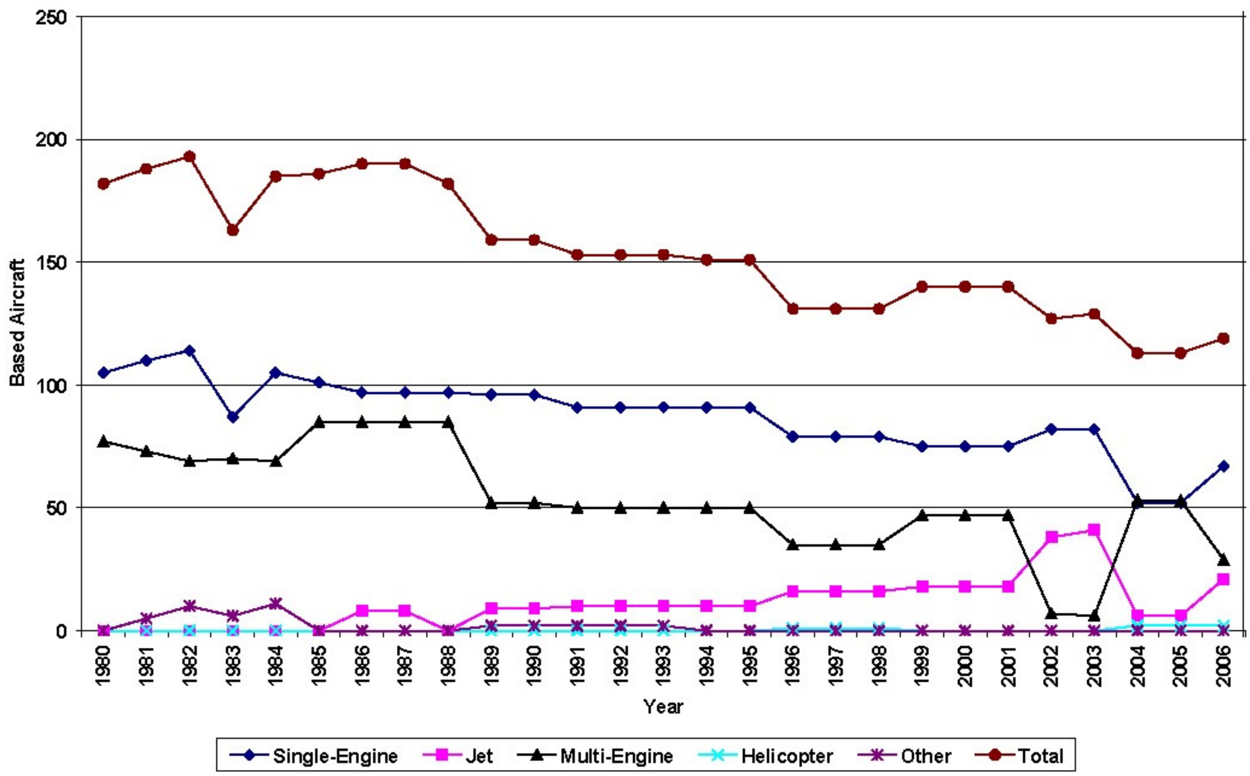
1.8.1.2 Historical Based Aircraft

Figure 1-22 presents historical numbers of aircraft based at PTI from 1980 through 2007. The figure reveals that based aircraft have also experienced a Long-Term decline although the number of jet aircraft is higher in recent years. This is consistent with national trends that indicate growing numbers of turboprop and jet aircraft associated with business aviation and fractional ownership of aircraft. The number of single-engine and multi-engine aircraft at PTI have been declining. This is also consistent with national trends that have experienced flat to negative growth in these categories.

1.8.1.3 Historical Operations per Based Aircraft

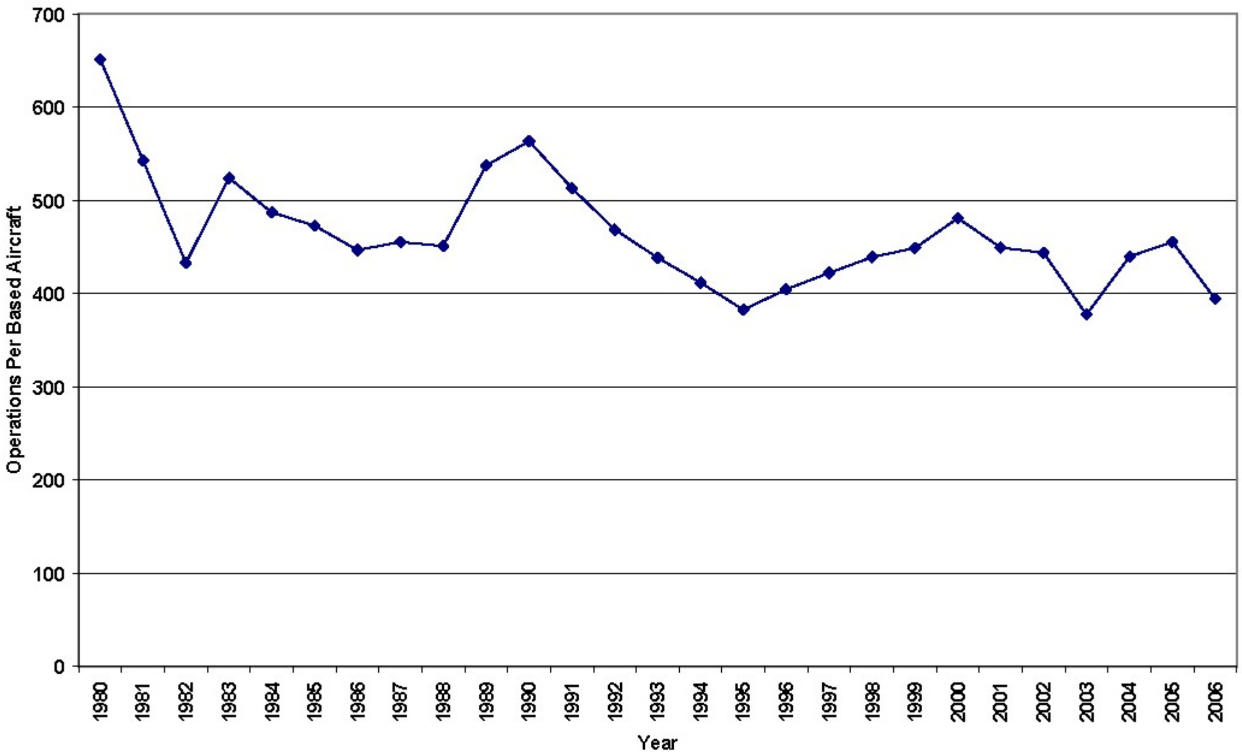
Figure 1-23 presents historical annual operations per based aircraft from 1980 through 2006. The data reveals that the number of annual operations per based aircraft has been steadily decreasing through the years. Values as high as 600 annual operations per based aircraft were experienced back in 1980, recent values have fluctuated in a range of 400 to 450 annual operations per based aircraft.

FIGURE 1-22
HISTORICAL BASED AIRCRAFT
(1980-2008)



Source: FAA APO Terminal Area Forecast, December 2007.

FIGURE 1-23
HISTORICAL OPERATIONS PER BASED AIRCRAFT
(1980-2006)



Source: FAA APO Terminal Area Forecast, December 2007.
Operations Per Based Aircraft compiled by URS Corporation, 2008.

1.8.2 CURRENT TRENDS IN GENERAL AVIATION

This section provides a general discussion of current trends in general aviation with a focus on types of aircraft and aircraft production. Trends discussed include the following:

- Very Light Jets
- Fractional Aircraft Ownership
- Increased Production of Business Jets

The following paragraphs describe these trends and provide an overview of their primary features.

1.8.2.1 Very Light Jets

Very Light Jets (VLJ's) are defined as a new type of small jet aircraft that generally weigh less than 10,000 pounds and generally cost between $1 and $3 million. Several aircraft manufacturers have announced plans to build VLJ's. **Table 1-14** presents a list of some of these manufacturers and their proposed VLJ's.

TABLE 1-14
PROPOSED VERY LIGHT JET AIRCRAFT

Manufacturer	Model	Seating	Maximum Takeoff Weight (pounds)	Projected Price (millions)
Adam Air[1]	A700	6	9,350	$2.45
Cessna	Mustang	6	8,645	$2.54
Diamond	D-Jet	5	5,000 (est.)	$1.38
Eclipse	500	6	5,995	$1.60
Embraer	Phenom	6 to 8	9,700	$2.98
Epic	Elite Jet	6 to 8	7,700	$2.35
HondaJet	Honda Jet	7 to 8	9,960 (est.)	$3.65
Piper	Piper Jet	6	NA	$2.20

Source: Manufacturers' Data
Notes: [1] Adam Air announced on February 11, 2008 that it was filing under Chapter 7 of the U.S. Bankruptcy code.

These aircraft are currently in various stages of development. Some are only at the conceptual level, while others are currently in production with finished aircraft already delivered to customers. As of January 1, 2008, the only VLJ's certified by the FAA and delivered to customers are the Eclipse 500 (98 aircraft delivered) and the Cessna Mustang (45 aircraft delivered). The Embraer Phenom 100 is expected to achieve FAA certification in 2008. The remaining aircraft are expected to achieve certification within the next few years although some, ultimately, may not make it to production. See Note 1 above.

A study conducted by the United States General Accounting Office in 2007 compiled forecasts of VLJ's by a variety of sources including aircraft manufacturers and aircraft component manufacturers, consultants and the Federal Aviation Administration. The report found that the various forecasts predict between 3,000 and 7,500 VLJ's will be delivered by 2016 to 2025.

These forecasts vary by a factor of 2.5. This variance reflects the high degree of uncertainty over the success of this category of aircraft and the fact that a significant number of these aircraft are being marketed to the air taxi market. The air taxi market consists of on-demand hire of aircraft and crew for point-to-point transportation. The market is not new and currently consists of numerous companies filling a niche for air transportation that is not adequately provided by schedule air service. What is new, however, is the anticipated change in the economics of air taxi service provided with VLJs due to their lower acquisition and operating costs compared to traditional business jets. It is anticipated that the VLJ will bring the cost of air taxi services to a broader market thereby stimulating demand for air taxi services.

The number of VLJ that will enter the industry in the next few years depends on how many manufacturers actually bring their aircraft to market. However, it should be noted that Eclipse and Cessna delivered nearly 150 VLJ's to customers in less than six months of production during the later part of 2007. This suggests that since thousands of these aircraft are on order several hundred could be delivered to customers annually during the next few years.

As with any new type of aircraft, it is reasonable to expect that some of the proposed aircraft will not make it to market or may make to market, but not remain competitive with other manufacturers and disappear from the marketplace. The current phase of the VLJ market is reminiscent of the initial market for regional jet aircraft. Several regional jets programs were initially announced by aircraft manufacturers, but several of them did not make it to market and some ultimately failed in the marketplace due to stronger competitors. It is possible that the VLJ market will follow a similar path. If this scenario unfolds, the lower range of the VLJ forecasts noted previously may ultimately be more accurate.

1.8.2.2 VLJ and Air Taxi Services

New companies such as the former DayJet have been started on the idea of using VLJ's specifically for air taxi services. Prior to its cessation of operations in September of 2008, DayJet offered "per seat, on demand" service. This means that the customer paid only for the "seat cost" of the trip not the entire "aircraft cost" of the trip. Consequently, the cost to the customer varied depending on the level of flexibility the customer has regarding schedule. Nonetheless, the seat cost was a premium to the cost of a passenger ticket using traditional scheduled airline service.

DayJet intended to use existing FBO facilities at smaller airports and to provide a "branded" service that stimulates customers demand beyond the traditional users of air taxi services. They also believed that their focus on smaller markets that do not have direct point-to-point will enable their cost premium to be justified by the elimination of overnight stays and their associated costs for business travelers. The ultimate success of this business model is yet to be proven in the air taxi market.

Other similar companies have also been proposed. For example, the former Chairman and Chief Executive Officer of American Airlines, Robert Crandall, is proposing a company called "Pogo" that would also provide air taxi service using VLJs. Pogo is targeting short-haul trips of less than 500 miles and intends to begin in the Northeast United States where they believe the highest concentration of potential customers live and work. Pogo intends to launch operations in 2008 using a fleet of VLJ's and to expand geographically as they acquire additional aircraft.

DayJet has been the only company operating solely on the basis of providing air taxi services using VLJs. The company used the Eclipse 500 to provide per seat, on-demand service to certain airports in Florida, Georgia, Alabama and South Carolina. DayJet planned to eventually expand its service beyond the Southeast United States.

It should be noted that the demand for VLJ's is not tied exclusively to air taxi operators. VLJ's have been ordered by all segments of the general aviation market including corporations and individuals. The actual demand for these aircraft will ultimately depend on the success of their economics (i.e., their ability to maintain low acquisition and operational costs) and manufacturers' ability to bring the aircraft to market.

1.8.2.3 Fractional Aircraft Ownership

Another trend in general aviation is the growth of fractional aircraft ownership programs. These programs allow individuals or businesses to purchase partial ownership of an aircraft; usually business jets. The purchaser receives access to the aircraft for an established number of flight hours in direct proportion to the percentage of the aircraft that they purchase. Companies offer a wide range of ownership percentages, thereby allowing the purchase of small or larger number of flight hours.

The benefit of these programs is that they allow the convenience of private aircraft ownership at a lower cost than buying an aircraft outright. The primary disadvantage of the programs is that the owner is responsible for their share of all costs associated with the aircraft including insurance, maintenance, etc. and they cannot use the aircraft beyond their allotted flight hours. Numerous companies such as NetJets, Flight Options, FlexJets and Citation Shares provide fractional aircraft ownership.

In additional to fractional ownership there are companies that sell access cards. These cards provide access to a pre-defined number of flight hours without actually becoming part owner of an aircraft. This enables customers to avoid certain costs that are incurred when becoming a fractional owner and usually enables access to aircraft at a lower total cost than purchasing a fractional share. Access cards are typically suitable for individuals who need fewer total hours of flight time.

The growth of fractional jet ownership and access cards has stimulated the market for business jets in recent years. **Table 1-15** presents the number of aircraft and fractional aircraft owners in recent years as compiled by the General Aviation Manufacturers Association (GAMA).

TABLE 1-15
FRACTIONAL AIRCRAFT AND OWNERSHIP

Year	Fractional Aircraft Fleet	Percent Growth	Fractional Share Owners	Percent Growth
2001	689	-	3,601	-
2002	780	13.2%	4,244	17.9%
2003	826	5.9%	4,516	6.4%
2004	870	5.3%	4,765	5.5%
2005	945	8.6%	4,828	1.3%
2006	984	4.1%	4,863	0.7%
2007	1,030	4.7%	5,168	6.3%

Source: General Aviation Manufacturers Association, 2008.

As the table indicates, the fractional aircraft market has experienced positive growth during recent years and now accounts for over a thousand aircraft and over five thousand owners. These aircraft have very high utilization rates and are concentrated in the business jet category. While recent growth rates of fractional aircraft have slowed, it is anticipated that the demand for this segment of general aviation will continue to experience positive growth rates if the number of affluent individuals in the U.S. increases.

1.8.2.4 General Aviation - Aircraft Production

Table 1-16 presents the number of general aviation aircraft manufactured worldwide from 2005 through 2007. As the table indicates, total shipments have been increasing, but the fastest growth is occurring in the business jet category. This reflects the continued growth of corporate aviation, as well as business jets used in fractional aircraft ownership programs.

TABLE 1-16
GENERAL AVIATION AIRCRAFT MANUFACTURED WORLDWIDE

	2005	2006	2007	05-06 Change	06-07 Change
Pistons	2,465	2,755	2,675	11.8%	-2.90%
Turboprops	365	412	459	12.9%	11.40%
Business Jets	750	886	1,138	18.1%	28.40%
Total Shipments	3,580	4,053	4,272	13.2%	5.40%

Source: General Aviation Manufacturers Association, 2008.

This data suggests that turboprop and jet aircraft will comprise a greater proportion of the general aviation fleet in the future.

Another factor to consider is the average age of general aviation aircraft. According to data from GAMA, the average age of piston aircraft is approaching 40 years, while the average age of a multi-engine turboprop is over 27 years and the average age of a multi-engine jet aircraft is 16 years. This suggests that the number of piston aircraft being retired will accelerate in future years as they reach the end of their useful lives. Again this suggests that turboprop and jet aircraft will continue to increase as a proportion of the total general aviation fleet.

1.8.3 LOCAL FACTORS AFFECTING GENERAL AVIATION

A variety of local factors can affect forecasts of future general aviation activity including based aircraft and operations. These factors include any of the following:

- Changes at Surrounding Airports (i.e., opening of new airports or closure of existing airports),
- Changes to Facilities at Surrounding Airports (i.e., plans for substantial new or improved facilities including new FBOs, aircraft parking aprons and, especially, new hangar facilities),
- Changes to Facilities at PTI (i.e., plans for substantial new or improved facilities including new FBOs, aircraft parking aprons and, especially, new hangar facilities),

The following paragraphs discuss these issues and the potential they have to positively or adversely impact general aviation activity at PTI.

1.8.3.1 Changes at Surrounding Airports

There are eleven airports within a 25 nautical mile radius of PTI. One of these airports is private use (May) and two of the airports (Warf and Hiatt) consist of turf runways. The rest are public use airports with paved runways of varying lengths, instrumentation and capabilities as shown in **Table 1-17**.

TABLE 1-17
AIRPORTS SURROUNDING PTI

Airport	Distance from PTI	Longest Runway	Lighted	Instrument Approach
Air Harbor	8 miles NE	2,400	Yes	None
Burlington-Alamance	23 miles E	5,000	Yes	ILS
Causey	19 miles SE	3,800	Yes	GPS
Davidson County	25 miles SW	5,000	Yes	ILS
Meadow Brook	16 miles NW	2,725	Yes	GPS
Rockingham	21 miles N	5,400	Yes	GPS
Smith Reynolds	14 miles W	6,600	Yes	ILS
Southeast Greensboro	15 miles SE	3,000	Yes	None

Source: FAA Airport Facility Directory, 2008.

No new airports are planned in the area and none of the existing airports are projected to close in the near future. Consequently, no significant shift of based aircraft between airports is anticipated in the near future.

Review of the FAA's TAF for these airports reveals that only Burlington-Alamance, Davidson County, Rockingham County and Smith Reynolds have projections of future based aircraft and all three forecasts show a continuation of current levels of aircraft. No estimates of growth are provided by the TAF.

Consultation with the North Carolina DOT revealed that a state system plan is currently in progress, but no forecasts of activity have been published for review. Consequently, there are no forecasts of based aircraft at airports surrounding PTI.

1.8.3.2 Changes to Facilities at Surrounding Airports

Consultations were undertaken with personnel at the larger surrounding airports to understand their growth plans and determine what impact, if any these plans may have on aircraft activity at PTI. Summaries of the growth plans are provided in the following paragraphs.

Burlington-Alamance Regional Airport – The airport plans to extend their runway from 5,000 feet to 7,000 feet to accommodate a greater proportion of the general aviation fleet. The airport also plans the construction of additional T-hangars and corporate hangars.

Davidson County Airport – The airport is currently building 10 T-hangars and 6 corporate hangars to accommodate general aviation demand.

Rockingham County Airport – The airport plans to extend its runway from 5,400 feet to 5,700 feet and install an ILS to accommodate poor visibility approaches. The airport also has plans for approximately 16 T-hangars and 2 corporate hangars.

In summary, growth plans at surrounding airports support a scenario of lower performance single and twin-engine piston aircraft being attracted to surrounding airports, thereby depressing growth prospects for those types of aircraft at PTI. However, runway length and instrumentation limitations at many of these airports limit their attractiveness for higher performance business aircraft that are anticipated to find PTI more attractive.

1.8.3.3 Changes to Facilities at PTI

Consultations were conducted with FBOs and other tenants at PTI to gain an understanding of their development plans and how they could affect the future level of general aviation demand at PTI.

Consultations with the airport's FBOs revealed that growth is only anticipated with high performance aircraft such as multi-engine turboprops and jets. Very little growth is expected at the low end of the general aviation market (i.e., single-engine and twin-engine piston aircraft). This is due to the fact that GA aircraft can operate less expensively at other local airports. There is no waiting list for hangar space and empty shade hangar space currently exists. There are, however, plans to redevelop area with larger hangars that can accommodate business jets and high performance turbo-props. These plans will likely increase both the number of based aircraft and operations by these types of aircraft.

The construction of the Honda Jet facility at PTI will likely generate substantial activity by very light jets. Thus, this facility will lead to an increase of high-end general aviation operations.

The Cessna Citation Service Center at PTI plans to double the size of its existing 50,000 S.F. facility. This will increase this facility's service capacity and will lead to a greater number of business jet operations.

In summary, planned expansions of existing facilities at PTI support a scenario of very little increase of operations by low performance aircraft, but significant growth of high performance general aviation operations.

1.8.4 FORECAST OF GENERAL AVIATION ACTIVITY

1.8.4.1 FAA Terminal Area Forecast

The FAA's TAF provides an estimate of future based aircraft and future general aviation operations at PTI. The TAF's estimate of based aircraft is shown for key years in **Table 1-18**. The estimate projects growth in all segments of general aviation activity at the airport. Review of the growth rates reveals that the forecast applies the growth rates contained in the FAA's Aerospace Forecast for Fiscal Years 2008 through 2025.

TABLE 1-18
FAA TERMINAL AREA FORECAST OF BASED AIRCRAFT AT PTI

Year	Single Engine	Multi Engine	Jet	Rotorcraft	Total
2006	67	29	21	2	119
2010	72	32	23	3	130
2015	78	36	26	3	143
2020	84	40	29	3	156
2025	91	44	32	4	171
CAGR	1.6%	2.2%	2.2%	3.7%	1.9%

Source: FAA APO Terminal Area Forecast, December 2007.

The resulting forecast shows positive growth throughout the forecast period and results in an estimate of 171 aircraft by the year 2025. That level of based aircraft was last attained in 1988. Given the steady and continuous decline in the number of historical based aircraft, as well as the challenges currently facing the GA industry, the TAF appears to be very aggressive. Historical trends do not support this level of growth at the low end of the fleet (i.e., single and twin-engine piston aircraft). However, growth is expected at the high end of the GA fleet as a result of the increased production of business jets and the introduction of very light jets into the market.

The forecast of general aviation operations contained in the TAF is somewhat less aggressive. **Table 1-19** presents the TAF for local and itinerant general aviation operations, as well as total general aviation operations.

TABLE 1-19
FAA TERMINAL AREA FORECAST OF GENERAL AVIATION OPERATIONS AT PTI

Year	Itinerant Operations	Local Operations	Total Operations
2007[1]	35,051	6,539	41,590
2010	37,672	6,889	44,561
2015	40,432	6,889	47,321
2020	42,374	6,889	49,236
2025	44,419	6,889	51,308
2030[2]	46,563	6,889	53,452
CAGR	1.3%	0%	1.1%

[1] Actual 2007 operations derived from FAA ATADS.
[2] 2030 operations extrapolated from 2025 TAF values.
Source: FAA APO Terminal Area Forecast, December 2007.

The TAF projects 1.3% growth for itinerant operations and no growth for local operations, resulting in an overall growth rate of 1.2%. The TAF forecast of aircraft operations was also examined in terms of the number of operations per based aircraft. The result is shown in **Table 1-20**. As the table indicates the number of operations per based aircraft is in the range of 350 to 300 and is declining throughout the forecast period. Both the level of operations per based aircraft and the declining trend are consistent with historical trends at PTI.

TABLE 1-20
FAA TERMINAL AREA FORECAST OF GENERAL AVIATION OPERATIONS AT PTI

Year	Total Operations	Based Aircraft	Operations Per Based Aircraft
2010	44,561	130	343
2015	47,321	143	331
2020	49,236	156	316
2025	51,308	171	300
2030[1]	53,462	168	318

[1] 2030 operations and based aircraft counts extrapolated from 2025 TAF values.
Source: URS Corporation, 2008.

1.8.4.2 GA Forecast

The FAA's TAF was used in this Airport Master Plan Update as the future projection of general aviation aircraft operations. However an alternate forecast of based aircraft is recommended on the basis of historical trends at PTI, growth plans of PTI tenants and the plans of surrounding GA airports. The recommended forecast of based aircraft assumes lower growth of single-engine and multi-engine piston aircraft and a higher growth of high performance turbo-prop and jet aircraft. The recommended forecast is presented in **Table 1-21**.

TABLE 1-21
RECOMMENDED FORECAST OF BASED AIRCRAFT AT PTI

Year	Single Engine	Multi Engine	Jet	Rotorcraft	Total
2006	67	29	21	2	119
2010	68	30	25	2	125
2015	70	31	30	3	133
2020	72	32	36	3	143
2025	74	33	44	4	155
2030	76	34	53	5	168
CAGR	0.5%	0.5%	4.0%	3.9%	1.4%

Source: URS Corporation, 2008.

1.9 SUMMARY OF TOTAL FLIGHT OPERATIONS

The overall forecast of flight operations incorporates passenger flights, all-cargo flights, general aviation, military, and other unclassified operations. Total operations at PTI are forecast to grow 1.6% per year, on average, between 2007 and 2030, driven by particularly strong growth by FedEx between 2009 and 2015, the period of operational build-up following the opening of their cargo hub facility (see **Table 1-22**).

Passenger flights, all-cargo flights, and general aviation flights at PTI are forecast to average 0.3%, 8.9%, and 1.1% increases per year, respectively, between 2007 and 2030. The number of military flight operations and other unclassified flights are forecast to remain unchanged over the forecast period.

The flight operations forecast is presented graphically in **Figure 1-24**, along with a comparison to the Airport Master Plan forecast completed in 2001 by LPA and the Terminal Area Forecast issued by the FAA in December 2007.

TABLE 1-22
FORECAST OF FLIGHT OPERATIONS
(CALENDAR YEARS)

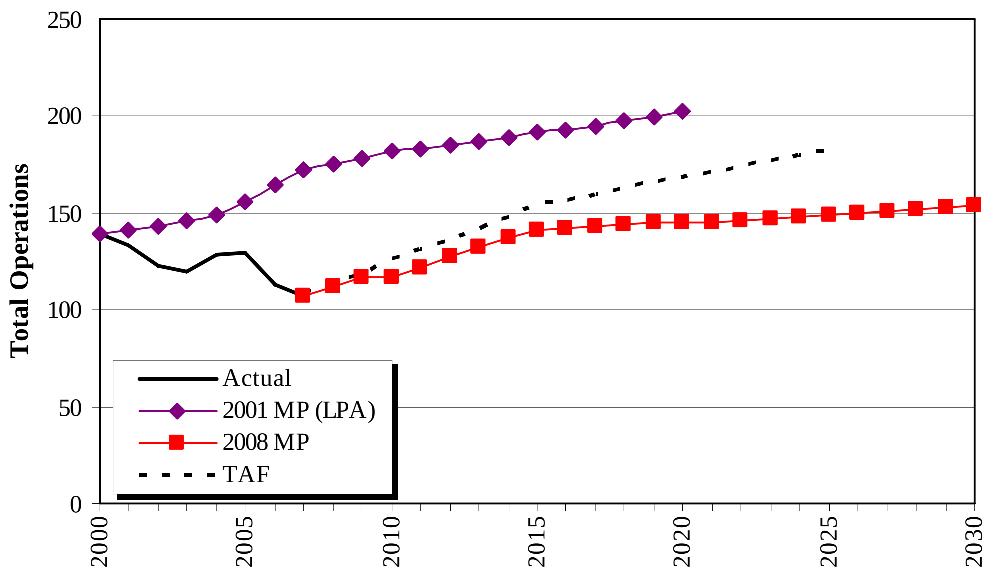
	Actual		Forecast				
	2006	**2007**	**2010**	**2015**	**2020**	**2025**	**2030**
Total Operations	**113,295**	**107,254**	**117,140**	**141,236**	**144,731**	**148,846**	**153,506**
Total Commercial Operations	65,709	64,690	71,629	92,965	94,545	96,588	99,104
Passenger Carriers	52,004	51,002	48,800	49,400	50,600	52,200	54,200
All-cargo Carriers	5,538	5,090	14,329	35,065	35,445	35,888	36,404
Unclassified Other	8,167	8,598	8,500	8,500	8,500	8,500	8,500
General Aviation[1]	46,628	41,638	44,561	47,321	49,236	51,308	53,452
Military	958	926	950	950	950	950	950

	Compound Annual Growth Rate				
	2010-15	**2015-20**	**2020-25**	**2025-30**	**2007-30**
Total Operations	**3.8%**	**0.5%**	**0.6%**	**0.6%**	**1.6%**
Total Commercial Operations	5.4	0.3	0.4	0.5	1.9
Passenger Carriers	0.2	0.5	0.6	0.8	0.3
All-cargo Carriers	19.6	0.2	0.2	0.3	8.9
Unclassified Other	0.0	0.0	0.0	0.0	0.0
General Aviation[1]	1.2	0.8	0.8	0.8	1.1

Sources: Actual—U.S. DOT, Schedule T100; Piedmont Triad Airport Authority.
Forecast—FAA, TAF; Jacobs Consultancy, Inc.; URS.

Note: [1] General Aviation operations in the forecast years are interpolated TAF figures. FedEx projects are based on estimates in the EIS and Part 150 Study.

FIGURE 1-24
COMPARISON OF OPERATIONS FORECASTS
(CALENDAR YEARS)



Sources: Piedmont Triad Airport Authority; Jacobs Consultancy, Inc.
Note: The 2001 LPA Group Airport Master Plan Forecast used forecast years 2004, 2009, 2014, 2019. Interim years were extrapolated.
The 2008 Airport Master Plan Forecast shown is the "Base" passenger forecast.

1.10 DERIVED FORECASTS

1.10.1 AIRCRAFT FLEET MIX

The types of aircraft operating at an airport, referred to herein as the aircraft fleet mix, are an important consideration in planning terminal and airfield improvements. The methodology used to forecast the number of flight operations by aircraft category, for each of the categories of operations at PTI is described below.

1.10.1.1 Methodology

The first step was to develop a set of operations data by aircraft type for 2006 and 2007. For commercial flights, PTAA staff provided statistical data as reported to PTI by the air carriers for their passenger and all-cargo operations. This data provided the detailed fleet-mix data required for approximately 99.5% of the passenger carrier operations recorded at PTI by the FAA traffic controllers. Fleet-mix data pertaining to charter carrier operations was not available.

For forecasting purposes, passenger flights were categorized into aircraft groupings by size as follows: wide-body jets and Boeing 757s (175+ seats), narrow-body jets (100 to 150 seats), large regional jets (65+ seats), small regional jets (35 to 50 seats), large turboprops (65 to 80 seats), and small turboprop aircraft (50 seats or fewer).

Published flight schedules were used to project Near-Term passenger flight operations (i.e., for 2008 and 2009) by aircraft type, providing a basis for the fleet-mix forecast in forecast years from 2010 forward (see **Table 1-23**).

The next step integrated the flight operations forecast presented earlier and the compiled base of historical fleet-mix data. In the forecast model, changes were estimated in the percentage of passenger flight operations that each aircraft grouping would represent. For example, it was estimated that small regional jets, which accounted for 75.5% of all passenger operations at PTI in 2007, would decline to 34% of all operations by 2030.

The all-cargo flight operations were split into two main groups: a) FedEx, and b) all other all-cargo operations. Within each group, operations were further categorized by specific aircraft type. The fleet-mix forecasts for the all-cargo operations were based largely on historical trends.

TABLE 1-23
ACTUAL AND PROJECTED NEAR-TERM PASSENGER FLIGHT OPERATIONS, BY AIRCRAFT TYPE (CALENDAR YEARS)

	Actual		Projected		Percent of Total			
	2006	2007	2008	2009	2006	2007	2008	2009
Total Passenger Flight Operations	**52,004**	**51,002**	**49,400**	**46,400**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Scheduled Flights	**51,700**	**50,734**	**49,129**	**46,096**	**99.4%**	**99.5%**	**99.5%**	**99.3%**
Wide-body & B757 (175+ Seats)	**33**	**32**	**0**	**0**	**0.0%**	**0.0%**	-	-
A321	6	2	0	0	0.0	0.0	-	-
A330-200	2	2	0	0	0.0	0.0	-	-
B757-200	16	20	0	0	0.0	0.0	-	-
B757-300	4	4	0	0	0.0	0.0	-	-
B767-200	2	0	0	0	0.0	-	-	-
B767-300	4	0	0	0	0.0	-	-	-
DC-10	0	4	0	0	0.0	0.0	-	-
Narrow-body (100-150 Seats)	**5,455**	**4,268**	**5,393**	**2,761**	**10.5%**	**8.4%**	**10.9%**	**5.9%**
A319	400	524	2,021	0	0.8	1.0	4.1	-
A320-100/200	43	32	10	0	0.1	0.1	0.0	-
B727-200	4	6	0	0	0.0	0.0	-	-
B737-100/200	766	248	0	0	1.5	0.5	-	-
B737-300	522	360	355	0	1.0	0.7	0.7	-
B737-400	33	14	0	0	0.1	0.0	-	-
B737-500	384	368	454	0	0.7	0.7	0.9	-
B737-700	6	10	10	0	0.0	0.0	0.0	-
B737-800	130	358	385	709	0.2	0.7	0.8	1.5
DC-9-15	4	2	0	0	0.0	0.0	-	-
DC-9-30	4	0	0	0	0.0	-	-	-
DC-9-50	2	0	0	0	0.0	-	-	-
MD-80	3,158	2,346	2,159	2,052	6.1	4.6	4.4	4.4
Large RJ (65+ Seats)	**6,902**	**7,686**	**7,552**	**7,700**	**13.3%**	**15.1%**	**15.3%**	**16.6%**
CRJ 700	4,085	4,692	2,652	3,495	7.9	9.2	5.4	7.5
CRJ 900	2,640	1,951	2,041	1,950	5.1	3.8	4.1	4.2
EMB 170	178	630	769	101	0.3	1.2	1.6	0.2
EMB 175	0	412	2,090	2,153	-	0.8	4.2	4.6
Small RJ (35-50 Seats)	**39,178**	**38,510**	**34,271**	**32,217**	**75.3%**	**75.5%**	**69.4%**	**69.4%**
CRJ 100	6,848	4,644	20,005	20,059	13.2	9.1	40.5	43.2
CRJ 200	14,345	16,428	0	0	27.6	32.2	-	-
EMB 135	987	678	217	0	1.9	1.3	0.4	-
EMB 140	841	830	1,006	709	1.6	1.6	2.0	1.5
EMB 145	16,157	15,930	13,044	11,448	31.1	31.2	26.4	24.7
Large TP (65-80 Seats)	**2**	**14**	**996**	**2,102**	**0.0%**	**0.0%**	**2.0%**	**4.5%**
ATR-72	2	14	0	0	0.0	0.0	-	-
DASH 8-400	0	0	996	2,102	-	-	2.0	4.5
Small TP (</= 50 Seats)	**130**	**224**	**917**	**1,317**	**0.2%**	**0.4%**	**1.9%**	**2.8%**
DASH 8-100	105	116	237	709	0.2	0.2	0.5	1.5
DASH 8-300	25	106	680	608	0.0	0.2	1.4	1.3
Pilatus PC-12	0	2	0	0	0.0	0.0	-	-
Charter Flights	**304**	**268**	**271**	**304**	**0.6%**	**0.5%**	**0.5%**	**0.7%**

Sources: U.S. DOT, Schedule T100; Jacobs Consultancy, Inc.; Piedmont Triad Airport Authority.

1.10.1.2 Fleet-Mix Forecast

In the forecast model, total passenger operations were categorized into the aircraft groupings according to the forecast percentage inputs. The model was also used to measure the impact of forecast inputs on passenger operations and total seats offered, and to calculate a measure of average seats per flight through the forecast period. The fleet-mix forecast is summarized in **Table 1-24** by aircraft group

Trends that emerged from the forecast of the passenger carrier fleet-mix included the following:

- Mainline jet operations (all narrow-body) are expected to decline as a percentage of all passenger operations at PTI, from 8.4% in 2007 to 5.1% by 2030;

- Regional jets as a whole will likely decline as a percentage of all passenger operations at the Airport, from 90.6% in 2007 to 68.2% by 2030 with large RJs growing as a percentage of the total and small RJs receding; and

- Turboprop operations are expected to increase as a percentage of all passenger operations, from only 0.5% in 2007 to 26.3% in 2030.

For the all-cargo carriers, FedEx is envisioned to account for virtually all growth at PTI until plateauing. The other remaining all-cargo carriers are projected to account for all growth after that.

TABLE 1-24
FLEET MIX FORECAST FOR COMMERCIAL OPERATIONS, BY AIRCRAFT GROUP
(CALENDAR YEARS)

	Actual		Forecast				
	2006	**2007**	**2010**	**2015**	**2020**	**2025**	**2030**
Total Commercial Flt. Ops.	**65,709**	**64,690**	**71,629**	**92.965**	**94,545**	**96,588**	**99,104**
Total Passenger Flt. Ops.	**52,004**	**51,002**	**48,800**	**49,400**	**50,600**	**52,200**	**54,200**
Passenger Carriers (sched.)	**51,700**	**50,734**	**48,507**	**49,104**	**50,296**	**51,887**	**53,875**
Narrow-body Jet	5,455	4,268	2,684	2,717	2,732	2,741	2,764
Wide-body Jet	33	32	0	0	0	0	0
Large Regional Jet	6,902	7,686	9,760	12,350	14,725	16,756	18,536
Small Regional Jet	39,178	38,510	30,744	26,676	23,276	20,619	18,428
Large Turboprop	2	14	3,123	4,150	5,262	6,290	7,263
Small Turboprop	130	224	2,196	3,211	4,301	5,481	6,883
Other Carriers (charter)	**304**	**268**	**293**	**296**	**304**	**313**	**325**
Total All-Cargo Flt Ops.	**5,538**	**5,090**	**14,329**	**35,065**	**35,445**	**35,888**	**36,404**
FedEx	**3,242**	**3,116**	**12,350**	**32,760**	**32,760**	**32,760**	**32,760**
Narrow-body Jet	772	572	5,330	14,139	14,139	14,139	14,139
Wide-body Jet	1,150	1,124	5,330	14,139	14,139	14,139	14,139
Turboprop	1,320	1,420	1,690	4,483	4,483	4,483	4,483
All Other-Cargo Carriers	**2,296**	**1,974**	**1,979**	**2,305**	**2,685**	**3,128**	**3,644**
Narrow-body Jet	1,090	982	1,178	1,372	1,598	1,877	2,369
Wide-body Jet	860	522	801	933	1,087	1,251	1,275
Turboprop	346	470	0	0	0	0	0
Unclassified Other	**8,167**	**8,598**	**8,500**	**8,500**	**8,500**	**8,500**	**8,500**
				Compound Annual Growth Rate			
				2010-15	**2015-20**	**2020-25**	**2025-30**
Total Commercial Flt. Ops.				**5.4%**	**0.3%**	**0.4%**	**0.5%**
Total Passenger Flt. Ops				**0.2%**	**0.5%**	**0.6%**	**0.8%**
Passenger Carriers (sched.)				**0.2%**	**0.5%**	**0.6%**	**0.8%**
Narrow-body Jet				0.2	0.1	0.1	0.2
Wide-body Jet				-	-	-	-
Large Regional Jet				4.8	3.6	2.6	2.0
Small Regional Jet				-2.8	-2.7	-2.4	-2.2
Large Turboprop				5.8	4.9	3.6	2.9
Small Turboprop				7.9	6.0	5.0	4.7
Other Carriers (charter)				**0.2%**	**0.5%**	**0.6%**	**0.8%**
Total All-Cargo Flt Ops.				**19.6%**	**0.2%**	**0.2%**	**0.3%**
FedEx				**21.5%**	**0.0%**	**0.0%**	**0.0%**
Narrow-body Jet				21.5	0.0	0.0	0.0
Wide-body Jet				21.5	0.0	0.0	0.0
Turboprop				21.5	0.0	0.0	0.0
All Other-Cargo Carriers				**3.1%**	**3.1%**	**3.1%**	**3.1%**
Narrow-body Jet				3.1	3.1	3.3	4.8
Wide-body Jet				3.1	3.1	2.8	0.4
Turboprop				-	-	-	-
Unclassified Other				**0.0%**	**0.0%**	**0.0%**	**0.0%**

Sources: Actual—U.S. DOT, Schedule T100; Piedmont Triad Airport Authority.
Forecast—FAA, TAF; Jacobs Consultancy, Inc.; URS.
Note: Phasing of FedEx operations and fleet mix based on estimates in the EIS and Part 150 Study.

1.10.1.3 Fleet-Mix Forecast Assumptions

The following assumptions were made when forecasting the fleet mix of passenger operations:

- The legacy carriers will increasingly rely on their regional partner carriers to provide service at PTI. The number of narrow-body jet operations will increase over the forecast period as demand will necessitate larger aircraft on high-density routes, although those flights will decline as a percentage of total operations.

- No growth in wide-body operations is expected.

- There will be an increase in the use of larger regional jets and a reduction in the use of the smaller, less-efficient 35 to 50-seat regional jets.

- There will be a greater reliance on small and large turboprop aircraft by the regional carriers serving the Airport. The use of the larger turboprops (such as the Dash 8-400) will increase as aircraft manufacturers develop more passenger-friendly (and fuel efficient) turboprop aircraft.

1.10.2 Peaking Forecasts

For airport planners, it is often the peak loading, rather than the average level of activity, that is the critical design factor in planning for new and expanded facilities. This sub-section details the analysis of peak period activity at PTI for both passengers and flight operations.

1.10.2.1 Peak Passenger Flows

The analysis of passenger peaking began by obtaining, from PTAA records, a monthly time series of enplaned passenger data, covering the period 2002 through 2007. The peak month was determined for each year and the percentage of annual enplanements that occurred in that month was calculated. The average of the peak-month percentages for the 6 years was used as the Peak Month factor in the forecast of monthly enplanement peaks. Deplaned passenger levels were assumed to be identical to enplaned passenger levels, both historically and in the future, for this analysis.

Daily peak passenger flows were calculated by dividing the peak monthly flows by 31 (days in the month).

Seat data from the *Official Airline Guide* were used to determine Peak Hour factors. Arriving and departing hourly seats from the month of June were used for each of the years 2006, 2007, and 2008, since June represents the peak month of activity at PTI exclusive of the skewing effect of traffic to and from the High Point International Home Furnishings Market in October. Summing the arriving and departing seats provided data for analysis of total passenger flows. In every case, the average number of seats was calculated for each hour of the day throughout the month, the peak hour identified, and the percentage of average daily seats that occurred in that peak hour calculated. The three-year average of those Peak Hour factors was used in the forecast of hourly passenger peaks. The forecast peak hour values were then calculated by multiplying the forecast passengers on an average day of the peak month by the appropriate Peak Hour factors.

The results of these analyses are presented in **Table 1-25**.

TABLE 1-25
PEAK PERIOD—PASSENGER ENPLANEMENTS
BASE CASE FORECAST
(CALENDAR YEARS)

	Actual		Forecast				
	2006	2007	2010	2015	2020	2025	2030
Total Passengers	**2,159,740**	**2,182,344**	**2,172,000**	**2,282,000**	**2,398,000**	**2,520,000**	**2,648,000**
Peak Month (9.7% of Total)	209,495	211,687	210,684	221,354	232,606	244,440	256,856
Average Day	6,758	6,829	6,796	7,140	7,503	7,885	8,286
Peak Hour	688	761	748	786	826	868	912
Enplaned Passengers	**1,079,870**	**1,091,172**	**1,086,000**	**1,150,100**	**1,199,000**	**1,260,000**	**1,324,000**
Peak Month (9.7% of Total)	104,747	105,844	105,342	111,560	116,303	122,220	128,428
Average Day	3,379	3,414	3,398	3,599	3,752	3,943	4,143
Peak Hour	459	413	426	430	471	495	520
Deplaned Passengers	**1,079,870**	**1,091,172**	**1,086,000**	**1,141,000**	**1,199,000**	**1,260,000**	**1,324,000**
Peak Month (9.7% of Total)	104,747	105,844	105,342	110,677	116,303	122,220	128,428
Average Day	3,379	3,414	3,398	3,570	3,752	3,943	4,143
Peak Hour	377	348	391	411	432	454	477
PEAK HOUR FACTORS							
Total Passengers	10.2%	11.1%	11.0%	11.0%	11.0%	11.0%	11.0%
Enplaned Passengers	13.6	12.1	12.5	12.5	12.5	12.5	12.5
Deplaned Passengers	11.2	10.2	11.5	11.5	11.5	11.5	11.5

Notes: Peak Month Factors are based on PTIA data for CY2002 through CY2007.
Peak Hour Factors are based on scheduled seats from the *Official Airline Guide*.
Peak Hour Factors projected for CY2009 through CY2030 represent the average of peak hour factors for the month of June in CY2006, 2007 and 2008.

1.10.2.2 Peaking of Flight Operations

Although FAA tracks and reports flight operations at PTI, the categorization of that data is different from the categorization used in this forecast. Consequently, PTAA data (reported to PTI by the carriers) were used for this peaking analysis.

Monthly flight data for the period 2002 through 2007 from DOT's Schedule T100 were used to analyze the monthly peaking pattern for passenger flights. The same methodology as for enplanements was employed to derive the Peak Month factor for flights in each year. The Peak Month factors for the 6 years were averaged, and the results were used in the forecast of monthly passenger flight peaks.

Average daily passenger flight operations were calculated by dividing the peak month operations by 31. The same approach described earlier, for passengers, was used to develop the Peak Hour factors, with the exception that scheduled flight operations, rather than seats, from *Official Airline Guide* were analyzed. Again, the average of the Peak Hour factors from the months of June 2006, 2007, and 2008 was used in the forecast of peak-hour passenger flight operations.

Calculations of peak-month and peak-hour passenger flight operations are presented in **Table 1-26**.

TABLE 1-26
PEAK PERIOD—PASSENGER FLIGHT OPERATIONS
BASE CASE FORECAST
(CALENDAR YEARS)

	Actual		Forecast				
	2006	**2007**	**2010**	**2015**	**2020**	**2025**	**2030**
Total Passenger Operations	**52,004**	**51,002**	**48,800**	**49,400**	**50,600**	**52,200**	**54,200**
Peak Month (9.5% of Total)	4,940	4,845	4,636	4,693	4,807	4,959	5,149
Average Day	159	156	150	151	155	160	166
Peak Hour	13	13	13	13	14	14	14
Peak Hour Factor	**8.2%**	**8.6%**	**8.7%**	**8.7%**	**8.7%**	**8.7%**	**8.7%**

Notes: Peak Month Factors are based on U.S. DOT, Schedule T100 data for CY2002 through CY2007.
Peak Hour Factors are based on scheduled flight departures from the *Official Airline Guide*.
Peak Hour Factors projected for CY2009 through CY2030 represent the average of peak hour factors for the month of June in CY2006, 2007 and 2008.

1.11 COMPARISON OF DRAFT FORECAST TO FAA-APO TERMINAL AREA FORECAST

Per guidance provided by the FAA APO-110, publication titled *Forecasting Aviation Activity by Airport*, dated July 2001, **Table 1-27** presents the Summary of Airport Planning Forecasts. **Table 1-28** presents a comparison of Airport Planning and the FAA-APO TAF Forecasts issued in December 2007, both of which follow the recommended format a presented in Appendix "B" and "C" of that document.

TABLE 1-27
SUMMARY OF AIRPORT PLANNING FORECASTS

A. Forecast Levels and Growth Rates

Specify base year: 2007

	2007	2008	2012	2017	2022		Average Annual Compound Grow	
	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 5yrs.	Base Yr. + 10yrs.	Base Yr. + 15yrs.	Base yr. to +1	Base yr. to +5	Base yr. to +10
Passenger Enplanements								
Air Carrier/Commuter	90,830	79,085	66,460	69,831	61,152	-12.9%	-6.1%	-2.6%
Commuter	986,500	1,010,245	1,041,214	1,094,024	1,161,885	2.4%	1.1%	1.0%
TOTAL	1,077,330	1,089,330	1,107,675	1,163,856	1,223,037	1.1%	0.6%	0.8%
Operations								
Itinerant								
Air carrier/Commuter/Cargo	64,422	64,636	77,746	93,373	95,048	0.3%	3.8%	3.8%
Air Taxi	268	276	294	299	308	3.0%	1.9%	1.1%
Total Commercial Operations	64,690	64,912	78,040	93,672	95,356	0.3%	3.8%	3.8%
General aviation	34,976	35,770	38,798	41,347	43,047	2.3%	2.1%	1.7%
Military	925	929	949	949	949	0.4%	0.5%	0.3%
Local								
General aviation	6,662	6,813	6,847	6,731	7,008	2.3%	0.5%	0.1%
Military	1	1	1	1	1	0.0%	0.0%	0.0%
TOTAL OPERATIONS	107,254	108,425	124,635	142,700	146,361	1.1%	3.0%	2.9%
Instrument Operations	213,656	216,262	245,133	290,670	323,267	1.2%	2.8%	3.1%
Peak Hour Operations	33	34	40	63	63	3.0%	3.9%	6.7%
Cargo/mail (enplaned+deplaned tons)*	27,082	27,922	31,548	36,751	42,182	3.1%	3.1%	3.1%
*Forecast Does Not Include FedEX Hub								
Based Aircraft								
Single Engine (Nonjet)	67	68	69	71	73	1.5%	0.6%	0.6%
Multi Engine (Nonjet)	29	29	30	31	32	0.0%	0.7%	0.7%
Jet Engine	22	23	27	32	39	4.5%	4.2%	3.8%
Helicopter	2	2	2	3	3	0.0%	0.0%	4.1%
Other	1	1	1	1	1	0.0%	0.0%	0.0%
TOTAL	121	123	129	138	148	1.7%	1.3%	1.3%

B. Operational Factors

	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 5yrs.	Base Yr. + 10yrs.	Base Yr. + 15yrs.
Average aircraft size (seats)					
Air carrier/Commuter	100-150	100-150	100-150	100-150	100-150
Commuter	70.0	70.0	70.0	70.0	70.0
Average enplaning load factor					
Air carrier/Commuter	70.9%	71.3%	72.0%	72.0%	72.0%
Commuter	70.9%	71.3%	72.0%	72.0%	72.0%
GA operations per based aircraft	344	346	354	348	338

Note: Show base plus one year if forecast was do If planning effort did not include all forecast yeai interpolate years as needed, using average annu compound growth rates.

NOTE: Right hand side of worksheet has embedded formulas for average annual compound growth rate calculations.

TABLE 1-28
COMPARISON OF AIRPORT PLANNING AND TAF FORECASTS

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2007	1,077,330	1,077,330	0%
Base yr. + 5yrs.	2012	1,107,675	1,161,579	-4.6%
Base yr. + 10yrs.	2017	1,163,856	1,330,669	-12.5%
Base yr. + 15yrs.	2022	1,223,037	1,526,361	-19.9%
Commercial Operations				
Base yr.	2007	64,690	65,339	-1.0%
Base yr. + 5yrs.	2012	78,040	76,675	1.8%
Base yr. + 10yrs.	2017	93,672	103,820	-9.8%
Base yr. + 15yrs.	2022	95,356	114,560	-16.8%
Total Operations				
Base yr.	2007	107,254	109,355	-1.9%
Base yr. + 5yrs.	2012	124,635	113,037	10.3%
Base yr. + 10yrs.	2017	142,700	141,878	0.6%
Base yr. + 15yrs.	2022	146,361	154,212	-5.1%

Notes: "Base Year" values reflect historical levels as reported for FY (October – September) 2007.
FAA-APO Terminal Area Forecast for PTI issued in December 2008.
TAF data is on a U.S. Government fiscal year basis (October through September).
AF/TAF (% Difference) column has embedded formulas.

Record of Transmittal to FAA

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URS

November 24, 2008

Mr. Rusty Nealis, Program Manager
Federal Aviation Administration
1701 Columbia Avenue
Campus Building – Ste.: 2-260
College Park, Georgia 30337

Reference: Transmittal of Draft Aviation Activity Forecast – Piedmont Triad International Airport

Dear Mr. Nealis:

Please find enclosed, a single printed and PDF copy of the draft Aviation Activity Forecast for the Piedmont Triad International Airport that has been developed as part of the Airport Master Plan Update.

To facilitate your review at the ADO, Regional or APO level, we have added two comparison tables that were developed following the guidance provided by the FAA's APO-110, publication titled *Forecasting Aviation Activity by Airport*, dated July 2001. To that end, Table 3-27 presents the Summary of Airport Planning Forecasts and Table 3-28 presents a comparison of Airport Planning and the FAA-APO TAF issued for GSO in December 2007. Both tables are presented in the tabular format as prescribed in Appendix "B" and "C" of the previously described FAA publication.

Please let us know if additional copies are required for your review.

Sincerely,
URS Corporation

Michael L. Thompson, AICP
Project Manager/Sr. Airport Planner

C: Mickie Elmore – GSO

Pawel Mankowski/Tampa/URSCorp
01/14/2009 02:10 PM

To Rusty.Nealis@faa.gov
cc Michael Thompson/Tampa/URSCorp@URSCORP
bcc
Subject Piedmont Triad International Airport (GSO) - Forecast

Hello Rusty,

As a courtesy, following the phone conversation with Mike Thompson, we are sending to you the two tables comparing the FAA TAF 2007 and TAF 2008 data. Table 3-28 provides updated TAF 2008 data and the airport forecast and respective percentage difference. The second table additionally provides the average annual compound growth rates between these two years.

Should you have any questions or comments, please feel free to contact us.

Best regards,

Pawel R. Mankowski
Airport Planner
URS Corporation
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GSO_Revised.pdf

INTERIM REVISED

TABLE 3-28
COMPARISON OF AIRPORT PLANNING AND TAF FORECASTS

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2007	1,027,570	1,077,330	-4.6%
Base yr. + 5yrs.	2012	1,107,675	1,161,579	-4.6%
Base yr. + 10yrs.	2017	1,163,856	1,330,669	-12.5%
Base yr. + 15yrs.	2022	1,223,037	1,526,361	-19.9%
Commercial Operations				
Base yr.	2007	64,690	65,339	-1.0%
Base yr. + 5yrs.	2012	78,040	76,675	1.8%
Base yr. + 10yrs.	2017	93,672	103,820	-9.8%
Base yr. + 15yrs.	2022	95,356	114,560	-16.8%
Total Operations				
Base yr.	2007	107,254	109,355	-1.9%
Base yr. + 5yrs.	2012	124,635	113,037	10.3%
Base yr. + 10yrs.	2017	142,700	141,878	0.6%
Base yr. + 15yrs.	2022	146,361	154,212	-5.1%

Notes: FAA-APO Terminal Area Forecast for GSO issued in December 2008.
TAF data is on a U.S. Government fiscal year basis (October through September).
AF/TAF (% Difference) column has embedded formulas.

PIEDMONT TRIAD INTERNATIONAL AIRPORT
Comparison of the 2007 TAF and 2008 TAF

Year	2007 TAF	AACGR	2008 TAF	AACGR	Change	Percent Change
Passenger Enplanement						
2007	1,027,570		1,077,330		49,760	4.8%
2008	1,055,620	2.73%	1,119,070	3.87%	63,450	6.0%
2012	1,176,058	2.74%	1,161,579	0.94%	-14,479	-1.2%
2017	1,347,027	2.75%	1,330,669	2.76%	-16,358	-1.2%
2022	1,543,967	2.77%	1,526,361	2.78%	-17,606	-1.1%
Commercial Operations						
2007	65,339		65,339		0	0.0%
2008	66,811	2.25%	64,553	-1.20%	-2,258	-3.4%
2012	84,316	5.99%	76,675	4.40%	-7,641	-9.1%
2017	110,957	5.64%	103,820	6.25%	-7,137	-6.4%
2022	122,915	2.07%	114,560	1.99%	-8,355	-6.8%
GA and Military Operations						
2007	44,016		44,016		0	0.0%
2008	44,295	0.63%	36,482	-17.12%	-7,813	-17.6%
2012	46,607	1.28%	36,362	-0.08%	-10,245	-22.0%
2017	48,959	0.99%	38,058	0.92%	-10,901	-22.3%
2022	50,942	0.80%	39,652	0.82%	-11,290	-22.2%
Total Operations						
2007	109,355		109,355		0	0.0%
2008	111,106	1.60%	101,035	-7.61%	-10,071	-9.1%
2012	130,923	4.19%	113,037	2.85%	-17,886	-13.7%
2017	159,916	4.08%	141,878	4.65%	-18,038	-11.3%
2022	173,857	1.69%	154,212	1.68%	-19,645	-11.3%

AACGR - Average Annual Compound Growth Rate

U.S. Department
of Transportation
**Federal Aviation
Administration**

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May 11, 2009

Mr. Edward A. Johnson
Piedmont Triad Airport Authority
Post Office Box 35445
Greensboro, North Carolina 27425

Dear Mr. Johnson:

We have reviewed the draft copy of *Chapter Three, Forecast of Aviation Activity* for the Piedmont Triad International Airport. The forecast data transmitted to us on January 14, 2009 was reviewed by the Federal Aviation Administration (FAA) Atlanta Airports District Office and is within 10% - 15% percent of the Terminal Area Forecast (TAF) as required. **Therefore, the forecast data, as submitted, is approved by the FAA through planning year 2022** and we concur with its use through the airport planning period. Any project development and/ or funding requests made beyond this planning period or as a result of significant deviations from the FAA approved forecast data may require additional information and FAA justification prior to proposed implementation.

Please call with any questions you may have regarding this matter.

Respectfully,

Rusty Nealis, PE
Program Manager

cc: Michael L. Thompson, AICP - URS

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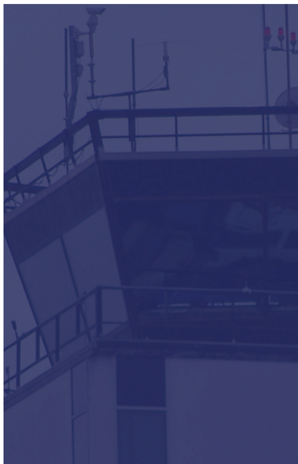

Airport Master Plan Update
and
Strategic Long-Range Visioning Plan

Prepared By:
URS

In Association With:
JACOBS CONSULTANCY

r m a
Ron Miller & Associates

Appendix F
Airport Capacity and Delay Data – Output

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

APPENDIX F

Airport Capacity and Delay Data - Output

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AIRPORT
AIRPORT CAPACITY AND DELAY DATA

C = Percent of airplanes over 12,500 lbs but not over 300,000 lbs . 82
D = Percent of airplanes over 300,000 lbs 0
Mix Index (C+3D) 82
Annual demand 107,000
Air carrier operations dominate

AIRPORT CAPACITY AND DELAY FOR LONG RANGE PLANNING

Runway-use Configuration (Sketch) No.	Capacity (Ops/Hour) VFR	IFR	ASV	Ratio of Annual Demand to ASV Ratio	Average Delay per Aircraft (Minutes) Low	High	Minutes of Annual Delay (000) Low	High
8	210	117	565,000	0.19	0.1	0.1	11	11
7	161	117	510,000	0.21	0.1	0.1	11	11
4	111	105	315,000	0.34	0.2	0.2	21	21
12	111	105	315,000	0.34	0.2	0.2	21	21
6	161	70	315,000	0.34	0.2	0.2	21	21
5	149	70	310,000	0.35	0.2	0.3	21	32
3	111	70	300,000	0.36	0.2	0.3	21	32
11	111	70	300,000	0.36	0.2	0.3	21	32
16	146	59	300,000	0.36	0.2	0.3	21	32
18	146	59	300,000	0.36	0.2	0.3	21	32
19	146	59	300,000	0.36	0.2	0.3	21	32
13	138	59	295,000	0.36	0.2	0.3	21	32
2	105	59	285,000	0.38	0.2	0.3	21	32
10	105	59	285,000	0.38	0.2	0.3	21	32
17	105	59	285,000	0.38	0.2	0.3	21	32
14	77	59	225,000	0.48	0.3	0.5	32	54
15	77	59	225,000	0.48	0.3	0.5	32	54
9	76	59	225,000	0.48	0.3	0.5	32	54
1	55	53	210,000	0.51	0.4	0.5	43	54

REFERENCE: Chapter 2 of AC 150/5060-5, Airport Capacity and Delay, including Changes 1 and 2.

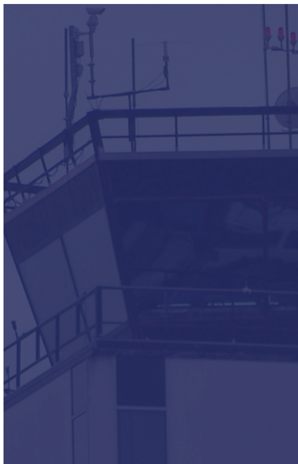
AIRPORT2
AIRPORT CAPACITY AND DELAY DATA

C = Percent of airplanes over 12,500 lbs but not over 300,000 lbs . 82
D = Percent of airplanes over 300,000 lbs 0
Mix Index (C+3D) 82
Annual demand 158,000
Air carrier operations dominate

AIRPORT CAPACITY AND DELAY FOR LONG RANGE PLANNING

Runway-use Configuration (Sketch) No.	Capacity (Ops/Hour) VFR	IFR	ASV	Ratio of Annual Demand to ASV Ratio	Average Delay per Aircraft (Minutes) Low	High	Minutes of Annual Delay (000) Low	High
8	210	117	565,000	0.28	0.1	0.2	16	32
7	161	117	510,000	0.31	0.2	0.2	32	32
4	111	105	315,000	0.50	0.4	0.5	63	79
12	111	105	315,000	0.50	0.4	0.5	63	79
6	161	70	315,000	0.50	0.4	0.5	63	79
5	149	70	310,000	0.51	0.4	0.5	63	79
3	111	70	300,000	0.53	0.4	0.6	63	95
11	111	70	300,000	0.53	0.4	0.6	63	95
16	146	59	300,000	0.53	0.4	0.6	63	95
18	146	59	300,000	0.53	0.4	0.6	63	95
19	146	59	300,000	0.53	0.4	0.6	63	95
13	138	59	295,000	0.54	0.4	0.6	63	95
2	105	59	285,000	0.55	0.4	0.6	63	95
10	105	59	285,000	0.55	0.4	0.6	63	95
17	105	59	285,000	0.55	0.4	0.6	63	95
14	77	59	225,000	0.70	0.7	1.0	111	158
15	77	59	225,000	0.70	0.7	1.0	111	158
9	76	59	225,000	0.70	0.7	1.0	111	158
1	55	53	210,000	0.75	0.8	1.2	126	190

REFERENCE: Chapter 2 of AC 150/5060-5, Airport Capacity and Delay, including Changes 1 and 2.



Airport Master Plan Update

and

Strategic Long-Range Visioning Plan

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Appendix G

Runway Takeoff and Landing Length Requirements

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport

Greensboro, North Carolina

APPENDIX G

Runway Takeoff and Landing Length Requirements

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RUNWAY LENGTH REQUIREMENTS FOR
COMMERCIAL AVIATION
JET AIRCRAFT

Piedmont Triad Int'l Airport - Specific Data	
Airport ID;	PTI
Field Elevation (MSL):	926.00
Temp ISO @ Sea Level:	59.00
Temp ISO @ Field EL.:	55.70
Temp - Hottest Day (F) :	87.60
Runway Length:	10,001
Runway 5R El:	899.50
Runway 23L El:	885.70
Elevation Difference:	13.80
Runway Slope	0.14%

						FAA TAKEOFF LENGTHS		FAA LANDING LENGTHS		
Make/Model	Number of Seats	Wing Span (Ft.)	MTOW (Lbs.)	Still Air Range (Mi.)	Approach Speed (Knots)	FAA Take-Off Field Length (Ft.)	FAA Takeoff Field Length (ft.) at RW Slope / Hottest Day Conditions[2&3.]	FAA Landing Field Length (Ft.)	FAA Landing Field Length (ft.) Wet Runway and Hottest Conditions[2&3.]	FAA Airport Reference Code (ARC)
Fokker 70	70-80	92.1	92,000	2,300	--	3,545	4,515	3,855	5,474	--
BAE Systems AVRO RJ70	70-85	86.4	95,000	1,800	--	3,610	4,595	3,550	5,041	--
BAE Systems BAE 146-100	70-85	86.4	84,000	1,200	--	3,650	4,645	3,500	4,970	--
BAE Systems AVRO RJ85	80-100	86.4	97,000	1,600	--	3,840	4,879	3,730	5,296	--
BAE Systems BAE 146-200	80-100	86.4	93,000	1,300	--	3,880	4,929	3,700	5,254	--
Airbus A318	107-132	111.1	149,910	3,210	--	4,200	5,324	--	--	--
Fokker 100	100-109	92.1	101,000	2,100	--	4,280	5,422	4,180	5,935	--
BAE Systems AVRO R100	95-112	86.4	101,500	1,500	--	4,330	5,484	3,970	5,637	--
Fairchild Donier Do 328-300	32-34	68.8	33,510	852	--	4,457	5,641	4,234	6,012	--
Fairchild Donier Do 328-310	32-34	68.8	34,524	1,036	--	4,530	5,731	4,284	6,083	--
BAE Systems BAE 146-300	95-112	86.4	97,500	1,300	--	4,670	5,904	3,950	5,608	--
Airbus A319-100	124-156	111.1	166,500	3,660	--	4,800	6,064	3,500	4,970	--
Embraer 170 STD	70-80	85.3	79,344	2,070	135	4,865	6,145	4,137	5,874	C-III
Embraer ERJ 140 ER	44	65.8	44,313	1,440	129	5,184	6,539	4,528	6,429	C-II
Embraer 170 LR	70-80	85.3	82,012	2,300	135	5,190	6,546	4,137	5,874	C-III
Embraer 190 STD	98-114	94.3	105,359	2,070	147	5,243	6,611	4,278	6,074	D-III
Bombardier CRJ700	70-78	76.3	72,750	1,700	--	5,271	6,646	5,087	7,223	--
Embraer 175 STD	78-88	85.3	82,673	1,960	135	5,289	6,668	4,242	6,023	C-III
Embraer ERJ 135 ER	36-37	65.8	41,888	1,500	134	5,381	6,782	4,462	6,335	C-II
Embraer 170 AR	70-80	85.3	85,098	2,416	135	5,394	6,798	4,180	5,935	C-III
Boeing 737-700W	126	117.4	154,500	3,380	130	5,500	6,929	4,690	6,659	C-III
Bombardier CRJ200 ER	50	69.6	51,000	1,474	--	5,511	6,942	4,847	6,882	--
Embraer 175 LR	78-88	85.3	85,517	2,190	135	5,656	7,121	4,242	6,023	C-III
Bombardier CRJ700 ER	70-78	76.3	75,000	2,050	--	5,657	7,123	5,087	7,223	--
Embraer 195 STD	108-122	94.3	107,564	1,730	155	5,715	7,194	4,154	5,898	D-III
Boeing 717-200	106	93.3	121,000	2,075	139	5,750	7,237	5,000	7,099	C-III
Embraer ERJ 135 LR	36-37	65.8	44,092	2,015	134	5,774	7,267	4,462	6,335	C-II
Bombardier CRJ700 Series 705	74-75	81.5	80,500	2,231	--	5,833	7,340	5,235	7,433	--
Bombardier CRJ900	86-90	81.5	80,500	1,501	--	5,833	7,340	5,235	7,433	--
Airbus A320-200	150-180	111.1	169,800	3,000	--	5,900	7,423	2,970	4,217	--
Embraer 190 LR	98-114	94.3	110,893	2,650	147	6,004	7,551	4,278	6,074	D-III
Bombardier CRJ200 LR	50	69.6	53,000	1,884	--	6,017	7,567	4,847	6,882	--
Embraer ERJ 140 LR	44	65.8	44,518	1,900	129	6,070	7,632	4,528	6,429	C-II
Bombardier CRJ700 LR	70-78	76.3	77,000	2,354	--	6,072	7,635	5,119	7,268	--
McDonnell Douglas MD-87	117	107.8	149,500	2,850	134	6,100	7,669	5,080	7,213	C-III
Bombardier CRJ700 Series 705 ER	74-75	81.5	82,500	2,344	--	6,105	7,676	5,235	7,433	--
Bombardier CRJ900 ER	86-90	81.5	82,500	1,792	--	6,105	7,676	5,235	7,433	--
McDonnell Douglas MD-81	143	107.8	140,000	1,540	134	6,150	7,731	5,080	7,213	C-III
Boeing 737-600	110	112.6	143,500	3,150	125	6,180	7,768	4,380	6,219	C-III
Airbus A321-100	185-220	111.1	183,000	3,030	--	6,300	7,916	2,960	4,203	--
Boeing 737-200	120	93.0	115,500	1,745	129	6,300	7,916	4,260	6,049	C-III
Bombardier CRJ700 Series 705 LR	74-75	81.5	84,500	2,344	--	6,379	8,014	5,321	7,555	--
Bombardier CRJ900 LR	86-90	81.5	84,500	2,076	--	6,379	8,014	5,321	7,555	--

						FAA TAKEOFF LENGTHS		FAA LANDING LENGTHS		
Make/Model	Number of Seats	Wing Span (Ft.)	MTOW (Lbs.)	Still Air Range (Mi.)	Approach Speed (Knots)	FAA Take-Off Field Length (Ft.)	FAA Takeoff Field Length (ft.) at RW Slope / Hottest Day Conditions[2&3.]	FAA Landing Field Length (Ft.)	FAA Landing Field Length (ft.) Wet Runway and Hottest Conditions[2&3.]	FAA Airport Reference Code (ARC)
Embraer 195 LR	108-122	94.3	111,973	2,190	155	6,388	8,025	4,151	5,894	D-III
McDonnell Douglas MD-90-30ER	153	107.8	166,000	2,680	138	6,400	8,040	1,445	2,052	C-III
McDonnell Douglas MD-90-30	153	107.8	156,000	2,175	138	6,500	8,163	4,565	6,482	C-III
Bombardier CRJ1000	100	85.9	90,500	1,716	--	6,549	8,224	5,756	8,173	--
McDonnell Douglas MD-88	143	107.8	160,000	2,510	144	6,650	8,349	5,400	7,667	D-III
Embraer ERJ 145 MP	48-50	65.8	46,275	1,380	136	6,660	8,361	4,593	6,521	C-II
Embraer 190 AR	98-114	94.3	114,199	2,760	147	6,745	8,466	4,341	6,164	D-III
Embraer ERJ 145 XR	48-50	68.8	53,131	2,300	134	6,791	8,523	4,692	6,662	C-II
Bombardier CRJ1000 ER	100	85.9	91,800	1,946	--	6,820	8,558	5,756	8,173	--
Boeing 737-700CW	--	117.4	171,000	3,040	130	6,840	8,583	4,840	6,872	C-III
Airbus A321-200	185-220	111.1	206,100	3,000	--	7,100	8,904	2,313	3,284	--
Embraer 195 AR	108-122	94.3	115,280	2,530	155	7,149	8,965	4,206	5,972	D-III
Boeing 767-200	181	156.1	335,000	4,785	135	7,200	9,028	4,850	6,886	C-IV
McDonnell Douglas MD-90-50	153	107.8	172,500	2,925	138	7,200	9,028	5,545	7,873	C-III
McDonnell Douglas DC-10 Series 15	247	155.3	455,000	3,630	138	7,270	9,114	5,940	8,434	C-IV
Boeing 737-800W	162	117.4	174,200	3,065	142	7,330	9,188	5,440	7,724	D-III
Embraer 175 AR	78-88	85.3	89,000	2,300	135	7,362	9,228	4,278	6,074	C-III
Airbus A300-600F	--	147.1	375,900	2,650	--	7,400	9,275	4,900	6,957	--
Airbus A310-300	220-280	144.0	361,600	5,200	--	7,400	9,275	4,950	7,028	--
McDonnell Douglas DC-9 Series 40	107	93.3	114,000	1,380	131	7,410	9,287	4,070	5,779	C-III
Embraer ERJ 145 LR	48-50	65.8	48,502	1,780	136	7,448	9,334	4,593	6,521	C-II
McDonnell Douglas MD-82	143	107.8	149,500	2,080	134	7,550	9,460	5,300	7,525	C-III
Airbus A300-600R	266	147.1	378,500	4,050	--	7,600	9,521	4,700	6,673	--
Boeing 737-300	126	94.8	138,500	2,260	135	7,600	9,521	4,700	6,673	C-III
Boeing 757-200	200	124.8	255,000	3,915	137	7,750	9,707	5,100	7,241	C-IV
Boeing 757-200F	0	124.8	255,000	3,140	137	7,750	9,707	4,950	7,028	C-IV
Boeing 737-900W	177	117.4	174,200	2,745	141	7,900	9,892	5,450	7,738	D-III
McDonnell Douglas MD-83	143	107.8	163,000	2,520	144	8,100	10,139	5,800	8,235	D-III
Boeing 767-200ER	181	156.1	395,000	6,590	142	8,150	10,201	5,300	7,525	D-IV
Boeing 737-200C	115	93.0	115,500	1,590	129	8,250	10,324	4,260	6,049	C-III
McDonnell Douglas DC-9 Series 50	122	93.3	121,000	1,150	135	8,300	10,386	4,230	6,006	C-III
Boeing 777-200	305	199.9	545,000	5,235	136	8,450	10,571	5,100	7,241	C-V
Boeing 767-300	218	156.1	351,000	4,285	140	8,600	10,756	4,900	6,957	C-IV
Boeing 757-300	243	124.8	273,000	3,400	143	8,650	10,818	5,700	8,093	D-IV
Airbus A330-200	253-380	197.8	513,670	7,650	--	8,700	10,880	5,723	8,126	--
Airbus A330-300	295-440	197.8	513,670	6,450	--	8,700	10,880	5,873	8,339	--
Boeing 737-500	110	94.8	115,500	2,390	128	8,700	10,880	4,500	6,389	C-III
Boeing 737-400	147	94.8	150,000	2,070	139	8,880	11,102	5,050	7,170	C-III
Boeing 767-300ER	218	156.1	412,000	5,975	145	8,900	11,127	5,500	7,809	D-IV
Boeing 737-200 Advanced	120	93.0	128,100	2,840	129	8,970	11,213	4,580	6,503	C-III
Boeing 737-200C Advanced	115	93.0	214,500	2,200	129	8,970	11,213	4,580	6,503	C-III
Boeing 737-900ERW	180	117.4	187,700	3,230	140	8,970	11,213	5,200	7,383	C-III
Boeing 747-400D	568	195.7	833,000	6,195	157	9,250	11,559	7,150	10,152	D-V
Boeing 727-200F	0	108.0	203,100	1,950	124	9,300	11,620	5,000	7,099	C-III
Boeing 767-300F	0	156.1	412,000	3,255	145	9,300	11,620	5,600	7,951	D-IV
Airbus A380-800	555	261.8	1,234,600	8,000	--	9,350	11,682	6,200	8,803	--
Airbus A380-800F	--	261.8	1,285,300	6,500	--	9,350	11,682	6,700	9,513	--
Boeing 777-200LR	301	212.6	766,000	9,450	140	9,700	12,114	5,250	7,454	C-V
McDonnell Douglas DC-10 Series 10	247	155.3	430,000	3,075	138	9,810	12,250	5,820	8,264	C-IV
Boeing 747-400	416	211.4	875,000	7,225	157	9,900	12,361	7,150	10,152	D-V
Boeing 747-400 Combi	266	211.4	875,000	6,695	157	9,900	12,361	6,800	9,655	D-V
Boeing 727-200 Advanced	134	108.0	190,000	2,240	124	10,000	12,485	5,300	7,525	C-III
Boeing 777-200ER	301	199.9	656,000	7,700	139	10,000	12,485	5,360	7,611	C-V
McDonnell Douglas MD-11 Combi	298	169.8	630,500	6,590	153	10,000	12,485	7,300	10,365	D-IV
McDonnell Douglas MD-11 Conv. Freigh.	298	169.8	630,500	6,620	158	10,000	12,485	7,600	10,791	D-IV
McDonnell Douglas MD-11 Freighter	0	169.8	630,500	3,820	158	10,000	12,485	7,600	10,791	D-IV
McDonnell Douglas MD-11 Passenger	298	169.8	630,500	7,070	153	10,000	12,485	7,100	10,081	D-IV
Airbus A340-200	261-380	197.8	606,270	9,210	--	10,043	12,538	6,115	8,683	--

						FAA TAKEOFF LENGTHS		FAA LANDING LENGTHS		
Make/Model	Number of Seats	Wing Span (Ft.)	MTOW (Lbs.)	Still Air Range (Mi.)	Approach Speed (Knots)	FAA Take-Off Field Length (Ft.)	FAA Takeoff Field Length (ft.) at RW Slope / Hottest Day Conditions[2&3.]	FAA Landing Field Length (Ft.)	FAA Landing Field Length (ft.) Wet Runway and Hottest Conditions[2&3.]	FAA Airport Reference Code (ARC)
Boeing 747-400F	0	211.4	875,000	4,455	158	10,200	12,732	7,200	10,223	D-V
McDonnell Douglas DC-10 Series 40	247	165.3	555,000	4,830	149	10,250	12,793	5,840	8,292	D-IV
McDonnell Douglas DC-10 Series 30	247	165.3	565,000	5,440	149	10,340	12,904	5,970	8,477	D-IV
Airbus A340-300	300-440	197.8	609,580	8,640	--	10,450	13,040	6,432	9,133	--
Airbus A340-500	329-475	208.2	811,300	9,960	--	10,450	13,040	6,601	9,373	--
Airbus A340-600	359-475	208.2	811,300	8,810	--	10,450	13,040	6,905	9,804	--
McDonnell Douglas DC-8 Series 63F	0	148.4	355,000	2,280	143	10,450	13,040	6,600	9,371	D-IV
Boeing 777-300ER	365	212.6	775,000	7,930	149	10,550	13,164	5,850	8,306	D-V
Boeing 747-800	467	224.6	970,000	8,000	150	10,700	13,349	6,800	9,655	D-VI
Boeing 747-800F	0	224.6	970,000	4,475	159	10,700	13,349	7,800	11,075	D-VI
McDonnell Douglas DC-10 Series 30CF	0	165.3	572,000	3,390	149	10,700	13,349	6,320	8,974	D-IV
McDonnell Douglas DC-10 Series 30F	0	165.3	580,000	3,190	149	10,700	13,349	6,320	8,974	D-IV
Boeing 767-400ER	245	170.4	450,000	5,625	150	10,800	13,472	6,200	8,803	D-IV
Boeing 777Freighter	365	212.6	766,000	4,885	149	10,800	13,472	5,850	8,306	D-V
Boeing 747-200B	366	195.7	833,000	6,560	150	10,900	13,596	6,150	8,732	D-V
Boeing 747-200B Combi	452	195.7	833,000	5,975	150	10,900	13,596	6,200	8,803	D-V
Boeing 747-200F	0	195.7	833,000	3,615	150	10,900	13,596	6,930	9,840	D-V
Boeing 747-300	400	195.7	833,000	6,330	142	10,900	13,596	6,250	8,874	D-V
Boeing 747-300 Combi	496	195.7	833,000	5,515	142	10,900	13,596	6,300	8,945	D-V
Boeing 747-400ER	416	211.4	910,000	7,670	157	10,900	13,596	7,150	10,152	D-V
Boeing 747-400BCF	39,679	211.4	870,000	4,280	158	10,950	13,658	--	--	D-V
Boeing 747-400ERF	0	211.4	910,000	4,980	157	10,950	13,658	7,150	10,152	D-V
Boeing 777-300	368	199.9	660,000	6,015	149	12,250	15,263	6,050	8,590	D-V
Boeing 747-200C	452	195.7	800,000	4,875	150	14,050	17,485	6,850	9,726	D-V

Source: Aviation Week & Space Technology, Aerospace Source Book, January 26, 2009.

1. International Standard Atmospheric Conditions, 0 ft. MSL Elevation, 59° F.

2. Runway length corrected for PTI.

3. Based on hottest day temperature, Hottest Month of 87.6º F.

Compiled by URS Corporation, March 2009.

RUNWAY LENGTH REQUIREMENTS FOR
BUSINESS AND GENERAL AVIATION
JET AIRCRAFT

Piedmont Triad Int'l Airport - Specific Data	
Airport ID;	PTI
Field Elevation (MSL):	926.00
Temp ISO @ Sea Level:	59.00
Temp ISO @ Field EL.:	55.70
Temp - Hottest Day (F) :	87.60
Runway Length:	10,001
Runway 5R El:	899.50
Runway 23L El:	885.70
Elevation Difference:	13.80
Runway Slope	0.14%

							FAA TAKEOFF LENGTHS		FAA LANDING LENGTHS		
Make/Model	Number of Seats	Wing Span (Ft.)	MTOW (Lbs.)	Max Range (w/ 45 Min. Reserves)	Approach Speed (MPH)	Approach Speed (Knots)	FAA Take-Off Field Length (Ft.)	FAA Takeoff Field Length (ft.) at RW Slope / Hottest Day Conditions[2&3.]	FAA Landing Field Length (Ft.)	FAA Landing Field Length (ft.) Wet Runway and Hottest Conditions[2&3.]	FAA Airport Reference Code (ARC)
Eclipse 400	4	36.0	4,780	1,439	91	79	2,045	2,663	2,100	2,982	A-I
Eclipse 500	6	37.9	6,034	1,496	--	90	2,345	3,033	2,250	3,195	A-I
Cessna 551 Citation II/SP	--	51.8	12,500	--	--	108	2,650	3,410	2,210	3,138	B-II
Cessna 501 Citation I/SP	--	46.8	10,600	--	--	112	2,830	3,632	2,350	3,337	B-I
Cessna 500 Citation	--	47.1	11,850	--	--	108	2,930	3,756	2,270	3,223	B-I
ADAMS Aircraft A700	8	44.0	--	1,100	100	87	2,950	3,780	2,078	2,950	A-I
Cessna 550 Citation II	--	51.7	13,300	--	--	108	2,990	3,830	2,270	3,223	B-II
Grob G 180 Jet	10	48.8	13,889	2,071	89	77	3,000	3,842	2,950	4,189	A-I
Cessna Citation Mustang	5	43.2	8,645	1,150	--	--	3,110	3,978	2,390	3,393	--
Cessna 525B Citation CJ3	8	53.3	13,870	1,875	124	108	3,180	4,064	2,770	3,933	B-II
Cessna 552/T-47A	--	52.2	16,300	--	--	107	3,180	4,064	2,800	3,976	B-II
Cessna 560 Citation V Ultra	8	52.2	16,300	--	--	108	3,180	4,064	--	--	B-II
Cessna 525 Citation CJ1	7	46.9	10,600	1,300	125	109	3,250	4,151	2,590	3,677	B-I
BEA Avro Business Jet	50	86.6	93,000	2,450	116	101	3,310	4,225	2,970	4,217	B-III
Cessna 525A Citation CJ2	9	49.8	12,500	1,613	128	111	3,360	4,286	2,980	4,231	B-II
Cessna 525C Citation CJ4	9	50.4	--	1,825	--	--	3,400	4,336	2,665	3,784	--
Empresa (Embraer) Phenom 100	7	40.4	--	1,450	103	90	3,400	4,336	3,000	4,260	A-I
Bombardier Learjet 31	9	43.1	16,500	--	--	124	3,410	4,348	2,870	4,075	C-I
Sabreliner 60	--	44.6	20,200	--	--	134	3,500	4,459	3,400	4,828	C-I
Cessna 560 Citation Encore	11	54.1	16,630	2,269	108	94	3,560	4,533	2,865	4,068	B-II
Cessna 560 Citation Excel	--	55.7	20,000	--	--	107	3,590	4,570	3,180	4,515	B-II
Cessna Citation XLS	11	55.8	20,200	2,126	--	--	3,590	4,570	3,180	4,515	--
Cessna 550 Citation Bravo	--	52.2	14,800	--	--	112	3,600	4,583	3,180	4,515	B-II
Cessna Citation Sovereign	12	63.3	30,300	2,847	127	110	3,640	4,632	2,650	3,763	B-II
Empresa (Embraer) Phenom 300	8	53.2	--	2,080	119	103	3,700	4,706	2,920	4,146	B-II
Hawker Beechcraft Premier 1 A	8	44.5	12,500	1,745	127	110	3,792	4,820	2,940	4,174	B-I
Hawker 400 XP	11	43.5	16,300	2,131	121	105	3,802	4,832	2,960	4,203	B-I
Bombardier Learjet 23	--	--	12,500	--	--	124	4,000	5,077	4,300	6,105	C-I
Empresa (Embraer) Legacy 450	9	66.4	--	3,450	--	--	4,000	5,077	--	--	--
BeechJet 400A/T/T-1A Jayhawk	--	43.5	16,100	--	--	121	4,169	5,285	2,960	4,203	C-I
Mitsubishi MU-300 Diamond	--	43.5	14,630	--	--	109	4,300	5,447	3,200	4,544	B-I
Bombardier Learjet 40	9	47.8	20,600	2,075	--	--	4,330	5,484	2,660	3,777	--
Bombardier Learjet 45	11	47.8	20,750	2,419	142	123	4,405	5,577	2,660	3,777	C-I
Sabreliner 75a/80	--	50.4	24,500	--	--	128	4,460	5,645	3,450	4,899	C-II
Dassault Falcon 10	6	42.9	18,740	1,880	--	104	4,500	5,694	--	--	B-I
Empresa (Embraer) Legacy 500	12	66.4	--	2,645	--	--	4,600	5,817	--	--	--
Bombardier Learjet 40 XR	9	47.8	21,250	2,099	--	--	4,680	5,916	2,660	3,777	--
Dassault Falcon 900	15	63.4	45,500	--	--	100	4,680	5,916	5,880	8,349	B-II
Hawker 750	14	51.3	27,000	2,832	127	110	4,696	5,936	2,344	3,328	B-II
Dassault Falcon 50	9	61.9	37,480	--	--	113	4,715	5,959	4,875	6,922	B-II
Dassault Falcon 2000 DX	19	63.4	41,000	3,740	--	--	4,800	6,064	2,615	3,713	--
Bombardier Challenger 300	11	63.8	39,000	3,568	--	--	4,810	6,077	2,600	3,692	--
Cessna 650 Citation VII	6	53.6	23,000	--	--	126	4,850	6,126	3,220	4,572	C-II
Dassault Falcon 50 EX	19	61.8	39,900	3,495	124	108	4,890	6,176	2,985	4,238	B-II
Dassault Falcon 900 DX	19	63.4	46,900	4,350	109	95	4,890	6,176	2,365	3,358	B-II
Sabreliner 40	--	44.5	18,650	--	--	120	4,900	6,188	2,950	4,189	B-I

							FAA TAKEOFF LENGTHS		FAA LANDING LENGTHS		
Make/Model	Number of Seats	Wing Span (Ft.)	MTOW (Lbs.)	Max Range (w/ 45 Min. Reserves)	Approach Speed (MPH)	Approach Speed (Knots)	FAA Take-Off Field Length (Ft.)	FAA Takeoff Field Length (ft.) at RW Slope / Hottest Day Conditions[2&3.]	FAA Landing Field Length (Ft.)	FAA Landing Field Length (ft.) Wet Runway and Hottest Conditions[2&3.]	FAA Airport Reference Code (ARC)
Hawker 900 XP	14	54.3	28,000	3,565	130	113	4,965	6,268	2,344	3,328	B-II
Bombardier Global 500	20	94.0	87,950	5,524	122	106	5,000	6,311	2,670	3,791	B-III
Bombardier Learjet 35/36	9	39.5	18,300	--	--	133	5,000	6,311	2,900	4,118	C-I
Hawker 800 XP	14	51.4	28,000	3,502	130	113	5,030	6,348	2,344	3,328	B-II
Hawker 850 XP	17	54.3	28,000	3,143	146	127	5,032	6,351	2,650	3,763	C-II
Bombardier Learjet 45 XR	11	47.8	21,750	2,284	--	--	5,040	6,361	2,660	3,777	--
Gulfstream G-350	19	77.8	71,300	4,150	167	145	5,050	6,373	3,260	4,629	D-II
Dassault Falcon 20	12	53.5	28,660	2,510	--	107	5,100	6,435	--	--	B-II
Gulfstream G-300	19	77.1	72,400	4,520	171	149	5,100	6,435	3,190	4,529	D-II
Cessna 750 Citation X	11	63.9	36,100	3,070	151	131	5,140	6,484	3,400	4,828	C-II
Cessna 650 Citation III/VI	9	53.3	21,000	--	--	131	5,150	6,497	2,900	4,118	C-II
Gulfstream G-500	19	93.5	85,500	7,100	156	136	5,150	6,497	2,770	3,933	C-III
Hawker 4000	12	61.8	39,500	4,119	128	111	5,169	6,520	2,995	4,253	B-II
Dassault Falcon 7 X	19	82.6	63,900	5,700	--	--	5,200	6,558	2,350	3,337	--
Dassault Falcon 900 EX	19	63.4	48,500	4,755	126	109	5,215	6,577	2,375	3,372	B-II
Raytheon/Hawker 125-1000	10	61.9	36,000	2,522	--	130	5,250	6,620	2,340	3,322	C-II
Gulfstream III	19	77.8	70,200	4,370	155	135	5,280	6,657	3,200	4,544	C-II
Gulfstream IV	19	77.8	73,600	5,078	161	140	5,280	6,657	3,200	4,544	C-II
Astra 1125	--	52.8	23,500	--	--	126	5,300	6,682	3,500	4,970	C-II
Bombardier Learjet 55	--	43.7	21,500	--	--	138	5,310	6,694	3,250	4,615	C-I
Bombardier Learjet 60	10	43.9	23,500	--	--	149	5,360	6,756	3,420	4,856	D-I
Dassault Falcon 2000 EX	19	63.4	41,500	4,130	129	112	5,375	6,774	2,640	3,748	B-II
Raytheon/Hawker 125-800	10	51.3	28,000	2,621		120	5,380	6,781	4,500	6,389	B-II
Gulfstream G-100	7	54.6	24,800	3,540	150	130	5,395	6,799	2,920	4,146	C-II
Dassault Falcon 2000	19	63.4	36,000	3,350	126	109	5,440	6,855	2,560	3,635	B-II
Bombardier Learjet 60 SE	11	43.8	23,750	2,872	160	139	5,450	6,867	3,420	4,856	C-I
Bombardier Learjet 60 XR	11	43.8	23,500	2,821	--	--	5,450	6,867	3,420	4,856	--
Empresa (Embraer) Legacy Shuttle	37	65.8	44,092	2,130	146	127	5,450	6,867	2,675	3,798	C-II
Gulfstream G-400	19	77.8	75,000	5,010	171	149	5,450	6,867	3,190	4,529	D-II
Gulfstream G-450	19	77.8	74,300	5,350	167	145	5,450	6,867	3,260	4,629	D-II
Gulfstream IV SP	19	77.8	75,000	5,078	171	149	5,450	6,867	3,190	4,529	D-II
Sabreliner 65	--	50.5	24,000	--	--	124	5,450	6,867	3,345	4,749	C-II
Galaxy 1126	--	58.2	34,850	--	--	140	5,500	6,929	3,500	4,970	C-II
Sabreliner 75	--	44.5	23,300	--	--	137	5,500	6,929	3,750	5,325	C-I
Empresa (Embraer) Legacy 600	16	68.9	21,995	3,720	145	126	5,551	6,992	2,684	3,811	C-II
Bombardier Challenger 600	19	61.8	41,250	3,375	--	125	5,700	7,176	2,775	3,940	C-II
Bombardier Challenger 601	19	61.8	41,250	4,155	--	125	5,700	7,176	2,775	3,940	C-II
Bombardier Challenger 601-3A/3R	19	61.8	41,250	4,440	--	125	5,700	7,176	2,775	3,940	C-II
Boeing Business Jet	63	117.4	171,000	7,135	132	115	5,790	7,287	2,313	3,284	B-III
Gulfstream G-150	8	55.6	26,150	3,540	--	--	5,830	7,336	3,450	4,899	--
Bombardier Challenger 604	22	64.3	47,600	4,692	136	118	5,840	7,348	2,776	3,942	B-II
Bombardier Challenger 605	15	64.3	48,200	4,655	--	--	5,840	7,348	2,777	3,943	--
Gulfstream G-550	19	93.5	91,400	8,130	156	136	5,910	7,435	2,770	3,933	C-III
Gulfstream G-650	19	99.6	100,000	8,400	151	131	6,000	7,546	3,000	4,260	C-III
Bombardier Challenger 870	70	76.2	77,500	--	--	--	6,072	7,635	3,071	4,360	--
Gulfstream G-200	10	58.1	35,600	4,170	162	141	6,080	7,645	3,280	4,657	D-II
Gulfstream V	19	98.5	90,900	7,879	156	136	6,110	7,682	2,760	3,919	C-III
Bombardier Global Express XRS	23	94.0	98,250	7,077	122	106	6,190	7,781	2,670	3,791	B-III
Bombardier Challenger 800	21	69.6	53,250	3,590	142	123	6,295	7,910	2,910	4,132	C-II
Airbus Corporate Jet Liner	126	111.8	166,450	6,100	101	88	6,300	7,916	2,500	3,550	A-III
Bombardier Global Express BD-700	--	94.0	96,000	--		126	6,300	7,916	2,700	3,834	C-III
Bombardier Challenger 850	17 to 50	69.6	53,250	--	--	--	6,305	7,923	2,910	4,132	--
Bombardier Challenger 890	90	81.6	85,000	--	--	--	6,379	8,014	3,193	4,534	--
Empresa (Embraer) Lineage 1000	19	94.3	120,150	4,630	128	111	6,660	8,361	2,250	3,195	B-III
Boeing Business Jet II	100	117.4	174,200	6,502	142	123	6,950	8,719	2,485	3,528	C-III
Boeing Business Jet III	--	117.5	187,700	5,483	140	122	7,900	9,892	5,450	7,738	C-III

Source: Aviation Week & Space Technology, Aerospace Source Book, January 26, 2009.

Note 1: Aircraft identified in **BLUE** color were taken from Regional Guidance Letter (RGL) 01-2, Airports Division, FAA Southern Region, Dated August 10, 2001. (Cancelled)

1. International Standard Atmospheric Conditions, 0 ft. MSL Elevation, 59° F.

2. Runway length corrected for PTI.

							FAA TAKEOFF LENGTHS		FAA LANDING LENGTHS		
Make/Model	**Number of Seats**	**Wing Span (Ft.)**	**MTOW (Lbs.)**	**Max Range (w/ 45 Min. Reserves)**	**Approach Speed (MPH)**	**Approach Speed (Knots)**	**FAA Take-Off Field Length (Ft.)**	**FAA Takeoff Field Length (ft.) at RW Slope / Hottest Day Conditions[2&3.]**	**FAA Landing Field Length (Ft.)**	**FAA Landing Field Length (ft.) Wet Runway and Hottest Conditions[2&3.]**	**FAA Airport Reference Code (ARC)**

[3.] Based on hottest day temperature, Hottest Month of 87.6º F.

Compiled by URS Corporation, March 2009.

RUNWAY LENGTH REQUIREMENTS FOR
COMMERCIAL, BUSINESS AND GENERAL AVIATION
PROPELLER AIRCRAFT

Piedmont Triad Int'l Airport - Specific Data	
Airport ID;	PTI
Field Elevation (MSL):	926.00
Temp ISO @ Sea Level:	59.00
Temp ISO @ Field EL.:	55.70
Temp - Hottest Day (F) :	87.60
Runway Length:	10,001
Runway 5R El:	899.50
Runway 23L El:	885.70
Elevation Difference:	13.80
Runway Slope	0.14%

							FAA TAKEOFF LENGTHS		FAA LANDING LENGTHS		
Make/Model	Number of Seats	Wing Span (Ft.)	MTOW (Lbs.)	Max Range (w/ 45 Min. Reserves)	Approach Speed (MPH)	Approach Speed (Knots)	FAA Take-Off Field Length (Ft.)	FAA Takeoff Field Length (ft.) at RW Slope / Hottest Day Conditions[2&3.]	FAA Landing Field Length (Ft.)	FAA Landing Field Length (ft.) Wet Runway and Hottest Conditions[2&3.]	FAA Airport Reference Code (ARC)
Sukhoi / Su-31	1	25.6	1,775	684	71	62	361	584	984	1,397	A-I
Sukhoi / Su-29	2	26.9	1,950	746	74	64	394	624	1,247	1,771	A-I
American Champion / Citabria Exp. 7GCBC	2	34.5	1,800	397	46	40	525	786	740	1,051	A-I
Lake Aircraft / Seawolf	6	38.3	3,650	1,450	80	70	600	879	750	1,065	A-I
Maule / M-7-235B	5	32.9	2,500	--	40	35	600	879	500	710	A-I
Maule / M-7-260	5	32.9	2,500	--	40	35	600	879	500	710	A-I
Maule / MT-7-235	5	32.9	2,500	--	40	35	600	879	500	710	A-I
Maule / MT-7-260	5	32.9	2,500	--	40	35	600	879	500	710	A-I
Maule / MX-7-180B	4	32.9	2,500	--	40	35	600	879	500	710	A-I
Maule Air / MT-7-420	5	32.9	2,500	--	50	43	600	879	500	710	A-I
American Champion / Citabria Adv. 7GCAA	2	33.5	1,750	418	52	45	630	916	850	1,207	A-I
Super Decathlon 8KCAB	2	32.0	1,800	500	53	46	833	1,166	1,023	1,453	A-II
Apex / DR 400/500 President	5	28.7	2,535	1,127	63	55	850	1,187	--	--	A-I
Lake Aircraft / LA-250	6	38.3	3,140	1,050	70	61	880	1,225	600	852	A-I
Lake Aircraft / LA-270	4	38.3	3,140	1,120	70	61	880	1,225	600	852	A-I
American Champion / Citabria Aurora 7ECA	2	33.5	1,750	586	52	45	890	1,237	885	1,257	A-I
American Champion / Super Decathlon 8KCAB	2	32.0	1,800	500	53	46	904	1,254	1,051	1,492	A-I
American Champion / Scout 8GCBC	2	36.2	2,150	806	49	43	1,025	1,404	1,235	1,754	A-I
Apex / DR 400/135CDI	4	28.7	2,163	545	54	47	1,034	1,415	1,262	1,792	A-I
Commander / 115	5	32.8	3,260	1,156	62	54	1,145	1,552	720	1,022	A-I
Maule / MX-7-180A	4	32.9	2,400	--	40	35	1,150	1,558	500	710	A-I
Maule / MXT-7-180A	4	32.9	2,400	--	45	39	1,150	1,558	500	710	A-I
Scout 8GCBC	2	36.2	2,150	806	49	43	1,245	1,675	1,055	1,498	A-II
Liberty / Liberty XL2	2	28.0	1,653	500	53	46	1,250	1,681	750	1,065	A-I
Pacific / CT/4E Airtrainer	3	26.0	2,600	598	32	28	1,300	1,743	1,200	1,704	A-I
Apex / DR 400/180R Remorqueur	4	28.7	2,205	490	54	47	1,312	1,758	1,542	2,189	A-I
Apex / DR 400/200R	4	28.7	2,425	469	56	49	1,312	1,758	1,360	1,931	A-I
Vulcanair / P68 Observer 2	6	39.4	4,630	2,965	57	50	1,312	1,758	1,968	2,794	A-I
Vulcanair / P68C	6	39.4	4,630	2,965	57	50	1,312	1,758	1,968	2,794	A-I
Vulcanair / P68C-TC/Observer	6	39.4	4,630	2,965	57	50	1,361	1,818	1,968	2,794	A-I
Cessna / Skylane T182T	4	36.0	3,112	867	47	41	1,385	1,848	1,350	1,917	A-I
Commander / 115TC	5	32.8	3,305	1,001	68	59	1,408	1,876	734	1,042	A-I
Beriev / Be-32K	2	55.8	16,094	1,106	106	92	1,411	1,880	2,723	3,866	B-II
Beriev / Be-32KM	17	55.8	16,094	1,210	106	92	1,411	1,880	2,723	3,866	B-II
Grob / G 115E.EG	--	32.8	2,183	506	60	52	1,510	2,002	1,500	2,130	A-I
Cessna / Skylane 182S	4	36.0	3,110	944	47	41	1,514	2,007	1,350	1,917	A-I
Pilatus / PC-6/82-H2	11	52.1	6,173	495	76	66	1,558	2,062	1,033	1,467	A-II
Eads / TB200 Tobago GT	5	32.8	2,535	733	84	73	1,560	2,064	1,474	2,093	A-I
Cirrus / SR22	4	38.3	3,400	791	67	58	1,574	2,081	2,325	3,301	A-I
Apex / DR 400/140B Dauphin	4	28.7	2,205	534	54	47	1,591	2,102	1,541	2,188	A-II
New Piper / PA-28 201 Arrow	4	35.4	2,758	880	61	53	1,600	2,113	1,520	2,158	A-I
Apex / Alpha 120T	2	27.3	1,984	640	52	45	1,608	2,123	1,575	2,236	A-II
New Piper / PA-28 181 Archer 3	4	35.5	2,558	522	52	45	1,608	2,123	1,400	1,988	A-I
Mooney / Acclaim	5	36.4	3,374	1,070	76	66	1,620	2,138	2,250	3,195	A-I
Mooney / Ovation2 GX	5	36.1	3,374	2,140	76	66	1,620	2,138	2,250	3,195	A-I
Mooney / Ovation3	5	36.1	3,374	2,140	76	66	1,620	2,138	2,250	3,195	A-I

Make/Model	Number of Seats	Wing Span (Ft.)	MTOW (Lbs.)	Max Range (w/ 45 Min. Reserves)	Approach Speed (MPH)	Approach Speed (Knots)	FAA Take-Off Field Length (Ft.)	FAA Takeoff Field Length (ft.) at RW Slope / Hottest Day Conditions[2&3.]	FAA Landing Field Length (Ft.)	FAA Landing Field Length (ft.) Wet Runway and Hottest Conditions[2&3.]	FAA Airport Reference Code (ARC)
New Piper / PA-28 161 Warrior 3	4	35.0	2,447	513	57	50	1,620	2,138	1,160	1,647	A-I
Cessna / Skyhawk 172S	4	36.1	2,558	596	61	53	1,630	2,151	1,335	1,896	A-I
Eads / TB10 Tobago GTampico GT	5	32.8	2,535	802	84	73	1,657	2,184	1,509	2,143	A-I
Cessna / Skyhawk 172R	4	36.1	2,457	668	59	51	1,685	2,218	1,295	1,839	A-I
Pacific Aerospace / PAC 750XL	10	42.0	7,500	670	67	58	1,695	2,231	1,928	2,738	A-I
New Piper / PA-34-220T Seneca 5	6	38.9	4,773	828	74	64	1,707	2,246	2,180	3,095	A-I
Cessna / Turbo Stationair T206H	6	36.0	3,617	654	54	47	1,740	2,286	1,395	1,981	A-I
Raytheon / Beech Bonanza F22 A	4	33.5	3,400	1,023	59	51	1,740	2,286	1,300	1,846	A-I
Apex / DR 400/120 Dauphin 2+2	4	28.7	1,984	575	51	44	1,755	2,305	1,510	2,144	A-II
Cessna / 441 Conquest II	8-10	49.3	9,850	2,193	--	99	1,785	2,342	1,095	1,555	B-II
Pacific Aerospace / Cresco	8	42.0	6,450	--	66	57	1,800	2,360	1,400	1,988	A-I
New Piper / PA-32R-301T Saratoga 2 TC	6	36.2	3,615	950	73	63	1,810	2,373	1,700	2,414	A-I
Komsomolsk-On-Amur / Be-103	2	41.7	4,193	665	--	--	1,837	2,406	1,312	1,863	--
Mooney / Eagle	4	36.1	3,300	207	67	58	1,850	2,422	2,100	2,982	A-I
Cessna / Stationair 206H	6	36.0	3,614	697	51	44	1,860	2,434	1,395	1,981	A-I
Eads / TB9 Tampico GT	4	32.8	2,337	650	77	67	1,870	2,447	1,378	1,957	A-I
Grob / G 140TP	4	33.8	3,968	1,320	66	57	1,870	2,447	2,200	3,124	A-I
Apex / Alpha 160A	2	27.4	1,964	529	53	46	1,883	2,463	1,444	2,050	A-II
Raytheon / Beech Bonanza G36	6	33.5	3,650	1,070	59	51	1,913	2,500	1,450	2,059	A-I
Apex / DR 400/160 Major	4	28.7	2,315	950	58	50	1,936	2,528	1,788	2,539	A-II
Mooney / Bravo	4	36.1	3,368	253	68	59	1,950	2,546	2,200	3,124	A-I
Eads / TB21 Trinidad GT Turbo	5	32.7	3,086	1,191	86	75	1,953	2,549	1,770	2,513	A-I
Cirrus / SR20	4	35.5	3,000	828	62	54	1,958	2,555	2,040	2,897	A-I
Apex / DR 400/180 Regent	4	28.7	2,425	903	59	51	2,000	2,607	1,739	2,469	A-II
New Piper / PA-32-301FT Piper 6X	6	36.2	3,615	804	68	59	2,028	2,642	1,822	2,587	A-I
Ibis / Ae 270	10	45.4	8,818	1,460	67	58	2,038	2,654	1,988	2,823	A-I
Cessna / 208 Caravan 675	14	52.1	8,000	1,490	70	61	2,053	2,673	1,665	2,364	A-II
Cessna / Caravan 675	14	52.1	8,000	1,229	86	75	2,055	2,675	1,625	2,307	A-II
Adam / A500	6	44.0	7,000	1,150	75	65	2,068	2,691	1,818	2,581	A-I
New Piper / PA-46-350P Mirage	6	43.0	4,358	1,345	67	58	2,090	2,718	1,968	2,794	A-I
Grob / Ranger G 160	8	42.7	7,275	2,500	91	79	2,130	2,768	2,130	3,024	A-I
Raytheon / Beech Bonanza B36 TC	6	37.8	3,850	1,345	55	48	2,130	2,768	1,692	2,402	A-I
Eads / TB20 Trinidad GT	5	32.7	3,086	1,277	86	75	2,150	2,793	1,820	2,584	A-I
Grob / G 120A	--	33.5	3,175	740	63	55	2,150	2,793	1,845	2,620	A-I
New Piper / PA-44-180 Seminole	4	38.6	3,816	770	63	55	2,200	2,854	1,490	2,116	A-I
Pilatus / PC-12	11	53.3	9,920	2,200	95	83	2,300	2,978	1,830	2,598	A-II
Raytheon / Beech Baron G58	6	37.8	5,500	1,798	86	75	2,300	2,978	2,450	3,479	A-I
Raytheon / Beech King Air C90GT	13	50.3	10,100	1,420	116	101	2,392	3,091	2,355	3,344	B-II
Cessna / 208B Grand Caravan	14	52.1	8,750	1,338	70	61	2,420	3,126	1,795	2,549	A-II
New Piper / PA-46 500 TP Meridian	6	43.0	5,134	1,000	92	80	2,438	3,148	2,110	2,996	A-I
Cessna / 208B Super Cargo Master	2	52.1	8,750	1,238	70	61	2,500	3,225	1,740	2,471	A-II
Raytheon / Beech King Air B200	16	54.5	12,500	2,212	119	103	2,579	3,322	2,845	4,040	B-II
Raytheon / Beech King Air B200 CSE	16	54.5	12,500	2,350	119	103	2,579	3,322	2,845	4,040	B-II
Raytheon / Beech King Air B200 SE	16	54.5	12,500	2,400	119	103	2,579	3,322	2,845	4,040	B-II
Reims / Cessna F 406 Caravan 2	14	49.5	9,925	1,990	90	78	2,635	3,391	2,212	3,141	A-II
Raytheon / Beech King Air B90 B	13	50.3	10,100	1,640	116	101	2,710	3,484	2,290	3,252	B-II
Bombardier / 415	10	93.9	43,850	1,508	--	--	2,750	3,533	2,210	3,138	--
Bombardier / 415MP	15	93.9	43,850	1,508			2,750	3,533	2,210	3,138	--
Eads, Socata / TBM 700C2	6	41.6	7,394	1,565	97	84	2,832	3,635	2,427	3,446	A-I
Piaggio / P.180 Avanti II	11	46.1	12,100	2,013	107	93	2,850	3,657	2,860	4,061	B-I
Bombardier Q200	39	85.0	36,300	1,065	96	83	3,280	4,188	2,560	3,635	A-III
Cessna / Caravan 675 Amphibian	14	52.1	8,360	1,039	89	77	3,280	4,188	2,045	2,904	A-II
Beriev / Be-200	3	107.5	83,555	1,780	124	108	3,281	4,189	4,265	6,056	B-III
Raytheon / Beech King Air 350	16	57.9	15,000	1,979	115	100	3,300	4,212	2,390	3,393	B-II
ATR 42-320 Basic	46-50	80.6	36,817	--	--	--	3,410	4,348	3,380	4,799	B-III
ATR 42-320 Increased Weight	46-50	80.6	37,257	--	--	--	3,504	4,464	3,380	4,799	B-III
ATR 42-300 Basic	46-50	80.6	36,817	--	--	--	3,575	4,552	3,380	4,799	B-III
ATR 42-300 Increased Weight	46-50	80.6	37,257	--	--	--	3,684	4,687	3,380	4,799	B-III
Raytheon / Beech 1900D Airliner	21	57.9	17,120	1,865	123	107	3,813	4,846	2,380	3,379	B-II
ATR 42-500	46-50	80.6	41,005	--	--	--	3,822	4,857	3,694	5,245	B-III
Bombardier Q300	56	90.0	43,000	970	101	88	3,865	4,910	3,415	4,849	A-III
ATR 42-400	46-50	80.6	39,462	--	--	--	3,904	4,958	3,688	5,236	B-III
ATR 72-210 Basic	64-72	88.9	47,400	--	--	--	3,970	5,040	3,440	4,884	B-III

Make/Model	Number of Seats	Wing Span (Ft.)	MTOW (Lbs.)	Max Range (w/ 45 Min. Reserves)	Approach Speed (MPH)	Approach Speed (Knots)	FAA Take-Off Field Length (Ft.)	FAA Takeoff Field Length (ft.) at RW Slope / Hottest Day Conditions[2&3.]	FAA Landing Field Length (Ft.)	FAA Landing Field Length (ft.) Wet Runway and Hottest Conditions[2&3.]	FAA Airport Reference Code (ARC)
ATR 72-500 Basic	64-74	88.9	48,500	--	--	--	4,012	5,091	3,438	4,882	B-III
Beriev / Be-200ES	4	107.5	90,389	1,780	--	--	4,167	5,283	4,265	6,056	A-III
ATR 72-210 Increased Weight	64-72	88.9	48,500	--	--	--	4,232	5,363	3,440	4,884	B-III
ATR 72-500 Increased Weight	64-74	88.9	50,265	--	--	--	4,232	5,363	3,500	4,970	B-III
ATR 72-200 Basic	64-72	88.9	47,400	--	--	--	4,625	5,848	3,970	5,637	B-III
BAE Systems / Jetstream 32 EP	12	52.0	16,204	644	134	116	4,700	5,941	3,700	5,254	B-II
ATR 72-200 Increased Weight	64-72	88.9	48,500	--	--	--	4,954	6,255	3,970	5,637	B-III

Source: Aviation Week & Space Technology, Aerospace Source Book, January 26, 2009.

1. International Standard Atmospheric Conditions, 0 ft. MSL Elevation, 59° F.

2. Runway length corrected for PTI.

3. Based on hottest day temperature, Hottest Month of 87.6º F.

Compiled by URS Corporation, March 2009.

MATHEMATICAL FORMULAS USED IN FAA RGL 01-2

TAKEOFF RUNWAY LENGTH ADJUSTMENT
(Given takeoff distance at sea level, mean max temperature, elevation & difference in Hi / Lo pts)

Altitude Correction (7% per 1,000' above sea level)
- E = Elevation
- L = Takeoff distance @ sea level
- L1 = Takeoff runway length corrected for altitude
- L1 = (.07 * E / 1000) * L + L

Temperature Correction (0.5% per degree above stnd temp in hottest month) (Stnd Temp adjusted to Sea Level)
- T1 = Adjusted Stnd Temp
- T = Mean Max High Temperature
- L2 = Takeoff RW length corrected for altitude & temperature
- T1 = 59 - (3.566 * E / 1000)
- L2 = (.005*(T - T1)) * L1 + L1

Effective Gradient Correction (10' for each 1' difference between Hi/Lo Pts.)
- G = Difference between Hi / Lo point in feet
- L3 = RW length corrected for alititude, temperature & gradient
- L3 = G * 10 + L2

LANDING RUNWAY LENGTH ADJUSTMENT
(given landing length in dry conditions at sea level, Mean Max Temperature, Elevation)

Altitude Correction (7% per 1,000' above sea level)
- E = Elevation
- L = Landing length @ sea level
- L1 = Length corrected for altitude
- L1 = (.07 * E / 1000) * L + L

Temperature Correction (0.5% per degree above stnd temp in hottest month) (Stnd Temp adjusted to Sea Level)
- T1 = Adjusted Stnd Temp
- T = Mean Max High Temperature
- L2 = Length corrected for altitude & temperature
- T1 = 59 - (3.566 * E / 1000)
- L2 = (.005*(T - T1)) * L1 + L1

Wet Pavement Correction (landing length only) (15% increase in length based on dry conditions)
- L3 = Landing RW length corrected for altitude, temperature & wet cond.
- L3 = 1.15 * L2

Takeoff Runway Length at Sea Level and 59 Degrees Fahrenheit

1. Enter the takeoff distance at sea level in feet from Table 1.	L =	
Altitude		
2. Enter Airport Altitude in feet above sea level	E =	
	L1 =	0
Temperature		
3. Enter Mean Max Daily Temp in degrees F	T =	
	T1=	59.00
	L2 =	0
Gradient Adjustment		
4. Enter Maximum Difference in RW Elevation in feet		
Takeoff Runway Length Adjusted for Temp, Elevation & Gradient	L3 =	0

Landing Runway Length in Dry Conditions at Sea Level and 59 Degrees Fahrenheit

1. Enter the landing runway length at sea level in feet	L =	
Altitude		
2. Enter Airport Altitude in feet above sea level	E =	
	L1 =	0
Temperature		
3. Enter Mean Max Daily Temp in degrees F	T =	
	T1=	59.00
	L2 =	0
Landing Runway Length Adjusted for Temp, Elev. & Wet Cond.	L3 =	0

Source: Regional Guidance Letter (RGL) 01-2, Airports Division, FAA Southern Region, Dated August 10, 2001. (Cancelled)

Airport Master Plan Update
and
Strategic Long-Range Visioning Plan

Prepared By:
URS

In Association With:
JACOBS CONSULTANCY
rma
Ron Miller & Associates

Appendix H
Strategic Long-Term Planning Considerations Report

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

APPENDIX H

Strategic Long-Term Planning Considerations Report

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Strategic Long-Term Planning Considerations to Supplement The Piedmont Triad International Airport Master Plan Update

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Patrick Howell, PhD.

Aerotropolis Business Concepts LLC

July 2009

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Strategic Long-Term Planning Considerations
to Supplement
The Piedmont Triad International Airport Master Plan Update

Introduction and Overview

Airport master plans aid airport operators to prepare for and help meet, in cooperation with airlines and other service providers, air service development needs for passenger air travel and air cargo transport service. Such needs are on-going and often require large capital investments in runways and facilities that are amortized over payback periods reaching over several decades. Aviation activity forecasts of expected demand therefore form the basis for airport master plans, including the related capital improvement plans. Typical aviation activity forecasts provide the foundation for air facility and on-airport land use planning over a five-, ten- and 20-year period. But land use planning and acquisition of land outside of airport boundaries for eventual airport expansion require a longer planning horizon. The nexus between the more immediate (10- to 20-year) air transport demand and the need for longer term planning for eventual airport expansion and land acquisition is our focus here.

The Changing Forecasting Context

Aviation activity forecasts for specific airports, in this case Piedmont Triad International Airport, are generally based on expectations for the aggregate demand for air transport services and an estimation of the regional market share of these services. The best source of information for these forecasts is, unavoidably, past trends in air service.

Forecasts based on past trends may perform adequately to support airport master plans in most situations during normal times. These are not normal times for air transport, however. Nor are these normal times for Piedmont Triad International Airport. The airport is facing a future that – by any account – will be markedly different from its past as a result of the opening of the FedEx mid-Atlantic hub. Specific events and trends affecting both national demand and the new regional role of Piedmont Triad International Airport suggest that it is prudent to look beyond traditional forecasts when planning for airport expansion and predicting future airport uses. We discuss factors affecting national demand because estimates of national demand often provide one basis for forecasts of regional demand, and we discuss the factors affecting the regional role because that provides another basis for forecasts of regional demand.

Most broadly, a national shift in the relationship between production, transportation, and consumption is underway. Goods are produced further from their point of consumption than in the past. Long supply and distribution chains imply that consumers can access least-cost producers and producers can tap increased economies of scale. Further, with individual professional careers increasingly tied to multi-establishment firms, families are increasingly far-flung. Vacations are now more likely to be spent at a distant resort than, for example, at a nearby mountainside. These geographic shifts are predicated on and, in turn, create additional demand for air transport.

The implication for forecasting models is that the traditional relationship between overall revenue passenger miles and GDP or between revenue freight tons and GDP is changing. The rapid shift of U.S. consumption to rely on Asian, especially Chinese, suppliers over the past decade has generated a disproportionate increase in the demand for cargo air transport services and, to a lesser extent, passenger services. This shift may not yet be absorbed by standard forecasting models. What was once a constant in aviation activity forecasting models now needs to be a variable. That is, there is an increased, and the authors believe, a growing reliance on air transport in contemporary supply chains that has downstream effects on business and leisure passenger travel.

As a consequence, the relationship between overall revenue passenger miles and fuel cost and between revenue freight tons and fuel cost is also changing. To be sure, fuel costs have and will continue to have an important impact on the cost of – and therefore demand for – air transport services, but the magnitude of the impact over the medium- and long-term is likely changing. The authors expect the strength of the relationship between fuel costs and demand for air transportation to continue to change.

Watershed Changes in the Piedmont Triad

With respect to the Piedmont Triad Region, several major events promise to change the role of the region in the national economy and its centrality in the national system of air transport. Therefore, the PTI share of national air transport demand is likely to increase. With such watershed changes, the corresponding increase in the PTI share of the national air transportation market cannot be predicted solely on the basis of past trends. The airport's new infrastructure represented by the recently opened FedEx mid-Atlantic hub and the airport's increased capacity created by the construction of a 9,000-foot parallel runway must be taken into account.

The decision of FedEx to locate a regional sort hub at PTI will be the most immediate factor changing the airport's regional role within the nation's air transport system. Expectations for the impact of the FedEx facility itself have been incorporated into the PTI Master Plan Update. FedEx's location decision, though operation is currently delayed and scaled back due to the current recession, will unavoidably change the region's long-term economic role. The FedEx presence will make the Piedmont Triad region a more attractive location for not only air-intensive industries but other sectors as well. The indirect impact (catalytic effect) of the FedEx facility on air service demand through its influence on additional firm location and expansion decisions may be underestimated in current forecasts. The Honda Aircraft Company investments and related restructuring of the Piedmont Triad economy will also have direct and indirect effects on the demand for air transport services.

These national and regional changes could not be adequately addressed in the traditional approach to aviation activity forecasts at PTI, but nevertheless deserve to be taken into consideration when undertaking strategic airport master planning.

There are additional trends that were intentionally not captured by the forecasts that the Piedmont Triad Airport Authority should consider. With respect to *non-FedEx cargo*, the discussion of past trends notes a decline in activity at PTI over the past several years. There may be a possibility for PTI to reverse this recent trend and capture a stable or growing share of non-integrated cargo. Many of the busiest cargo airports are facing sometimes severe capacity constraints due to congested airspace, limited take-off and landing slots, and restricted cargo processing space. Increasing non-integrated cargo at PTI will involve market influence related to inherent economies of scale at established air cargo centers and creating similar economies at PTI. The opportunities for non-integrated cargo growth and the corresponding challenges should be contemplated or considered as a possibility in connection with this aspect of the forecast. For example, if congestion at busy airports leads to a shift to PTI, the volume of cargo processed by PTI may take a substantial jump and grow at an above-average annual rate.

In addition, the *sectoral mix of manufacturing* in the Piedmont Triad is changing. The industries which have come to be seen as "traditional" for the region, furniture, textiles, and tobacco, have been shedding employment and will likely continue to do so. At the same time, new industries have been gaining ground. "Mid-tech" industries, the production segment of high technology value chains, have been gaining ground as has aerospace. These latter industries have different shipment patterns from the traditional industries.

Much of the anticipated economic growth will have different air passenger demands as well. New goods-producing establishments will often be branches of large multi-establishment firms that rely heavily on passenger air transportation to facilitate management coordination. Almost all of them will have geographically extensive supply and distribution trends, requiring air travel for negotiation and synchronization.

Summary

There are two conclusions that can be drawn from this brief overview of traditional and non-traditional approach to aviation activity forecasts. First, traditional aviation activity forecasts cannot take into account single events that may have significant impacts on airport usage and are limited in their time frame and reach. Past experience can only be projected so far into the future with any expectation of accuracy.

Second, and more immediately, any possible catalytic impact of the FedEx mid-Atlantic sort hub at PTI on the demand for air traffic caused by firms attracted to the area is beyond the typical scope of the FAA-approved aviation activity forecasting. Let us look more closely at these effects.

The Potential Catalytic Effects Associated With the FedEx Sort Hub at PTI

The importance of cargo transportation is in its impact on production, trade, and ultimately consumption – and thus human welfare. "Transport is demanded to bridge the consumer-producer gaps … A catalyst – as those who studied chemistry will remember – is a component which enables some other process to be carried on more quickly and efficiently. Transport in many ways acts as a *catalyst*, raising the level of economic activity in an economy" (emphasis added).[1] The additional transportation capacity that the FedEx region is bringing to the Piedmont Triad Region will result in additional economic activity.

The additional activities made possible by transport – a mix of productivity enhancements and regional redistribution – are sometimes grouped together under the term, "catalytic effects," and are central in understanding the economic impact of air freight activities on regions and the nation. One broad definition of economic catalytic effects is "The net economic effects (e.g., on employment, incomes, government finances, etc.) resulting from the contribution of air transport to tourism and trade (demand-side effects) and the long run contribution to productivity and GDP of growth in air transport usage (the supply-side performance of the economy)."[2] More germane to PTI, catalytic effects represent the revenues,

[1] Benson, Don, Ralph Bugg, and Geoffrey Whitehead. 1994. *Transport and Logistics*. New York: Woodhead-Faulkner, page 17.
[2] Cooper, Adrian and Phil Smith. 2005. *The Economic Catalytic Effects of Air Transport in Europe*. EUROCONTROL Experimental Centre, Bretigny sur Orge, EEC/SEE/2005/004, page 12.

employment and earnings generated by aviation-oriented firms locating in the airport area because of the accessibility the airport provides to their suppliers, enterprise partners, or customers. Since they are aviation-oriented to begin with (and hence attracted to the hub), firms locating in the PTI region as a consequence of FedEx' mid-Atlantic hub will generate additional cargo and passengers for the airport down the road.

Decisions on transport infrastructure investments are often made on the basis of their anticipated benefit to existing traffic and existing users. The siting of a transportation facility can have an effect on the subsequent location decisions of firms, however. These add to the traffic processed by the facility and can lead to an increased concentration of employment near the transport infrastructure. The operation of the FedEx mid-Atlantic sort facility will likely have such an effect on firms' location decisions, and, as we just noted, future cargo and passenger flows above that predicted by models that exclude such catalytic effects.

To gain a better understanding of their importance, we will discuss two types of direct cargo catalytic effects and the resulting induced passenger catalytic effects. The direct cargo catalytic effects can be functional, symbolic, or, more probably, a mix of the two. *Functional catalytic effects* are those that have a significant effect on the operational costs and effectiveness of firms. Certain types of firms are more heavily dependent upon air transport than others and thus will be more likely to be influenced by the advantages offered. The more extensive the FedEx route structure and the more frequent the service, the greater the sort hub's attraction to shippers and consignees will be.

The strength of these effects will be difficult to judge until FedEx begins operations and establishes a track record. There may be a significant lag between the opening of the sort facility and its effects on location decisions. When the economy as a whole is not expanding (or, as at present, contracting), firms are less likely to make major new capital investments, such as investments in new facilities – even if a more recent vintage of equipment and operating procedures would be more efficient in the long run.

The strength of the functional catalytic effect will depend upon the cost savings and efficiency enhancements made possible by the transport infrastructure, the FedEx hub. To the extent that the FedEx facility services an area that can be reached via overnight trucking, its attractive power will be more limited. In that case, shippers would be more likely to opt for lower cost surface transport. Given the cost advantages, many e-commerce fulfillment centers, like the nearby Dell plant, use surface transportation whenever possible and choose air shipments primarily for emergencies.

If and to the extent that FedEx decides to include long distance routes to destinations such as Chicago, the West Coast, and international destinations – Europe and Latin America or straight through service to Asia, the influence on the location decisions of firms that might use the services will be stronger. Firms making location decisions now are likely to discount those possibilities in their decision-making heavily until FedEx establishes a trustworthy track record in this location.

Adding busy long distance routes to the sort hub's portfolio, if that occurs, will be an important factor affecting firm location decisions. Right now, New York's Kennedy Airport is one of the nation's largest ports. Newark Airport is also an important international port as well as a key FedEx facility. While New York offers a very attractive nearby market, the limited cargo-processing space on the airports, the congestion, and the land and labor costs discourage its use for goods with a non-New

York destination or origin. The Piedmont Triad Region suffers from none of those disadvantages but is nevertheless excellently situated to serve much of the eastern portion of the U.S.

Although international air cargo is now heavily concentrated in the New York area, like the Atlantic Ocean sea trade, air trade may move away from the crowded largest metro areas. New York may become an air cargo "spoke" rather than "gateway hub," if a decision is made to route international FedEx shipments to and from the East Coast through PTI. Possibly not even FedEx officials can make a realistic assessment of this prospect at this moment. Prospective users will need to watch and wait and much of the potential effects on business location decisions will follow the establishment of FedEx route patterns.

In addition to the effects on firm production (or cost) functions, the FedEx sort facility can have *symbolic catalytic effects*. These are a result of the increased visibility that the Piedmont Triad receives simply as a result of the FedEx decision. The more visible and the larger a firm facility investment is – and FedEx is very visible – the stronger the symbolic catalytic effect will be.

The FedEx decision implies an underlying desirability of a Piedmont Triad location that may not be immediately apparent from commonly available information sources. A large competent firm such as FedEx would be expected to complete full due diligence supporting an investment decision as large as the sorting hub. That means that FedEx would have carefully considered the region's labor force availability and quality as well as the business climate in general and come to a favorable decision. Other firms which are considering investing in a new facility will not necessarily decide upon a site located in the Piedmont Triad region but, seeing the

FedEx decision, might include the region on their "short list" more readily than they otherwise would.

Despite the decreasing manufacturing employment, the Piedmont Triad region is a region in transition, not decline. The growth of employment in new sectors, often the production phase of high technology industries, does not yet outweigh the losses in the older sectors. The Piedmont Triad region has many of the attributes that goods-processing sectors value in making location decisions – whether or not those sectors rely on air shipments for their normal operations. The Piedmont Triad has a strong blue collar labor force with a proven work and skill development track record. The costs are reasonable and the region has a developing record of training workers to fit company skill needs.

It is difficult to rigorously apportion new firms locating in the region into groups that are reacting to the FedEx decision and those that are locating here without being influenced by FedEx's presence in the Piedmont Triad. The symbolic catalytic effects are those that might have occurred anyway. Nevertheless, spokespersons for several firms have attributed their company's location decision, in part, to the FedEx decision. Few firms are seeking new sites right now but as the overall economy improves, we should see the region's market share (or capture rate) of new facility sitings increase.

The FedEx facility is not the only attractor at Piedmont Triad International. The Honda Aircraft Company investments continue to deepen. Honda Aircraft Company's presence is likely to influence the decisions of other firms in the aircraft manufacturing sector even if they have no direct relationship with the firm. Honda and the region's labor force are likely to have an even stronger pull once the Spirit facility in Kinston begins operations in earnest. While supply chains in the aircraft manufacturing industry are generally long and the Spirit facility may not attract suppliers *per se*, firms considering a new facility will likely find the Piedmont Triad labor market deeper and more skilled than that of Eastern North Carolina.

While it is possible to analytically separate operational from symbolic effects, it may be difficult to do so empirically. For many firms, both influence mechanisms will operate to affect their location and subsequent production decisions.

New goods producing facilities will not only create new regional employment and new cargo shipping demand but will create *induced catalytic effects* by generating new passenger demand. Many of the facilities will be parts of far-flung multi-establishment firms. These types of establishments generally use air travel at a high rate to facilitate organizational coordination. Because managers and skilled staff personnel often need to relocate for the new facility, their placement tends to generate air travel to visit friends and family. Because those same personnel are highly paid, their employment spawns additional vacation travel.

Right now, the operation of catalytic effects is nearly frozen. FedEx has put expansion plans on hold. Moreover, the depressed state of the economy has firms looking to consolidate and close facilities, not open new facilities. At the moment, there is little basis for predicting the magnitude of the catalytic effects at PTI which generally operate over the medium to long term. Nevertheless, these catalytic effects, reflecting PTI's future enhanced centrality in the air transport network and therefore new role the national economy, will begin to function in earnest once the FedEx facility is operating at capacity and the global economy recovers.

On-Airport Commercial and Industrial Development

Piedmont Triad International Airport, together with the FedEx sort hub, has the potential to become the "Central Business District" of a vibrant industrial region boasting an economy based on high technology production and rapid-response logistics. Two previous reports outlined a general vision for a Piedmont Triad Region Aerotropolis, specified the functional needs for the aerotropolis, and recommended needed steps towards implementation.[3] We will not repeat the substance of those reports, much of which goes beyond the mandate of the Master Plan Update, though pertinent material will be incorporated into the Update. In addition, we will highlight some of the most promising prospects for on-airport commercial and industrial development. We are chiefly concerned with those that have the greatest potential to leverage the Piedmont Triad Airport Authority's and the Federal Aviation Authority's investments in aviation infrastructure. In addition, proposed surface transportation facilities, including relocated highways, access roads, a potential PART inter-modal rail and bus terminal, and an inland port, while not all on airport grounds are all planned for the immediate area. We will cover these and potential Aerotropolis commercial functions on land near the airport. All commercial and industrial development at PTI must conform to the Authority's statutory authorization, which limits such development to that "related to, developed for, or facilitates further airborne commerce and cargo and passenger traffic." NCGS 63-53(6)

Selected Present PTI Land Uses

As illustrated in Exhibit 1, Piedmont Triad International Airport already houses a significant amount of on-airport fixed base operator employment and aircraft

[3] "Leveraging Piedmont Triad International Airport and other Regional Assets for Piedmont Triad Regional Competitive Advantage," June 2007 and "The Piedmont Triad Aerotropolis Plan: From Guidelines to Implementation," September 2008.

maintenance employment. As of 2008, fifty companies with nearly 4,500 employees had already located on the PTI campus, the largest being TIMCO, an MRO complex. These were discussed in prior reports. These can be expected to expand incrementally as general aviation expands. With the forthcoming operations of FedEx's and Honda Aircraft Company's facilities, total PTI campus employment could reach 6,000 by 2012. The airport also has retail, restaurant, and hotel facilities. These may expand as passenger traffic at PTI increases.

Possible Future Commercial and Industrial Development

At the moment, the largest potential for on-airport development is probably the *aircraft manufacturing industry*.[4] Honda is already committed and has deepened its investment in its Piedmont Triad International Airport location with a headquarters, research and development facility, and major assembly plant. As noted above, the Sprit airframe assembly plant to be established in Kinston, could well add to the demand for on-airport industrial space at PTI, given the Triad's labor market depth with the potential to support a significant aircraft parts manufacturing sector. Should any firm consider establishing a new facility in North Carolina to serve the Spirit Kinston facility, the Piedmont Triad region would be an attractive possibility. North Carolina's emerging aerospace clusters are synergistic and PTI should benefit as a result of this emergence.

Given the proposed overnight route structure developed by FedEx, there is also a good possibility for a PTI *cool chain facility* (*perishables center*). These do not necessarily need to be located on the airport grounds but most existing facilities have been well-served by such locations. The possibility for a cool chain facility is

[4] Kenan Institute of Engineering, Technology, and Science. 2008. "Ready to Soar: Aviation and Aerospace in North Carolina." North Carolina State University.

discussed more extensively in a prior report.[5] We review that discussion here because it would be a new activity for PTI and because it would very directly leverage the recent infrastructure investments, the FedEx operation, and other regional assets.

The Piedmont Triad Region may have the potential to play two complementary roles in the transport of sensitive perishables. The first is as an inward transfer point for food and fresh-cut flowers to consumer markets to the Piedmont Triad area. The second is as an outward transfer point for the pharmaceutical and biotechnology industries which are increasingly making their homes in North Carolina.

The Piedmont Triad Aerotropolis is excellently placed to receive fresh-cut flowers from Europe and South America, the two largest sources of flowers for the U.S. It is also equally well-placed to receive shipments of fresh fruits and vegetables from South America, which is a growing source of U.S. produce. The U.S. now imports approximately one-third of its produce by air. Produce loses much of its value after harvest if temperatures are not carefully controlled to prevent deterioration. With the appropriate investments in facilities, the Piedmont Triad could be well-positioned should trade increase.

Biotechnology and pharmaceuticals continue to be growth industries in North Carolina from the laboratories of the Research Triangle Park to the emerging center in Kannapolis to the production plants sprinkled around the periphery of the Triangle region. These industries are likely to continue to grow in employment and output. They are, in general, reliant on air transport but some specialized products need to be kept within very well-controlled temperature bounds.

[5] "The Piedmont Triad Aerotropolis Plan: From Guidelines to Implementation," September 2008.

An estimated 2.6 million tons of perishables was air freighted in 2008. Perishable commodities amount to nearly 8 percent of all air cargo shipped. Time, temperature and treatment are crucial and the integrity of the cold chain must be maintained in order to prevent irreversible damage. Aside from the cool chain facilities at Stockton, Houston and Atlanta have perishables centers with 60,000 and 42,000 square feet of climate controlled space, respectively. New Orleans has a 15,000 square foot facility. Overseas, Amsterdam, Brisbane, Dubai, and Frankfurt have, or are building, substantial facilities.

PTI is well-placed to act as a gateway serving the East Coast for perishables from Latin America and Europe. Miami, now the busiest Latin American gateway, is far from most major East Coast markets. Atlanta suffers from heavy congestion. The New York airports are also congested, making them excellent for serving the large New York market but unattractive as gateways for onward shipments.

Given the industrial trends in North Carolina and in the Piedmont Triad Region, PTI has solid potential for outward cool chain shipments. Of the more than $650 billion of pharmaceutical products sold worldwide in 2005, over ten percent ($65 billion) were biopharmaceuticals. The U.S. share of these markets was approximately $200 billion and $20 billion, respectively. Approximately 40 percent of the total pharmaceutical market is temperature sensitive and 100 percent of the biopharmaceutical market is temperature sensitive.

Between 2004 and 2005, the biopharmaceutical market grew by 17.1 percent, significantly faster than the traditional pharmaceutical market. The expectations are that the market will grow exponentially. Moreover, climate controlled logistics have the potential to significantly improve the operations of several ends of the biopharmaceutical industry where temperature and humidity deviations cause large costs because drugs may become ineffective or even harmful.

In addition to aeronautical manufacturing and perishables processing, PTI may be able to attract e-commerce fulfillment centers and, particularly if cargo airlines find it advantageous to provide services, third-party logistics providers. Both of these latter may rely on FedEx for at least a portion of their air transportation needs. PTI might also attract additional hotel, exhibition, and office facilities related to air commerce.

The Guilford Tech Community College (GTCC) Aviation Campus is a special asset for PTI air logistics and Aerotropolis development now and will grow in significance as aviation-related facilities expand. In collaboration with Embry-Riddle Aeronautical Aviation University, GTCC is able to offer two and four-year degrees, providing education and training support for all aspects of the aerospace industry, including manufacturing, maintenance, and air logistics. Complete skills and career development support will be available right on airport grounds. As noted in a prior report, the Piedmont Triad region is fortunate to have a full range of cooperating educational institutions supporting all aspects of Aerotropolis development.

Regional Surface Transportation Infrastructure

Accommodating future aviation-related industrial and commercial development will very likely require altering regional transportation infrastructure. Some of the needed changes are already incorporated into regional planning. As part of the regional transportation improvement plan, I-73 will be extended to the southwest along the current Bryan Boulevard and a right-of-way corridor for the future I-73 located north of the airport. Once the interstate is extended, portions of

Bryan Boulevard can be removed to allow development of land areas west of the new parallel runway to their highest and best revenue potential and aviation-related use.

To provide surface access to these land areas, a new surface access tunnel beneath or overpass over I-73 must be constructed along with a new north-south roadway corridor between NC 68 and points north of the airport. The development of a support road would require that the development of an overpass or tunnel system through the I-73 right-of-way would need to be part of the initial design considerations of the Interstate This corridor should be developed west and parallel of Runway 5L-23R at an offset distance of approximately 2,150 feet.

In addition, there is a possibility for high-speed rail service with an intermodal center serving the airport. The intermodal center could include a people mover serving the PTI passenger terminal and other on-airport destinations. Being centrally located in the region, the PTI area will be increasingly seen as a preferred location for aviation and non-aviation functions and will require the corresponding surface transportation.

Competing Land Uses

Aside from the potential for additional on-airport commercial and industrial development leveraging the airside infrastructure and the surface transportation improvements that will support or complement airport facilities, the airport area is increasingly attractive to non-complementary economic activities ranging from residences to consumer retail. The spatial structure of the Piedmont Triad Region has evolved from that of three proximate yet distinct cities to an increasingly spatially and functionally-integrated single metropolitan region. While PTI's location may be somewhat peripheral to downtown Greensboro, it is centrally located within the region.

PTI and its immediate environs, especially those with easy access to I-40, will also be increasingly sought out as sites for commercial and industrial developments that are not necessarily closely tied to aviation. That has two important implications for the airport. First, PTI needs to guard against developments that could encroach upon future needed airport expansion. While well-served, air service expansion is precluded in several major metropolitan areas, including Boston and San Diego. At the very least, encroachment may preclude later commercial and industrial developments that complement the airport. Second, if the Airport Authority and other land use authorities in surrounding jurisdictions manage the local real estate development process carefully, they can preserve long term options for aviation-related economic activities, contributing to the airport's emerging role as the Central Business District of the Piedmont Triad Aerotropolis. Doing so would enhance the future well-being of the region and contribute to Aerotropolis development objectives.

Land Uses near PTIA

The Master Plan Update discusses the present land uses on and near the airport. Here, we highlight the issue of residential encroachment and reiterate the ever-growing threat of conflicting commercial encroachment that could hamper long-term airport expansion to the detriment of Aerotropolis development and the overall Piedmont Triad Region.

Much of the land to the south and west of the airport is either used for commercial, office, or industrial uses or is zoned for such uses. Further, the land to the northeast of the airport along the flight path of the main existing runway is devoted to commercial and office uses. Three of the four approach/departure paths of the two parallel runways are free from residences, as are the paths for the cross runway. Unfortunately, most of the land to the north and east of the airport is used for residential development. Future residential development could interfere but that depends on its location and the night-time traffic pattern. Fortunately, most of the land near the airport is not zoned for residential use.

The business park to the northwest of the airport and the hotel and office complex near the intersection of I-40 and NC 68 are the most promising complementary developments in the immediate off-airport area. Further afield, I-40 acts as a regional corridor attracting office, industrial, hotel, and other commercial developments to the west of Greensboro and north of High Point. The I-40 corridor also contains major shippers such as Dell Computers and is home to a large number of distribution centers and trucking firms.

Some of the land near the Piedmont Triad International Airport is vacant. The airport needs to work in close cooperation with Guilford County and the cities of Greensboro and High Point to ensure that non-complementary uses do not occupy that land and that the long-term highest and best use of airport area land as a whole is preserved. One way to accomplish that goal is for the airport to purchase additional land near the airport.

Recommendations for Acquiring Land

Airport land acquisition can allow the region to make the steps between the present situation and the full aviation-oriented complex of activities envisioned for full airport build out. Our provisional initial assessment is that the PTAA should proceed with a carefully considered land acquisition strategy along the lines suggested by the master plan prepared by URS and elaborated by us above.

The potential cost to the community will be substantial if land for airport growth is not acquired or protected. The airport must acquire and/or surrounding communities must protect sufficient land to accommodate a potential third parallel runway.

If the airport does not accumulate the specified land and it turns out that there is a demand for airport expansion, the region's growth potential could be restricted. This prospect is real and has already constrained air service expansion in several metropolitan areas.

To some extent, reserving land for a possible future third parallel runway can be subsidized by leasing land to firms which need an inside the fence location, such as those summarized above. The airport already owns a significant tract of land to the northwest of the new parallel runway. A first phase of land acquisition could include filling in 200 acres of "missing pieces" in that area and additional parcels around the airport grounds as they are now defined. Additional acquisitions might include 35 acres on the north side of Bryan Boulevard, 12 acres to the east, 5 on the southeast, 49 acres in the southwest corner of the airfield and 47 acres to the west.

Those acquisitions will serve to rationalize airport boundaries and provide flexibility in allocating on-airport land to its best use. A larger acquisition, spanning the present route of NC 68 and reaching to its proposed new route would allow for the construction of a third parallel runway, should it some day be needed. That second phase would complete the airport footprint as it can be envisioned today.

Piedmont Triad International Airport should also consider acquiring land to prevent residential encroachment. With the possibility of expanding night-time operations and with complaints often stemming from far beyond the usual noise barriers, PTI could find itself facing strong resident reaction if proper steps are not taken to minimize future residential development in nighttime approach and departure paths.

Conceptual Airport Land Use Possibilities

The socio-economic projections performed as part of the Environmental Impact Assessment for the second parallel runway calculated that Piedmont Triad Regional employment would increase from a baseline expectation of 900,500 to a total of 911,250 within approximately 20 years. The additional 10,700 jobs (an additional 1.2 percent over the baseline projections) were expected to increase to a net additional 17,510 jobs (1.7 percent more than otherwise projected). FedEx will account for approximately 15 percent of the additional employment directly with another 5 percent being direct spin-off results of its operation. The large majority of the new employment will be in facilities that supply and accept the cargo made possible by the new capacity and by the induced effects of the retail and service spending of the additional employment. We have not calculated the portion of the catalytic effects that would be located on the airport property.

URS in cooperation PTI management provided us with working maps of potential property acquisitions and airside investment over the long term. We add a potential land use allocation of the total property. Our exposition is as an aid to practical thinking. As noted earlier in this report, the present projections of activity do not allow for rigorous planning nor have we calculated the space needs of the specific activities or the Competitiveness of the Piedmont Triad airport in attracting these activities. In the exposition that follows, we assume that FedEx expands its route structure in a manner discussed above, that PTI is successful in attracting a high level of non-integrated cargo, and that the Piedmont Triad region is seen as competitive for the activities described. These assumptions are for planning purposes. Whether these developments will occur, and the extent and timing of these developments are uncertain.

For future PTI development contributing to the planning and implementation of the Piedmont Triad Aerotropolis, we will present 21-year (2030) and 41-year (2050) conceptual plans. Both plans will assume that by 2030, roadways will have been realized as discussed above and that PTI will have acquired all land designated above as well. The acquired land, in addition to the existing PTI campus would constitute the footprint for expanded and diversified PTI functions.

Even with the anticipated catalytic effects of the FedEx mid-Atlantic hub and other drivers, it is unlikely that sufficient cargo and passenger traffic would justify a third parallel runway by 2030. (The Forecasts predict a number of operations just slightly higher than in the late 1990s.) Yet, with the additions discussed above, PTI may well have sufficient cargo and passenger volume to require a third runway by 2050. Therefore, for the period between now and 2030, the authors (and URS) are proposing an extended taxiway to the center of the acquired property northwest of the new runway for activities requiring runway access. This taxiway, along with its apron, could later provide access to a future third parallel runway should it be demanded at some point after 2030.

Exhibit 2 illustrates the potential land use and facility makeup of PTI in 2030 on this expanded footprint. Also shown is the extended cargo transport system to the new aviation-related areas and a potential site for a regional commuter rail and bus terminal which could eventually be connected by a people mover to the PTI passenger terminal. We repeat that its placement is for conceptual purposes only and does not represent a recommendation or an endorsement of that location.

By 2030, only a portion of the PTI campus will have been developed. Additional hotels, offices, a potential exhibition complex and medical and wellness facilities along with mixed-use commercial and some yet-to-be-identified special uses might emerge. As noted above, we also expect to see some additional aircraft parts and assembly develop near the GTCC campus along with a possible EDI/telecom facility for advanced tracing, tracking, and controlling of product movements.

A small portion of the "T" taxiway extension could have e-commerce fulfillment and third-party logistics functions, should any desire an on-airport location. On the northwest side of the second parallel runway, near the extended taxiway, a new shared central cargo facility would be built to expeditiously serve non-FedEx airlines, if significant non-integrated cargo service is attracted to PTI. A state-of-the art perishables/cool chain facility could be located adjacent to the new central cargo facility with nearby third-party logistics facilities and related fulfillment centers.

Under ideal conditions, full buildout of the PTI Airport City might be possible by 2050. This build out is illustrated conceptually an Exhibit 3. The potential third parallel runway may well be justified by this date, so it is shown in the exhibit. (If it is not yet justified, the "T" shown in Exhibit 2 can be extended as needs require with additional cargo and logistics functions located along and near it.)

By mid-century, PTI may have emerged as a significant aircraft parts and assembly cluster, attracting a number of new parts and aircraft equipment manufacturers. PTI's logistics and e-commerce fulfillment activities may also have expanded considerably as may its other activities. It is possible that by 2050 more than 20,000 people could be employed on PTI grounds, making it one of the largest employment centers in North Carolina.

While the above strategic visioning is only conceptual, it points out what could emerge if appropriate planning, land acquisition, and development take place at PTI consistent with aerotropolis principles. If such planning and land acquisition does not take place, this special opportunity could be lost forever.

Land Development Outside of the Fence

Taking the land acquisition steps recommended in the Master Plan Update and outlined above will require adjustments in the focus and operation of the Piedmont Triad Airport Authority. Yet such adjustments are not without precedent. Coordinated airport expansion and real estate development, while not ubiquitous, is common. The real estate development at or near airports may include hotels, convention centers, office buildings, or industrial facilities. Contrary to conventional wisdom, the Federal Aviation Administration has long been sympathetic to such development and has at times even promoted the idea on efficiency grounds.[6] There is a long precedent for FAA support for industrial and commercial development across types of airports, ownership and governance structures, and modes of property acquisition. Such efficiency-enhancing developments improve the welfare of the citizenry, boost airport-specific catalytic effects, and help support regional air service, the FAA's prime concern.

We review governance and ownership structures of airport-related business and industrial developments, making reference to selected cases for illustration. In doing so, we exclude the air transport support activities, such as cargo processing,

[6] For example, Federal Aviation Authority Advisory Circular AC 150/5070-3 *Planning the Airport Industrial Park*, September 30, 1965 which reviewed current and best practice while describing such developments at a sample of 11 airports.

terminal retail, hotels, and automobile rentals, commonly found on commercial airports. We then discuss the several routes to airport land acquisition and real estate expansion.

Ownership and Governance Options

There are a number of governance and ownership structures for such coordinated real estate developments which depend upon state laws regulating public enterprise and accidents of land acquisition and development history. The airport and commercial real estate may be under separate ownership (as when a private firm develops property adjacent to a public airport), under common ownership (as when a municipal aviation department operates an airport and a municipal economic development agency owned by the same municipality develops contiguous land), or part of the same organization (often a department in or agency of a municipal government).

Looking across airports, whether coordinated real estate development is inside or outside the airport fence, is often an accident of developmental history. For example, the Irvine Company, which has developed much of the land in Orange County, designed an industrial complex to fill 2,600 acres surrounding Orange County Airport (now John Wayne Airport). The airport was built on land that was originally owned by the Irvine Company but was deeded to the County before the plans for the Industrial Complex were drawn up. Alliance Airport has a somewhat similar history. Alliance Airport is managed by the same company (Hillwood) as the surrounding industrial and commercial land. While the Irvine Industrial Complex was designed to accommodate runway access to a subset of the parcels, they appear to be not in use.

While both the Irvine and Alliance developments were initiated by private developers, airport owners sometimes recruit private firms to leverage aviation assets. In 1963, the City of Hayward entered into an agreement with Airport Investors and Developers, Inc. to operate the municipal airport which was a decommissioned airfield from the Second World War. Five years later, after obtaining permission from the FAA to change the terms of the original property transfer agreement, 167 acres were sold for the Cabot, Cabot, and Forbes Industrial Center.[7] With the impending departure of the National Guard, the airport intends to split the freed space between aviation and non-aviation uses. Van Nuys' airport business park is also privately managed.

In other cases, an airport-related industrial park may be operated by an industrial development authority. The Accomack Airport in the Eastern Shore region of Virginia is owned by the municipality but the Accomack Airport Industrial Park is operated under the direction of the municipality's industrial authority. The Chamber of Commerce/Economic Development Partnership manages the Corvallis Airport Industrial Park. Kingman Airport Authority leases the airport and adjacent industrial park from the municipality and operates both on a non-profit basis for the municipality. Big Rapids Township MI operates both the airport and the industrial park. The same situation is found in Missoula MT where the airport industrial park accommodates over 50 tenants. Ponca City OK Airport's and Rock Hill SC Airport's industrial parks are operated by local economic development offices.

Some airport industrial or business parks are operated by the airport itself. That is the case for the Colorado Springs Airport Business Park. More than 300 acres of that park's nearly 1,000, have direct runway access. Spokane International Airport

[7] Having developed much of Boston's Route 128, Cabot, Cabot, and Forbes, a firm with more than a century of real estate development service was perhaps the design and market leader in developing facilities for post Second World War electronics and high technology companies.

operates nine real estate areas totaling over 1,000 acres. Some but not all of these boast direct runway access. Orlando Sanford Airport operates a 395 acre industrial and business park with over 90 tenants. The Fort Wayne Airport Authority operates two parks within its fence. The first is a 110-acre shovel-ready tract oriented towards offices and light industry. The other is a 450-acre parcel at the opposite end of the airport which serves cargo and heavy industrial uses.

In Duncan OK, the airport industrial park is operated by a foundation created expressly for that purpose. Among a sample of approximately 300 airport-linked business and industrial parks, management was split approximately equally among airports, industrial development authorities, non-airport government departments, non-profit organizations, and private developers.

Routes to the Acquisition of Airport Industrial and Commercial Land

Land for commercial real estate development is acquired in several ways, some with Federal support, some without. One method whereby airports come to own land that is available for commercial development may be the downgrading of aviation-related land. While many airports are pressed for space, some airports, such as Dallas-Fort Worth International and Kansas City International were built in an era of great uncertainty about future land needs. Runway length requirements had recently doubled with the introduction of jet aircraft and there was the possibility that they might double again with the introduction of the then-anticipated inter-continental transporters. As it became apparent that such aircraft, even if they could be built, would be of limited use because few overseas airports could accommodate them, the excess land at several of these airports has been converted to non-aviation uses.

Other airports also have excess land that will very likely never be needed for aviation. Dayton Airport has recently been granted permission to release land for non-aviation use that because of its relationship to prevailing winds and runway placement is inconvenient for aeronautics. The funds generated as a result of the conversion will help support the airport. Gadsden's airport will be supported by the industrial development of over 1,000 acres of airport land released by the FAA for non-aviation uses.

Other land is acquired after the airport begins operation. Some of the land acquisition is to relieve homeowners of noise disamenity and a portion of the acquisition is to prevent development of parcels of land in a way that would interfere with airport operations. Much of this acquisition is supported by funds from the Airport Improvement Program. From Fiscal Years 1982 through 2003, the FAA granted $3.8 billion in Airport Improvement Program funds for airport noise mitigation projects. Of these funds, $1.8 billion was directed towards noise-related land acquisitions. (AIP funding has continued to grow but we have not compiled the funding allocation.)

FAA regulations require that airports receiving these funds either use the land for aviation purposes or dispose of the land once no longer needed. FAA leadership has not pressed airports to dispose of the lands for two reasons. First, they argue that some of the acquired land has little value for non-aviation purposes. Often the land is poorly accessible and lacks adequate services for commercial use. Second, they argue that the costs of re-acquisition, should the need for expansion arise, could easily outweigh the short-term benefits of a sale. In practice, the FAA is also satisfied with leasing arrangements by which airports earn income that can be repaid to the AIP or used for other noise amelioration purposes. In some cases, land acquired with Airport

Improvement Funds is transferred to another unit of local government for management. This is the case with Wayne County's Pinnacle Park outside of Detroit Metro Airport. The parcels for many airport-related business and industrial parks in our database, mentioned above, were originally assembled for noise mitigation purposes.

Some, such as Indianapolis Airport, prefer that the assembled tracts be developed by private developers. In the case of Indianapolis Airport, which is in the midst of an extensive land acquisition program, some of the acquired land is inconveniently located for aviation purposes. That city also has a history of aggressive privatization of all possible municipal functions. The airport has, however, recently retaken direct control over the management of its passenger terminal.

Allegheny Airport Authority, serving the county in which Pittsburgh is located, has taken the opposite tack. At its establishment in 1999, the authority gained control over several outside the fence properties near Pittsburgh International Airport that had been under county government ownership. The resulting improved coordination with the airport and clarified responsibilities has resulted in rapidly progressing development of what had been languishing properties.

Airports also purchase land for incorporation inside the fence. Most of the development possibilities discussed for PTI above are inside the (expanding) fence. FAA regulations permit the use of Federal funds to support land banking but, unfortunately, only for a period of time that is insufficiently long for most situations. In those cases, state and local funding can pay for the entire purchase price of the land. Some states support airport land acquisition for aviation purposes and airport-related industrial development. Localities can incorporate airport land acquisition into their Comprehensive Plans. Once in the Comprehensive Plan, land acquisition can be included in a Capital Improvement Plan and arrangements made for financing land purchase. Some localities draw funds for these purposes from their General Fund. Others commit a specific component of their tax collection, such as a portion of the sales tax, to airport capital improvements.

Under some conditions, it may be possible to use Passenger Facilities Charges to support airport land acquisition. This source requires FAA approval and might not apply to uses that do not have an immediate impact on passenger travel. In other cases, local tax abatements and foreign trade zone status are used to induce firms to choose an airport location. Funds generated by leasing can be used to help defray land acquisition costs.

In some cases, airports acquire land incidentally. For example, the Metropolitan Washington Airport Authority (MWAA) could only purchase the land needed for aviation purposes by acquiring a larger parcel than was necessary. Given the increasing encroachment of residential subdivisions in the airport's noise zone they have been reluctant to release the land to private developers. At least until the recent lull in the real estate market, they had been considering developing 400 acres of the acquired the land in the form of a public-private partnership with a master developer for control and mutual benefit.

The airport will also need to ensure compatible uses within the obstacle and noise control zones of the potential third parallel runway. Careful coordination with officials in the Cities of Greensboro and High Point should reduce long term resistance to the opening of a third runway. Zoning and tax incentives are two possible methods of ensuring land use compatibility.

As a practical matter, airport real estate development often requires an agreement between the airport and the surrounding localities to share tax revenues, or the tax revenues that would have been generated by the class of use of the relevant portion of the airport property. A good example of this is Dallas-Fort Worth International airport where commercial revenues are shared with the two counties and four municipalities which the airport occupies. DFW has also actively engaged in land swaps with at least one of the municipalities.

Conclusion and Recommendations

The Piedmont Triad International Airport now finds itself in a very promising, but difficult, situation. One of the airport's ultimate responsibilities is to support the regional and national economy. It is faced with making long term plans for a future which, due to the shifting nature of the global economy, the related changes in the relationship of air transport to final demand, and recently unfolding events specific to the region which will unavoidably alter the region's role in the national economy, will not be a simple continuation of past trends.

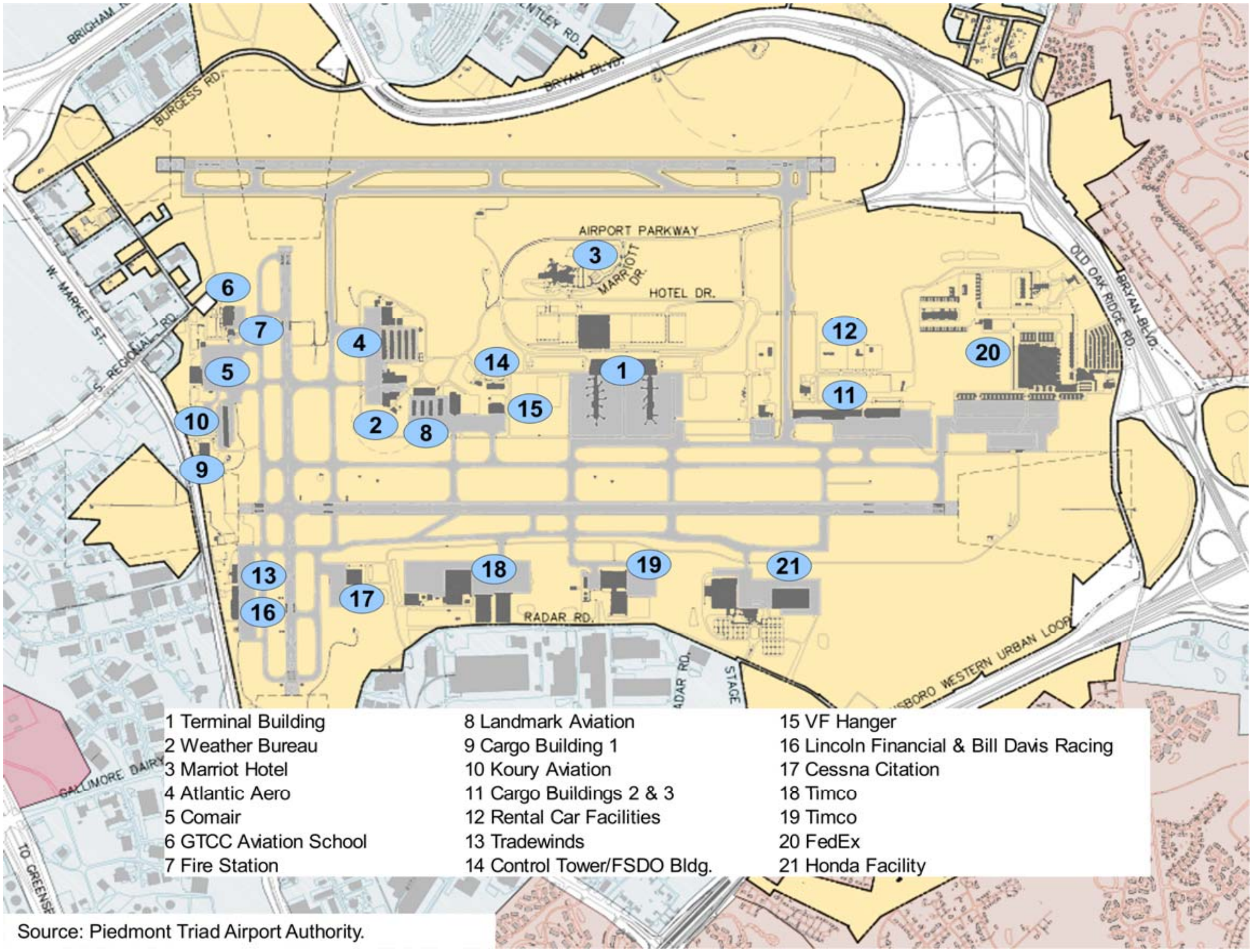
Our professional opinion is that the airport needs to plan for the region's emerging future while fully recognizing the uncertainties inherent in planning for that future. Doing so requires an ambitious vision of PTI operations at full build out and taking steps to realize that future as demand requires. Our understanding of current and emerging trends in commercial aviation and aerotropolis development, while not guaranteeing that such a vision will come to fruition, are sufficiently viaible to warrant a full consideration of the possibilities.

On a practical level, the Piedmont Triad Airport Authority needs to take steps now in order to preserve future options for the region. It needs to ensure that land is available for aviation-linked needs as they emerge. Zoning and tax abatements to discourage inappropriate uses is recommended. The FAA generally supports such initiatives.

Those steps, however, do not provide the security afforded by land ownership. The airport authority should proceed with plans to acquire land in the near future to ensure against the encroachment of conflicting or otherwise non-complementary land uses and to preserve its ability to develop a third parallel runway. The development of the acquired land for aviation-related commercial and industrial uses can help support the needed land acquisition even as it leverages existing investments in infrastructure and provides the airport with a source of income that is not directly tied to operations.

There are of course risks to any ambitious capital development program. Only a portion of the envisioned demands may materialize. Prudent management of costs and a periodic review of airport and regional development trends will reduce downside risk while preserving upside potential.

Exhibit 1. Major Facilities on PTI Campus, 2009



Source: Piedmont Triad Airport Authority.

Exhibit 2. PTI Airport City 2030 Conceptual Plan

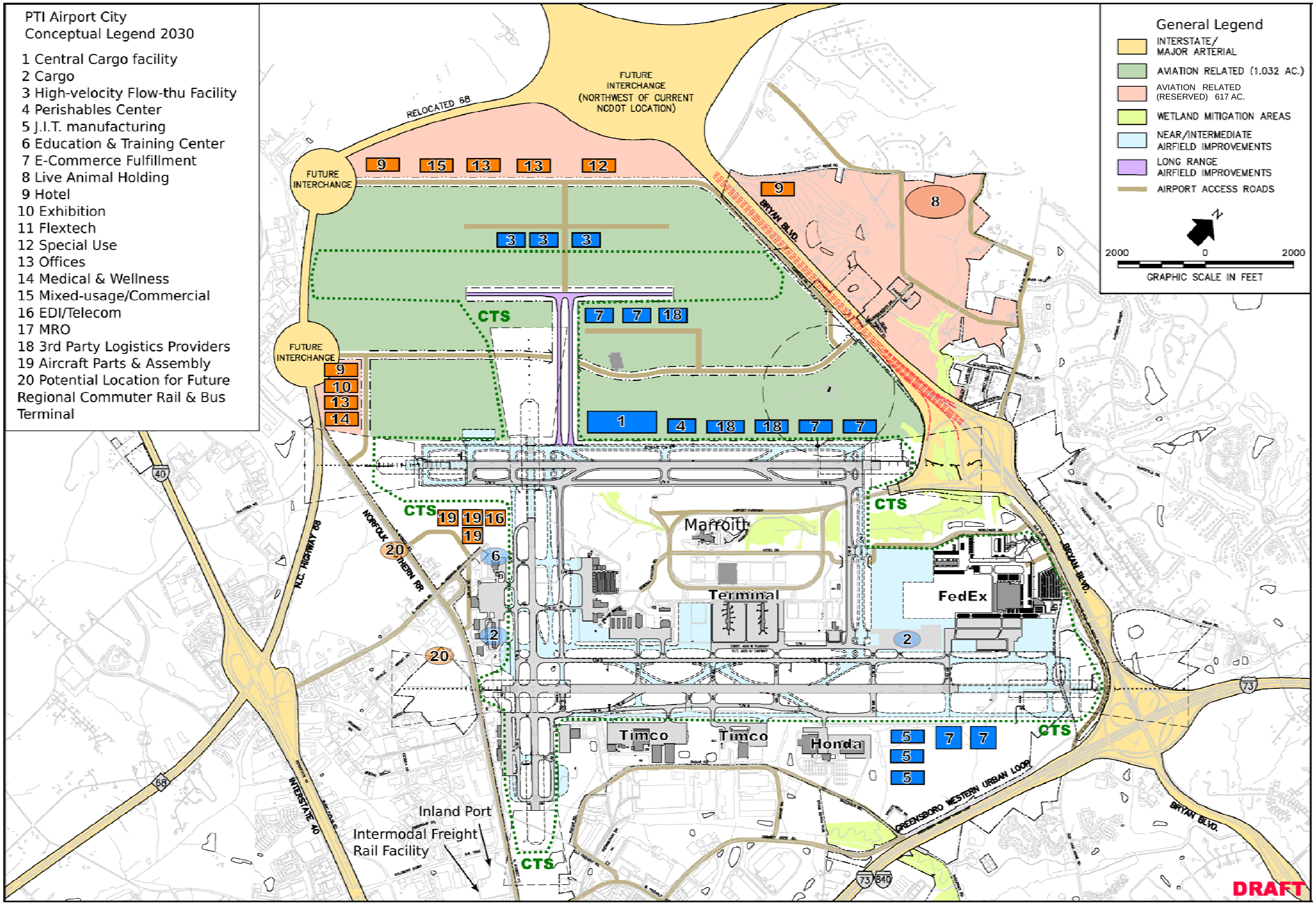
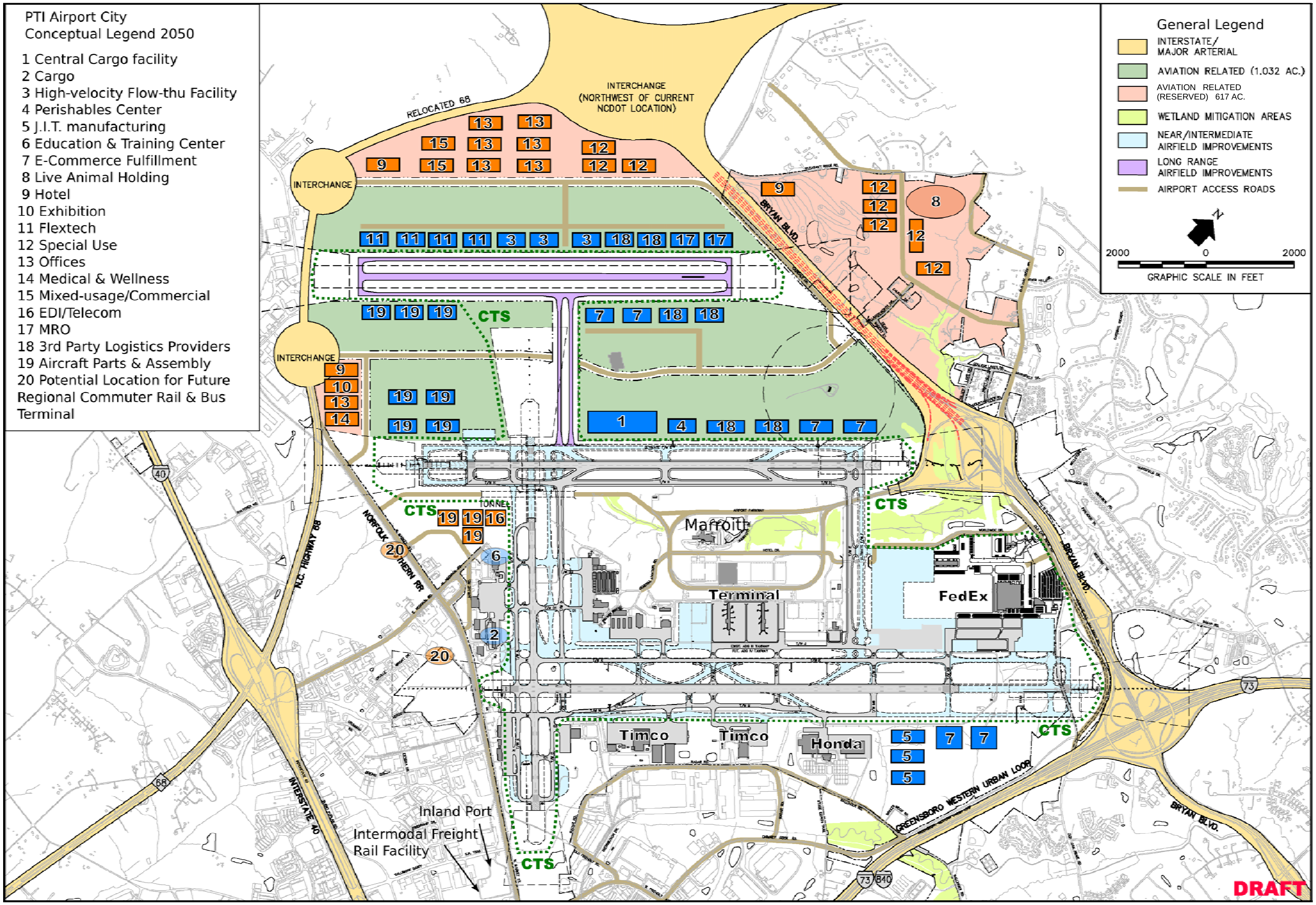


Exhibit 3. PTI Airport City 2050 Conceptual Plan



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Airport Master Plan Update
and
Strategic Long-Range Visioning Plan

Prepared By:

URS

In Association With:

JACOBS CONSULTANCY

rma

Ron Miller & Associates

Appendix I
Public/Stakeholder Presentations & Public Comments

PTAA
PIEDMONT TRIAD AIRPORT AUTHORITY

Piedmont Triad International Airport
Greensboro, North Carolina

APPENDIX I

Public/Stakeholder Presentations & Public Comments

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1.0 DISCLOSURE OF PROPOSED DRAFT AIRPORT MASTER PLAN UPDATE

The draft Airport Master Plan Update was presented to the Piedmont Triad Airport Authority during its regularly-schedule monthly meeting on May 25, 2010. A Public Information Workshop was conducted at the Greensboro-High Point Marriott Airport later that same day. The opportunity for the public's review and comment regarding the draft Airport Master Plan Update was offered during a 107-day Public Comment Period that began May 25, 2010 and closed September 8, 2010. The draft Master Plan Update Report and Airport Layout Plan Drawing Set were made available to the public for inspection and electronic retrieval via the Airport's website (http://www.flyfrompti.com/) throughout the entire 107-day Public Comment Period. Public comments were also accepted through use of this same website. During that period, 15 written comments were received by the Airport Authority through the website submittal process. One hand-written comment was also delivered directly to the Airport Authority offices. Of the 16 comments submitted a limited number did not directly pertain to or directly concern the draft Airport Master Plan Update, but instead, addressed aircraft-generated noise and other issues specific to the airport. These particular comments were directed to the proper Airport Authority representatives so that they could be addressed outside the scope of the Airport Master Plan Update process. The written comments submitted to the Airport Authority regarding the draft Airport Master Plan Update are contained in this appendix.

2.0 PRESENTATIONS TO PUBLIC AND STAKEHOLDERS

Following the May 25th, 2010 presentation to the Airport Authority and Public Information Workshop later that same day, the draft Airport Master Plan Update was presented to 18 different groups across the Triad region during the Public Review Period that included professional Planners, the North Carolina Department of Transportation representatives, City Councils, Town Councils and Metropolitan Planning Organizations (MPOs). A listing of the 20 public presentations is provided below:

Public/Stakeholder Meeting Groups	**Date**
Airport Authority Meeting	May 25
Public Workshop at Airport Marriott	May 25
Mike Fox, North Carolina Board of Transportation Regional Planners and MPO reps at Airport	June 15
High Point City Council	June 22
Public Hearing Airport Authority Meeting	June 22
Greensboro MPO Technical Committee	June 24
Greensboro MPO Board	June 24
Economic Developers at Airport	July 8
Triad Business Journal	July 15
News & Record	July 20
TREBIC/Triad Realtors	July 20
High Point City Council	July 20

Greensboro City Council	July 27
Oak Ridge Town Council	August 5
Winston-Salem Council Committee	August 10
High Point Chamber of Commerce	August 18
High Point Rotary	August 19
High Point MPO	August 24
Dan Lynch Developers Group (UHC)	September 14
Winston-Salem Urban Area MPO	September 19

3.0 RESULTANT MODIFICATIONS TO THE PROPOSED MASTER PLAN UPDATE

The comments and suggestion offered by the public and stakeholders regarding the draft Airport Master Plan Update were greatly appreciated by the Piedmont Triad Airport Authority. It is the Authority's belief that such public participation served to enhance and validate the Airport Master Plan Update.

As a result of the public comments received, the Airport Authority made the following modifications to the draft Airport Master Plan Update:

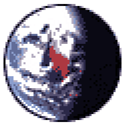
- A proposed future Piedmont Authority for Regional Transportation (PART) Mass Transit Passenger Transfer Facility was identified along West Market Street to provide light rail / bus PART passenger access to the terminal curbside.
- Three potential locations for the future development of an Inland Port / Multi-modal Facility that would take advantage of nearby railroad service.
- Modification of the proposed three-phase land acquisition program in response to comments, requests and specific concerns raised by the public.

4.0 ACCEPTANCE AND ADOPTION OF DRAFT AIRPORT MASTER PLAN UPDATE

Following the public's review and comment and the resultant modification to the proposed draft Airport Master Plan Update, the Piedmont Triad Airport Authority unanimously accepted and fully adopted the proposed Airport Master Plan Update during its regularly-scheduled monthly meeting on September 28, 2010.

5.0 PUBLIC COMMENTS

Public comments, offered during a 107-day Public Comment Period, received by the Piedmont Triad Airport Authority are enclosed herein.



"Dehnert, Rick"
<Rick.Dehnert@highwoods.com>

09/17/2010 04:40 PM

To <comment@ptimasterplanupdate.com>

cc

bcc

Subject

History: This message has been forwarded.

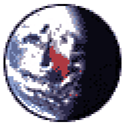
We would appreciate strong consideration being given to the movement of Air Park North into Phase II if not Phase III of the Master Plan.

Regards,

Rick Dehnert
Division Manager / Vice President

Highwoods Properties
420 Gallimore Dairy Road, Suite C / Greensboro, NC 27409

336-668-2982 Main
336-668-7025 Fax
rick.dehnert@highwoods.com / www.highwoods.com



"Charles Angel" <cangel3@triad.rr.com>
09/08/2010 11:14 PM

To <comment@ptimasterplanupdate.com>
cc
bcc
Subject Public Comment on PTIA 2010 Master Plan Update

Thank you for the opportunity to comment on the PTIA 2010 Master Plan Update. We are homeowners in a neighborhood adjacent to Cude Road about one mile north of Pleasant Ridge Road. Our neighborhood is zoned as a “Rural Preservation District” and includes streams, woods, and a nature trail that is shared with an equestrian therapeutic center for disabled children. Although we are pleased to see proactive planning to help the region prosper economically, our primary concern is that the airport expansion plans would include measures to preserve the quality of life of the current residential neighborhoods and natural habitats surrounding the airport as much as possible. Our specific requests regarding the Master Plan Update are listed below.

1. The quality of life and beauty of a region significantly contribute to making the area attractive to new or re-locating businesses in the near and long-term. Please consider incorporating measures into the PTIA Plan such as these below.
    - Prevent any adverse environmental impact of the airport expansion on the Greensboro water supply as the expansion area is in the Greensboro water supply watershed. Consider the combined effect on the Greensboro water supply watershed of the airport expansion plus of the proposed adjacent major roadways.
    - Plan for measures to reduce the effects of noise, light, & air pollution around the expanded airport that will result from the air traffic, runway lighting, warehouse operations, and industrial processes at the airport complex.
    - Promote environmentally-responsible “green” building at the airport.
    - Encourage surrounding municipalities to proactively develop scenic overlay districts in the areas of the future roadways that will surround the airport such as (or preferably better than) the scenic overlay district that currently exists for N.C. Highway 68 near the airport.

2. Please plan for measures to ensure the safety of homes, schools, and businesses adjacent to the airport from accidents from air traffic including airplane test flights by airport maintenance companies. Test flights of FedX planes under repair currently fly very low over our neighborhood a couple days each week although our neighborhood is outside typical commercial aviation flight paths. We would expect that test flights would increase with the growth of the airport maintenance companies.

3. Please make every attempt to coordinate the PTIA Master Plan with all municipal & town governments and the various DOT authorities that may be affected by the airport expansion and aerotropolis plans. This would possibly include the Town of Kernersville which has annexation plans that extend as far east as North Bunker Hill Road in Guilford County. Our neighborhood was rezoned as a “Rural Preservation District” as recently as ca. 2003. Apparently Guilford County planners weren’t informed that our area of the

county was designated to become part of an aerotropolis.

4. We wish to see the Piedmont Triad region prosper economically. Please consider what safeguards might be taken to prevent the indebtedness of the Kinston Global TransPark project. See http://www.carolinajournal.com/exclusives/display_exclusive.html?id=6154

Thank you for considering these concerns and requests.

Sincerely,

Mr. & Mrs. Charles Angel
3500 Sanfords Creek Court
Colfax, NC 27235-9804
Phone: 366-665-1439
Email: cangel3@triad.rr.com

Greg and Kim Shue <gkshue@yahoo.com>
09/02/2010 09:35 PM

To comment@ptimasterplanupdate.com
cc
bcc
Subject Comment

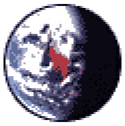
I write to strongly oppose the expansion of PTI airport to the Northwest. Said expansion of an airport with declining flights requires excessive expense for land acquisition, major road and future interstate relocations, and loss of commercial and residential properties.

Greg Shue
8211 Quail Creek Dr.
Colfax, NC 27235

<wejmking@sbcglobal.net>
08/16/2010 04:34 PM

To <comment@ptimasterplanupdate.com>
cc
bcc
Subject noise abatement

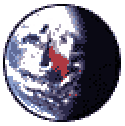
What noise mitigation plans does PTI have for NW Guilford county outside the noise cone?



Jody Butler <jjmcbutler@bellsouth.net>
08/13/2010 04:59 PM

To comment@ptimasterplanupdate.com
cc jjmcbutler@bellsouth.net
bcc
Subject (No subject header)

Hi I want to let you know that the noise levels for subdivisions at pleasant ridge and Hamburg mill road have intermittently been intolerable and we are supposed to be outside of the noise cone. Please rectify this unreasonable burden on our neighborhoods. Keep the airplanes from turning and flying low as I am sure we are above the reccommended noise levels. Are we contained in the noise cone for the new runway at a higher noise level. Pleasant Ridge Run is concerned about the adverse effects of building an additional runway even though it is 50 years out. The authority reassured us that planes would only be taking off at night over high point to get the current runway in. Butler



"james morrison" <jmorrison4@triad.rr.com>
08/09/2010 12:40 PM

To <comment@ptimasterplanupdate.com>
cc
bcc
Subject AIRPORT MASTER PLAN COMMENTS

COMMENTS:

1) ***Noise cones*** need to be establish for any future runway(s) so planners can update land use plans to exclude future zonings for major residential developments within the noise cones
2) The ***NC Transportation Improvement Plan*** (TIP) needs to be updated to reflect all of the Airport Master Plan road plan updates; and the US 220/NC 68 connector needs to be constructed as soon as possible to better handle all the additional traffic from FEDX and new developments to come in the near future.

Jim Morrison
602 Tangle Dr.
Jamestown, NC 27282
EMAIL: jmorrison4@triad.rr.com

Daisuke Tsujii <dttsujii@gwmail.gwu.edu>
08/04/2010 12:08 PM

To comment@ptimasterplanupdate.com
cc
bcc
Subject 2010 PTI Airport Master Plan

History: This message has been forwarded.

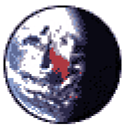
Here are my comments and suggestion for the updated Airport Master Plan:

1. Add more shops and restaurants in the terminal (think BWI, Newark, and Reagan National). This is part of making Greensboro a desirable destination. After all first impressions matter, the airport is the first thing passengers see when they board off of the plane and into the terminal.

2. Build another runway or two. Let's diversify our airline services by looking into getting Southwest Airlines and Jet Blue. I think there is a tremendous need for more serviceable destinations and frequent flight times. I would like to fly out to California from PTI as oppose to having to go to RDU or Douglas and I would prefer not departing at 6:00am.

3. Build a landmark or develop something innovative that would make PTI stand out from the other airports. For example, Orlando International's monorail, Atlanta's Hartsfield-Jackson's automated people mover (APM) system, and Newark's underground mini-subway that takes passengers from one concourse to another. Another example is Dulles Airport, which is known for its architectural structure and PlaneMate airfield vehicles.

Tim Tsujii
10 Planters Wood Trail
Greensboro, NC 27407
(336) 601-3376



Maryfabrizio@aol.com
07/26/2010 08:03 PM

To comment@ptimasterplanupdate.com
cc
bcc
Subject (no subject)

This plan has so many flaws, it is difficult to know where to begin to comment.
*There appears to be no coordination with this plan and existing plans for transportation by the DOTor local municipalities (Greensboro MPO, High Point MPO, Oak Ridge, etc.) . Why are the local towns said to be taken "completely by surprise" by this plan and why wouldn't there be cooperation and coordination with local planners? Why are the maps showing a relocated 68 that is different from the DOT maps? Haven't we already paid to move Bryan Boulevard once because of poor planning?

*The "aerotropolis"/Kasarda plan failed miserably and wasted millions of tax payer dollars in that other town in North Carolina that I can't even remember the name of.

*The examples of other airport plans (from Orange County to Indianapolis) used in the Kasarda report are amazingly complicated and misleading and offered up as "proof" that the Airport has considered all these different situations and can do whatever it wants because its been done before in some other far off place. There should be examples of the law suits brought about by these airports and the amount of people displaced and negatively impacted by the terribly planned growth of these airports with no accountability by the Airport Authorities who do it to them.

*People from the Triad drive in droves to Raleigh to fly cheaply now. This airport has failed miserably to serve the needs of the LOCAL residents by attracting more airlines to provide more flights to more cities at competitive rates.

*The failure of the Dell plant and the delay of the opening of Fed Ex should be red flags for cautious planning, not aggressive and unrealistic growth expectations.

*A total of seven municipalities spent the last five years "working together" to develop a "Heart of the Triad" plan that has be completely ignored by the Airport Authority with this plan.

*Our country should be looking to building alternative energy based transportation systems like light rail and NOT building more roads and airports.

*The future of logistics REDUCES the amount of hard goods in need of transport and even if the Airport Authority had any business in meddling in economic development (it doesn't), the focus should be on attracting business to the airport that is digital and wireless.

This plan is ridiculously ambitious and is a clear abuse of the "power" that the Airport Authority should not be given. Local officials should rise up and demand accountability from the board of directors of PTI and re-claim our airport and bring it back to its orginal intended use: to SERVE the NEEDS of its people, not the greedy commercial developers who stand to profit from this speculative garbage we clearly do not need. Yes, this area needs economic growth and jobs but the AIRPORT AUTHORITY has pretending to create it.

eaglecay@aol.com
07/22/2010 04:45 PM

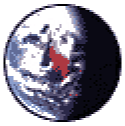
To Comment@ptimasterplanupdate.com
cc
bcc
Subject Residential Impact

I would like to pose a question/comment on the expansion of PTI. How will this expansion effect the noise nuisance to the residents to the North and East of the airport? I recently moved to Riley Village, which is I would guess Northeast of Flemming Rd off of Pleasant Ridge Rd and Long Valley Rd. There are planes that pass directly over my house well after 10:00 pm. Last night I was laying in bed and watched, as well as heard, four of them outside my window as the went directly over my home, waking the children who were sleeping. This morning there was one that flew over at 5:45 am. Will this expansion increase this issue?

I know expansion is inevitable. I am a reasonable and business minded person. So please don't take this as a crazy resident who likes to complain. I would just like to make a plan for my future just as the airport is making one for its future.

Thank you for your response.

Ellen Williams
5214 Helsley Ct
Summerfield, NC 27358



June Koster <jkoster07@yahoo.com>
07/08/2010 10:17 AM

To elmorem@gsoair.org
cc comment@ptimasterplanupdate.com
bcc
Subject Extremely low flying aircraft

History: This message has been forwarded.

Yesterday afternoon, July 7th, for about an hour between 1:30 - 2:30 ish there were numerous very large aircraft flying way too close all over the top my house and my entire neighborhood. The noise even inside the house was deafening much less outside. This was extremely inappropriate for the airport to allow these planes to **terrorize** our homes at any point on any given day. Is it just that no one at the airport realizes there are people in these homes who have rights too? I managed to snap one picture of one of the planes just at the tree top level after it had just cleared the roof of my house. Besides the noise, safety was a huge factor. I can't even imagine what might happen if there was an accident or crash.

I need to know who else to contact to have this and the direct take offs over my house **stopped.** The people who live in this area should be protected from that airport noise and be provided some safety from low flying aircraft.

Please respond so that I know who else to contact.

We also oppose the future plans of yet 4th runway being added that would further deteriorate the quality of life in northwest Greensboro. The added noise would not only be more stress on people but also on the abundance of wildlife, including bald eagles and their habitat which is used yearly to raise new eagle chicks. The new take off pattern(s) going eastward is low flying and directly over where they nest each year. It also will affect the great blue heron rookery which is used yearly to raise 50 - 60 baby herons.

Greensboro needs to see a return to the original flight patterns for the safety of everyone involved.

Sincerely,
June Koster
4603 Tamaron Dr.
Greensboro, NC 27410
jkoster07@yahoo.com

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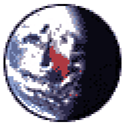


DT Bokoski <dbokoski1@clearwire.net>
07/03/2010 04:18 PM

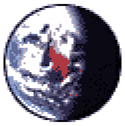
To comment@ptimasterplanupdate.com
cc
bcc
Subject Master Plan Update

It is clear the direction the airport authority intends to take and there is no reason to believe the comment period exists for any reason beyond administrative requirements. The airport is not a good neighbor, it is a business entity. As such, it has no concern for the impact its actions have on surrounding communities.

The economy is stagnant. Whether through management actions or natural response to area economic conditions PTIA is not now, nor is it likely to be, in need of any expansion contingent upon passenger growth. It is not a reasonable time to undertake the expense of a study of future needs. A cynic would argue the ultimate purpose of the study is to depress housing costs in the areas named, driving away existing home owners and discouraging future home sales. This will ultimately speed residential flight and make it cheaper for business interests to acquire property in the area.

PTIA, with unnecessary speculation on needs it does not currently have and future conditions which are far from likely to exist, has harmed every residential property owner named in the plan. It has devalued homes, made it difficult for families to make long range plans, and cynically begun a process which will destroy neighborhoods.

I would recommend the authority table the plans shown in Phase 2 and Phase 3 for future consideration.



Ed Poleshuk <edpoleshuk@gmail.com>
06/19/2010 08:58 AM

To comment@ptimasterplanupdate.com
cc
bcc
Subject airport expansion

Mr./Ms.,

Why do the members of of the Piedmont Triad Airport Authority insist on destroying the quality of life in Guilford county?

Aircraft noise is disturbing and disruptive to the citizens of the region where the Piedmont Triad International Airport is located.

Please stop and desist from all activity that increases aircraft traffic over our community so we are not bombarded with noise pollution.

-Ed Poleshuk

Kevin MacDonald <kevin@enduraproducts.com>

06/01/2010 05:24 PM

To "comment@ptimasterplanupdate.com" <comment@ptimasterplanupdate.com>

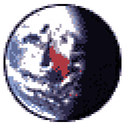
cc

bcc

Subject June meeting

From your website, "A public comment period will be held at the Airport Authority meeting in June to allow the public to address the Airport Authority directly about the draft Airport Master Plan Update". When is the June Airport Authority meeting?

Kevin T. MacDonald
V.P. Operations
Endura Products, Inc.
8817 W.Market St.
Colfax, NC 27235
Ph. (336) 668-2472 ext.4029
E-Fax (336) 217-0924
www.enduraproducts.com



Monica Baxter <monicasgreathomes@yahoo.com>

05/29/2010 05:14 PM

To comment@ptimasterplanupdate.com

cc

bcc

Subject Airport Plan

It is my understanding that the new runway that was built for Fed Ex is not being fully used

That Fed Ex's new Distribution Center is not up and running and may not be for a few years because Fed Ex has pulled back because of the economy.

My concern as a Realtor is this Plan is being throw out here and it is just that a Plan that will only happen as needed.

Cardinal was ruined many years ago because of Fed Ex and is just now starting to come back around again

I do not see the need.

Monica S Baxter Realtor/Broker

RE/MAX Realty Consultants
2731 Horse Pen Creek Rd
Greensboro, NC 27410
336.601.0335 cell
336-790-2204 efax
monicasgreathomes@yahoo.com

www.monicabaxter@remax.com

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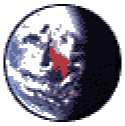


Tom Taydus <tst1924@gmail.com>
05/26/2010 04:55 PM

To Comment@ptimasterplanupdate.com
cc
bcc
Subject Comments on the Airport Master Plan

While it is nice to plan for the future, I think we are putting the cart before the horse. We need to attack a major low cost airline, Jet Blue or Sourthwest, to fly out of this airport. There needs to be an effort similar to what was done to get Google to bring high speed Internet to a local community. I believe that if a community effort is made coupled with the infrastructure now and what will be built in the future should attact one of these airlines. This would be a major boost to the area and the furniture market. Saying if you build it they will come really doesn't work with airlines. Just my two cents.

Tom Taydus
High Point

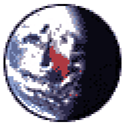
<Dennis_Hedrick@beaerospace.com>
05/27/2010 09:47 AM

To comment@ptimasterplanupdate.com
cc
bcc
Subject Master Plan

I live in Quail Creek, very close to the area of these expansion plans (reference page 129). I find the plan quite unbelievable. The only reason for an airport of this magnitude is massive numbers of flights, size of planes, etc. This would raise issues of safety, noise and excessive costs right on top of one of the most premiere living/working areas of the Triad. We also have airports like this already in Research Triangle Park and Charlotte less than an hour drive away.

This plan reads more like an agenda of someone on a 'bigger is better' power trip. I expect Triad leadership using the stewardship of government powers of aquisition and taxation to be balanced, smarter and more innovative.

Dennis Hedrick
E-mail Dennis_Hedrick@beaerospace.com



Holly Geary <ermgeary@gmail.com>
05/26/2010 09:57 PM

To comment@ptimasterplanupdate.com
cc
bcc
Subject Expert Land and Avigation Easement Negotiators ERM & ASSOCIATES, LLC

Dear PTI

After reading a recent article regarding the Piedmont Triad Airport Authority requiring approximately 800 additional acres for future development, I would like to introduce our land acquisition and avigation easement company, ERM and Associates, LLC. We are expert negotiators in the acquisition and/or purchase of property under the relocation act.

We would like to follow up and send you more information regarding our company, expertise and recent projects. Additionally, please visit our website, www.ermjr.com, for further information on our firm. Thank you for taking the time to get to know ERM. I would appreciate it if this message could be forwarded to the appropriate department/person.

We look forward to your response.

Sincerely,

Holly Geary

ERM & Associates
Virginia's Land and Easement Acquisition Specialists
PO Box 3648
Warrenton, VA 20188
(540) 270-1933
www.ermjr.com

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Piedmont Triad International Airport
P.O. Box 35445 Greensboro, North Carolina 27425
Phone: 336-665-5600
Fax: 336-66a5-5679
www.FlyFromPTI.com

PTAA
PIEDMONT TRIAD
AIRPORT AUTHORITY