

EXECUTIVE SUMMARY

Leveraging Piedmont Triad International Airport and other Regional Assets for Piedmont Triad Regional Competitive Advantage

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Preface

Piedmont Triad leaders have placed high priority on leveraging the FedEx hub and the Region's highway and other location and logistics assets to develop a world-class competency in global logistics and air cargo for business recruitment and economic growth. An immediate need is for coordinated Region-wide planning and local government partnerships to accomplish this, thereby helping Piedmont Triad International Airport (PTI) to achieve its full potential as an engine for job creation and economic development, not only immediately around the airport but also throughout the entire 12-county Piedmont Triad Region.

With this objective in mind, the Piedmont Triad Partnership (PTP) has contracted with John D. Kasarda, Ph.D., Director of the Kenan Institute of Private Enterprise at UNC-Chapel Hill, to develop a report and a set of recommendations to leverage the Piedmont Triad's global logistics assets. The report, captioned *Leveraging Piedmont Triad International Airport and other Regional Assets for Piedmont Triad Regional Competitive Advantage* (the Report), provides (1) the vision, (2) lessons learned from other air logistics developments, (3) strategic guidelines, and (4) action-specific recommendations for PTI (and especially its new FedEx hub) to become a catalyst for regional economic development and a state-wide resource for business competitiveness. The Report is pivotal to the vision, strategy, and actions necessary to position PTI as a leading multi-modal air logistics hub that will drive airport-linked business development on and near its property, as well as substantially beyond airport perimeters, creating a greater Piedmont Triad Aerotropolis.

Airport-Driven Development Experiences Relevant to the Piedmont Triad Region

I. Introduction

The Piedmont Triad (the Region) is at an economic crossroads. Low-wage global competition, combined with productivity increases in manufacturing, has stripped the Region's traditional industrial clusters in furniture, textiles, and tobacco manufacturing of tens of thousands of jobs since 2000. Although 36th in relative population size, the Piedmont Triad metropolitan area ranked 165th in 2005 among the nation's 200 largest metro areas in terms of job and income growth according to the Milken Institute's study of Best Performing Cities.

There is some sunlight appearing on the horizon, however. New regional high tech clusters are emerging, and the FedEx decision to establish its Mid-Atlantic hub at PTI provides the Piedmont Triad special competitive advantage in air logistics, offering time-sensitive industries speedy, reliable long-distance connectivity, heretofore lacking in the Region.

Indeed, there are signs of PTI and its environs becoming the new "downtown" of the Piedmont Triad, the same way that the Research Triangle Park (RTP) has become the functional downtown of the greater Raleigh-Durham-Chapel Hill region. It is important to note that in no way have the municipalities of Raleigh, Durham, or Chapel Hill suffered as a result of RTP's development. In most respects, all three cities and the entire 13-county region have been substantially enhanced by the RTP's growth and commercial success.

Led by FedEx and HondaJet locating at PTI, a similar process can occur in the Piedmont Triad. In fact, how PTI and its immediate surrounding areas develop will determine to a large extent how the Piedmont Triad and its constituent cities and counties go in terms of

industrial mix, business competitiveness, job creation, and citizen quality of life. For this development to succeed, it must be based on new economic realities shaping business location, especially the growing importance of speed, agility and connectivity that air logistics provides.

II. New Realities of Business Location

It is already clear that an increasingly fast-paced, globally networked economy is changing the rules of business competition and industrial location. These rules are being altered by a catalytic convergence of digitalization, globalization, aviation, and time-based competition.

The combined importance of these factors is creating a new economic geography, with commercial airports driving and shaping business location and industrial development in the 21st century as much as highways did in the 20th century, railroads in the 19th and seaports in the 18th. Today, these airports have become key nodes for time-critical manufacturing, distribution, and business services and engines of economic development, attracting numerous types of air commerce-linked enterprises. These include, among others, time-sensitive manufacturing and distribution, e-commerce fulfillment and third-party logistics firms, hotel and exhibition complexes, and office complexes that house air-travel intensive professionals such as researchers, consultants, auditors, and high-tech industry executives.

As more and more aviation-intensive businesses cluster near these airports and along transportation corridors radiating from them, a new urban form—the Aerotropolis—is emerging, stretching up to 20 miles outward from the airports. With the airport serving as a multi-modal transportation and logistics nexus, strings and clusters of business and technology parks, industrial parks, distribution centers, and information and communications technology (ICT) complexes are forming around the airports and along connecting surface transportation corridors. Even some cities and development zones located up to 60 minutes drive from some airports are experiencing accelerated economic growth. The potential for direct economic benefits from PTI extends to the entire Region and can be further enhanced by improvements to connecting highways as described more specifically in the Report.

III. Air Logistics and Industrial Competition

To remain competitive, today's industries require fast-cycle logistics. Manufacturers must be able to access regional, national, and global networks of suppliers of materials, components and sub-assemblies in order to obtain the best-quality components at the lowest possible price. At the same time, increased flows of information worldwide are leading to rapid changes in customer demands. It is becoming clear that new strategies to meet these challenges will require the development of innovative multi-modal air logistics infrastructures which synthesize information and multi-modal transportation to speed the delivery of parts, components and finished goods from suppliers to manufacturers and from manufacturers to customers around the nation and increasingly worldwide.

The rise of e-commerce further heightened time-based competition and the importance of airports. Most of this explosive growth is expected to be business-to-business (B2B), supply-chain transactions where materials and components will be ordered through the Internet and quickly shipped to next-stage producers.

The expansion of the B2B e-commerce and direct-to-customer Internet orders has placed a particular premium on speed and reliability in the delivery process. To meet these

new imperatives in order fulfillment, e-commerce distribution centers are being built near air express hubs that have speedy, reliable shipping networks. Air express hubs actually extend the business day for e-commerce fulfillment by allowing shippers to take orders for expedited national or global delivery as late as 11:00PM in some locations.

Air logistics, which includes air cargo, air express, and their supporting logistics services, represented a \$ 250 billion industry in 2006. It is expected to triple by 2025, while international air-express shipments are expected to increase at least four-fold during this period. Already, air cargo and air express are the preferred modes of international shipping of higher value-to-weight B2B transactions in microelectronics, automobile electronic components, aircraft parts, mobile telephones, fashion clothing, pharmaceuticals, optics and small precision manufacturing equipment, as well as many perishables such as seafood and fresh cut flowers. These time-critical industries are increasingly locating near airports to improve their speed, agility and connectivity to their suppliers and customers.

IV. Airports as Service Sector Magnets

Not only time-sensitive goods-processing and distribution facilities are being drawn to locations near airports. As the world's service economy also shifts into fast-forward, these airports are becoming magnets for regional corporate headquarters, trade representative offices, and professional associations that require executives and staff to undertake frequent long-distance travel. Airport access is likewise a powerful attraction to information-intensive industries such as consulting, advertising, legal and financial services, data processing, accounting and auditing, which often send out professionals to distant customers' sites or bring in their clients by air. The accessibility commercial airports provide has become essential to attracting business meetings and conventions, trade shows, exhibitions and merchandise marts.

High-tech industries and airports also increasingly reinforce each other. With intellectual capital supplanting physical capital as the primary factor in 21st Century wealth creation, time has taken on heightened importance for today's knowledge workers as has the mobility of these workers over long distances. Research in the U.S. has shown that high-tech professional workers, for example, travel by air at least 60 percent more frequently than most other professionals.

With this sector's supply chains and employees increasingly geared to speed, connectivity and mobility, quality air express and air passenger service have become essential to the location of many high-tech firms. Clusters of high-tech companies are thus locating at and near air express hubs such as Memphis, Louisville, Indianapolis, Alliance Texas, Ontario, California, Subic Bay Philippines, Penang, Malaysia, and Campinas Brazil. The impact of airport-induced job growth on land use in the vicinity of airports is likewise substantial.

V. The Rise of the Aerotropolis

Emerging corridors, clusters, and spines of airport-linked businesses are giving rise to a new urban form—the *aerotropolis*—extending outward up to 20 miles from larger airports. The airports function as the multi-modal logistics hub and commercial nexus of this diffuse airport-integrated urban complex, analogous to the function central business districts (CBDs) play in the traditional metropolis. Indeed, under the rubric of Airport Cities, some of these airports have assumed the very same roles of metropolitan CBDs by becoming regional intermodal surface transportation nodes and significant employment, shopping, meeting and

entertainment destinations in their own right.

Reflecting the new economy's demands for connectivity, speed and agility, the *Aerotropolis* is optimized by corridor and cluster development, wide lanes, and fast movements along highways as well as good rail connectivity. While some such infrastructure development at and around PTI is likely decades away, the regional planning process needs to commence immediately and appropriate land reserved before on-going property development precludes this critical future infrastructure.

VI. Existing Piedmont Triad Logistics Assets and Challenges

The Piedmont Triad is rich in logistical assets and is strategically located in the center of the Atlantic coast air transport corridor. The Triad offers excellent interstate highway access and competitive rail service, as well as being within five-hour trucking proximity to deep-water ports at Wilmington, NC, Morehead City, NC, Charleston, SC, and Norfolk, VA. In addition, the area is served by the Norfolk Southern and CSX rail lines, with existing lines that can be extended to airport property development sites. PTI also boasts world-class maintenance facilities for aircraft of all types.

Telecommunications infrastructure is also important in further leveraging the Piedmont Triad's multi-modal transportation assets. Here, the Region already possesses a state-of-the-art telecommunications infrastructure that is reliable, robust, and redundant.

High tech industry cluster development not only tends to go hand-in-hand with air logistics complex development, but also where the area's colleges and universities produce ample numbers of appropriate graduates. The Piedmont Triad's nine community colleges and eleven 4-year degree colleges and universities offer an excellent labor pool as well as knowledge-based skills. A number these institutions are currently offering or are developing logistics curricula to leverage and be leveraged by the FedEx Mid-Atlantic hub and the Piedmont Triad's other emerging logistics assets. Further stimulating high-tech clustering are the growing number of scientists, engineers, architects, designers, medical professionals, and other "creative class" professionals being produced or employed by the Piedmont Triad's primary research institutions: Wake Forest, UNC-Greensboro, and North Carolina A&T.

Given the Piedmont Triad's logistics and other assets to be soon reinforced by the FedEx Mid-Atlantic hub, the Region has a propitious opportunity to create a world-class, differentiating competency in multi-modal air logistics that can strengthen its traditional manufacturing economy and attract new economy industries such as microelectronics, pharmaceuticals, medical devices, and aerospace equipment. Indeed, the Piedmont Triad's confluence of location, interstate highways, PTI and its new FedEx hub provide the Region competitive advantage that can help brand the Piedmont Triad nationally and globally in the same way that RTP and research have branded the Raleigh-Durham-Chapel Hill area and financial services have branded Charlotte. Beyond branding, the Piedmont Triad's combination of logistics assets gives the Region true economic advantage (its unique selling proposition) that can have the potential to drive the creation of ten of thousands of new jobs across the entire 12-county Region.

This will not likely happen, however, under the present city-county centric planning and action paradigm that predominates in the Piedmont Triad Region. To compete nationally and globally, all jurisdictions in the Piedmont Triad must work together as a unified entity reflecting the reality that the Region is, in fact, a single market economy. This involves planning, developing and marketing the Region as a whole to create integrated multi-modal

infrastructure and economies of scale and to coordinate actions to maximize the regional brand and long-term benefits to individual jurisdictions. For example, without established protocols between jurisdictions, companies choosing to locate in the Piedmont Triad will likely continue to play the cities/counties of the Region off one another to the detriment of the local jurisdictions, their tax bases, and ultimately their citizens.

PTI has an excellent opportunity to develop as the primary economic driver of this integrated region. Planned, developed, and marketed effectively, PTI will not only grow and prosper in its own right, but with coordinated Region-wide planning and action, PTI will serve as a powerful engine for Piedmont Triad job creation and economic development for many decades to come. As this occurs, it is likely that numerous aerotropolis features one sees emerging around and outward from U.S. and Asian air logistics hubs will take place in the Piedmont Triad Region.

In point of fact, there is little doubt that an aerotropolis in some form will emerge and grow around PTI. *The critical question is: will it emerge and grow in an intelligent manner so that development is economically efficient, aesthetically pleasing, and environmentally sustainable, bringing jobs and an improved quality of life to residents of the entire Piedmont Triad Region? Or will it emerge and grow in a spontaneous, haphazard, unsightly, and ultimately unsustainable manner as has occurred around so many commercial airports in the U.S. to date, which will substantially impede the potential benefits not only to areas proximate to PTI but to the entire Region?*

Pivotal Infrastructure Issues

I. Piedmont Triad International Airport and FedEx Hub Impact

PTI needs additional commercial airline passenger service. Boosting the number of passengers using PTI will be key to attracting this additional airline service. The new FedEx hub should contribute to this in the longer term by attracting time-sensitive industries to the Piedmont Triad which research has shown generate substantial additional passenger travel.

In terms of regional economic impact, a consultant study contained in the Environmental Impact Statement for the project (released in late 2000) estimates that the FedEx hub will create nearly 20,000 new jobs in a 14-county catchment area over a 16-year period after the hub opens. Total new wages and salaries are projected at \$5.5 billion, with a total value-added impact of \$9.3 billion on the Region's economy, according to the study. The study estimates that \$703 million in new state tax revenues and \$236 million in new local tax revenues will be generated over the 16-year period. These figures are not adjusted for inflation.

Based on airport-linked employment growth that has occurred around other regional air express hubs, the Report suggests that the 20,000 new job forecast figure may be low. This is because it is based largely on traditional economic impact methods that focus primarily on direct, indirect, and induced (multiplier) effects and therefore do not fully capture "catalytic" hub effects. Catalytic effects represent employment growth created by firms locating in an airport region due to the connectivity the airport provides to their suppliers and customers.

One important attraction of air express hubs is that they offer considerably later drop-off times of time-sensitive parcels for next-day delivery compared to areas without hubs. As time-based competition and time-critical delivery increase in the future, these much later drop-off times will likely make a marked difference for more and more time-sensitive firms

shipping up and down the East Coast. The extensive FedEx trucking network that will accompany the Mid-Atlantic hub will also likely attract numerous firms to the Region that rely on time-definite deferred (two- to three-day) delivery.

II. Piedmont Triad Surface Transportation Assets and Needs

The battle for air cargo is won on the ground, not in the air. It was the Piedmont Triad's superb present and future interstate highway access that was a pivotal factor in FedEx selecting PTI for its Mid-Atlantic hub. Similarly, these excellent connectors provide opportunities for the entire Piedmont Triad Region to directly benefit from PTI. Yet, there are growing choke points and needed surface transportation improvements to maximize the potential regional benefits of the Piedmont Triad Aerotropolis.

III. PTI Surrounding Area Land Use

To plan for future commercial growth and allow PTI's infrastructure and flight schedule to expand, it is important for the Airport Authority to consider acquiring additional land. It is further recommended that all undeveloped property in the vicinity of the airport be carefully examined by local zoning authorities to make sure that non-conflicting development occurs. In particular, new residential developments that may conflict with future PTI expansion needs and operation should be discouraged or prohibited.

Encroachment of residential and other non-compatible land uses threatens the huge economic potential that PTI and the Piedmont Triad Aerotropolis can provide in employment, wages, and local government tax revenue both immediately proximate to the airport and to the entire 12-county Region. Elected officials, economic developers, and planners in areas on and around PTI must understand that they have a long-term fiduciary responsibility to manage land uses near the airport for the benefit to the entire Region.

IV. PTI Campus Facilities and Infrastructure Expansion

Additional facilities and infrastructure are required on the PTI campus for the airport to anchor the Piedmont Triad Aerotropolis. The appropriate placement of new facilities and infrastructure at PTI will have a significant bearing on the ability of PTI and the Piedmont Triad Region to realize its potential as a world-class air cargo airport. These facilities and infrastructure include a supplementary air cargo area and shared state-of-the-art central cargo facility located along one of PTI's main taxiways, a cargo transfer system, direct inter-modal (highway and rail) interfaces, and a ring road around the airport. Though market conditions will determine when a new cargo operating area and new cargo facilities are demanded, the PTI campus and nearby land should be reserved for these facilities and planning guidelines established in the coming year.

V. Workforce Readiness

Soft infrastructure, including in particular workforce skills, is also a primary location factor. To ensure that tenants have enough skilled workers and managers, a wide range of worker training, management education, and technology transfer functions should be provided through an on-site education and training center (ETC). A key feature of the ETC should be distance-learning capability, providing tenants and users with real-time audio, video, and tactile worker training customized to their skill needs, from virtually any location in the world. The creation of an ETC will provide a timely opportunity for PTI to market and distinguish itself among other competing industrial sites in North Carolina and the Eastern Seaboard.

Creating an Appropriate Logistics Business Environment

I. Introduction

The ability of Piedmont Triad companies to respond rapidly and flexibly to market opportunities will depend not only on internal management and operational changes, but also on the creation of the external business environment that makes time-critical commercial practices effective. This again involves both hard and soft infrastructure.

II. Logistics Resource Needs

First, logistics success depends on multi-modal transportation systems for fast and flexible supply chain management. Second, the PTI air logistics hub and regional logistics system require an integrated telecommunications network to obtain information on markets and orders, trace, track and manage materials and inventory, and control movements of goods to customers. Such a network is also essential to assisting, supporting, and attracting sophisticated third-party logistics (3PL) companies and 4PLs (advanced logistics integrators) to the Piedmont Triad Region that can provide state-of-the-art logistics services to PTI air logistics hub (ALH) users and tenants.

Third, the new business environment requires modern commercial services support, including foreign trade zone operators (which already exist at PTI) in-transit bonded warehouses at and near the airport, financial institutions, marketing, sales and employment agencies, legal services, and trade and exhibition centers. In addition, investors' ability to attract managers and highly-skilled younger workers requires a full array of community amenities including modern housing, quality public schools, good shopping and restaurants, vibrant nightlife, and recreational and cultural facilities. Much of this is currently available in the Piedmont Triad, but efforts to further improve nightlife, entertainment, restaurants, and cultural attractions will help attract and hold the new "creative class" of knowledge workers.

Fourth, many high-tech and other new economy industries need access to knowledge resources that can generate innovation and provide a reliable source of trained workers and managers. Among the most important knowledge-based organizations on which innovative businesses depend are top-notch colleges and universities and consultancy organizations that help commercialize technology, develop new products, and service local, national, and foreign firms more effectively. Likewise, a PTI distance education and training facility drawing on the ALH's telecommunications network could provide real-time audio, video and tactile worker training on-site (or distributed education and training to facilities throughout the Piedmont Triad) from training centers in distant headquarter firm locations around the world. This distance education and training facility should tie into the entire community college network in the Region.

III. Enhancing and Building upon the FedEx Hub

The FedEx Mid-Atlantic hub represents a unique opportunity for the Piedmont Triad to attract new investment to the Region while boosting the competitiveness of existing firms in the area. Full leveraging of the hub requires not only vision but also coordinated regional planning actions. Guiding the development of a business plan for the ALH and the greater Piedmont Triad Aerotropolis should be a set of overarching planning themes that, if followed, will greatly facilitate commercial success. These include:

- The PTI ALH/Aerotropolis Must Be Designed Around Emerging 21st Century Business

Practices.

- Development Plans for the PTI ALH/Aerotropolis Must Give High Priority to Quality of Life Considerations.
- Master Plans for the ALH/Aerotropolis Must Be Flexible and Reconfigurable.
- The PTI ALH/Aerotropolis Must Establish Synchrony with other Infrastructure Projects Around the Country and the World.
- The Piedmont Triad Must Emphasize the Importance of Logistics-Based Capabilities in Assisting, Supporting, and Attracting Globally-Oriented Businesses.
- Master Plans Must Demonstrate Regional and Statewide Benefits of the FedEx Mid-Atlantic Hub and PTI's Cargo Capabilities.

IV. Development Strategy for the PTI ALH

At an appropriate time, PTI might consider (i) partnering with a private sector firm to operate the shared-use (non-FedEx) multi-modal logistics infrastructure and facilities, and (ii) partnering with major commercial real estate developers to attract additional firms to the airport and nearby properties. This may well require new enacting legislation or an innovative financial partnership with private sector investors. The core business of PTI management is aviation, not commercial real estate development. So, bringing in private-sector master developers could add considerable development expertise and investor networks.

V. Marketing Strategy

At every stage of marketing, PTI's and the Piedmont Triad Region's promotional strategies should be grounded in solid business research and planning. This will involve market research of a generic nature of likely PTI tenants and users, given its stage of hub development, as well as market research specific to the greater Piedmont Triad Region.

Target industry analyses for air logistics hubs conducted by UNC's Kenan Institute of Private Enterprise identified eleven industrial groups that are most likely to utilize the air express and air cargo facilities. Most of these would no doubt also be the best target industries for the larger Piedmont Triad Region, as well. They include:

- Logistics service providers
- Semiconductor and computer chip manufacturers
- Pharmaceuticals and contract biotech and pharmaceutical lab testing facilities
- Computer and electronic sub-assembly manufacturers
- Aircraft assembly, aircraft parts suppliers and aircraft maintenance services
- Fashion, garments and accessory suppliers
- Scientific and medical instruments manufacturers, particularly those supplying small volumes of high value products (for example aromatics)
- Optics and small precision equipment manufacturers
- Suppliers of perishable products—for example, fresh seafood, live animals, fresh fruit and flowers

- Digital automotive component manufacturers and related spare parts suppliers
- Jewelry and watch manufacturers

Summary of Recommendations and Action Steps

The thirty recommendations and action steps contained in the Report may be summarized under six categories (1) Overarching regional recommendations, (2) Infrastructure and transportation, (3) PTI-specific recommendations, (4) Education and workforce, (5) Marketing, and (6) Leadership.

I. Overarching Regional Recommendations

- To compete nationally and globally, Piedmont Triad local governments must work together as a single entity.
- Air logistics represents the Piedmont Triad's best opportunity to create a world-class differentiating competency, leverage it fully.
- The Region's multi-modal logistics assets provide an advantage that can attract investment, generate tens of thousands of new jobs and raise the image and awareness of the Piedmont Triad. Build and brand around these assets.
- The Piedmont Triad Aerotropolis will complete, not compete with, what cities are doing in the Region. Work together for success.
- Fast-cycle logistics should become the Region's new competitive tool, not low-cost and traditional incentives.

II. Infrastructure and Transportation

- PTI tenants and users will require upgraded local highways, new interstates, extended rail lines, and state-of-the-art telecommunications infrastructure.
- Substantial improvements need to be made in the Region's transportation system.
- PART should consider establishing a task force to plan transportation improvements in PTI airport area.
- PART should establish multiple bus routes to facilitate transportation for part-time FedEx and other workers to the airport.

III. PTI-Specific Recommendations

- PTI's master plan must be flexible and responsive to future needs.
- PTI's intermodal transportation infrastructure should be designed to allow seamless and flexible flows of materials among convergent transportation modes.
- Planning for the PTI air logistics hub should prioritize aesthetics and environmental sustainability.
- PTI must continue to aggressively recruit additional passenger and air cargo service.
- Piedmont Triad Airport Authority should explore additional non-aeronautical revenue sources.
- All PTI entrances should be well-designed and attractive.

- PTAA should consider engaging private sector partner(s).

IV. Education and Workforce

- Develop a state-of-the-art education and training center at or near PTI to serve the entire Region.
- Logistics curricula concentrations at Piedmont Triad community colleges and universities need to expand and improve.

V. Marketing

- Marketing of the PTI Air Logistics Hub should emphasize the importance of its logistics-based capabilities in attracting time-sensitive goods-processing businesses.
- PTI and regional economic development organizations should enlist experts in logistics/supply chain management, multi-modal infrastructure development and IT to design systems to support fast-cycle logistics.
- Piedmont Triad Airport Authority and Piedmont Triad Partnership should focus marketing efforts on major corporate relocation/site selection consultants.
- PTAA and economic development organizations should consider branding the Piedmont Triad Aerotropolis.

VI. Leadership

- Regional leaders, particularly from PTAA, PART, and PTP, should look at best practices at other airports (e.g. Amsterdam Schiphol Airport and Denver International Airport)
- Piedmont Triad municipal and county officials and planners should meet to coordinate actions.
- Piedmont Triad leaders should produce a comprehensive, multi-year action plan to guide development of the Piedmont Triad Aerotropolis.
- Piedmont Triad local governments should expedite building and other permit approvals for companies.
- Aerotropolis and Heart of the Triad (HOT) development should be coordinated.