

Final Report

A Peninsula Air Logistics Hub at Newport
News/Williamsburg International Airport:
Vision and Development Guidelines

John D. Kasarda, Ph.D.
Director
Kenan Institute of Private Enterprise
The University of North Carolina at Chapel Hill
Chapel Hill, North Carolina 27599
U.S.A.
Email: john_kasarda@unc.edu

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Executive Summary

Newport News/Williamsburg International Airport (NNIWA) and the Virginia Peninsula are facing increased competition from other airports and regions. New strategies are required to meet new competitive realities. These strategies must focus less on cost factors and traditional government incentives and more on creating competitive advantages through speed, agility and connectivity.

It is proposed that speed, agility, and connectivity can best be generated by creating an air logistics hub (ALH) at NNWIA that will drive a Peninsula and greater Hampton Roads fast-cycle logistics network. Cornerstoned by AirCommerce Park, which is envisioned as developing in three phases over an approximately 15-year period, this multimodal logistics hub will integrate air, highway, rail, and sea transportation modes with advanced telecommunications, sophisticated materials handling systems, and state-of-the-art support services to provide tenants and users capability to respond rapidly and flexibly to changing markets nationally and worldwide. Upgraded local highways, additional interstate exchanges, and new and extended rail lines (including those to the Port of Hampton Roads) are required to integrate the ALH with regional business clusters and major national and international transport modes.

The Peninsula ALH's intermodal transportation infrastructure should be designed to allow seamless and flexible flows of materials among convergent transportation modes and AirCommerce Park as well as other commercial facilities both in the core and peripheral areas of the ALH. A cargo transfer system should be planned linking the multi-use Central Cargo Facility (CCF) to cargo related tenants as well as to an on-site intermodal rail facility at mid-field. A larger intermodal rail facility and adjacent inland port will be developed off-site. The CCF would provide off-ramp tenants and off-site production facilities, warehouses, and distribution centers with efficient sorting capability, customs

clearance, and air freighter access. At full development, the entire ALH should be served by a ring road encircling it, providing quick access to all parts of the complex, to local and regional highway systems, and to the intermodal rail facilities. Internal roads should likewise be designed to connect the Central Cargo Area and ALH commercial tenants and users to the ring road.

AirCommerce Park can provide a propitious jumpstart to the Peninsula ALH. The former's three phases of proposed development must be carefully planned and all facility construction on it consistent with the master plan. Success of AirCommerce Park will rest on functions and facilities described in the planning guidelines for the ALH and inconsistent short and long-term uses should be discouraged. While it may seem prudent by some to use the ramp and land reserved for AirCommerce Park for alternatives to which it was envisioned, such use would damage prospects for successful ALH development.

Related to the above, small tenants (1 to 2 acres) should be prevented from locating facilities at AirCommerce Park. This could preclude much larger projects down the road. Likewise, if small aircraft are left parked on the existing AirCommerce Park ramp (even though it is currently vacant), this could well detract from marketing to future tenants for which AirCommerce Park was designed.

The Peninsula ALH must be more than a multimodal logistics infrastructure supporting AirCommerce Park, however. Its full potential and ultimate success rest on creating a total business environment that will substantially improve sourcing, production, and distribution activities of all its tenants and users. This includes soft infrastructure support in the commercial and knowledge arena along with hard infrastructure such as multimodal transportation and integrated telecommunications.

Planning for the Peninsula ALH should give high priority to aesthetics and quality of life. Newport News/Williamsburg International Airport must

support not only logistics activities but also regional recreation activities and tourism, as well as business travel. To the extent possible, logistics, manufacturing, trucking, and cargo handling should be physically separated from flows of business and leisure travelers. High quality design standards should be maintained at and surrounding the ALH for buildings, landscaping, and site improvement. Entranceways and signage should be aesthetically pleasing. Since first impressions are often enduring, physical appearance is extremely important. Therefore, to the degree feasible, the ALH and immediate surrounding areas should be designed to look more like a university campus or business park than a traditional industrial or logistics park.

As to the construction and management of the Peninsula ALH, serious consideration should be given to bringing in an outside firm with successful experience in airport-linked logistics development and operation. Such companies have market contacts that can be leveraged for tenant recruitment.

To further bolster tenant recruitment, the Peninsula Airport Commission should establish a close working relationship with major corporate relocation and site selection consultants, making them aware of the NNWIA's assets and regularly updating them on development progress. In most cases, large companies looking to expand or relocate rely on site selection specialists to provide them with a short-list of potential locations to choose from, along with their strengths and weaknesses. Likewise, major commercial real estate firms such as Colliers International, CB Richard Ellis, Hines, and Jones, Lang, Lasalle and REIT's (Real Estate Investment Trusts) such as Prologis and AMB properties often work closely with corporations in their site selection and eventual commercial development. By taking an indirect marketing approach via major site selection consulting firms and large corporate commercial real estate companies, a far broader range of likely potential tenants can be reached.

It is recommended that a good part of the initial marketing focus on attracting “big name” or “trophy” logistics service providers as Peninsula ALH tenants. Once a couple of these are landed, it sends out a market signal to other 3PLs (third party logistics providers) and freight forwarders that the ALH is a choice location. Since smaller fish tend to like big fish as neighbors, landing a big fish will be a significant long-term marketing advantage for the ALH in its own right.

At every stage of marketing, the Peninsula ALH (including AirCommerce Park) promotional strategy should be grounded in solid business research and planning. This will involve market research of a generic nature on likely ALH tenants and users, given its stage of development, as well as market research specific to southern Virginia. Research on commercial shippers from around the world points to five generic types of shipments where air transport is the consignees’ mode of first choice. These are when:

- Flexible and customized production is the norm
- The high value of the product compared to its weight justifies the extra cost of airfreight
- The product is perishable—either in the physical or economic sense
- Short production cycles and/or “just-in-time” inventories require fast delivery
- Immediate delivery of spare parts, time sensitive documents or products is required

Target industry analysis identifies eleven industrial groups that are most likely to be attracted to AirCommerce Park and the ALH. They include:

- Logistics service providers

- Semi-conductor and computer chip manufacturers
- Pharmaceuticals
- Computer and electronic sub-assembly manufacturers
- Aircraft parts suppliers and aircraft maintenance services
- Garments and fashion accessory suppliers
- Specific elements in the industrial supplies business, particularly those supplying machine tools and/or those in the petrochemical industries supplying/manufacturing small volumes of high value products, for example aromatics
- Optics and small precision equipment manufacturers
- Suppliers of perishable products—for example, seafood and fish, live animals and animal parts for traditional medicine, fresh fruit and flowers
- Automotive component manufacturers and spare part suppliers
- Jewelry and watch manufacturers

In terms of structure and content, the report commences with a summary of the business rationale for a Peninsula ALH and regional logistics system. This includes contemporary competitive forces shaping production and distribution and how airport-centered logistics hubs in the U.S. and Europe have harnessed these forces for development advantage. Such development has attracted numerous growth industries to the airport environs.

It is concluded that NNWIA and the Virginia Peninsula possesses a unique opportunity to drive similar development outcomes if it puts in place the logistical infrastructure and business environment to provide superior speed and agility in airport materials handling and distribution. This new logistics strategy

would build on the Peninsula's existing assets including a rich set of knowledge-based advanced technology industries, moderate costs and a well-educated, disciplined workforce, among others.

Following an introductory chapter covering the above issues, three chapters offer, in order, the infrastructure, business plan, and implementation plan guidelines to design, develop, operate, and manage an air logistics hub at Newport News/Williamsburg International Airport and generate the greatest region-wide economic impact. Critical success factors are presented, as well as target firms specified. To attract newer, high growth, high value-adding industries, it is stressed that the relative importance of traditional government incentives will be superceded by logistical capabilities of the site with quick and efficient business access to suppliers and customers.

The fourth chapter concludes with 26 recommendations and action steps to be followed by the Peninsula Airport Commission, a number of which were noted above, to successfully develop AirCommerce Park, the ALH, and the Peninsula logistics network. Those recommendations and action steps focus on required hard and soft infrastructure as well as the business strategies to be pursued to provide connectivity, speed, and agility to Peninsula firms: the three emphasized factors for their gaining competitive advantage in the 21st century. The recommendations also address infrastructure and facility phasing and marketing strategies along with the public and private sector options for developing, operating, and managing the Peninsula ALH at NNWIA.

Chapter 1

Regional Challenges and Strategic Response: The Air Logistics Hub/Air Commerce Potential

I. Introduction

The Virginia Peninsula is at an economic crossroads. Strategic decisions and development initiatives taken today will determine the 21st century direction the area goes in terms of industrial mix, business competitiveness, job creation, and citizen quality of life.

Critical issues are at stake. Will the Peninsula (and greater Hampton Roads region, see Exhibit 1.1) successfully transition to “new economy” high-tech, R&D, and information-intensive business services sectors? Will both its traditional manufacturing and emerging high-tech and white-collar service industries be able to compete effectively, domestically and worldwide, in the new knowledge-based, speed-driven marketplace? Will the region’s job creation over the coming decade capitalize on its multimodal transportation infrastructure, public schools and universities, and quality labor force (including 125,000 well-trained military personnel)? Or, will the region’s chief export be its well-educated, well-trained labor? Finally, will commercial physical development on the Peninsula be spatially efficient, attractive, and environmentally sustainable, becoming an enduring magnet for new economy knowledge-based workers, tourists, and long-term residents alike?

All these issues, of course, are inextricably interwoven. Taken together, they will determine the economic fate of the Virginia Peninsula and the greater Hampton Roads metropolitan area. It is therefore imperative that they be addressed with both strategic vision and coordinated action. This requires, first, a solid understanding of the new drivers of 21st century industrial

competitiveness, job creation, and economic development. Second, the Peninsula Airport Commission in partnership with regional government and business leaders must implement an integrated set of strategies, policies, and programs to harness and leverage these new competitive drivers to the region's and to the entire state's commercial advantage.

Apropos the above, it is already clear that an increasingly fast-paced, globally networked economy is changing the rules of industrial competition and business location. These rules are being altered by a catalytic convergence of digitalization, globalization, aviation, and time-based competition. Speed, agility, and connectivity have become the mantra of many of the world's most successful firms.

The combined importance of these factors is creating a new economic geography with first-rate commercial airports driving and shaping business location and urban development in the 21st century as much as highways did the 20th century, railroads in the 19th and seaports in the 18th. Today, major airports have become key nodes in time-critical manufacturing, distribution, and commercial systems and engines of a local economic development, attracting air commerce-linked businesses of all types to their environs. These include among others, just-in-time manufacturing and distribution, e-commerce fulfillment and third-party logistics firms; hotel, tourist, and exhibition complexes; and office buildings that house regional corporate headquarters and air-travel intensive professionals, such as researchers, consultants, auditors, and high-tech industry executives.

As more and more air travel intensive-businesses cluster near commercial airports and along transportation corridors radiating from them, a new urban form is emerging—the Aerotropolis—stretching 15–20 miles outward from the airports. With the airport serving as a multimodal transportation and logistics nexus, strings and clusters of business and technology parks, industrial parks,

distribution centers, information and communications technology (ICT) complexes and tourist attractions are forming around the airports and along connecting surface transportation corridors. Even cities and development zones located as far as 60 minutes drive from some airports are experiencing accelerated economic growth as will be documented later.

Such development is occurring because of the connectivity and accessibility advantages commercial airports (especially these that have developed as multimodal air logistics hubs) provide to business and business people in the new speed-driven, networked economy. For decades, Norfolk International Airport (ORF) has dominated Newport News/Williamsburg International Airport (PHF), hereafter referred to as NNWIA in flight networks and passenger service (see Exhibit 1.2), even with the strong growth exhibited in enplaned passengers in recent years at NNWIA. The same holds for air cargo. NNWIA cargo volumes have been modest compared to Norfolk. Yet, as will be elaborated herein, air cargo and multimodal air logistics pose rich potential for NNWIA and the region if the appropriate infrastructure and business environments are developed.

Apropos the above, Newport News/Williamsburg International Airport is commencing a master plan update. A primary objective of this report is to provide the vision and strategic business and infrastructure planning guidelines to assist the new planning effort so that NNWIA becomes more competitive and serves as a much stronger driver of economic development across the Peninsula and throughout the broader Hampton Roads region. Pivotal to this vision and strategy is to reposition NNWIA as a multimodal air logistics hub and build upon its forward-looking Air Commerce Park to attract new industry and drive development.

To set the real-world context for this vision and strategy for a Peninsula Air Logistics Hub at NNWIA, the remainder of this chapter will (1) discuss its

underlying business rationale and competitive logic, (2) provide concrete examples of air logistics hub success elsewhere (as well as note some failures), and (3) discuss the credibility and viability of successfully transforming NNWIA into a successful air logistics hub and air commerce center.

Following its introductory chapter covering the above issues, three additional chapters offer, in order, the infrastructure, business plan, and implementation plan guidelines to design, develop, operate, and manage an air logistics hub at Newport News/Williamsburg International Airport and generate the greatest local and region-wide economic impact. Critical success factors will be presented, as well as target industries specified. To attract newer, high growth, high value-adding industries, it is stressed that the relative importance of traditional tax incentives by government will be superceded by logistical capabilities of the site offering firms quick and efficient access to national and global suppliers and customers.

The report concludes with 20 recommendations and action steps to be followed by public sector agencies responsible for Newport News/Williamsburg International Airport and both the Peninsula and greater Hampton Roads regions to successfully develop the air logistics hub and regional multimodal network. Those recommendations and action steps focus on required hard and soft infrastructure as well as the business and aviation policy strategies to be pursued to provide connectivity, speed, and agility to Peninsula firms: the three emphasized factors for their gaining competitive advantage in the 21st century. The recommendations also address infrastructure and facility phasing and marketing strategies along with the public and private sector options for developing, operating, and managing a Peninsula Air Logistics Hub at NNWIA.

II. Business Rationale for an Air Logistics Hub at NNWIA

With increased global competition and rapidly evolving markets, substantial changes are occurring in the way business is being conducted around the world. At the forefront is the emergence of a new commercial environment where price and quality are necessary—but not sufficient—for competitive success. Increasingly, customers from both established and developing markets are demanding fast and reliable delivery of products often with distinctive, customized features. An industrial advantage is being gained by firms that respond flexibly and rapidly to their domestic and global customers, delivering lower cost, high-quality products quickly and efficiently.

Staying on top of the industrial competition also requires more efficient fast-cycle supply-chain management. Manufacturers must be able to access regional and global networks of suppliers of raw materials, components and sub-assemblers in order to obtain the best-quality products at the lowest possible price. At the same time, increased flows of information worldwide are leading to faster changes in market demands. Companies that can detect these changes, design and produce the desired products, and deliver them more quickly than other producers will capture the market. Since speed also reduces warehousing and inventory costs, stock-outs and remaindered goods, the speed advantage becomes a cost advantage as well.

The logistics speed advantage is being further validated by marketing research which shows that, worldwide, consumer tastes and product demands are changing much more swiftly today than was the case in prior decades. Indications are that such shifts will accelerate even faster in the decades ahead, resulting in situations where products that are “hot” one month may become obsolete just six months later. Such is already happening in the fashion clothing and the computer software industry where delivery time to the retail shelf (or now directly to the customer) frequently separates market winners from losers.

The implications of these trends for new logistics strategies are already evident. Adapting to growing global demands for flexibility and speed, companies such as Acer, Benneton, Boeing, Dell, General Electric, IBM, Nokia, Siemens, Toyota, and Wal-Mart are reengineering their sourcing and distribution systems to become much more agile and customer responsive. They now compete not only on price and quality but also on the basis of (1) concept-to-cash cycle time, (2) flexibility, (3) speedy, reliable delivery, and (4) after-sales support (or return) of their products. They manage complex international networks that encompass the entire value chain of suppliers, distributors, and customers across national borders, with speed and agility overarching goals.

Companies will not be able to meet the challenges of such a time-critical environment without dramatic changes in how they organize their flows of information, components, and finished products. This is why they are rethinking the role that logistics plays in their organizations and are reassessing their current strategies in light of the new demands for efficient supply chain management and quick response. It is becoming increasingly clear that new strategies capable of meeting these challenges will require the development of new agile logistics infrastructures which synthesize information and multimodal transportation to speed the delivery of materials and goods from suppliers to manufacturers and from manufacturers to customers, worldwide.

Mandating such changes are rapid and relentless worldwide technological, political, and economic transformations. Modern transportation, telecommunications, and goods-producing technologies have spread throughout the globe. Trade policies are being liberalized and new markets opened. Socialist and former socialist countries such as China, Russia and Poland have entered the capitalist marketplace with vigor. Huge wage differences between advanced industrial and developing countries have resulted in much wider geographic dispersion of component manufacturing sites, places of assembly,

and of distribution. With rising workforce skills and rapid cross-border technology transfer, what were previously known as Third World countries in Asia and Latin America have achieved much higher levels of output and now produce sophisticated goods and services. Even white-collar information-processing functions are being out-sourced to countries such as India, Ireland, and the Philippines. International consulting firm McKenzie forecasts that 3.1 million white-collar jobs will be out-sourced by U.S. firms to foreign locations in the next 12 years.

International customers (including those in India, China, Southeast Asia, and Latin America, which many believe pose the best long-term markets for U.S. companies) have also become far more sophisticated and demanding. They have available an unparalleled variety of products from all over the world. They are able to assess and identify value, and are therefore highly selective in purchasing. They expect quality, reliability, and competitive pricing. They also want customization of the products they buy, and they want these customized products right away, not in two to six months. For many purchases, not even two to six weeks is fast enough.

E-Commerce and Fast-Cycle Supply-Chain Management

The rise of e-commerce further heightened time-based competition. As late as 1995, sales through the Internet were essentially zero. By 1999, U.S. Internet-based business-to-consumer (B2C) sales had grown to nearly \$7 billion, skyrocketing to a \$54.9 billion in 2003, a 30 percent increase over 2002 compared to a 5 percent increase in total U.S. retail sales (U.S. Department of Commerce, 2004). According to Forrester Research, 166 million packages were shipped in 1999 by Internet retailers (e-tailers), with approximately 70 percent going by expedited delivery. By 2003, e-tailers were shipping 1.1 billion packages annually. Despite the death of thousands of dot.coms between 2000 and 2003, it

is near consensus among economic and business forecasters that e-commerce will flourish in the future.

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. Manufacturers already are able to electronically access an international network of suppliers in order to acquire the best-quality materials and parts at the lowest possible price. The introduction of e-marketplaces (auctions, aggregators, bid systems, and exchanges) is greatly expanding B2B e-commerce: Forrester Research predicts that e-marketplaces will account for up to two-thirds of B2B supply-chain transactions by 2006, predicated on industry, capturing 42 percent of online industrial trade and an average 28 percent of all business to business trade. Many suggest that with the simultaneous introduction of Enterprise Resource Planning (ERP), these e-figures could go even higher.

The expansion of the B2C e-commerce and direct-to-customer Internet orders has placed a particular premium on speed and reliability in the delivery process. To meet the imperatives of speed and reliability in order fulfillment, e-commerce distribution centers were built near gateway airports that have excellent flight networks, a location trend that's sure to accelerate in the decades ahead. This is especially the case at major air express hubs such as Louisville (UPS), Memphis International (FedEx), and Cincinnati (DHL). Air express hubs actually extend the business day for e-commerce fulfillment by allowing shippers to take orders for next day delivery as late as midnight. Dozens of e-tailers have thus already located their fulfillment centers near Memphis International Airport to leverage the FedEx air express network. The same story holds for Louisville International Airport and Ontario, California where numerous companies have also sited e-commerce fulfillment centers near these UPS air express hubs.

Complementing airport-linked e-commerce fulfillment centers are flow-through facilities for perishables (either in the physical or economic sense), just-in-time supply-chain and emergency parts provision centers, and reverse logistics facilities for the repair and upgrade of high-tech products such as computers and mobile phones. The clustering of such time-critical goods facilities around airports (often within air logistics parks), is stimulating further expansion of air cargo, air express, less-than-load (LTL) trucking, freight forwarders, and third party logistics providers (3PLs) along major arteries leading into and out of gateway airports.

Speedy, reliable delivery of products over long distances has become so critical to the new economy that air commerce is quickly becoming its logistical backbone. According to the International Air Cargo Association, forty percent of the value of world trade now goes by air, and the percentage is steadily rising. Air logistics, which represented a US\$ 250 billion industry in 2003, is expected to triple in the next 15 years while international air-express shipments are expected to increase at least five-fold during this period (Boeing Company, 2003).

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. (The global supply-chain model of Dell Computer pioneered this process in the early 1990s.) Even lower value to weight B2B product distribution such as apparel, shoes and toys are becoming time-sensitive and increasingly shipped by air.

The rapidly growing importance of air commerce to the U.S.'s economy is illustrated in Exhibit 1.3. This exhibit shows exports from the United States by transportation mode, and value in 1990, 1996 and 2002. Observe that in terms of

value, by 2002 air exports substantially exceeded export by vessel (\$225 billion vs. \$191 billion).

Not only time-sensitive goods-processing and distribution facilities being drawn to commercial airports. As the world's service economy also shifts into fast-forward, many larger airports are becoming magnets for regional corporate headquarters, trade representative offices, and professional associations that require officers 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.

High-tech facilities and airports also increasingly reinforce each other. With intellectual capital supplanting physical capital as the primary factor in wealth creation, time has taken on heightened importance for today's knowledge workers. So has the mobility of these workers over long distances. Research has shown that high-tech professional workers, for example, travel by air up to four times more frequently than most other professionals (Erie, Kasarda, McKenzie, and Molloy, 1999).

Some observers have suggested that advances in Internet access, videoconferencing, and other distributed communications technologies will diminish the need for air travel. The evidence indicates that telecommunications advances often promote additional air travel by substantially expanding long-distance business and personal networking.

Others have suggested that prolonged global economic downturns exacerbated by catastrophic events such as 9/11 (New York World Trade Center attack) and the constant threat of terrorism, as well as contagious disease outbreaks such as SARS will permanently diminish air commerce, in general, and business travel by air, in particular. This does not seem likely since the

business imperatives giving rise to the growth of air commerce and business travel (speed, mobility and global access) are increasing in importance. Air commerce and air travel should therefore be expected to rebound strongly from their 2001 to 2003 cyclical dip to record levels in the decade ahead.

Nowhere has the importance of airports been more permanent than in the high-tech sector. With this sector's supply-chains and employees increasingly geared to speed, mobility and global access, good air service has become essential to the location of many information and communications technology (ICT) firms and other high-tech facilities. In the U.S., clusters of ICT and high-tech companies are thus locating along major airport corridors, such as those along the Washington, D.C. Dulles Airport access corridor in Northern Virginia and the expressways leading into and out of Chicago's O'Hare International Airport. Dulles's and O'Hare's experiences are being replicated across the U.S., and throughout the world with aviation service becoming a primary predictor of an area's high-tech job growth.

Regarding overall economic development, numerous studies of airports in the U.S. and around the world document their remarkable impact on local and regional economies. To note just a sample:

- Los Angeles International Airport (LAX) is responsible for over 400,000 jobs in the five-country Los Angeles region; 80 percent of which are in LA County, where one in 20 jobs was found to be tied to LAX. The airport currently generates \$61 billion in regional economic activity, which translates to \$7 million per hour
- Dallas-Ft. Worth International Airport has become the primary driver of Metroplex's fast-growing economy. The number of companies located within the dynamic Las Colinas area, just to the east of the airport, has expanded to more than 2,000 and includes Abbott Laboratories, AT&T, Exxon, GTE, Hewlett-Packard, and Microsoft.

- In the 26-mile commercial corridor linking Washington, D.C.'s two major airports—Reagan National and Dulles International—employment grew from 50,000 in 1970 to over 800,000 by 2000. Among the companies located along the airport corridor near Dulles are America Online, Computer Associates, Nextel Communications, Cisco Systems, and EDS.
- In the Philippines, Subic Bay Freeport is rapidly expanding around a former U.S. naval air base that was converted to commercial use in 1993. Since FedEx located its Asia/Pacific hub at Subic Bay in 1994, over 150 firms—employing 40,000 workers—have located there, generating almost \$2.5 billion in investment. Between 1995 and 2000 the annual value of exports from Subic Bay jumped from \$24 million in to \$559 million. Acer has opened its largest personal computer assembly facility in the world at Subic Bay; the facility relies heavily on air freight for its supply-chain management. Nearer to Manila, the former U.S. Clark Air Base is attracting tens of thousands of ICT and other high-tech manufacturing jobs, as UPS is growing its Asia air express hub there.

Of course, with the exception of Subic Bay, the above examples represent large airports. Yet, the impact of medium-size airports on job creation, and economic development (as will be documented in moment) is also large. An analysis of employment growth in the suburban rings of all U.S. metropolitan areas showed that areas within four miles of airports added jobs two to five times faster than the overall job-growth rate of the suburban ring within which the airport was located (Weisbrod, Reed and Neuwirth, 1993). While most of the employment was concentrated around the airport or along major connecting highways within 15 to 20 minutes of the airport, recent research at Massachusetts Institute of Technology's International Center for Air Transportation documents that much broader region-wide impacts occur with air connections significantly

facilitating a region's access to suppliers, markets, ideas and capital (EconSouth, 2003).

Those in the air cargo industry know that the competitive battle for cargo is won on the ground—not the air—with good highway connections key. This is why most of the world's leading air cargo airports also have excellent on-site or nearby intermodal and truck cross-docking facilities with interstate highway access. Some of the most successful airports in job creation are quadramodal, possessing efficient access to all four transportation modes (air, highway, rail, sea). After discussions how airports more similar to NNWIA have developed as successful multimodal air logistics hubs, I will return to the potential of NNWIA to assume this role and become the Peninsula's primary engine of economic development.

III. Emerging Air Logistics Hub Examples

Ontario, California

Commercial growth surrounding Southern California's Ontario Airport—an emerging air logistics hub 45 miles east of Los Angeles—offers an excellent contemporary illustration of multimodal accessibility. The airport is at the nexus of major east-west and north-south interstate highways I-10 and I-15, with the Burlington Northern–Santa Fe intermodal rail yard nearby. The ports of Los Angeles and Long Beach are connected by interstate highways and rail lines. Over 25 million square feet of warehouse and distribution space were added in 1999 and 2000 adjacent to the airport and along Interstates 10 and 15 radiating out from it. During the past three years, another 40 million square feet were added, led by e-commerce fulfillment and distribution facilities ranging up to 1 million square feet in floor space.

Enhancing Ontario's position as a leading logistics and e-commerce fulfillment center is the growth of air express transportation services at and

around Ontario Airport. During 2003, UPS, whose west coast regional hub is at Ontario Airport, handled over 700 million pounds of freight while FedEx carried over 100 million pounds. This express service was boosted by another 100 million combined pounds carried by BAX Global, Emory Worldwide and Airborne Express. Ontario's development as a multimodal logistics hub has greatly contributed to making its surrounding "Inland Empire" the fastest growing major urban region in the United States and the leading job creator in Southern California.

Alliance, Texas

Another air logistics hub success is Fort Worth (Texas) Alliance International Airport. Promoted as the nation's first industrial airport by Ross Perot's company, development began in 1988 with the objective of serving business and commercial users rather than passengers. From the beginning, multimodality was emphasized, especially quick and efficient access to regional and national markets via interstate highways and intermodal rail connections. A major development driver was put in place in 1997 when FedEx opened its southwest regional hub at Alliance. Since then, over 100 major companies (33 from the Global 500 largest) have located at and around Alliance; such as AT&T, Nokia, BFGoodrich Aerospace, Bell Helicopters, Gulfstream, Zenith Electronics, Nestle Distribution, and Dell Computers. Alliance provides a Foreign-Trade Zone, an enterprise zone, a world trade center, state-of-the-art fiber optics and telecommunications, and a special inventory tax exemption as well as efficient U.S. customs services.

As a result of its wide variety of present and expected future tenants and users, such as time-sensitive manufacturers and distributors, third-party logistics providers, retailers, international firms and aviation-related companies, Alliance

is partitioned into geographic sectors geared to different tenant needs and requirements. These developments include:

- *Alliance Center*, a 2,600-acre high-density business complex that encircles the airport and is geared primarily towards aviation-related enterprises that require direct taxiway access.
- *Alliance Commerce Center*, a 300-acre business park for manufacturing and high-tech firms, which has served as a starting point for several small and mid-sized companies that have expanded into larger facilities throughout Alliance.
- *Alliance Air Trade Center*, a 52 acre air cargo development with direct access to the Alliance Airport runway system, direct access to Interstate 35W, and nearly adjacent to the BNSF intermodal facility. It has over 250,000 square feet of warehouse space available for intermodal cargo and international air freight companies.
- *Alliance Gateway*, a 2,400-acre distribution, manufacturing and office sector which provides parcels of land for constructing large-scale facilities such as warehouses and is designed to accommodate large distribution and industrial firms. It also has convenient access to Dallas/Fort Worth International Airport via State Highway 170.
- *Alliance Advanced Technology Center*, a 1,400-acre complex that is becoming one of the nation's premier technology hubs for major companies from around the world.
- *Heritage Reserve at Alliance*, which is integrated into a woodlands greenbelt and offers locations for research and development facilities in a natural setting.
- *Westport at Alliance*, a 1,500-acre industrial and distribution sector located directly adjacent to Burlington Northern Santa Fe Railway's

main north/south line and Intermodal Center. It caters to shippers needing rail access and other multimodal transportation options.

- *Alliance Crossing*, a 170-acre retail complex that is designed to accommodate retailers, restaurants and other service-oriented firms needed to service the areas increasing population base as well as employees and visitors of Alliance.

Alliance's commercial success has been attributed to its excellent multimodality, a variety of economic incentives it provides to tenants, its attracting a substantial number of third-party logistics (3PL) providers who offer manufacturers, distributors and retail shippers with value-added services including packaging, labeling, inventory management, transportation and transportation tracking as well as returns management. Alliance also provides educational and technical training facilities for companies located at its complex, including conference and teleconference facilities.

Perhaps most important, all firm recruitment and development is managed by a private company, Hillwood Development. Of the US\$4.8 billion invested in Alliance thus far, 97 percent has been from private sources. According to the Alliance website, this translates into over 20,000 permanent jobs at the air logistics complex and US\$150 million in property taxes generated.

Rickenbacker, Ohio

A third air logistics hub success story, centered at a mid-sized airport, is Rickenbacker International Airport in Columbus, Ohio. A former air force base, Rickenbacker was put into service in 1980 as an air cargo airport. Despite being a hub for the air cargo firm, Flying Tigers (now part of FedEx), Rickenbacker did not obtain success until the 1990s when a new public-private management model

was put in place and a new marketing strategy developed based on the “Inland Port” concept.

Rickenbacker’s success thereafter rested largely with efficient and cost-effective handling and distribution of supplies and finished goods, in contrast to more costly, less efficient handling at alternative airport complexes that lacked multimodality and as efficient logistics operations. The airport, strategically located in the Midwest U.S. to serve national markets, has excellent access to major interstate highways and intermodal rail facilities. Rickenbacker has an adjacent Foreign Trade Zone. It also has special state and federal tax exemptions such as those on inventory, abatement on real estate taxes for improvements to land and buildings as well as a subsidy of US\$3 million per year from local governments. In addition, the State of Ohio has committed US\$65 million in revenue bonds for future facility improvements.

Economic development around Rickenbacker since the early 1990’s has been remarkable. The airport serves as the logistics hub of a 15,000-acre (65 square mile) development zone called the Rickenbacker Area. This area contains over 20 million square feet of state-of-the-art logistics and distribution space, employing 15,000 workers. Despite the national and global downturn in air cargo during 2001 and 2002, Rickenbacker experienced robust air cargo growth.

Rickenbacker provides tenants and users with a 500,000-square-foot cargo terminal, which is being continuously expanded, modern materials handling equipment and logistics services, and direct airfield access to freight forwarders, third-party logistics providers and time-sensitive manufacturers and distributors who are advantaged by airside access. For example, Excel Logistics, one of the world’s largest supply chain management companies, operates a 230,000 square foot one stop shop facility that includes customs brokerage, airfreight forwarding, intermodal operations, value-adding logistics services, and warehousing. Rickenbacker’s logistics and fulfillment firms are undergirded by

state-of-the-art fiber optic loops, high-speed data circuits, and teleconference facilities.

As mentioned above, Rickenbacker's development success can be attributed in large part to its management strategy implemented in 1991 with the establishment of the Greater Columbus Inland Port Commission to promote trade through developing and leveraging logistics services and intermodal infrastructure. The Inland Port Commission is an exemplary public-private partnership made up of city, county, state and federal representatives from the public sector and the Greater Columbus Chamber of Commerce and individual manufacturers, shippers, logistics providers, and others from the private sector, with thought leadership from Ohio State University's highly-regarded Department of Logistics. Cost-benefit analyses have shown that for every U.S. dollar of public investment in Rickenbacker, three dollars in private investment have resulted with twenty-five dollars in regional economic impact, estimated to be US\$2.8 billion in 2002. This regional impact is forecast to grow to US\$3.8 billion in 2006.

North Carolina Global TransPark

Not all air logistics hubs have proven immediately successful. The North Carolina Global TransPark (GTP) falls in this category. The GTP is a multimodal business complex designed to support manufacturing, distribution, agribusiness, and transportation-related companies. A comprehensive planning effort was completed in 1994 with the objective of fully integrating air, rail, road, and sea transportation capabilities to serve the logistics requirements of industrial and distribution tenants and users.

The GTP encompasses 5,000 acres in eastern North Carolina, 80 miles east of the Research Triangle Park and 50 miles from the Atlantic coast. At full build-out (forecasted to be around 2025), the project will have two long-range parallel

runways, a state-of-the-art central cargo processing area, a highway-to-rail intermodal terminal, a dedicated system for transporting cargo throughout the GTP, internal road networks, and upgraded connections to regional road and rail systems. Two deepwater ports are located approximately one hour away by rail and highway. Thousands of acres within the GTP are available for private industrial, manufacturing and distribution facilities, all to be developed in a campus like environment.

Development History

In 1990, the author presented the conceptual outline for a new type of logistics infrastructure, a “Global TransPark” to North Carolina Governor James Martin and state officials.

A number of factors under-girded the concept:

- The rapid shift from national economies to global cooperative commerce;
- The emergence of just-in-time, flexible and agile manufacturing practices to reduce inventories for suppliers and customers and to provide quick customer response;
- The growing importance of air commerce which includes air cargo and air express;
- The need to utilize air commerce, shipment by sea and delivery by trucks and rail in an overall multimodal distribution system;
- The need for an advanced multimodal logistics hub in the Eastern United States to provide a gateway to national and global markets.

Studies at the University of North Carolina’s Kenan Institute and the Department of Transportation prompted North Carolina government to seek legislative approval for the concept by establishing the North Carolina Air Cargo

Airport Authority (later renamed, Global TransPark Authority) to conduct a feasibility study and produce a master plan for the project. A technical feasibility study was conducted by the state. The Federal Aviation Administration showed considerable interest in the concept from its inception, providing a \$1 million research grant to the Kenan Institute of Private Enterprise to research further the function for and configuration of a 21st century air cargo/industrial complex. The FAA also contributed \$300,000 to the state air cargo system plan/GTP technical feasibility study, and it provided \$622,000 towards the cost of the Global TransPark's Master Plan.

The Global TransPark Authority considered 11 site proposals from throughout North Carolina, before selecting an underutilized airport (the Kinston Regional Jet Port) in an economically lagging part of the state as the project site in May 1992. Political realities and the perceived need to stimulate economic development in the state's most impoverished region drove this siting decision.

In 1993, the North Carolina Global TransPark Foundation, a private not-for-profit corporation, was established and began a \$30 million campaign for private money to assist development at the Global TransPark. In the same year, the 13-county regional Global TransPark Commission was chartered by the General Assembly to provide marketing, low-interest loans and grants for economic development in its member counties.

The Global TransPark Authority began its Master Plan for the Global TransPark in late 1992 and completed the plan in early 1994. The plan was prepared by a team of internationally recognized professionals, headed by Kimley-Horn and Associates Inc. of North Carolina, Bechtel Engineering of San Francisco, California, and Greiner of Dallas, Texas. Wilbur Smith Associates of South Carolina also contributed. The Master Plan depicted a Global TransPark

of eventually 15,300 acres at full development with two parallel runways of 11,500 feet and 13,000 feet.

The Master Plan's original configuration called for a new runway in the first phase of the development. The Global TransPark Authority later modified the plan to extend the existing 7,600-foot runway to 11,500 feet in lieu of constructing an expensive all-new runway. The second runway remains a part of the Master Plan and will to be developed when needed. The Master Plan also identified the road and rail network to serve the Global TransPark and provide distribution links to deep-water ports. It included engineering, design, environmental, and forecast elements.

As part of the Master Plan, the Global TransPark Authority conducted an Environmental Assessment to measure impacts that would result from development of the Global TransPark. The assessment was accompanied by a Conservation Plan, which detailed a number of positive steps to be taken regarding wetlands. An Environmental Assessment is a comprehensive study but is not as detailed as a full Environmental Impact Statement (EIS). In May 1994, at the end of the review period for the Environmental Assessment, the FAA requested a full Environmental Impact Statement. The EIS was performed and the FAA concluded the EIS process with a Record of Decision issued in September 1997. This permitted bids for the runway extension.

In the meantime, Mountain Air Cargo/Mountain Aircraft Services Inc. opened a new \$8.5-million maintenance hangar and office complex. Mountain Air Cargo, a major contract carrier for FedEx, maintains a fleet of 62 aircraft that serve 30 states, Canada and the Caribbean. A sister corporation, Mountain Aircraft Services, LLC, performs aircraft maintenance for Mountain Air Cargo and other companies.

Mountain Air Cargo's 65,000-square-foot facility was built by the Global TransPark Foundation and is being leased by the company. The Global

TransPark Commission also leases office space in the Mountain Air Cargo facility. Mountain Air Cargo employs 300 people at the Global TransPark.

The Global TransPark was also designated as a Foreign Trade Zone in 1996. This allows companies within the Global TransPark to defer, reduce or eliminate payment of some tariffs and duties. It also provides incentives for companies to maintain production facilities in the United States. Regional companies that are not located within the perimeter of the Global TransPark are eligible to apply for subzone status, giving them the same trade advantages.

In 1997, the Authority requested and received state and federal funding for a \$6.3 million training and education center for the Global TransPark. The center is now completed and operational. Through a cooperative arrangement with the 11 regional community colleges in the Global TransPark Region, the center offers training programs for workers in a wide range of logistics and skilled blue-collar jobs.

Thus far, approximately \$80 million has been allocated from federal and state governments with an expected total investment of \$250 million required for full development.

Challenges and Hurdles to GTP Progress

Only 700 people are currently employed at the GTP which is disappointing to many. Locational problems have created severe constraints. As noted, the North Carolina GTP Authority purposely selected a relatively isolated low income region of the state as the site of the GTP to spur job growth and overall economic development in a distressed region. This location has posed a number of liabilities. First, the highway system and related transportation and telecommunications infrastructure were not well developed to the site. The GTP is about 40 miles from the nearest interstate quality, limited access highway and building high-speed highway connectors to the interstate will take years. The

lack of interstate highway accessibility dissuaded a number of early targeted manufacturing firms from locating at the GTP. In addition, the runway at the Kinston Jetport (the GTP) was only 7,100 feet long, and therefore unable to handle the take-offs and landings of large cargo aircraft. Securing the environmental approvals and federal and state financing to extend the runway to 11,500 feet took four and a half years.

These approvals and financing came in late 1997 and 1998 and the runway extension was completed in late 2002. Without federal environmental approvals (which is an involved and extensive process in the United States) and a sufficient runway length for fully loaded all cargo aircraft to land and take-off, it was impossible to recruit major cargo airlines and therefore the firms that would use them. The lack of a nearby developed industrial base further discouraged a number of air cargo firms. The North Carolina GTP found itself in a chicken and egg situation that is now only beginning to be resolved through transfer of activities and responsibility to a major private sector commercial real estate development firm and private sector development consultants. This keyed the development of a large space cargo building which is already 95 percent occupied with an additional large structure planned to come on line next year. Newport News/Williamsburg International Airport with its modern airport infrastructure in place and well-established nearby industrial bases does not face the critical problems which have significantly slowed development of the North Carolina GTP, though NNWIA still lacks appropriate cargo transfer facilities.

Southern California Logistics Airport

Another effort to create an air logistics center that has faced similar difficulties to the GTP is Southern California Logistics Airport (SCLA) in the high desert, approximately 100 miles northeast of Los Angeles. This converted former B-52 air base is considered too isolated for air express activity and its local

industrial base is not strong. There is also intense competition from other nearby “Inland Empire” airports, including Ontario, San Bernardino, and March Air Base. Los Angeles International and Ontario International Airports have a solid grip on freight forwarders, who are reluctant to move to SCLA, despite major incentives provided. Since freight forwarders account for the vast majority of traditional (non express) air cargo, this has proven to be a liability that SCLA has yet to overcome. Again, Newport News/Williamsburg International Airport is in a much better position with an established aviation network and local industrial base. Newport News/Williamsburg International Airport also has the potential to be quadromodal, providing area firms with air, highway, rail, and sea access.

European examples

There are a number of mid-size airports in Europe attempting to become significant air logistics hubs. These include Vatry International Airport in the Champagne region of France, about 100 miles north of Paris. This airport has been trying to position itself as a multimodal logistics hub and third airport of the greater Paris region. Vatry commenced operations in March 2000 following a seven million euro investment by local authorities and advertised itself as “the first multimodal 100% cargo center in Europe.” In 2002, Vatry handled 6,100 tons of freight and had a total of 10,300 aircraft movements. It is near the center of major trucking in Europe linked to the French motorway network (A26 and A4). Prologis, a major U.S. real estate investment trust (REIT) focusing on logistics and distribution centers is building a substantial complex at Vatry. Overall, development at Vatry has been slower than many anticipated with the primary reason given as its distance from Paris and paucity of freight forwarders and 3PLs in the vicinity.

A primary cargo airport in Germany at Hahn, about 90 miles from Frankfurt, is likewise positioning itself as a multimodal air logistics complex. This former U.S. airbase has consistently raised its freight tonnage from just 5,500 tonnes in 1997 to over 130,000 tonnes in 2002, the vast majority truck freight, however. Frankfurt Airport has taken a major equity stake (73%) in Hahn and the airport has been renamed Frankfurt Hahn. A number of 3 PLs are active at Frankfurt Hahn. The airport features a five-lane road feeder system with an integrated express land as well as complete logistics services including all documentation and processing of special cargo. The airport features 24/7 operation and is the German base of a number air cargo charter companies, including the Western European hub of Volga-Dnepr Heavy Lift. It also serves as the European hub for Antonov (Russia) and as the German base for low-cost passenger carrier Ryanair. Although growth of air freight has been sluggish at Hahn, it continues to work with Lufthansa and Fraport to get a major potential boost if and when a total night flight ban becomes operational at Frankfurt-Main which was negotiated as part of its agreement to add a fourth runway in 2006.

A relatively unknown, but apparently up and coming, cargo airport in England is Manston Airport about 65 miles from London. Manston was originally Kent International Airport until it was acquired in 1999 by the Wiggins Group, Plc from the British Ministry of Defense who then changed the name of this former RAF base to Manston Airport. The Wiggins Group proceeded to invest 12 million British pounds in the 700-acre facility and began advertising it as London Manston. They have had some success with cargo throughput increasing from 5,000 tonnes in 1999 to 40,000 tonnes in 2002. An Arthur D. Little study forecasts cargo to reach 200,000 tonnes in 2005. Passenger traffic is currently at 16,000 annually. One company that chose to switch its UK operations from Stansted to Manston is MK Airlines, a Ghanaian air cargo company flying two 747s and eight DC-8s. According to a company executive quoted in Air Transport Week (May 2002), "speed and efficiency were the main

drivers behind the move—our offload from landing to the trucks leaving the airport site improved from 3–4 hours to 40–60 minutes.” Manston is promoting its speed advantage over London’s large airports in an effort to attract businesses.

Newport News/Williamsburg International Airport will continue to face its greatest competitive challenge from Norfolk and Richmond as well as more distant Raleigh/Durham and DC area airports. Yet, the growing importance of smaller air cargo and air logistics complexes is testified to by the rapid expansion of some and by the fact that major commercial real estate development firms have been taking equity stakes or management positions in such airports as their cargo prospects grow. There is some feeling that the smaller air cargo airports will get a boost in the future not only as a result of increased congestion and capacity problems at larger airports, but also cargo security issues. The latter poses a significant opportunity for Newport News/Williamsburg International Airport if it can implement a fast, flexible and reliable air cargo security clearance system that is unmatched on the East Coast.

IV. Newport News/Williamsburg Air Logistics Hub Potential—Credibility and Viability, and Transferability of the U.S./European Experience

Of course, Newport News/Williamsburg International Airport does not have the commercial scale nor the international airport connectivity of a Washington Dulles, Dallas-Ft. Worth, LAX, Chicago, or Miami. It is closer to an Alliance, Rickenbacker, Memphis, Louisville, and Ontario California, absent their excellent air express and air cargo services, and better positioned air service-wise and industrial base-wise than the Global TransPark and Southern California Logistics Airport.

NNWIA is one of the nation’s fastest growing mid-size commercial airports with over 50 non-stop flights to Atlanta, Boston (2004), Charlotte,

Philadelphia, New York, and other major urban centers. Over 125 trucking firms service Newport News including most of the nation's largest LTL (less-than-truckload) firms that are critical to supply-chain management. The airport is strategically located at the mid-point of the East Coast and its interstate highway connections put it within overnight trucking of two-thirds of the nation's businesses and 7 of the 10 largest U.S. metropolitan markets.

The Port of Hampton Roads, with the world's deepest harbor with a 50-foot channel, is only 8 miles (15 minutes drive) away. The port is the second busiest container port on the East Coast, attracting 80 percent of the world's shipping lines, serving 300 ports in over 100 countries.

NNWIA's Hampton Roads catchment area, with more than 1.5 million residents is the largest urban complex between Washington, DC and Atlanta. The Hampton Roads has over 150 international firms from 20 countries, 14 appointed foreign counsels, an estimated 60,000 bilingual and multilingual persons, as well as 72,000 students in its eight four-year colleges and graduate universities and four community colleges.

The Peninsula's two major federal research laboratories oriented to technology transfer cornerstone an immense amount of intellectual capital in aerospace, information and communications technology, biotechnology, advanced manufacturing and other high tech fields. These professionals are complemented by engineers, scientists, and other researchers at graduate universities in the area.

The Peninsula and greater Hampton Roads labor force, totaling 750,000, has been recognized as among the best performing in the nation whether it is precision machine operation or advanced information processing. Between 12 and 15 thousand highly skilled workers leave the area's military facilities each year offering substantial expertise in logistics and supply chain management,

aeronautics, jet engine repair, robotics, advanced manufacturing, and general management, among many other sectors.

The state's overall business climate is routinely rated as among the best in the nation and so is the local area's quality of life. So, with all these physical and human resources, what's lacking as an economic catalyst? One could say nothing, and that in time the Peninsula and greater Hampton Roads will become an economic growth machine. This machine needs an engine, however. Herein, I will propose a multimodal air logistics hub at NNWIA as that new engine that will provide firms locating in the Peninsula and greater Hampton Roads with three prime requisites for 21st century business success—speed, agility, and connectivity.

Recall, neither Alliance nor Rickenbacher had much to show in the early 1990s at which time they developed and leveraged their multimodality and inland port status with an effective logistics management and marketing strategy to “take-off.” Alliance and Ontario, CA, received their big boost when FedEx and UPS, respectively, established their regional air express hubs there providing the “speed” advantage to other local multimodal assets they leveraged.

Given similar Peninsula assets, Newport News/Williamsburg International Airport has a credible and viable opportunity to put in place a multimodal air logistics hub and manage and market it effectively to achieve at least equal commercial success and regional economic leveraging in the decade ahead. As this occurs, it is highly likely much of the business development one sees emerging at and around other U.S. air logistics hubs will take place in the Newport News/Williamsburg International Airport area. Its economic impact will likely be felt throughout the Virginia Peninsula and greater Hampton Roads region and, indeed, all of Virginia, boosting the competitiveness of the entire state.

The following chapter (Chapter 2) describes what needs to be done in terms of logistics infrastructure and planning at and around Newport News/Williamsburg International Airport to replicate air logistics success stories elsewhere. Chapter 3 will then propose the business plan guidelines, functional requisites, critical success factors and marketing principles to create a complementary and reinforcing commercial environment to attract new industry. This chapter will also describe some first-order estimates of costs and revenues of a multimodal air logistics hub based on Global TransPark financial assessments.

The final chapter will offer implementation plan guidelines and a set of specific recommendations for a Peninsula Air Logistics Hub, including timetables for infrastructure development phasing, key organizations and actors who must be brought to the table, and suggested management options for development and operation of the envisioned Peninsula Air Logistics Hub.

EXHIBIT 1.1
HAMPTON ROADS PLANNING DISTRICT



EXHIBIT 1.2

TOTAL AIRLINE PASSENGERS AT NNWIA AND NORFOLK: 1994–2003

Year	NNWIA	Growth	Norfolk	Growth
1994	336,674	—	3,415,802	—
1995	362,000	7.52%	2,684,715	-21.40%
1996	342,515	-5.38%	2,784,108	3.70%
1997	332,239	-3.00%	2,897,148	4.06%
1998	346,454	4.28%	2,921,744	0.85%
1999	436,249	25.92%	2,999,420	2.66%
2000	457,509	4.87%	3,048,726	1.64%
2001	423,045	-7.53%	2,963,223	-2.80%
2002	592,092	39.96%	3,464,246	16.91%
2003	729,281	23.17%	—	—

EXHIBIT 1.3
 UNITED STATES TOTAL AIR AND VESSEL EXPORTS
 FOR 1990, 1996, AND 2002 BY VALUE
 (IN MILLIONS OF US\$)

<i>VALUE</i>			
	1990	1996	2002
TOTAL VALUE	\$261,298	\$417,434	\$416,384
AIR VALUE	\$110,471	\$196,182	\$225,322
VESSEL VALUE	\$150,827	\$221,252	\$191,062

<i>GROWTH</i>			
	1990–1996	1996–2002	1990–2002
TOTAL VALUE	59.8%	-0.3%	59.4%
AIR VALUE	77.6%	14.9%	104.0%
VESSEL VALUE	46.7%	-13.6%	26.7%

Source: U.S. Department of Commerce, 2003.

Chapter 2

Peninsula Air Logistics Hub Infrastructure and Facilities Guidelines

I. Introduction

We turn now to basic infrastructure design guidelines and facilities for a Peninsula air logistics hub (ALH) at Newport News/Williamsburg International Airport. Operating at full development as an integrated multimodal transportation and commercial complex, the ALH will enable tenants and firms throughout the greater Hampton Roads region to respond flexibly and rapidly to their domestic and global suppliers and customers. Its logistical infrastructure and business support services should be designed to enhance the speed and agility of manufacturing, distribution and other time-sensitive industries having access to Newport News/Williamsburg International Airport, thereby improving their competitiveness and catalyzing economic growth throughout the Hampton Roads.

In achieving this objective, logistics and commercial synergies and multimodal transportation upgrades should be developed throughout the region based on a solid working partnership leveraging the comparative advantages of each others' business assets, location, and infrastructure. Upgraded regional highways and new or extended rail lines bringing together the Port of Hampton Roads, Newport News/Williamsburg International Airport, and municipalities across the broader region should create regional economic complementarities and be a major impetus for achieving full regional development potential. These linkages and synergies will be elaborated in the next two chapters. My focus in the present chapter is to provide basic design guidelines for the multimodal air logistics hub infrastructure and facilities at Newport News/Williamsburg

International Airport that will be the integrating commercial nexus and driver of the greater Hampton Roads fast-cycle logistics network.

II. Basic ALH Infrastructure Design and Configuration

The Peninsula ALH will include many proven elements of a modern industrial park. What will set it apart is the fusion of modern manufacturing and distribution facilities with multimodal transportation, advanced telecommunications, efficient materials-handling systems, and commercial support services. Bringing these elements together according to ALH design principles to be outlined herein will substantially improve access and response time of tenants and regional businesses to both domestic and international suppliers and markets. Exhibit 2.1 provides an overview of the current aviation infrastructure configuration and highway linkages at and around Newport News/Williamsburg International Airport.

Exhibit 2.2 describes the initial core design for a Peninsula ALH at Newport News/Williamsburg International Airport leveraging the current AirCommerce Park. Manufacturing, distribution and logistics facilities can be located near or along customized taxiways and ramps, allowing air freighters to come virtually to these facilities. AirCommerce Park represents a propitious jump-start for the Peninsula ALH. It offers 35 acres of improved, level building sites and free use of up to 25 additional acres of ramp, including 13 acres of concrete stressed for widebody aircraft.

AirCommerce Park is located along NNWIA's 7R-25L 8,000 ft all-weather CAT-1 ILS runway (to be extended to 10-11,000 ft). The park is fully served by electrical power, natural gas, water and sewer facilities in ground along a 3-lane road designed to accommodate both large supplier trucks as well s large volumes of employee vehicles. Fiber-optics could be made available, if needed.

The extended building site area spans 3,400 feet and provides site depths ranging from 340 feet up to 700 feet. The site has quick and easy road access to Interstate 64 and major local roadways. AirCommerce Parkway links the complex in minutes to Interstate 64 and Jefferson Avenue (Route 143), one of the Peninsula's major arteries.

AirCommerce Park is one of three designated Enterprise Zones in the region, enabling a range of state and local subsidies and tax credits to newly locating firms. The complex is fully ready for custom construction.

Complementing the above, Newport News has a consolidated and streamlined site development plan review and approval procedures. Properly submitted site plans can be received and approved in a week or less for typical industrial projects.

At the second phase of development (2006-2010, see Exhibit 2.3), AirCommerce Park will be expanded (AirCommerce Park Phase II), and runway 7R-25L extended to 10,500 ft. Three to five years would be considered a fast track for runway extension funding, design, EIS, environmental mitigation, and construction. A new interchange at I-64 and Bland Boulevard would also be constructed with an adjacent intermodal station planned.

During the envisioned third phase of development (2011-2017) a ring road would be completed, with another new interchange constructed at I-64 and Denbigh Boulevard, intermodal road and rail connectors introduced. AirCommerce Park Phase III would begin development in the midfield area with an adjacent intermodal rail facility introduced (see Exhibit 2.4). A taxiway connected to Runway 2-20 would form a spine of AirCommerce Park Phase III, with a roadway around the exterior connecting to a midfield intermodal rail facility (IRF) allowing tenant's air, rail, and road access.

Two road approaches are contemplated to the midfield site of AirCommerce Park Phase III. The first route is from the site east along Oriana Road (two lanes) 1.25 miles to George Washington Memorial Highway (U.S. 17) (four lanes divided) then south on U.S. 17 for 2.25 miles to Victory Boulevard (VA 171) (six lanes), then 1.25 miles on VA 171 to Interstate 64 (total 4.75 miles); or alternatively south on U.S. 17 for 3.5 miles (total 5.5 miles). The second approach is contingent on an evaluation of its impact on the Airport Master Plan by the Peninsula Airport Commission. From the site, a two-lane service road would loop around Runway 7-25 and proceed 1 mile south to Providence Road (two lane), then south on Providence Road for 1.2 miles to Brick Kiln Boulevard (wide two lane), then 0.5 mile west on Brick Kiln to Jefferson Avenue (VA 143) (six lane), then 0.2 miles south to Interstate 64 (total 2.9 miles).

The rail connector to the site will travel upon existing utility easement for approximately 1.5 miles, connecting to the Chesapeake and Ohio rail line (to be shown below).

In the ultimate stage of development (2017-2030), predicted on demonstrated demand and FAA cost/benefit analysis, Runway 2-20 would be expanded to 11,500 ft. (necessary to handle the largest fully-loaded wide-body freighters on the hottest days) and a new 8000 ft parallel runway (7L-25R) constructed (see Exhibit 2.5).

In this final development stage, a cargo transfer system (CTS) will be completed to carry materials, components, and finished products throughout the ALH on an internal network of dedicated rights-of-way. This network will link off-ramp tenants to the central cargo area, a state-of-the-art intermodal complex providing access to air freighters, trucks, rail, and materials-handling systems. In addition, the CTS will connect tenants and the central cargo area to a large off-site intermodal rail facility (IRF) containing multiple rail sidings, loading platforms, and truck cross-docking. The IRF could be sited and built along the

Chesapeake and Ohio rail line between Denbigh and Fort Eustis Boulevards and Richneck Rd and Highway 17. It will handle primarily bulk products and containerized cargo and will be a valuable link to the Port of Hampton Roads and a regional network through new connecting rail lines. The IRF should be linked to a new inland port with appropriate truck cross-docking facilities and road link to Fort Eustis Blvd (see Exhibit 2.6).

Key to the efficiency of the entire operating infrastructure is the ALH's intermodal interfaces. These must be designed to allow seamless and flexible flows of materials among convergent transportation modes and commercial facilities, both in the core and peripheral areas of the ALH.

The hub of the central cargo area and cargo transfer system is the central cargo facility (CCF) located along one of Newport News/Williamsburg International Airport's main taxiways (possibly at AirCommerce Park). The CCF provides off-ramp and off-site factories, warehouses, and distribution centers with automated sorting capability, customs clearance, and air freighter access. Since most Peninsula ALH tenants will not have the volume of cargo to justify direct air freighter docking, the central cargo facility offers them air access via the cargo transport system and/or direct truck cross-docking at the rear of the facility. (See Exhibit 2.7 ALH Central Cargo Facility)

At full development, the entire complex will be served by the ring road encircling it, providing efficient access to all parts of the ALH to local and regional highway systems and to the intermodal rail facility. Internal roads will connect the central cargo area and the tenants to the ring road. In this ultimate stage, a core road and rail line will be extended to manufacturing and logistics facilities located in AirCommerce Park, Phase III located between the two current runways. This will require careful planning now to insure multimodal rail and road accessibility to the center of the complex given anticipated runway extensions and the new parallel north runway.

The Peninsula ALH must be conceived as more than a multimodal logistical infrastructure, however. Its full potential and ultimate success rest on creating a total business environment that will substantially improve sourcing, production and distribution activities of its tenants and region-wide users. This business environment will be elaborated in the next chapter. Sufficient to note here that along with its multimodal transportation and cargo-handling systems, the ALH design must support tenants and users with comprehensive advanced commerce capabilities. Electronic data interchange (EDI) and other telecommunications systems using the latest technologies, including broadband fiber optics, WiFi, multimedia networks, an on-site digitized satellite uplinks and downlinks, should offer Peninsula ALH tenants and users state-of-the-art electronic access to the global commercial world. EDI improves supply-chain management and a variety of other logistical practices at it tracks, coordinates, and controls materials and product flows across both domestic and international transportation modes. Open architecture, plug-in software systems (described later) will allow the ALH's tenants and regional users real-time access to worldwide supplier, distributor, and customer databases.

International air cargo is expected to be a substantial component at Newport News/Williamsburg International Airport in the future. Expedited customs procedures using automated manifest systems and express customs clearance will therefore be essential to facilitate tenant and user import and export activities. In addition, Newport News/Williamsburg International Airport should establish a foreign trade zone to allow tenants to defer, reduce, or eliminate payment of taxes and duties normally associated with importing and exporting parts, components and other goods, as well as to eliminate bureaucratic delays. Bonded warehouse facilities near the airport will also be needed.

In focus group interviews conducted with potential industrial tenants for North Carolina Global TransPark, targeted workforce skills was always mentioned as a key location factor. As was noted in Chapter 1, the Hampton Roads already possesses a skilled, adaptable labor force. To ensure that future tenants have precisely the skills they need, a wide range of worker training, management education, and technology-transfer functions should be provided through an on-site education and training center (ETC), in association with the Peninsula Workforce Development Center. 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. As will be discussed in the next chapter, the creation of an ETC will provide a timely opportunity for the Peninsula ALH to market and distinguish itself among other competing industrial airport and logistics sites on the East Coast.

III. Central Cargo Area Design

The basic design element of the ALH is the Central Cargo Area (CCA) which constitutes a zone of facilities at the operational center of the complex. The CCA includes the Central Cargo Facility (CCF), Perishables Centers (PC) to support in-transit and regional agricultural shipments, and the Customs Clearance Center (CCC). Other primary components of the Central Cargo Area are the Airport Operating Area (AOA), manufacturing and distribution tenant facilities, a possible general aviation passenger terminal, nearby intermodal truck and rail terminals (linked to port facilities), special materials handling and freight forwarder and 3PL facilities, along with a Cargo Transport System (CTS) linking ALH tenants with cargo processing facilities. Since the CCA is the primary and most important component of the ALH, its development and design guidelines are elaborated below.

III-1. Guidelines for Central Cargo Area Design

Three key principles of agility should be followed in the design for the Central Cargo Area: 1) Flexibility; 2) Targeted Mechanization; and 3) Expandability/Phased Growth. Building agility into the processing capability and location of facilities is essential because of: 1) unpredictable longer-term cargo handling demands the ALH; and 2) a dynamically changing and improving technological environment.

Flexibility

A critical design requirement of the CCA is that its development be demand-driven and responsive to changing needs and requirements of ALH tenants and users. A flexible, incremental development approach is highly recommended, given the difficulties of forecasting the exact types and levels of cargo activity at Newport News/Williamsburg International Airport's ALH. Thus, for example, automation of materials handling systems or full-scale development of intermodal connectors and interfaces may not be prudent early in the implementation of the ALH. In the design of most processing systems, cost, flexibility of operation, and operational efficiencies demand appropriate compromises at different stages of infrastructure and technology development.

Three realities caution against initial automation of CCA materials handling and processing systems: 1) Newport News/Williamsburg International Airport's airport operating area (AOA) will likely have to accommodate all manner of aircraft and cargo equipment (i.e., standardization of aircraft gauge and related cargo handling equipment for serving an international air cargo market is currently not possible); 2) non-automated materials handling and accumulation (short-term storage) systems are often more cost-effective and flexible in terms of meeting peak requirements and other unanticipated immediate problems by simply providing more forklifts and manpower to meet

unexpected or peak requirements; and 3) longer-term air cargo demand and other transportation mode cargo demand are difficult to forecast in early stages for a newly evolving complex such as the ALH.

Only as actual demands are experienced over time for such a multimodal logistics complex would it be possible to incrementally predict materials handling, equipment, infrastructure, and facility needs, and to gain verification of the estimated industry mix of cargo demands placed on the Newport News/Williamsburg International Airport ALH (e.g., parts and components, manufactured products, fresh cut flowers, seafood and other perishables, retail distribution products, etc.). For these reasons, it is recommended that the Newport News/Williamsburg International Airport's ALH commence operations with relatively inexpensive, low-tech systems, to be upgraded over time as the demand and future tenant requirements become better known and the benefits to be acquired through automation become better understood, measured and demonstrated.

One means of attaining processing flexibility, and commonly employed in modern just-in-time (JIT) operations, is to create subsystems that have multiple processing equipment rather than one large processing system. Designing one large system often appears to offer economies of scale (i.e., less cost per unit produced as process equipment size increases). Such "all the eggs in one basket" type of operation, however, typically leads to inflexibility and an inability to shut down part of the total process capability for maintenance, equipment testing, equipment enhancing and even off-line employee training.

To save initial expenses and promote flexibility, mobile equipment is generally preferred to fixed position equipment (e.g., a mobile nose loader/unloader as compared to a fixed-bridge nose loader/unloader). Ideally, all equipment should be readily reconfigurable and rearrangeable as operations layout requirements change over time. Fixed position equipment (e.g.,

automated conveyors attached to the floor or hung from the structural system) hinders the “fluid” design concept recommended for the Newport News/Williamsburg International Airport’s ALH.

Targeted Mechanization

Experiences of air cargo operations and associated materials handling needs at Newport News/Williamsburg International Airport and airports elsewhere do permit initial determination of some targeted modest mechanization in Peninsula ALH operations essential to efficient cargo handling. Mechanization of standard processing operations such as container consolidation, container breakdown, and conveyors to accommodate x-ray equipment should be included in initial operations. Yet, such targeted mechanization should be provided only when and where it is clearly demand driven and economically justified.

As stressed above, because of the difficulty of predicting material handling demands for this first-of-its-kind facility in Virginia, and a desire to provide flexibility of arrangement which is consistent with 21st century business practices, the ALH facility design should assume that initial material handling operations would be performed with low-tech material handling equipment (e.g., forklifts, motorized tugs, pallet jacks, etc.). This technology is not only far less costly but also “tried and true” time-tested and reliable. At likely relatively low initial levels of manufacturing and supply-chain management demand at the Newport News/Williamsburg International Airport ALH, fully automated materials handling systems, though flashy, simply do not make economic sense

When demands over time become better known and experienced, one-at-a-time evaluation of potential productivity benefits of automated equipment and facilities can be assessed and enhancements implemented to take advantage of operational improvements. For example, as available Central Cargo Facility

(CCF) space fills up over time with increased activity, pallet racks should be provided to gain better use of the facility cube. Later when sufficient put-away and picking requirements develop, fork-lift use would be discontinued for automated put-away and picking of cargo from racks and replaced by computerized rail-guided picking and put away equipment.

Expandability/Phased Growth

I have been stressing that future demands placed on Peninsula ALH facilities and their resulting space needs are difficult to predict with any confidence. This is why it was proposed that facility development at the ALH encompass flexible, evolutionary and phased growth. Facility requirements should be estimated as accurately as initially possible based on air cargo data currently available, but the Peninsula ALH must also be allowed to become what it needs to be as requirements reveal themselves over time. Thus, proposed design guidelines are not so much a fixed plan as they are a flexible framework to accommodate a wide variety of tenant industries, regional users, and physical layouts.

The above framework allows for ALH development to be modified as demand, resources, new technologies, and infrastructure advances occur. For example, the central cargo area including commercial facilities should employ a modular layout for maximum flexibility and phased development. Ground transportation designs should incorporate redundant routings and flexible road systems to minimize the impact of congestion or accidents, both within the ALH and in connecting highway systems. Rights-of-way should be sized to allow future expansion without negatively affecting ongoing highway operations. Newport News/Williamsburg International Airport's runways must always be equipped with state-of-the-art navigational aids to allow for growing air capacity demands and eliminate weather delays. Extensive zoning controls in flight paths

should be implemented to minimize potentially conflicting land uses and noise problems that could preclude the optimal 7-day, 24-hour airport operation. The new runway being planned can significantly help here.

Public sector agencies responsible for Newport News/Williamsburg International Airport and the Peninsula region also must be prepared to respond rapidly and creatively to evolving tenant and user needs and an ever-changing business environment; hence, Peninsula ALH management itself must be agile as it creates or coordinates “one-stop shop” support for tenants and regional users from each logistical or institutional sector. In this sense, such agencies may not only wish to market the ALH, but is also will operate as a strategic partner with tenants and users in dealing with Customs and other government agencies and in seeking access to a full range of technical, financial, and political resources.

Consistent with ISO 14000 standards (international standards that enable companies to systematize and improve their environmental management efforts), maintaining environmental quality and safety are a fundamental objective of Peninsula ALH planning and development. The ALH system must provide facilities and procedures for the handling, storage, transportation, and disposal of environmentally sensitive materials as a continuous process. Likewise, modern ALH utility systems must offer high-quality and reliable power, water, natural gas, wastewater treatment, and solid-waste disposal to meet growing tenant needs.

Each potential tenant at AirCommerce Park and throughout the ALH should be evaluated for its compatibility with environmental regulations and standards. The Newport News/Williamsburg International Airport management/tenant partnership will address the requirements for operating within acceptable environmental parameters jointly. Innovative site planning and design should ensure visually attractive development with ample landscaping and aesthetic touches. Aging buildings at the airport should be

restored or replaced, making the ALH more aesthetically appealing. Ideally, the Peninsula ALH should appear more like a university campus than a traditional industrial/logistics park.

Although cost savings remain important in today's industrial location decisions, the ALH system should be designed and developed on the assumption that tenants will pay more for its integrated, high-quality, reliable services and sound environmental planning. Because a delicate tradeoff exists between costs and on-site services, however, the Peninsula ALH's cost effectiveness will be achieved by the phasing of development to minimize initial investment and location costs for tenants. Development of the overall site infrastructure should be incremental, demand-driven, modularized, and reconfigurable. Further flexibility will be achieved by oversizing and reserving spacious rights-of-way for future infrastructure and facility expansion. The internal transportation corridors linking the transportation modes and production facilities also should be oversized to meet increasing traffic levels overtime and to accommodate future developments in vehicles and transport systems. The same corridors should have all the underground utility channels needed for powering and servicing production and distribution facilities. This includes designing corridors with rapid and flexible plug-in telecommunications capability for tenants, as needed.

I've recommended that the Central Cargo Area be designed for low-tech, cost-effective, flexible or expandable facilities with modular and reconfigurable attributes. Such design would allow facilities to grow over time to accommodate ultimate space needs. One way to reserve space initially is to provide excess separation between contiguous facilities, allowing them to grow closer together as increasing space requirements are met over time. Another way is to site selected easy-to-relocate facilities between other facilities with the intention of moving them at a later date to permit the surrounding facilities to grow together

in the space vacated by the relocated facility. All of this is key to agile infrastructure development that should guide the planning at the Peninsula ALH.

III-2. Major Facilities within the CCA

The Central Cargo Area, as noted, is the primary area within the ALH for processing of shipments. These include just-in-time (JIT) fabricators, assemblers, and distributors, and third-party logistics firms that may receive direct air, truck, or rail shipments. The purpose of the CCA is to provide, in one location, a complex of structures, infrastructure, and services capable of providing interfaces with domestic and international air, ocean, truck, and rail transportation networks. Major facilities located within the ultimate stage CCA should include the following:

- Central Cargo Facility (CCF)
- Perishables Center (PC)
- Decompression Facility
- Fumigation Facility
- Live Animal Inspection
- Live Animal Holding/Quarantine Area
- Ground Support Equipment (GSE) Staging (Parking) Areas
- GSE Maintenance and Service Facility
- All-Cargo Aircraft Parking Apron
- Aircraft Maintenance
- Truck Loading/Unloading Court
- Freight Forwarder and 3PL Facilities zone

- Visitor/Customer/Employee Parking

III-3. Central Cargo Area Activity Relationships

An activity relationship chart for the CCA should be developed to assure the efficient and continuous flow of various types of cargo through the ALH. Proximity relationships for space within the CCA building, and between other associated buildings, should be determined as a guide to facility layout. Specific activity and space relationships clarified through the CCA relationship analysis—both within the CCA and from/to other facilities—should be determined for the following elements of the CCA, as appropriate:

- CTS—The Cargo Transportation System's most desirable interface points between the Central Cargo Facility and the CTS land network are at the receiving dock where goods arrive on the CTS for processing as outbound shipments and the delivery dock where processed inbound cargo is ready for transport by the CTS to Newport News/Williamsburg International Airport ALH tenants. The CTS should run the full length of the CCF building (initial and ultimate buildout) and other ALH manufacturing and distribution facilities. It is recommended that the CTS be above grade, reached by ramps within the CCF, and other hub facilities in order to eliminate problems of cross flow of cargo on the main floor of the CCF or on-site manufacturers, distributors and 3PLs.
- Security X-Ray and Decompression Facilities—Security X-ray equipment and decompression facilities are closely related to outbound cargo. As such, they need to be close to outbound and transit air cargo accumulation areas. The decompression facility, however, poses a hazard to neighboring personnel, facilities, and equipment. Because of those hazards, the decompression facility

should be located in an area where there is the least likelihood of major interaction with large numbers of personnel or major facilities. The area surrounding the decompression chamber should be cleared of personnel or major equipment assets during its occasional operation.

- EDI—The services provided by the electronic data interchange (EDI) system will be required wherever cargo is processed including receiving, inspection, make up, breakdown, accumulation, and delivery. The capability for input and readout of data must therefore be available at all points where cargo is processed.
- Fumigation Area—Given anticipated growing flows of agricultural products through the ALH, fumigation of products will likely be required predicated on country of destination or, in cases of in-bound flows, origin. Fumigation can take place on an open apron type area (under tent type covers) and should be remote from other functions to prevent hazards to personnel or contamination of other cargo by fumigation chemicals.
- Hazardous Materials—Hazardous materials should be processed in an isolated or protected area. If processed within the Central Cargo facility building, it is recommended that an area be set aside and isolated by fire walls and doors. Radioactive materials may require a special vault.
- Live Animal Quarantine—The quarantine of live animals within the CCA is not recommended because of aircraft noise and air pollutants. A more remote location at the ALH or an off-site location is recommended for live animal quarantine.
- Perishables Center—Some perishable goods may be processed within the CCF. As the volume of such goods increases, however, separate

perishables centers would be added. Some refrigerated and freezer space should always remain within the CCF, however.

- Customs—The inspection of cargo by U.S. Customs authorities should occur at a centralized customs inspection area, in the CCF but also at separate facilities at later development stages. For large foreign forwarders and 3PL's at the ALH, customs may be located in these private facilities as was described for Excel at Rickenbacher Airport in Chapter 1. Customs requires office space for their inspectors, an accumulation area for cargo being inspected and cleared, and offices with public access and cross-docking facility where shipments may be released.
- Aircraft Maintenance—Despite the current aviation industry downturn there is no doubt the 21st century will witness a strong growth in cargo and passenger aircraft. Given Newport News/Williamsburg International Airport's strategic location at the center of the East Coast, a heavy maintenance facility may prove valuable down the road and space in the airport operating area should be reserved.

IV. Intermodal Interfaces

A major process element of the ALH is the interconnection and integration of multiple modes of transport (air, ocean, truck and rail). Ideally, each mode must be able to seamlessly and efficiently connect to any other mode without significant loss of time or high cost. The primary operational ALH connector (the "glue" that connects the various transportation modes) is a cargo transfer system. The transfer system will emanate from the Central Cargo Facility (CCF). The cargo transfer system may be composed of a combination of trucking modes operating on internal roads, or in later phases of development by dedicated

automated cargo movement systems (for example, rail or tram) depending on the relative configuration of the elements of the ALH and the level of activity.

IV-1. Guidelines for On-Site Transportation Connectivity

The CCF would need to interface with the following modes of transportation: 1) air, via Newport News/Williamsburg International Airport's taxiways; 2) truck, with adequate cross-docking at the CCF and other CCA facilities, as required to meet trucking demand forecasts; 3) sea, with connection to Hampton ports; and 4) rail, by first providing a rail access and an intermodal terminal at the ALH, and later providing an interface between the CTS and a rail hub in proximity to the CCF. The CTS would also be the primary connector between the CCF and off-ramp ALH production and distribution facilities, as well as an inland port. These intermodal interfaces are illustrated in Exhibit 2.6.

Because the predominant mode of transportation of products moving to and from Newport News/Williamsburg International Airport domestically would be via highways, truck terminal facilities and facility cross-docks at the ALH along with ring road links to I-64 would be critical design elements for successful operation of the ALH (see Exhibit 2.5).

IV-2. Guidelines for ALH Connectivity

A Hampton Roads multimodal logistics system must be able to accommodate a broad variety of transportation origins and destinations to and from the ALH. Flow paths of domestic and international air, ocean, truck and rail modes are represented in Exhibit 2.7 as they might occur between the ALH and domestic or international origins and destinations at ultimate development. Flow paths of intra-ALH cargo are shown within the boundaries of the ALH in the Exhibit. Sea links and an air cargo terminal are included as nodes of the cargo transfer system. Truck and rail terminals, separate from the Central Cargo

Facility, may locate near manufacturing or distribution tenants as the ALH develops in later phases.

Regional truck and rail transportation should be available between all major Hampton Roads commercial nodes and the ALH. Truck shipments consigned to ALH tenants will most likely be delivered directly to those tenants. Deliveries to consignees located further from the ALH will be delivered to the Central Cargo Facility, or to appropriate truck or rail terminals for processing and subsequent delivery to the consignee. During early stages of operations, the truck or rail terminal may be located beyond the core of the Peninsula ALH (i.e., outside of the CCA).

Direct rail transportation lines between the ALH and the Ports of Hampton will eventually be required if the ALH is to achieve its full development potential. Also to be considered is the eventual provision of spur rail lines to larger Peninsula area industrial or distribution facilities that may have a high dependence on rail transportation.

Transportation to and from international origins and destinations both through a future ALH-type network linking Peninsula businesses to the Americas, Asia, and Europe will be provided by air and ocean transport. Much of this will likely go through Hampton ports or even be transited through Dulles International Airport, but more eventually air freighted directly from Newport News/Williamsburg International Airport. (See Exhibit 2.7 titled “Transportation Linkages between ALH and Domestic and International Cargo Network”)

IV-3. Guidelines for EDI Design

- To support 21st century business practices of electronic commerce, just-in-time delivery, and supply chain management electronic data interchange (EDI) must be provided as a tool for ALH operators, tenants, logistics service

providers, the U.S. Customs. The ALH EDI system will be a network of computers and databases that provide an interface between all parties involved in arranging a shipment. This EDI system must be capable of interfacing with multimodal carrier systems to provide on-line tracking and tracing capability for the shipper. A key function of this system should be to interface with U.S. Customs. The local ALH EDI network should also have access to global telecommunications networks via satellite transmission. Similarly, the EDI system should be tied to a bar-coding or more advanced RFID systems for shipment identification within the system and in-transit. The general objectives of the Newport News/Williamsburg International Airport's ALH EDI system, consistent with the communication vision of 21st century business practices are to:

- Build a cost-effective, resilient, and manageable EDI network, throughout the Hampton Roads region.
- Allow all Hampton Roads businesses to connect to the Newport News/Williamsburg International Airport ALH via a network backbone at lowest charges possible;
- Ensure connectivity by providing enough fiber optics bandwidth and connection channels;
- Ensure capacity so that the Hampton Roads community and ALH tenants can connect and not be denied access due to insufficient ports;
- Provide support for all protocols required by the users of the system;
- Allow tenants, users, and logistics service providers with a range of hosts (e.g., workstations with high-speed network access, mobile computing and data exchange via secure WiFi wireless networking) to connect to the Peninsula ALH's network.

- Allow Peninsula ALH tenants and the Hampton Roads user community to access applications (e.g., database inquiries/updates) on a range of different information management systems operated by third-party entities.

Conceptually, the ALH Communications System can be viewed in Exhibit 2.8. This exhibit presents a vision of a possible future global communications system for the Peninsula ALH.

V. Peninsula ALH Planning Integration Strategy

As described in the previous sections, the ALH represents a new kind of logistical center in which information technology, transportation and supply chain activities are operationally integrated to create a seamless business environment. Traditional planning activities do not capture the intersections and linkages that are necessary to create this new environment.

The proposed integrated planning process at and around Newport News/Williamsburg International Airport must differ from traditional planning processes in three respects:

1. Shift from Element Focus to Process Focus. Traditional master planning exercises target individual elements of infrastructure in separate plans. For example, independently produced a master plan for ports, highways, and the airport. Each of these master plans is based on traditional concepts of the role and function of these infrastructures. In a process-oriented plan, the exercise begins with an understanding of the integrated business processes and needs of the tenants and customers. In this new approach, for example, the design concept for a port or airport should be guided by the desire to create value for the commercial user of the facility rather than to maximize the utilization of designed capacity. Also, logistical synergies need to be emphasized such as sea-air linkages that have been successfully

implemented at other sites around the world, such as Singapore, Dubai and Seattle-Tacoma. This will involve a close coordination and integration of all elements infrastructure planning for the Peninsula ALH and Hampton Roads region.

2. **Identify New Elements of the ALH.** The Peninsula ALH will require new elements of infrastructure. In the 21st century, businesses will compete based on how efficiently and creatively they manage information to create competitive advantage. Even Fred Smith, Chairman of FedEx, has described his company as an IT firm that happens to fly airplanes. The provision of information technology therefore is not an afterthought, addressed once the size and function of a building or infrastructure have been designed, but rather an organizing principle around which the identity and function of a building or infrastructure have been designed. In this process planning environment, information technology capabilities must complement and reinforce the development of multimodal transportation and industrial capabilities at the Peninsula ALH and throughout the Hampton Roads region.
3. **Establish New Linkages Between Infrastructure Elements.** The creation of a 21st century business environment at Newport News/Williamsburg International Airport requires new linkages among key infrastructure elements. Uninterrupted flows of products and materials through the Peninsula ALH require the integration of various modes of transportation. It is therefore necessary to plan the material handling and management systems that will integrate the movement of goods and materials from across these modes regionally and to and from the Peninsula ALH.

VI. Designing for Future Tenant Needs

Business Process Needs of Tenants

The ultimate success of Peninsula ALH will depend on how well it meets the business needs of future tenants. The real customer for the planning process is not the Peninsula Airport Commission or any government body, but firms, the Commission, and other regional development organizations wish to recruit. Therefore, concepts and capabilities targeted to 21st century business practices described below should guide and inform the planning process and the required functionality of the Peninsula ALH and regional infrastructure. These businesses need the following:

- **Paperless Environment.** Companies are moving to a paperless environment in which orders for materials as well as finished goods are transmitted electronically from customers worldwide to their suppliers. Global manufacturers are increasingly requiring that their suppliers communicate electronically, and the availability of access to global communications and information networks will qualify future ALH tenants, large and small, for new commercial opportunities.
- **End-to-End Supply Chain Visibility.** The ever growing imperative for speed and lower costs has caused companies to more closely manage their supply chains. The basis of competition has changed from head-to-head competition between companies to a competition that pits supply chain against supply chain. A weak link anywhere along the supply chain can have a devastating impact on a company's ability to perform. Increasingly companies are requiring end-to-end asset visibility along the entire chain requiring state-of-the-art tracing and tracking information technology.

- **Just-in-Time Delivery.** As companies manufacture in increasingly smaller lots and provide more customization of their products, the need for just-in-time delivery has grown. Not only must small batches of materials be shipped as economically as large batches, but they must be delivered within 24 to 48 hours anywhere in the nation and, indeed, across the globe. Traditionally, manufacturers seek suppliers that are located near the manufacturing site. The availability of an integrated information and transportation infrastructure provides the capability for suppliers, manufacturers, and customers to work across great distances as if they were located nearby.
- **Real-Time Asset Control.** To assure flexible and fast response to changing customer needs, companies must not only be able to trace and track their assets quickly, but also to change their destination, routing or carrier mode as customer requirements change. Only the complete integration of information, transportation and manufacturing can provide this capability. Few, if any companies are able to do this now, but this will be a required standard of doing business in the near future.

In sum, successful development of the Peninsula ALH intermodal and information technology systems will require a broad understanding of the basic business processes of tenants, users, and logistics service providers, their current information system capabilities, and future technology/business needs. These include better understanding of the emerging needs of information-rich industries such as software packaging, financial services, transport-related services such as intermodal logistics and trading and transshipment, strategic and high-growth industries such as aerospace parts, micro-electronics, pharmaceuticals, and telecommunications, and even hospitality industries, such

as hotels, tourism, and recreation that will form the service backbone of airport-driven commercial development.

Attracting manufacturers, assemblers, and distribution industries will also require a thorough understanding of modern supply chain management principles and the order-to-delivery process. To offer a truly marketable competitive advantage, the Peninsula Airport Commission with the assistance of regional development organizations should bring together experts in logistics and supply chain management, multimodal infrastructure development, and information technology to work to create the design specifications that properly integrate all system elements. Few locations in the U.S. are doing this, so the Peninsula ALH can have a first-mover advantage in attracting high value-adding industries if it takes the lead in seizing this opportunity.

EXHIBIT 2.1
HIGHWAY LINKAGE IN THE NNWIA AREA

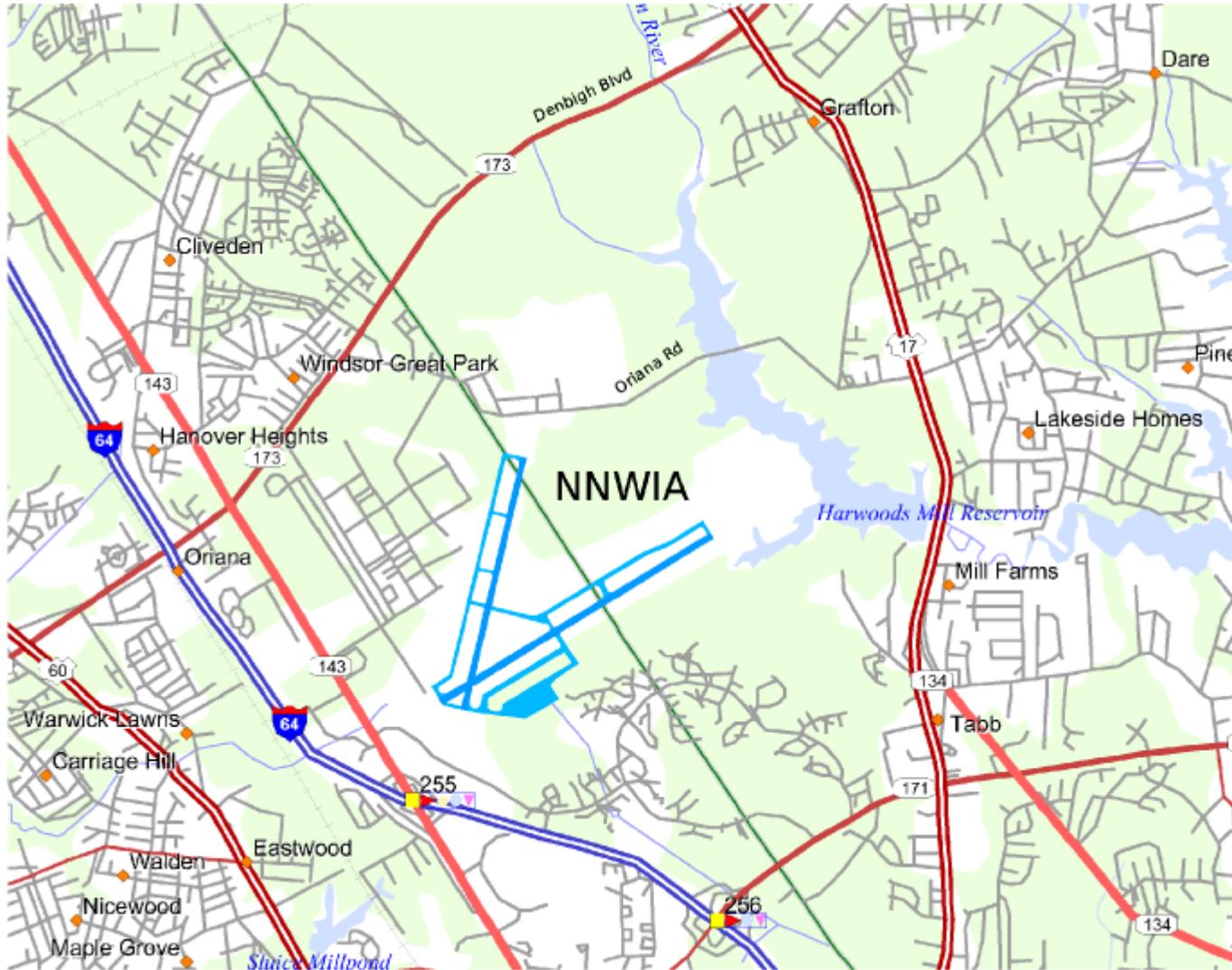


EXHIBIT 2.2

EXISTING AVIATION INFRASTRUCTURE AND AIRCOMMERCE PARK SITE (PHASE I)

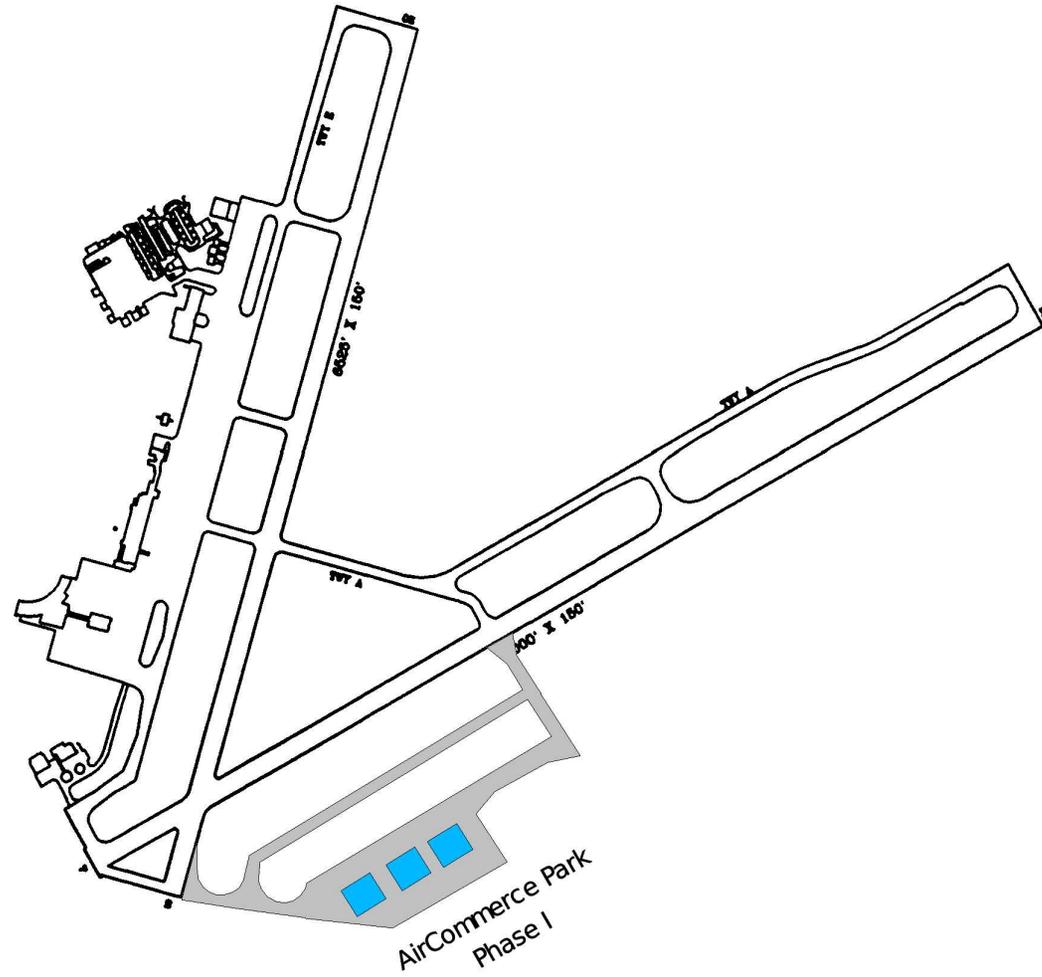


EXHIBIT 2.3

RUNWAY 7-25 EXTENSION AND AIRCOMMERCE PARK (PHASE II)

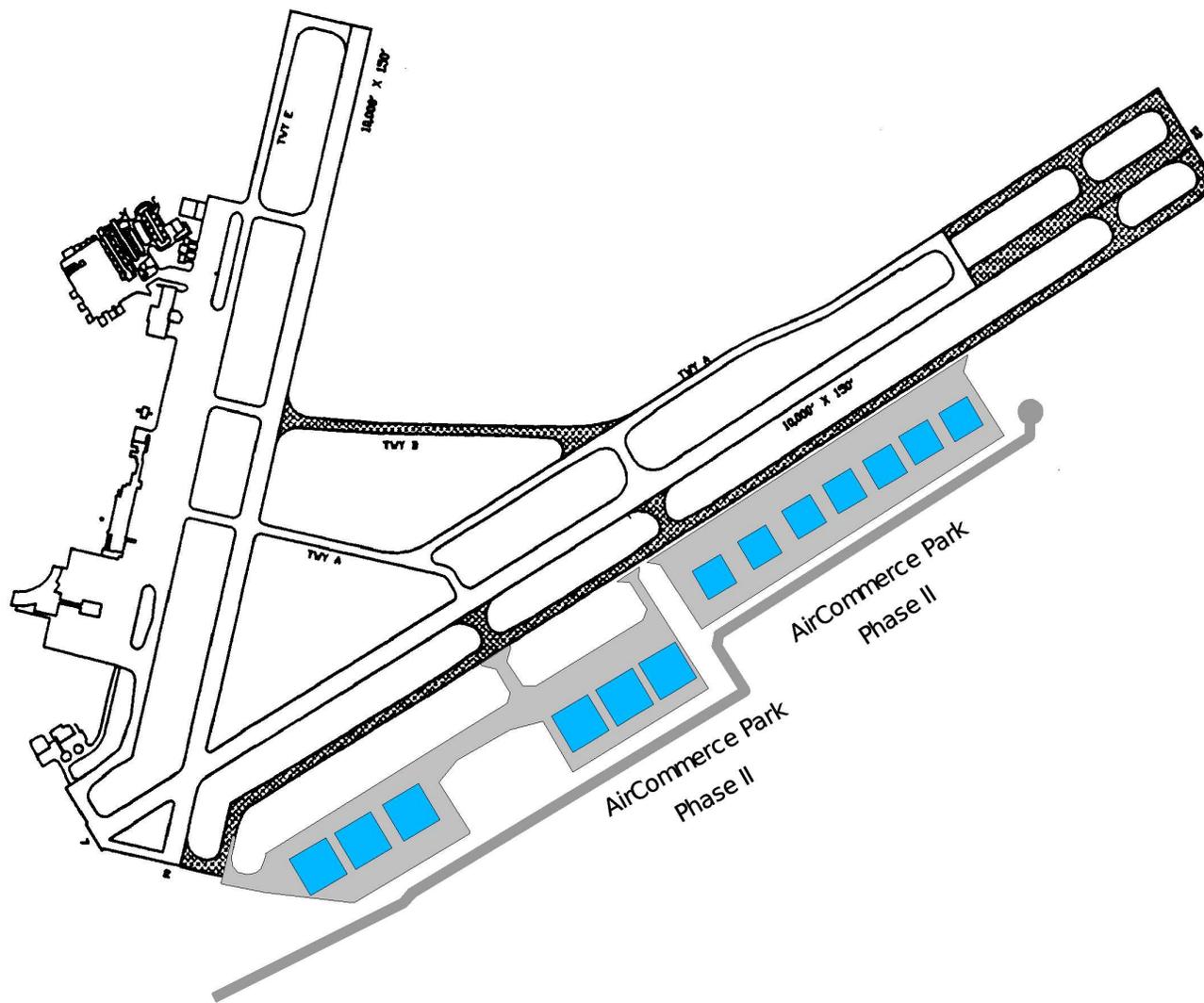


EXHIBIT 2.4

AIRCOMMERCE PARK PHASE III WITH INTERMODAL CONNECTIVITY AT MIDFIELD SITE

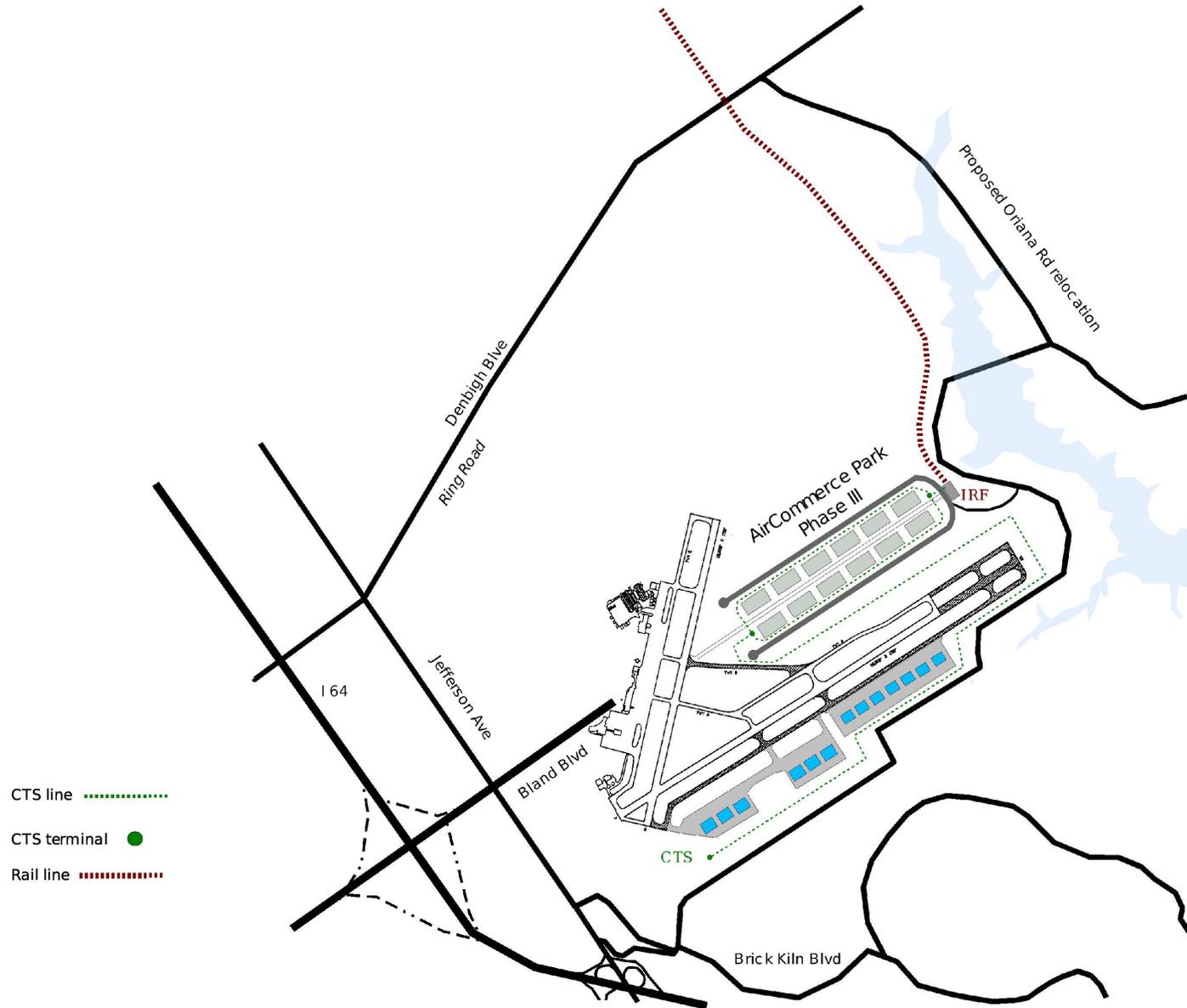


EXHIBIT 2.6

PENINSULA ALH CONNECTIVITY TO OFF-SITE INTERMODAL RAIL FACILITY AND INLAND PORT AT ULTIMATE DEVELOPMENT

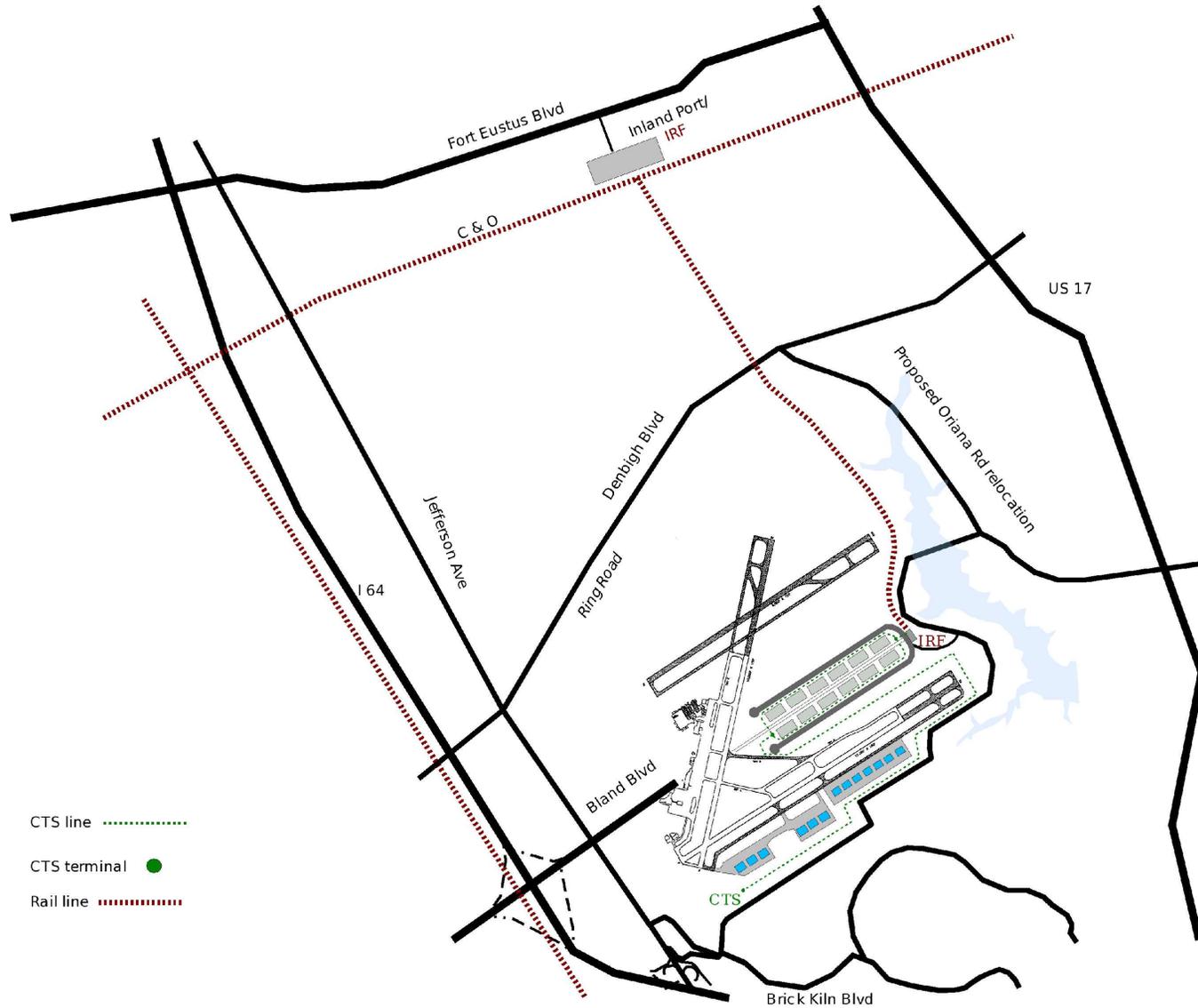
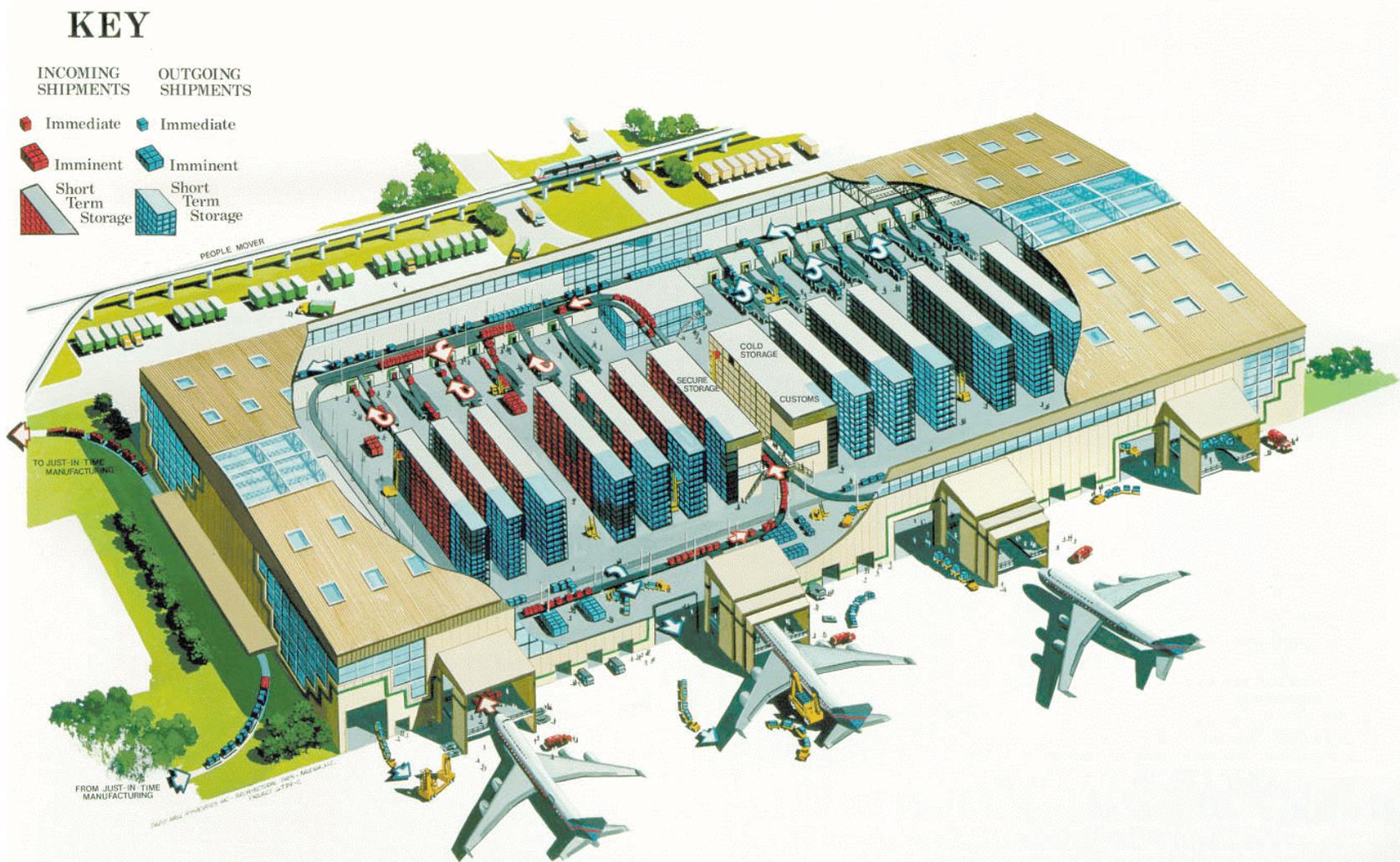


EXHIBIT 2.7 PENINSULA ALH CENTRAL CARGO FACILITY



**EXHIBIT 2.8
INTERMODAL INTERFACES AT THE PENINSULA ALH**

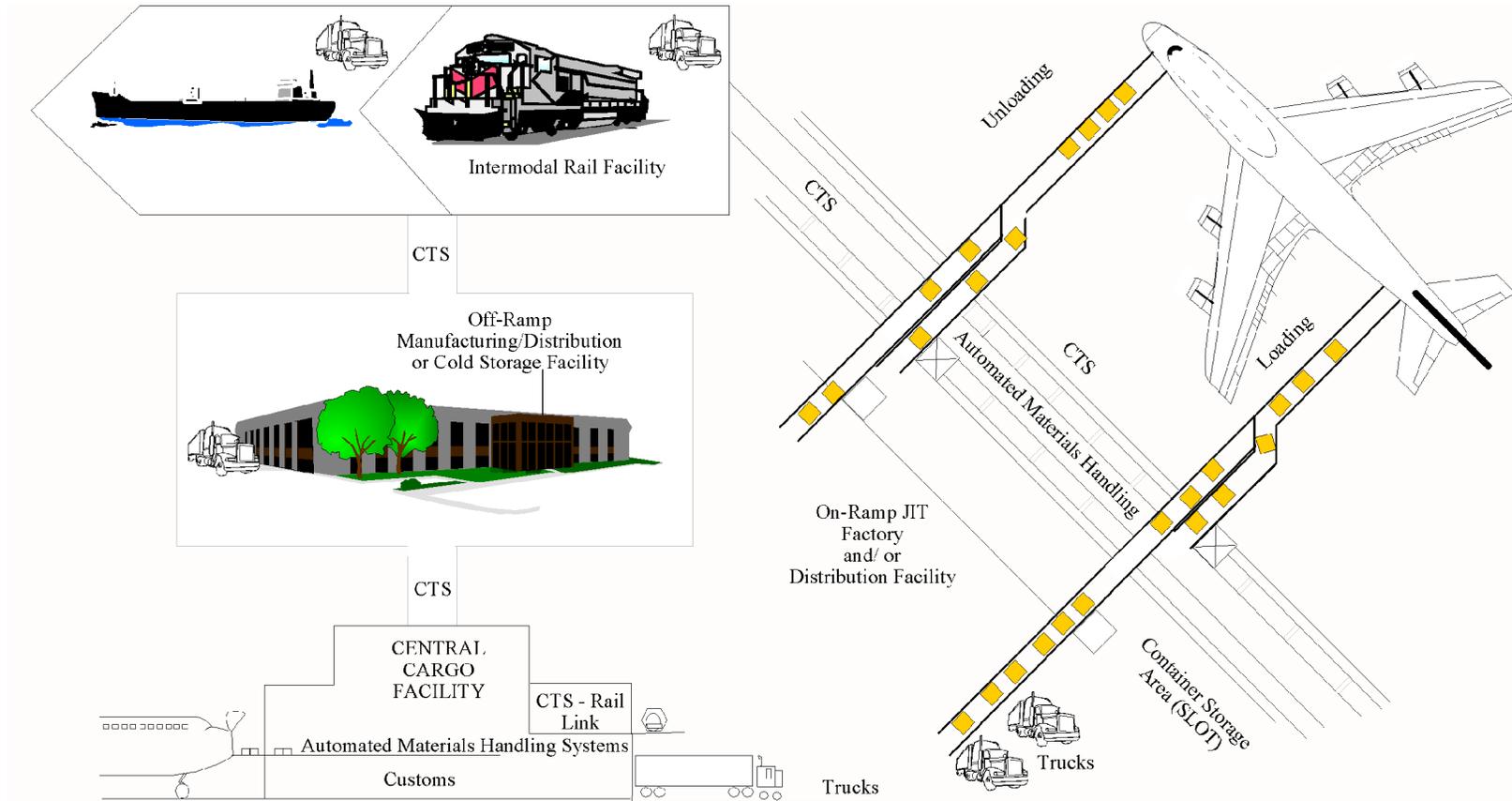


EXHIBIT 2.9
TRANSPORTATION LINKAGES BETWEEN
PENINSULA ALH AND DOMESTIC AND INTERNATIONAL CARGO NETWORK
AT FULL OPERATION

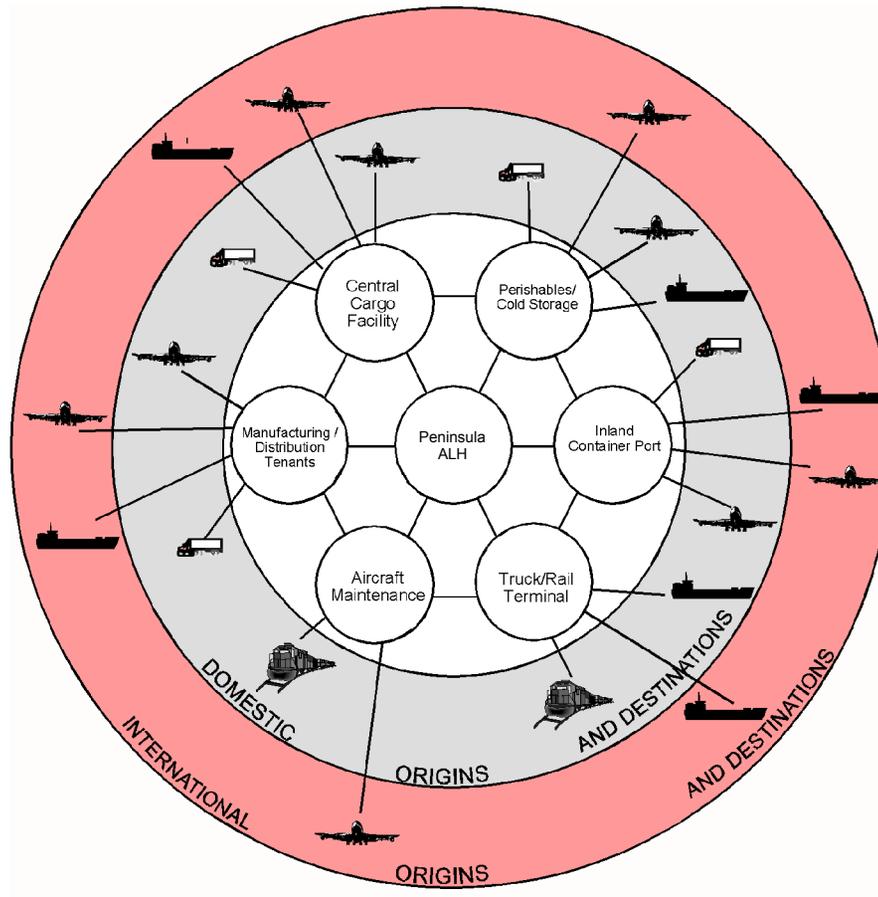
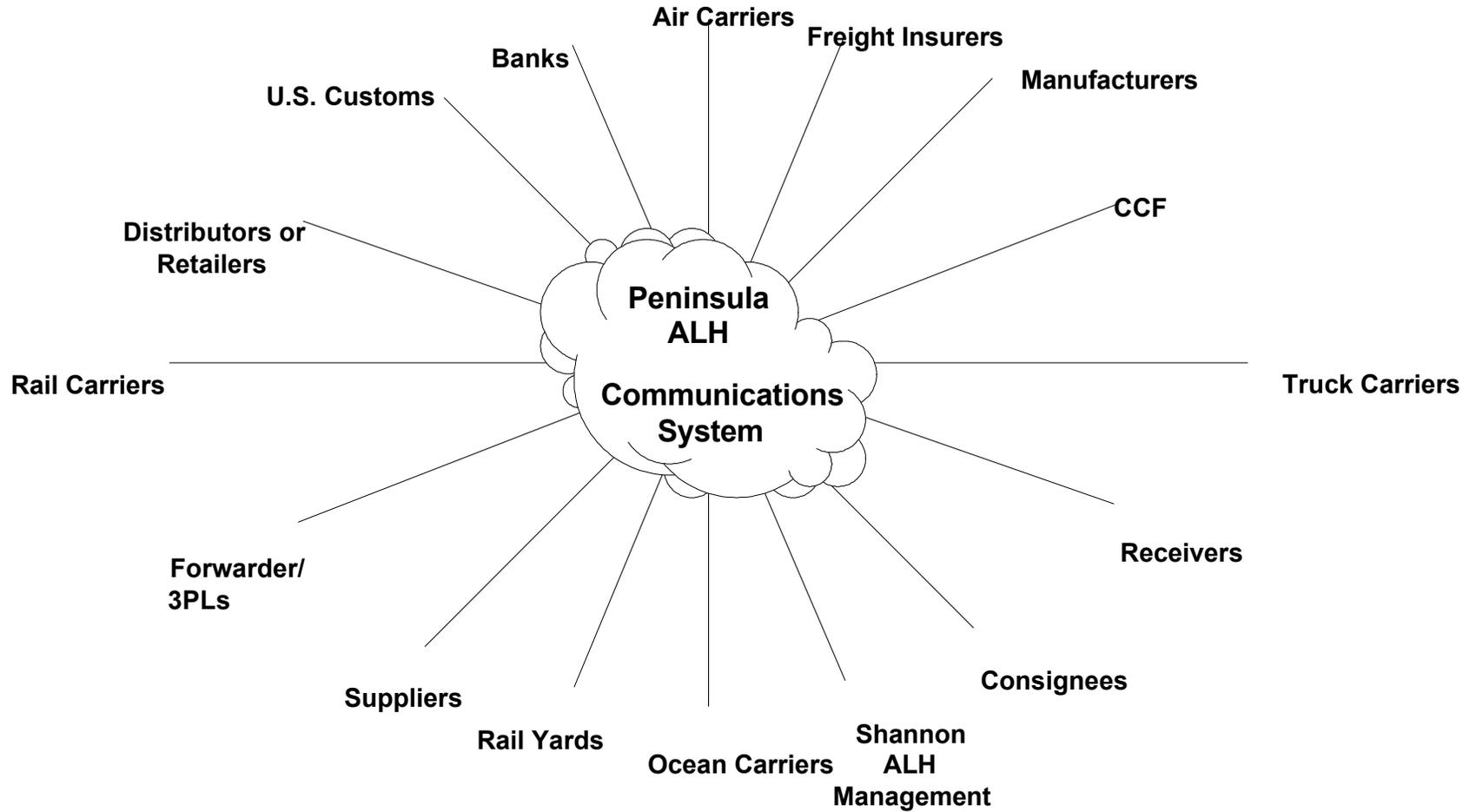


EXHIBIT 2.10
VIEW OF PENINSULA ALH COMMUNICATION SYSTEM AT FULL BUILDOUT



Chapter 3

Peninsula Air Logistics Hub Business Plan Guidelines

I. Introduction

The ability of Peninsula 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 new commercial practices possible. Exhibit 3.1 identifies the key resource needs for a competitive business environment at the Peninsula Air Logistics Hub (ALH) and broader region.

II. Business Resource Needs

First, agile logistics success depends on multimodal transportation systems for fast and flexible supply chain management. Seamlessly connected multimodal transportation systems have become a key to efficient business logistics. Raw materials, perishables, manufacturing inputs, and finished products must flow among geographically dispersed firms in a continuous and synchronized fashion. Air cargo facilities that are integrated closely with modern seaports, efficient highways and rapid railways are needed to support the development of logistics parks, industrial parks, distribution centers, and to more efficiently link them to their sourcing, production and customer networks. For example, the ability of agribusiness firms to get fresh produce to and from distant markets quickly and reliably requires cross-docking facilities that link regional surface transport with aircraft servicing overseas markets. Similarly, manufacturers require cross-docking facilities that bring raw materials, parts, components, and semifinished goods efficiently to production sites, and facilitate the rapid shipment of assembled products to distant customers.

The automotive industry (a proposed growth cluster for the Peninsula) is a good example of how the proper convergence of local logistical networks and ocean and air routes can attract a major industry. Heavy metal components would arrive through deep-water ports. At the same time smaller high-value digitized parts and custom components, often made by local and regional suppliers, must be delivered on a just-in-time basis to the assembly facility. These may arrive from local suppliers by truck and from long-distance suppliers by air. The newly assembled automobiles are then trucked or transported by rail to domestic markets and to the port for shipment to international markets.

Second, the Peninsula ALH and regional logistics system require an integrated telecommunications network as described in the previous chapter to obtain information on markets and orders, manage materials and inventory, and deliver goods quickly to distant customers. Such a network is also essential to attracting more sophisticated transportation-related and third-party logistics (3PL) companies and 4PLs (advanced telecommunications logistics support firms) to the Peninsula that will provide state-of-the-art logistics services to its air logistics hub users and tenants. The Peninsula ALH telecommunications system should feature multimedia technologies served by fiber optics loops, RFID, WiFi, and GPS satellite linkages that connect companies at the airport and throughout the region to their suppliers and customers and to their own branches, offices, and partners around the world. A teleport with advanced information and telecommunications management systems will serve customer premise equipment, including rapid worldwide communication, electronic data interchange (EDI) systems, B2B exchanges, and video conferencing equipment through broadcasting and communications satellite networks. Operations research is showing that telecommunications infrastructure external to a firm now heavily influences the effectiveness and efficiency of internal firm processes.

As international air commerce is introduced through Newport News/Williamsburg International Airport, this telecommunications system must also support express customs clearance and efficient trade data processing. As discussed in Chapter 2, automated, paperless customs clearance is a key attribute of the ALH concept. Newport News/Williamsburg International Airport should be used as a laboratory for new expedited customs clearance procedures and electronic data interchange to achieve high-speed, barrier-free international flows of agricultural products, parts and components, and manufactured goods. In the future, to speed approvals, the Peninsula ALH should house automated customs inspections and, through joint determination with U.S. Customs of appropriate technology, procedures, and staffing levels, it should take the lead in creating the nations most efficient and effective express customs clearance, 24 hours a day, 7 days a week. The mantra of the Peninsula ALH will be speed and agility in moving product to and from the region providing a major competitive edge in fast-cycle logistics.

Third, the new business environment requires modern commercial services support. Global manufacturers, assemblers, and distributors must have access to foreign trade zones and in-transit bonded warehouses at distribution nodes near the airport, financial institutions, marketing, sales and employment agencies, legal services, and trade and exhibition centers. As noted above, expedited customs procedures will be required when international air commerce is introduced to streamline and accelerate the import of raw materials, parts and components and the export of finished goods. One-stop government service centers (combining federal, state, and local agency requirements) are also necessary to provide foreign investors with all required licenses, permits, and investment promotion privileges. Trade and exposition facilities are needed to display and market products of the region's firms. In addition, investors' ability to attract professional managers and highly-skilled younger workers requires a full array of community amenities including modern housing, quality public

schools, good shopping and restaurants, nightlife, recreational, and cultural facilities, much of which is already available on the Peninsula.

Fourth, new economy industries must be located near or have access to knowledge resources that can generate or stimulate innovation and provide a reliable source of trained workers and managers. Among the most important knowledge-based organizations on which global businesses depend are excellent universities such as VCU providing well-educated professionals and research capacities, and consultancy organizations that help commercialize technology, develop new products, and service local and multinational firms more effectively. Such knowledge resources have proven to be a strong asset in meeting these objectives as well as attracting science and technology parks geared toward the development of export products. Likewise, a Peninsula distance education and training facility drawing on the ALH's telecommunications network could provide real-time audio, video and tactile worker training on-site at the airport (or distributed education and training to facilities throughout the greater Hampton Roads region) from almost any location in the world.

III. Functional Requirements of the ALH

The Peninsula ALH vision represents integrated responses to the business resource needs described above. To succeed, it must incorporate five broad functional capabilities targeted to these needs. For each functional (business) requirement, examples of key infrastructure elements are noted. Refer back to Chapter 2 for more detailed discussion and design/location of these elements.

1. *Multimodal Transportation System with Access to Local and Global Transportation Networks*

On-site terminals and inland ports with efficient intermodal capability must link to Peninsula regional highway and rail systems and with global sea and air transportation networks. Primary integration capability at the Peninsula ALH must provide a seamless interface between modes and between ALH's tenants and major air cargo and ocean shipping routes so that goods and materials can flow uninterrupted through the hub quickly, at low cost, and with a minimum of human handling. Efficiently linking all four modes of transportation is essential to establishing a competitive infrastructure at the ALH and to attracting commercial investment.

Examples of critical infrastructure needs at the Peninsula ALH:

- Upgrades of highway and rail connectors to the broader region and to Hampton Roads ports
- Terminals and/or hubs for all major transportation modes, including an inland dry port
- Intermodal integrators for seamless connections between alternative modes
- Electronic tracking capability from mode to mode

2. On-site Cargo Processing Capability

At the core of an air logistical hub must be a cargo processing capability and infrastructure with advanced materials handling that can accommodate the needs of a variety of aircraft and industries. Flexibility in both the processing capability and location of materials handling activities is essential because of nonstandard aircraft and ground cargo-related equipment, and because of a dynamically changing cargo processing environment. Targeted mechanization at the Peninsula ALH

for standard cargo operating processes, as discussed in Chapter 2, can be provided when it is productivity-driven and justified.

Examples of key infrastructure elements include:

- Central Cargo Facility (CCF) with advanced material-handling systems (MHS)
- High-velocity flow through facilities with air side cargo access and land-side truck cross-docking
- Automated express customs clearance procedures and facilities
- In-bound breakdown and delivery staging areas
- Cargo inspection, security, and holding areas
- Facilities for value-added service provision, such as temperature-controlled and storage.

3. On-site Cargo Transport System

A third need is a cargo transport system that connects the ALH with all transportation modes and terminals (air, sea, rail and road), with each mode to the other, and with the proposed foreign trade zone and regional manufacturing and distribution facilities, as well as logistics support facilities. These systems can be fully automated, semi-automated or manual depending on traffic flow profiles (cargo demand) and the specifics of the site.

Examples of such infrastructure elements include:

- Both low-tech and advanced materials handling capability
- Internal road and tram network
- Automated storage/retrieval systems

- RFID tagging and tracking technologies and sortation systems

4. *Shared Communications System with Transparent User Interface*

Computer-to-computer information transfer between companies (Electronic Data Interchange and B2B e-commerce) have all but replaced paper and fax transmissions and most traditional face to face supply chain transactions. This electronic interchange of information and data requires message standards, translation software and transmission capability. Recent technology developments have created new opportunities to enhance inter-company and inter-industry communications with more powerful work stations, improved data transportation mediums, global communications networks and faster switching systems for electronic transmissions. These capabilities and new technologies will greatly facilitate seamless relationships among Peninsula ALH tenants, their suppliers and customers regionally and worldwide. The net effect is to accelerate materials handling, customs processing and product transfers among commercial facilities, aircraft, trucks, rail cars, and ships, as well as to other U.S. and eventually global airports. A key planning challenge, as described in Chapter 2, is to design a communications system that is flexible enough to support the majority of Peninsula ALH and Hampton Roads users, that offers rapid connection to regional and global networks, that maximizes functionality, and that allows for continuous improvement and innovation.

Examples of key electronic commerce elements include:

- Electronic data interchange (EDI) capability
- Ties to fiber optic and satellite networks
- Wide-area and value-added broadband

- Common web-based open architectures and message standards

5. *Access to On-site and Remote Services for Commercial Support, Education, and Training*

In the new speed-driven economy, businesses are demanding access to a variety of support services that reduce the time and cost of logistical transactions. Desirable commercial support services noted earlier include a variety of legal, financial, and government services such as the securing of permits, customs clearances, and export licenses. Some of these services can be provided electronically. Co-location of these services at the Peninsula ALH can provide a “one-stop-shop” support for tenant companies.

Similarly, electronic access to education and training facilities throughout the country and the world can provide substantial value to Peninsula ALH tenants. The proposed distance education facility at the ALH would provide agile support for custom training the local labor force by offering tenant companies real-time audio and video access to knowledge and training resources from around the world. For example, if Rolls-Royce wanted to locate a jet engine production facility at Newport News/Williamsburg International Airport or elsewhere on the Peninsula, worker training could be conducted on site, via simultaneous audio, video, and tactile instruction from its European production headquarters.

Examples of such key infrastructure elements:

- Broadband two-way video capability
- RFID intelligent information access technology
- Wide area broadband information exchange

- On-line interactive and/or automated support of negotiations and contracting
- Education and training center with distance-learning capabilities

IV. Critical Success Factors for the Peninsula ALH

Effective planning requires not only vision but also an appropriate strategy. Guiding the development of a business plan for the Peninsula ALH should be a set of overarching themes that, if followed, will greatly facilitate its ultimate success. Realizing these critical success factors will provide Newport News/Williamsburg International Airport and the Peninsula area with a major competitive edge in attracting business and industry over many other sites in the U.S.

Critical Factor #1

The Peninsula ALH Must Be Designed Around Emerging 21st Century Business Practices

Beginning with our frequently repeated fundamental point, planning of the Peninsula ALH must reflect the business practices and processes of 21st century global companies. We noted that dramatic changes are occurring in how companies transact their business, and especially in how mega-retailers, manufacturers and logistics providers move goods and materials around the country and the world. Infrastructures can no longer be designed and built as isolated civil engineering investments or that reflect more traditional business practices. New business practices require new infrastructures. These must be geared to modern supply-chain management that fuse multimodal transportation, advanced telecommunications, sophisticated materials handling

systems, and state-of-the-art business support services to offer unmatched speed and agility to tenants and users.

Critical Factor #2

Development Plans for the Peninsula ALH Must Give High Priority to Quality of Life Considerations

Unlike most other logistical complexes around the world, the ALH should be developed as a multi-functional zone that will support not only manufacturing and distribution activities, but also recreational activities and tourism, so important to the Peninsula's economy. This raises the importance of quality of life considerations with respect to its broader built environment. By balancing industrial, commercial and environmental factors, the Peninsula ALH can provide benefits not only to the companies that locate there, but also to nearby residents and tourists, as well.

Critical Factor #3

Master Plans for the ALH Must Be Flexible and Reconfigurable.

I stressed in Chapter 2 that planning for a Peninsula ALH should not be viewed solely as detailed site and civil engineering plans to guide construction and development. Rather, the master plans should be developed as a flexible framework that can accommodate a wide variety of commercial facilities, tenants, and physical layouts. In order to create a sustainable future, Master Planning must look to the long-term, with a design that is both environmentally and economically sustainable and can adapt to new business needs and incorporate new technologies and infrastructure advances. A basic planning principle is that the Peninsula ALH itself be designed as a flexible infrastructure system that can be rapidly adapted to current and future tenant requirements. While the features of the competitive landscape for the near term are clearly in focus, competitive strategies will undoubtedly change over time and the

Peninsula ALH must be able to respond quickly to these new logistical needs and infrastructure requirements. A 10 to 20 year development horizon is not unreasonable to build milestones on.

Critical Factor #4

The ALH Must Establish Synchrony with Other Infrastructure Projects Around the Country and the World.

With are moving into an era in which networks of firms compete rather than individual companies. In this new commercial environment, Hampton Roads companies and Peninsula ALH tenants must be able to access their partners quickly and effectively. This requires synchrony with other air cargo systems around the world and with harmonized communications systems and ground/sea transportation networks. Major air logistics firms such as FedEx, Lufhansa, UPS, and DHL, are racing to set up efficient and seamless international networks. By attracting such cargo providers to Newport News/Williamsburg International Airport and linking to their networks, the Peninsula will be able to participate more quickly and efficiently in the rapidly growing global economy. Locally, synergies need to be developed with Norfolk International Airport to support mutually reinforcing complementaries rather than direct competition for passengers and cargo.

Critical Factor #5

The Peninsula ALH Must Emphasize the Importance of Logistics-Based Capabilities in Attracting Export-Oriented Businesses.

As companies search around the world for quality parts and components at competitive prices, and as customers demand quick response and fast delivery, access to global transportation networks and 3PL's will be a major criteria for industrial location. Companies will certainly continue to require traditional investment incentives, such as local investment offsets for land or

facilities, tax holidays and workforce training. However, as the competitive priorities of speed and efficient consumer response predominate, the relative attractiveness of these traditional factors will lessen. Increasingly, investment decisions will be made as much on the basis of the logistical capabilities of the site and access to global networks as on government incentives.

Critical Factor #6

Master Plans Must Demonstrate Regional and Countrywide Benefits of the Peninsula Air Logistical Hub.

In order for the Peninsula ALH to obtain the maximum popular and governmental support, development must be positioned as a vehicle for greater Hampton Roads and Virginia economic growth. The creation of an air logistical hub at Newport News/Williamsburg International Airport that will attract commercially successful companies is a primary goal of this plan. But, ultimately, the success of the ALH will depend on how its capabilities can leverage businesses throughout Southeastern Virginia shore and, indeed, the entire state. In this regard, it is critical that ALH planning recognize and highlight the growing integration of its primary commercial and transportation centers and develop an integrated logistics system plan that builds synergies among regional and state-wide commercial sites.

V. Marketing Strategy for the Peninsula ALH

This section presents a suggested marketing strategy to help the Peninsula Airport Commission attract commercial investors and service providers to the ALH. We assume that for the immediate future, the Peninsula Airport Commission will continue to have the lead role and responsibility for promoting the concept of its ALH and for identifying and attracting viable tenants to the complex. In the next chapter, I will make recommendations regarding potential future organization and management of the Peninsula ALH. Here, I will raise

the prospect that within the next three years, a private-sector firm would be entrusted with the task of developing and operating the complex on a long-term concessionary basis. Among the core functions would be the promotion of the Peninsula ALH, from the creation of a marketing program for the complex, complete with public relations, advertising and publicity brochures and materials, to the identification, contact and “sales” effort with potential tenants and users. If a commercial site developer is chosen for the Peninsula ALH, it would be expected to have its own approach and techniques to marketing the project.

In view of these assumptions, in the present section I first concentrate on the immediate marketing strategy tasks that fall to the Peninsula Airport Commission in the period prior to the possible involvement of a private-sector developer and operator. However, it is also understood that Peninsula Airport Commission may retain responsibility indefinitely for the ALH project. Recognizing this possibility, in this section I also address longer-term marketing goals and issues for the ALH that would be relevant either to a private-sector developer/operator or to the Peninsula Airport Commission should the latter continues to be the entity to promote and to develop the ALH for the life of the project.

1. Phased Marketing Themes

The ultimate objective of the Peninsula ALH is to serve as a major East Coast multimodal hub and industrial complex offering tenants and users state-of-the-art logistics, knowledge resources, and commercial support. Based on experience with similar multimodal centers elsewhere, achievement of this goal will mean the ALH will likely evolve through a series of phases. In each phase, the marketing effort should be designed to attract a nucleus of facility users, which in turn serves as a catalyst to

pull additional complementary companies to the complex. The kinds of tenants likely to be attracted to the Peninsula ALH will vary with each phase of the complex's development. Marketing activities should be planned to match these anticipated development stages and tailored to the kinds of tenants that are most suitable to each stage.

a. Near Term

The near term represents a period from the present through the next 2 to 3 years. Based on interviews and surveys of potential users at air cargo airports, the near-term marketing strategy should build on the strong previous efforts by the Peninsula Airport Commission to attract internationally networked air cargo carriers, especially the integrated air express carriers (e.g., UPS, FedEx, DHL). Though excellent efforts to date by the Commission have shown how difficult this can be, the international air express industry is growing rapidly and is expected to dominate air cargo expansion in the future growing at an average annual rate of 18 percent (see Exhibit 3.2). Their regional hubs often do not have a sufficient cargo or manufacturing base nearby, but they can operate efficiently through sorts. These international air express firms can also operate at the existing Newport News/Williamsburg International Airport without major infrastructure modification. As will be discussed in the recommendations, it may be time to bring a private-sector third party on board to work on this and other Peninsula ALH development efforts.

b. Mid-Term

The mid-term for Peninsula ALH development represents roughly the years 3 through 7. This period's marketing strategies should be designed

to further boost the air cargo demand at Newport News/Williamsburg International Airport, and then to expand this demand by progressively widening and deepening the nature of activities located at and near the airport. These strategies are:

- attracting charter air cargo service providers to the ALH;
- targeting industrial and commercial users of those air services;
- encouraging improved logistics management; and
- facilitating the integration of production and logistics.

While these strategies are broadly sequential, there would naturally be an overlap from one stage to another in implementing them. Most important, the impact of this marketing will be cumulative, with efforts in one stage preparing a network of contacts and a Peninsula ALH operating reputation to make it possible to begin moving the facility toward its next phase of evolution.

(1) Attracting charter air cargo service providers (years 3 to 10)

For the Peninsula ALH to attract traditional point to point (airport to airport) air cargo service providers, a critical mass for air cargo demand (load) is necessary on a regular basis. Previous surveys have indicated that charter air cargo operators (e.g., Atlas Air, BAX Global, Cargolux, Evergreen, and Polar) serve airports where they can be assured of a significant volume of airfreight. The key to building a critical mass of cargo demand will be to focus on promoting the Peninsula ALH to all southern Virginia industries that are largely airfreight dependent. The intent here will be to persuade the firms not necessarily to relocate to the Peninsula, but to use the ALH as a point for consolidation and transshipment of cargo between Virginia and distant points, similar to

FedEx's Asia hub at Subic Bay. Here again, may be where the services of a third party may prove beneficial.

Initial marketing targets should focus on 3PL's, freight forwarders and shippers of time-sensitive products in Virginia. These include microelectronics companies, pharmaceutical firms, fresh produce, and seafood, and other high value to weight export products. Marketing strategies geared to shippers, freight forwarders, 3PL's and air cargo firms should emphasize the value-added that the Peninsula ALH can mean in terms of lower cost and more efficient shipment services. During this phase of development, the Peninsula ALH will seek to become a much more significant air cargo airport, featuring highly efficient cargo handling and transshipment capabilities.

(2) Attracting more logistics service providers to the Peninsula (years 3 to 10)

Once the Newport News/Williamsburg International Airport's cargo expands significantly, marketing should also focus on attracting shippers (i.e., manufacturers and assemblers of export products) and forwarders or third party logistics providers (3PLs) to locate at and around Newport News/Williamsburg International Airport. The goal will be to begin generating on-site origin/destination cargo shipments in terms of in-bound raw materials and components and out-bound intermediate and final goods flowing to and from the manufacturers and assemblers that operate at or near Newport News/Williamsburg International Airport. Again, the emphasis will be on showing a set of real cost, speed, and service quality advantages for locating at Newport News/Williamsburg International Airport that are compelling to shippers, forwarders, and 3PLs.

c. Longer Term

The longer term (years 11 to 20 and beyond) will focus on developing Newport News/Williamsburg International Airport into a full-scale ALH logistical complex and attracting the necessary complement of manufacturers, logistics managers and service providers to accomplish ultimate ALH objectives.

(1) Improved logistics management (years 11 to 16)

Once a core of air cargo firms, shippers and forwarders or 3PLs have located and successfully operated at the Peninsula ALH, the marketing emphasis will shift to promoting an extension of the range of value-added logistics management services the ALH offers. From its inception the Peninsula ALH will have its current enterprise zone status that should be extended to full Foreign Trade Zone status and associated in-transit bonded facilities. Pointing to the importance of these features for cost-effective logistics, plus the record of efficiency that Newport News/Williamsburg International Airport will have established for its tenants and users to that date, marketing programs will begin to focus more on the advantages of the ALH in overall logistics management. The marketing emphasis will be on helping industrial and commercial shippers and 3PLs find opportunities at the ALH to coordinate the movement of materials and finished goods so that they can rapidly and flexibly respond to customer's needs as well as to cut costs and increase supply-chain management efficiency. The possibilities of performing value-added logistics functions such sequencing, pick and pack, packaging, product labeling and assembly of knock-down product kits will be stressed. The marketing targets during this phase will be the companies already located in southern Virginia, plus the whole spectrum

of world class third party logistics providers that serve shippers globally. The Peninsula ALH's later capabilities in automated warehousing/distribution, electronic data interchange, and electronic tracing-tracking will be underlined for these logistics specialists. The ALH's sales proposition during this phase will not only be price and quality of service advantages, but also the enhancements to the speed and agility of supply chain operations that the Peninsula ALH could provide shippers and 3PLs.

(2) Integration of production and logistics (years 11 to 20 and beyond)

Once the Peninsula ALH has developed a reputation for world-class cargo handling and logistics management, a final stage of ALH marketing can begin. The emphasis at this stage would be essentially an intensification of the "improved logistics management" marketing theme set forth above, whereby the marketing program will concentrate on supporting shippers and 3PLs to find ways to integrate production and logistics so as to substantially reduce inventories and further improve manufacturers' supply chain management. Promotional materials will seek to differentiate the Peninsula from other industrial-commercial-logistics locations as sharply as possible in terms of the price, quality, speed and agility benefits that it offers. The Peninsula ALH will at this point be marketed internationally to the most sophisticated shippers and 3PLs as a site where airfreight dependent manufacturers fully coordinate their supply chains and overall manufacturing capacity with customer demands. The marketing message will also stress the Peninsula ALH's world-class standards in total logistics management practices including fusion of all transportation modes (air, sea, road, and rail), integrated

telecommunications, sophisticated materials handling systems, and state-of-the-art commercial and knowledge support services.

2. Target Industries

At every stage of marketing, the Peninsula ALH promotional strategy should be grounded in solid business research and planning. This will involve market research of a generic nature on likely ALH tenants and users, given its stage of development, as well as market research specific to southern Virginia. Research on commercial shippers from around the world points to five generic types of shipments where air transport is the consignees' mode of first choice. These are when:

- Flexible and customized production is the norm
- The high value of the product compared to its weight justifies the extra cost of airfreight
- The product is perishable—either in the physical or economic sense
- Short production cycles and/or “just-in-time” inventories require fast delivery
- Immediate delivery of spare parts, time sensitive documents or products is required

Target industry analysis for Southeast Asia markets conducted by the Kenan Institute Asia in Bangkok identified eleven industrial groups that are most likely to utilize the facility. Most of these would no doubt also be the best target industries for the Peninsula ALH, as well. They include:

- Logistics service providers
- Semi-conductor and computer chip manufacturers

- Pharmaceuticals
- Computer and electronic sub-assembly manufacturers
- Aircraft parts suppliers and aircraft maintenance services
- Garments and fashion accessory suppliers
- Specific elements in the industrial supplies business, particularly those supplying machine tools and/or those in the petrochemical industries supplying/manufacturing small volumes of high value products, for example aromatics
- Optics and small precision equipment manufacturers
- Suppliers of perishable products—for example, seafood and fish, live animals and animal parts for traditional medicine, fresh fruit and flowers
- Automotive component manufacturers and spare part suppliers
- Jewelry and watch manufacturers

Exhibit 3.5 provides a list of potential target firms in these industries. In targeting these firms and others in the industries, noted above, there are a number of services that need to be highlighted in a marketing plan for the Peninsula ALH. Many have already been discussed, but let me provide a summary list of the key support services to be implemented and leveraged in marketing the Peninsula ALH.

- Expedited customs clearance and pre-clearance procedures
- Full electronic data interchange capability
- Foreign Trade Zone and in-transit bonded status for re-exports
- New highway and rail access to the ALH and with port connectors

- State-of-the-art materials handling services
- Reliable utility services (e.g., electricity, water, sewer)
- Industrial support services such as repair and maintenance and machine shops
- Quality of life—good housing, schools, recreation, nightlife
- Knowledge and education support, including a distance education and worker training facility at the Peninsula ALH
- Enhanced one-stop servicing for foreign investors
- Governmental incentives and investment promotional privileges

All of the above need to be woven into both the business plan and the implementation plan for the Peninsula ALH. They are not only essential to the marketing effort, but also to developing a successful multimodal air logistics hub and regional network.

VI. Rough Financial Estimates: Costs, Revenues, and Profit Forecasts

To date, no full-scale agile logistics hubs have been completely developed but cost and revenue forecasts have been made as part of master planning and cost/benefit studies conducted for Global TransPark under development in North Carolina. These may serve as a rough first-order estimate for a Peninsula ALH, but targeted financial assessment would really need to be focused on Newport News/Williamsburg International Airport to get meaningful results.

The North Carolina project is projected to cost approximately \$130 million to convert to an air logistics hub with a single long-range runway and \$260 million as a dual-runway complex, requiring a new 11,000 ft runway. If all rail

and highway upgrades are included, total cost will likely be between \$300 and \$350 million.

Basic NCGTP costs include the following: master planning (aviation, infrastructure, industrial, environmental), government approvals and public relations, site acquisition, site preparation, utilities (including power, water supply, sewage treatment, etc.), telecommunications, airport infrastructure (runways, taxiways, ramp areas, control tower, nav aids system), central cargo facility, and other basic facilities (e.g., general aviation) intermodal interfaces including truck cross-docking, intermodal rail links and internal road system, operations and maintenance, education and training center (optional), and marketing. The most costly components of the infrastructure are the additional runway, taxiways and ramps (\$110 million if constructed from scratch), the central cargo facility (\$8 million to \$30 million depending on size and extent of automation) and state-of-the-art nav aids systems (approximately \$10 million) and extended rail access and intermodality (\$50 million). This is why Newport News/Williamsburg International Airport with its existing runways, excellent ramps, telecommunications infrastructure, and utilities in place, has such a cost-effective infrastructure advantage over the Global TransPark in addition to its much larger local and regional market.

Revenues include aircraft landing fees, ramp cargo handling fees, central-cargo facility and warehousing fees, facility rentals and leasing and various concessions. These revenues will be closely tied to cargo volume passing through the ALH making accurate traffic demand forecasts key to financial risk assessment. Summary models of the structure and basics of the financial assessment framework and estimation of GTP demand (both developed by HLB, Inc.) are shown in Exhibits 3.3 and 3.4. In 1999, Dr. David Lewis, President of HLB (Hickling Lewis Brod) and Mr. Robert Schaevitz of HLB Decision

Economics prepared a generic set of GTP cost, revenue, ROE and ROI numbers based on industrial airport projects underway.

As noted above, Dr. David Lewis and his colleagues have conducted a U.S. based prototype Global TransPark Pro Forma Financial Analysis based on converting an existing airport to an agile logistics hub. Their first-order estimate pro-forma financial analysis covers a twenty-year period in three phases of development: under construction, ramp-up, and mature operations (see Exhibit 3.6). The analysis yields an average annual ROE of 14.9% and an internal rate of return (after interest) of 18.8%, with a quite respectable debt service coverage ratio. Let me reiterate that these assessments and results have numerous assumptions and hypothetical elements and are meant only to be illustrative. Were the Peninsula Airport Commission to proceed with a full feasibility study for the ALH, I would recommend that an investment-grade cost-benefit analysis be conducted as part of that study.

VII. Conclusion

This chapter summarized the main elements that should guide development of a full business plan for a Peninsula ALH and highlighted pertinent findings from related studies. Emphasis was on creating a competitive business environment at the ALH, business resource needs, critical success factors, marketing strategies, target industries, and financial factors. Key to this competitive environment will be based capabilities at the ALH and a region-wide integrated logistics network that provides advantages of speed and agility to goods-processing firms throughout southern Virginia. In the final Chapter 4, I will focus on key elements of an ALH implementation plan and a set of recommendations, and action steps to design, develop, manage, operate, and otherwise move the project forward.

**EXHIBIT 3.1
PROPOSED BUSINESS ENVIRONMENT FOR A PENINSULA AIR LOGISTICS HUB**

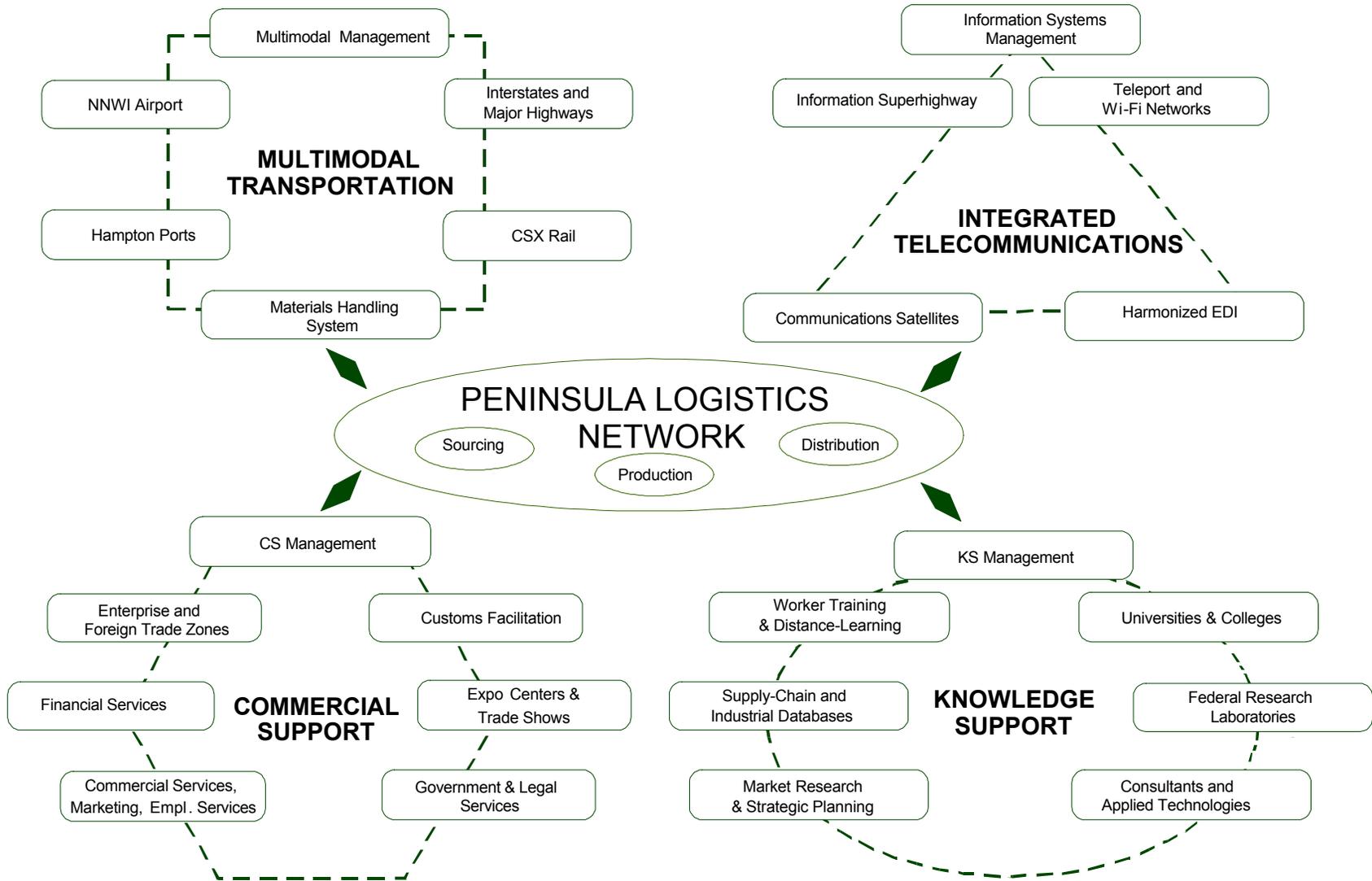
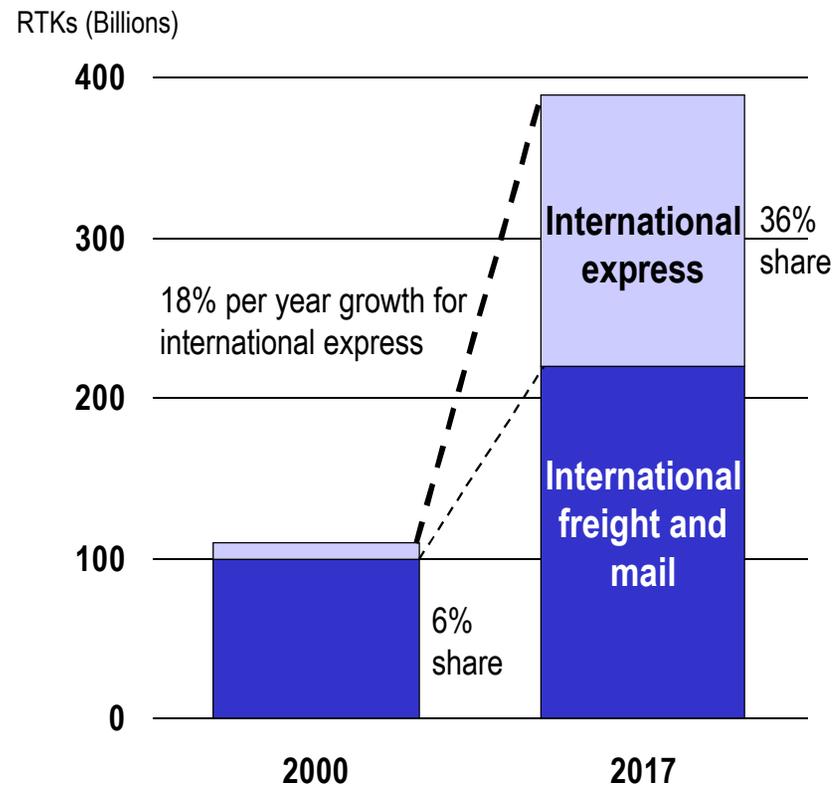


EXHIBIT 3.2
INTERNATIONAL AIR CARGO EXPRESS BECOMES A MAJOR FORCE



Source: Boeing Commercial Airplane Group, Current Market Outlook, 2003

EXHIBIT 3.3
OVERVIEW OF GTP ASSESSMENT FRAMEWORK

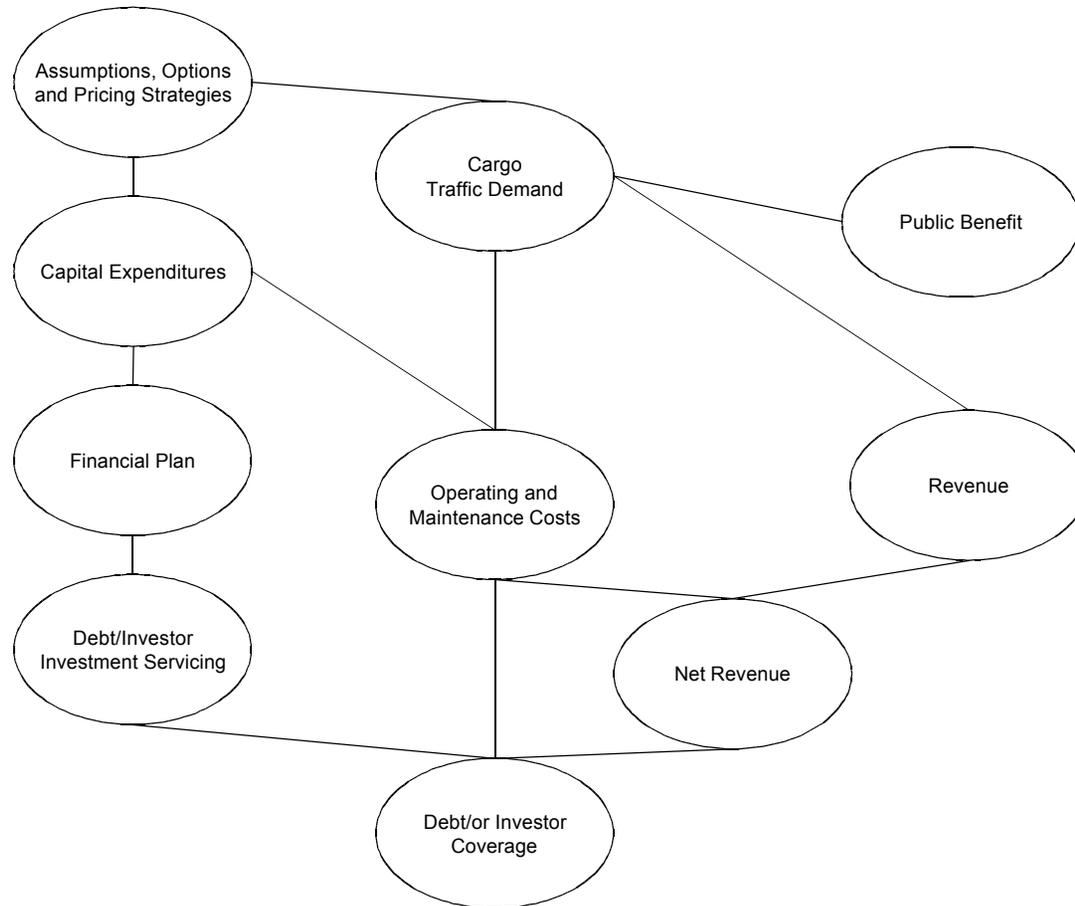


EXHIBIT 3.4
ESTIMATION OF GTP DEMAND

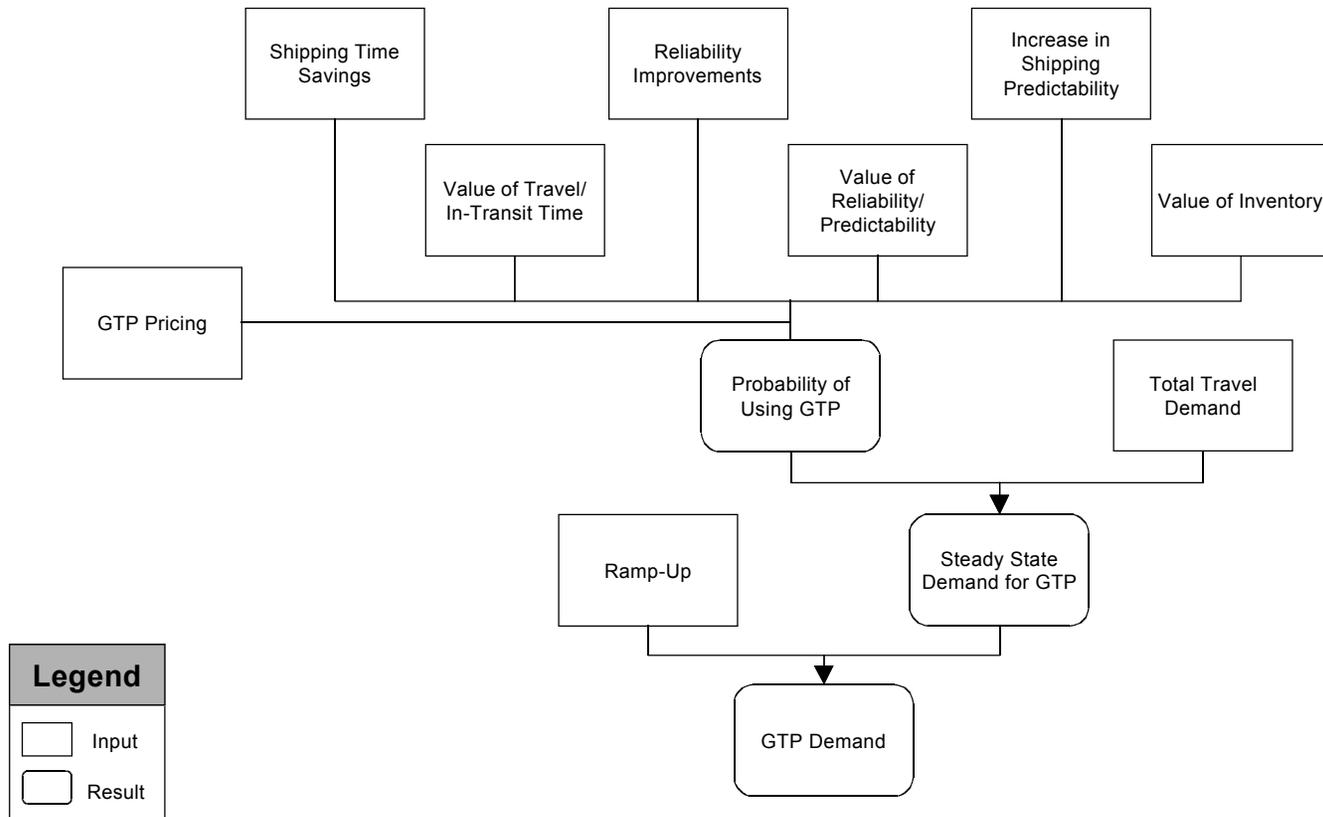


EXHIBIT 3.5
 POTENTIAL FIRMS FOR THE PENINSULA ALH

Company	Industry	Website
3Com	Networks	http://www.3com.com/
ABB Asea Brown Boveri	Electronics, Electrical Equipment	http://www.techrepair.com/abb.html
Abbott Laboratories	Pharmaceuticals	http://www.abbott.com/
ABX Logistics (USA) Inc	Logistics	www.abxusa.com
Acer	Computers & Semiconductors	http://www.acer.com
Advanced Micro Devices (AMD)	Computers & Semiconductors	http://www.amd.com
Airbus Industrie	Aerospace	http://www.airbus.com
AIT Worldwide Logistics	Logistics	www.aitworldwide.com
Alcatel	Telecommunications	http://www.alcatel.com/
AlliedSignal	Aerospace	http://www.honeywell.com/
Amazon.com	E-Commerce	http://www.amazon.com
American Home Products	Pharmaceuticals	http://www.ahp.com/
Americold Logistics	Logistics	www.americold.net
AMH Corp.	Logistics	www.amh-corp.com
AMP	Networks	http://www.amp.com/
Analog Devices	Networks	http://www.analogdevices.com/
Anam Group	Telecommunications	http://www.anam.ie/
APL Logistics	Logistics	www.apllogistics.com
Apple	Computers & Semiconductors	http://www.apple.com/
Applied Materials	Computers & Semiconductors	http://www.appliedmaterials.com/
Arnold Logistics	Logistics	www.arnoldlogistics.com
AstraZeneca	Pharmaceuticals	http://www.astrazeneca.com/
AT&T	Telecommunications	http://www.at&t.com
Averitt Express	Logistics	www.averittexpress.com
Barnes & Noble	E-Commerce	http://www.bn.com
BAX Global Supply Chain Management	Logistics	www.baxglobal.com
Baxter	Medical Products	http://www.baxter.com/
Bekins Worldwide Solutions	Logistics	www.bwslogistics.com
BigDogLogistics	Logistics	www.bigdoglogistics.com
Bigwords	E-Commerce	http://www.bigwords.com/
BMW	Motor vehicles and Parts	http://www.bmw.com
Boeing	Aerospace	http://www.boeing.com/
Breitling	Watches	http://www.breitling.com/

EXHIBIT 3.5—*Continued*
 POTENTIAL FIRMS FOR THE PENINSULA ALH

Company	Industry	Website
Bristol-Myers Squibb	Pharmaceuticals	http://www.bms.it
C.H. Robinson	Logistics	www.chrobinson.com
Cable & Wireless	Telecommunications	http://www.cwplc.com
Cabletron Systems	Networks	http://www.cabletron.com/
Canon Inc.	Electronics, Electrical Equipment	http://www.canon.com
Cardinal Logistics	Logistics	www.cardlog.com
Cartier	Apparel & Accessories/Watches	http://www.cartier.com
Caterpillar Logistics Services Inc.	Logistics	www.catlogistics.com
Cendian	Logistics	www.cendian.com
China Telecom	Telecommunications	http://www.cthk.com/
Ciena	Networks	http://www.ciena.com/
Cisco Systems	Networks	http://www.cisco.com
Comapny	Industry	Website
Commodity Logistics	Logistics	www.commoditylogistics.com
Compaq	Computers & Semiconductors	http://www.compaq.com
Compuware	Networks	http://www.compuware.com
Concentrek Inc.	Logistics	www.concentrek.com
Continental Traffic Service	Logistics	www.contraf.com
Con-Way Logistics	Logistics	www.con-way.com/logistics
Corporate Traffic	Logistics	www.corporate-traffic.com
Crowley Logistics	Logistics	www.crowley.com
DaimlerChrysler	Motor vehicles and Parts	http://www.daimlerchrysler.com/
Dana	Motor vehicles and Parts	http://www.dana.com/
Data General	Networks	http://www.dg.com/
DDD Company	Logistics	www.dddcompany.com
Dell Computer	Computers & Semiconductors	http://www.dell.com
Deutsche Telekom	Telecommunications	http://www.dtag.de
DHL Worldwide Express	Logistics	www.dhl.com
Disney Stores Distribution	E-Commerce	http://www.disney.com
EDS	Networks	http://www.eds.com/
EGL Eagle Global Logistics	Logistics	www.eaglegl.com
Electrolux	Electronics, Electrical Equipment	http://www.electrolux.com/

EXHIBIT 3.5—*Continued*
 POTENTIAL FIRMS FOR THE PENINSULA ALH

Company	Industry	Website
Eli Lilly	Pharmaceuticals	http://www.lilly.com
Emerson Electric	Electronics, Electrical Equipment	http://www.emersonelectric.com
Ericsson	Telecommunications	http://www.ericsson.com
Esprit	Fashion Clothing	http://www.esprit.com
E-Toys	E-Commerce	http://www.e-toys.com
Exel plc	Logistics	www.exel.com
FedEx Supply Chain Services	Logistics	www.fedex.com
Flextronics	Computers & Semiconductors	http://www.flextronics.com/
Ford Motor	Motor vehicles and Parts	http://www.ford.com
Fujitsu	Computers & Semiconductors	http://www.fujitsu.com/
Gap Inc.	Fashion Clothing	http://www.gap.com
Gateway 2000	Computers & Semiconductors	http://www.gateway.com
GENCO	Logistics	www.genco.com
General Electric	Electronics, Electrical Equipment	http://www.ge.com
General Motors	Motor vehicles and Parts	http://www.gm.com
General Warehouse & Transportation	Logistics	www.gwtlogistics.com
Geodis Logistics	Logistics	www.geodis.com
GeoLogistics	Logistics	www.geo-logistics.com
Glaxo Wellcome	Pharmaceuticals	http://www.glaxowellcome.com/
GTE	Telecommunications	http://www.gte.com
Hewlett-Packard	Computers & Semiconductors	http://www.hp.com/
Hitachi	Electronics, Electrical Equipment	http://www.hitachi.com/
Honda Motor	Motor vehicles and Parts	http://www.honda.com
Honeywell	Electronics, Electrical Equipment	http://www.honeywell.com/
Hub Group Inc.	Logistics	www.hubgroup.com
IBM	Computers & Semiconductors	http://www.ibm.com
InSite Logistics	Logistics	www.insitelogistics.com
Integrated Device Technologies	Computers & Semiconductors	http://www.idt.com/
Intel	Electronics, Electrical Equipment	http://www.intel.com
Isuzu Motors	Motor vehicles and Parts	http://www.isuzu.com/
J.B. Hunt Dedicated Contract	Logistics	Services (www.jbhunt.com)
Jacobson Companies	Logistics	www.jacobsonco.com

EXHIBIT 3.5—*Continued*
 POTENTIAL FIRMS FOR THE PENINSULA ALH

Company	Industry	Website
Johnson & Johnson	Medical Products	http://www.jnj.com
Kane Is Able	Logistics	www.kaneisable.com
Kenco Logistic Services	Logistics	www.kencogroup.com
Keystone Dedicated Logistics	Logistics	www.kdlog.com
Kuehne & Nagel	Logistics	www.kn-portal.com
Landstar Logistics	Logistics	www.landstar.com
LG Electronics	Electronics, Electrical Equipment	http://www.lge.co.kr
Liz Claiborne	Fashion Clothing	http://www.lizclairborne.com
Lockheed-Martin	Aerospace	http://www.lockheedmartin.com
LogiMax	Logistics	www.e-logimax.com
Logistics Management Solutions	Logistics	LMS (www.lmslogistics.com)
LSI Logic	Electronics, Electrical Equipment	http://www.lsilogic.com
Lucent Technology	Networks	http://www.lucent.com/
Maersk Logistics Inc.	Logistics	www.maersk-logistics.com
Marubeni	Electronics, Electrical Equipment	http://www.marubeni.co.jp/home/english/
Matsushita Electric Industrial	Electronics, Electrical Equipment	http://www.panasonic.com
Mattel	Toys	http://www.mattel.com/
MCI WorldCom	Telecommunications	http://www.wcom.com/
Menlo Worldwide Logistics	Logistics	www.menlolog.com
Merck	Pharmaceuticals	http://www.merck.com
Meridian IQ	Logistics	www.meridianiq.com
Micron Technologies	Pharmaceuticals	http://www.microntech.com/
Mitsubishi Electronic	Electronics, Electrical Equipment	http://www.mitsubishi.com
Mitsubishi Motors	Motor vehicles and Parts	http://www.mitsubishi-motors.co.jp
Mitsui	Electronics, Electrical Equipment	http://www.mitsui.com
Motorola	Telecommunications	http://www.mot.com
Movado	Watches	http://www.movado.com
nAL	Logistics	www.nalworldwide.com
National Distribution Centers	Logistics	www.ndc-nfi.com
National Semiconductor	Computers & Semiconductors	http://www.national.com
NCR	Electronics, Electrical Equipment	http://www.ncr.com/
NEC	Electronics, Electrical Equipment	http://www.nec.com

EXHIBIT 3.5—*Continued*
 POTENTIAL FIRMS FOR THE PENINSULA ALH

Company	Industry	Website
Nestle	Food Products	http://www.nestle.com/
Network Equipment Technologies	Networks	http://www.net.com
New Breed Inc.	Logistics	www.newbreed.com
Newgistics	Logistics	www.newgistics.com
Nextel	Telecommunications	http://www.nextel.com/
Nike	Apparel & Accessories	http://www.nike.com
Nippon Telegraph & Telephone	Telecommunications	http://www.ntt.com
Nissan Motor	Motor vehicles and Parts	http://www.nissan.com
Nokia	Telecommunications	http://www.nokia.com
Nortel Networks	Networks	http://www.nortel.com
Novartis	Pharmaceuticals	http://www.novartis.com
Novell	Networks	http://www.norvell.com
NT Logistics Inc., Logistics Division	Logistics	www.ntlogistics.com
NYK Logistics	Logistics	www.nyklogistics.com
Odyssey Logistics and Technology	Logistics	www.odysseylogistics.com
OMNI Logistics	Logistics	www.omniez.com
Oracle	Telecommunications	http://www.oracle.com
Ozburn-Hessey Logistics	Logistics	www.ohlogistics.com
P&O Nedlloyd	Logistics	www.ponl.com
Pacer Global Logistics	Logistics	www.pacerglobal.com
Packard Bell NEC	E-Commerce	http://www.packardbell.com
Panalpina	Logistics	www.panalpina.com
Patek Philipe	Watches	Web site is under construction
PBB Global Logistics	Logistics	www.pbb.com
Pegasus Logistics Group	Logistics	www.pegasuslogisticsgroup.com
Penske Logistics	Logistics	www.penskelogistics.com
Pfizer	Pharmaceuticals	http://www.pfizer.com
Plant Site Logistics	Logistics	www.plantsitelogistics.com
Polo Ralph Lauren	Fashion Clothing	http://www.polo.com/
Qualcomm	Telecommunications	http://www.qualcomm.com
R.R. Donnelley Logistics	Logistics	www.rrdonnelly.com
Rambus Inc.	Computers & Semiconductors	http://www.rambus.com

EXHIBIT 3.5—*Continued*
 POTENTIAL FIRMS FOR THE PENINSULA ALH

Company	Industry	Website
Raytheon	Aerospace	http://www.raytheon.com/
RMX Global Logistics	Logistics	www.rmxglobal.com
Robert Bosch	Motor vehicles and Parts	http://www.robertbosch.com/
Roche Holding	Pharmaceuticals	http://www.roche.com/
Rolex	Watches	http://www.rolex.com
Royal Philips Electronics	Electronics, Electrical Equipment	http://www.philips.com
Ruan Transportation Management	Logistics	Systems (www.ruan.com)
Ryder System Inc.	Logistics	www.ryder.com
Saddle Creek Corp.	Logistics	www.saddlecrk.com
Samsung Electronics	Electronics, Electrical Equipment	http://www.samsung.com
Sanyo Electric	Electronics, Electrical Equipment	http://www.sanyo.com
SBC Communications	Telecommunications	http://www.sbc.com
Schenker Inc.	Logistics	www.schenker.com
Schneider Logistics	Logistics	www.schneiderlogistics.com
Seagate Technology	Networks	http://www.seagate.com/
Seiko	Watches	http://www.seiko.com/
Seiko Epson Corp.	Electronics, Electrical Equipment	http://www.epson.co.jp/epson/e/ae/
SEKO Worldwide	Logistics	www.sekoworldwide.com
ServiceCraft Logistics	Logistics	www.servicecraft.com
Sharp	Electronics, Electrical Equipment	http://www.sharp.com
Siemens	Electronics, Electrical Equipment	http://www.siemens.com
Silicon Graphics	Computers & Semiconductors	http://www.sgi.com
Smithkline Beecham	Pharmaceuticals	http://www.sb.com
Sony	Electronics, Electrical Equipment	http://www.sony.com
Standard Corp.	Logistics	www.standardcorp.com
Stonier Transportation Group Inc.	Logistics	www.stonier.com
Sumitomo	Electronics, Electrical Equipment	http://www.sumitomo.com
Sun Microsystems	Networks	http://www.sun.com/
Swift Transportation Co.	Logistics	www.swifttrans.com
Technical Transportation Inc.	Logistics	www.techtrans.com
Tektronix	Electronics, Electrical Equipment	http://www.tek.com
Tellabs Operations	Networks	http://www.tellabs.com

EXHIBIT 3.5—*Continued*
 POTENTIAL FIRMS FOR THE PENINSULA ALH

Company	Industry	Website
Temic Semiconductor	Computers & Semiconductors	http://www.temic-semi.de/nt/corp/
Texas Instruments	Telecommunications	http://www.ti.com
The Bender Group	Logistics	www.bendergroup.com
Tibbett & Britten Group plc	Logistics	www.tbgameamericas.com
Timex	Watches	http://www.timex.com/
TMSi	Logistics	www.tmsilog.com
TNT Logistics North America	Logistics	www.tntlogistics.com
Toshiba	Electronics, Electrical Equipment	http://www.toshiba.com/
Total Logistic Control	Logistics	www.totallogistic.com
Toyota Motor	Motor vehicles and Parts	http://www.toyota.com
Transfreight	Logistics	www.transfreight.com
Transplace	Logistics	www.transplace.com
Transport Logistics Inc.	Logistics	www.translogistics.com
Tranzact Technologies	Logistics	www.tranzact.com
TSI Logistics	Logistics	www.tsilogistics.com
Tucker Company Inc.	Logistics	www.tuckerco.com
Tyco International	Electronics, Electrical Equipment	http://www.tyco.com
Unisys	Networks	http://www.unisys.com/
UPS Supply Chain Solutions	Logistics	www.ups-scs.com
US Worldwide Logistics Inc.	Logistics	www.usworldwidelogistics.com
USCO Logistics	Logistics	www.usco.com
USF Logistics	Logistics	www.usflogistics.com
Volkswagen	Motor vehicles and Parts	http://www.vw.com
Volvo	Motor vehicles and Parts	http://www.volvo.com
Wagner Industries Inc.	Logistics	www.wagnerindustries.com
Walmart Stores Distribution	E-Commerce	http://www.walmart.com
Warner-Lambert	Pharmaceuticals	http://www.warner-lambert.com
Weber Distribution	Logistics	www.weberdistribution
Whirlpool	Electronics, Electrical Equipment	http://www.whirlpool.com/
Xerox	Electronics, Electrical Equipment	http://www.xerox.com
Xilinx	Computers & Semiconductors	http://www.Xilinx.com

EXHIBIT 3.6
PROTOTYPE GLOBAL TRANSPARK NON-GREENFIELD SITE
PRO FORMA FINANCIAL ANALYSIS SCENARIO — 80/20 DEBT/EQUITY

(All Figures in Nominal US\$Millions)

	Under Construction			Ramp-Up			Mature Operations				
	1	2	3	4	5	6	7	8	9	10	11
0 OPERATING DATA											
1 REVENUES											
13 TOTAL REVENUES	\$0.0	\$0.0	\$0.0	\$42.5	\$48.1	\$54.0	\$60.5	\$67.7	\$75.9	\$85.0	\$95.3
14 EXPENDITURES											
15 Capital Outlay											
21 Subtotal Capital Outlay	\$50.0	\$75.0	\$75.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
22 Recurring Costs											
27 Subtotal Recurring Costs	\$0.0	\$0.0	\$0.0	\$12.8	\$14.4	\$16.2	\$18.1	\$20.3	\$22.8	\$25.5	\$28.6
28 TOTAL EXPENDITURES	\$50.0	\$75.0	\$75.0	\$12.8	\$14.4	\$16.2	\$18.1	\$20.3	\$22.8	\$25.5	\$28.6
29 OPERATING STATEMENT											
30 Gross Operating Profit (Loss)	\$0.0	\$0.0	\$0.0	\$29.8	\$33.7	\$37.8	\$42.3	\$47.4	\$53.1	\$59.5	\$66.7
31 Gross Profit Before Taxes	\$0.0	\$0.0	\$0.0	\$25.7	\$24.1	\$23.2	\$29.1	\$35.4	\$42.2	\$49.7	\$57.8
32 Taxes	\$0.0	\$0.0	\$0.0	(\$9.0)	(\$8.4)	(\$8.1)	(\$10.2)	(\$12.4)	(\$14.8)	(\$17.4)	(\$20.2)
33 Net Profit After Taxes	\$0.0	\$0.0	\$0.0	\$16.7	\$15.6	\$15.1	\$18.9	\$23.0	\$27.4	\$32.3	\$37.6
34 CASH POSITION (NOT Incl Bond Proceeds)											
35 Beginning Cash Position	\$0.0	\$10.0	\$15.0	\$15.0	\$44.8	\$78.5	\$116.2	\$158.6	\$206.0	\$259.1	\$318.6
36 Net Change	\$10.0	\$5.0	\$0.0	\$29.8	\$33.7	\$37.8	\$42.3	\$47.4	\$53.1	\$59.5	\$66.7
37 End Cash Position	\$10.0	\$15.0	\$15.0	\$44.8	\$78.5	\$116.2	\$158.6	\$206.0	\$259.1	\$318.6	\$385.3
38 SHAREHOLDERS EQUITY											
39 Initial Capital Contribution	\$10.0	\$15.0	\$15.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
40 Additional Working Capital Contribution	\$10.0	\$5.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
41 TOTAL EQUITY	\$20.0	\$20.0	\$15.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
42 TOTAL INVESTED CAPITAL (Equity & Debt)	\$76.0	\$104.0	\$99.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
43 PERFORMANCE METRICS											
44 Debt Service Coverage	–	–	–	4.5	2.1	1.6	1.9	2.3	2.7	3.3	4
45 AVERAGE Annual ROE Undiscounted	14.9%										
46 Equity Pybk Per (Yrs after Start of Ops)	4.0%										
47 Average Annual ROI (Capital) Undiscounted	5.9%										
48 Cptl Pybk Per (Yrs after Start Ops)	10.0%										
49 Internal Rate of Return (Before Interest)	21.4%										
50 Internal rate of Return (After Interest)	18.8%										

EXHIBIT 3.6—CONTINUED
PROTOTYPE GLOBAL TRANSPARK NON-GREENFIELD SITE
PRO FORMA FINANCIAL ANALYSIS SCENARIO — 80/20 DEBT/EQUITY

(All Figures in Nominal US\$Millions)

	Under Construction			Ramp-Up			Mature Operations				
	1	2	3	4	5	6	7	8	9	10	11
51 DEBT SERVICE (20-Yr Level Amort)											
52 Inflation Rate	100.0%	96.6%	93.4%	90.2%	87.1%	84.2%	81.4%	78.6%	75.9%	73.4%	70.9%
53 Principal	\$0.0	\$0.0	\$0.0	(\$2.5)	(\$6.1)	(\$9.4)	(\$9.1)	(\$8.8)	(\$8.5)	(\$8.2)	(\$7.9)
54 Interest	\$0.0	\$0.0	\$0.0	(\$4.1)	(\$9.6)	(\$14.5)	(\$13.3)	(\$12.1)	(\$10.9)	(\$9.9)	(\$8.9)
55 TOTAL	\$0.0	\$0.0	\$0.0	(\$6.6)	(\$15.7)	(\$24.0)	(\$22.4)	(\$20.9)	(\$19.4)	(\$18.1)	(\$16.8)
56 Debt Schedule Calculations											
57 Bond Size Calculations											
58 Issue Year 1 (8.5%, 3y Capl; 2% COI)	\$56.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
59 Issue Year 2 (8.5%; 3y Capl; 2% COI)	\$0.0	\$84.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
60 Issue Year 3 (8.5%; 3y Capl; 2% COI)	\$0.0	\$0.0	\$84.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
61 Annual Total	\$56.0	\$84.0	\$84.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
62 Cumulative Total	\$56.0	\$140.0	\$224.0	\$224.0	\$224.0	\$224.0	\$224.0	\$224.0	\$224.0	\$224.0	\$224.0
63 Interest Calculation – Principal Basis											
64 Issue Year 1	\$0.0	\$0.0	\$0.0	\$53.2	\$50.4	\$47.6	\$44.8	\$42.0	\$39.2	\$36.4	\$33.6
65 Issue Year 2	\$0.0	\$0.0	\$0.0	\$0.0	\$79.8	\$75.6	\$71.4	\$67.2	\$63.0	\$58.8	\$54.6
66 Issue Year 3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$79.8	\$75.6	\$71.4	\$67.2	\$63.0	\$58.8
67 Annual Total	\$0.0	\$0.0	\$0.0	\$53.2	\$130.2	\$203.0	\$191.8	\$180.6	\$169.4	\$158.2	\$147.0
68 Retirement Schedule											
69 Issue Year 1	\$0.0	\$0.0	\$0.0	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8
70 Issue Year 2	\$0.0	\$0.0	\$0.0	\$0.0	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2
71 Issue Year 3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2
72 TOTAL	\$0.0	\$0.0	\$0.0	\$2.8	\$7.0	\$11.2	\$11.2	\$11.2	\$11.2	\$11.2	\$11.2
73 Debt Outstanding (Year End)	\$56.0	\$140.0	\$224.0	\$221.2	\$214.2	\$203.0	\$191.8	\$180.6	\$169.4	\$158.2	\$147.0

EXHIBIT 3.6—CONTINUED
PROTOTYPE GLOBAL TRANSPARK NON-GREENFIELD SITE
PRO FORMA FINANCIAL ANALYSIS SCENARIO — 80/20 DEBT/EQUITY

(All Figures in Nominal US\$Millions)

	Mature Operation									GRAND
	12	13	14	15	16	17	18	19	20	TOTALS
51 DEBT SERVICE (20-Yr Level Amort)										
52 Inflation Rate	68.5%	66.2%	63.9%	61.8%	59.7%	57.7%	55.7%	53.8%	52.0%	—
53 Principal	(\$7.7)	(\$7.4)	(\$7.2)	(\$6.9)	(\$6.7)	(\$6.5)	(\$6.2)	(\$6.0)	(\$5.8)	(\$121.0)
54 Interest	(\$7.9)	(\$7.0)	(\$6.2)	(\$5.4)	(\$4.6)	(\$3.9)	(\$3.2)	(\$2.6)	(\$2.0)	(\$126.1)
55 TOTAL	(\$15.6)	(\$14.4)	(\$13.3)	(\$12.3)	(\$11.3)	(\$10.4)	(\$9.5)	(\$8.7)	(\$7.9)	(\$247.2)
56 Debt Schedule Calculations										
57 Bond Size Calculations										
58 Issue Year 1 (8.5%, 3y Capl; 2% COI)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$56.0
59 Issue Year 2 (8.5%; 3y Capl; 2% COI)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$84.0
60 Issue Year 3 (8.5%; 3y Capl; 2% COI)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$84.0
61 Annual Total	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$224.0
62 Cumulative Total	\$224.0	\$224.0	\$224.0	\$224.0	\$224.0	\$224.0	\$224.0	\$224.0	\$224.0	—
63 Interest Calculation – Principal Basis										
64 Issue Year 1	\$30.8	\$28.0	\$25.2	\$22.4	\$19.6	\$16.8	\$14.0	\$11.2	\$8.4	\$579.6
65 Issue Year 2	\$50.4	\$46.2	\$42.0	\$37.8	\$33.6	\$29.4	\$25.2	\$21.0	\$16.8	\$856.8
66 Issue Year 3	\$54.6	\$50.4	\$46.2	\$42.0	\$37.8	\$33.6	\$29.4	\$25.2	\$21.0	\$840.0
67 Annual Total	\$135.8	\$124.6	\$113.4	\$102.2	\$91.0	\$79.8	\$68.6	\$57.4	\$46.2	\$2,052.4
68 Retirement Schedule										
69 Issue Year 1	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$47.6
70 Issue Year 2	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$67.2
71 Issue Year 3	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$4.2	\$63.0
72 TOTAL	\$11.2	\$11.2	\$11.2	\$11.2	\$11.2	\$11.2	\$11.2	\$11.2	\$11.2	\$177.8
73 Debt Outstanding (Year End)	\$135.8	\$124.6	\$113.4	\$102.2	\$91.0	\$79.8	\$68.6	\$57.4	\$46.2	\$2,724.4

Source: HLB, Inc. December 1998

Chapter 4

Guidelines and Recommendations for a Peninsula ALH Implementation Plan

I. Introduction

In the previous two chapters, guidelines were provided for ALH infrastructure and facility design and for the development of a Peninsula ALH business plan. Building on these two chapters, this chapter will present guidelines for an ALH implementation plan, including elaboration of infrastructure and marketing phasing, incentives to attract and leverage appropriate air cargo service providers and industry, coordination and harmonization with multimodal logistics hubs elsewhere and alternative institutional mechanisms for financing and managing Peninsula ALH development and operation. I will conclude with 25 recommendations for the Peninsula Airport Commission and other public agencies in the Hampton Roads region.

II. Infrastructure Phasing and Industrial Development Timetable

Whereas the Peninsula ALH is conceived ultimately as a fully integrated multimodal transportation, telecommunications, manufacturing, and logistics support complex, the reality is that it will likely evolve over a 5- to 20-year-period through a series of overlapping development stages. Understanding this is necessary to making prudent investments in infrastructure timed to industry demand. Below I summarize key stages of a phased infrastructure and facilities implementation plan.

Stage I

Stage I will be when the Peninsula Airport Commission and the appropriate government units establish the institutional and legal environment that will affect future ALH development. This includes regulatory and customs issues, land and facility ownership/leasing and concessionary rights as well as exploring a third party developer structure. These issues will be elaborated later in this chapter. During Stage I, which can last up to three years, initial tenants will also be recruited and basic multimodal and aviation-related infrastructure improved, including approval for extension of the at least one of the runways to 11,500 feet. With the ring road planned for future years, extending runway 7R-25L beyond 10,500 ft may not be possible. Runway 2-20 has this potential but initially extending 7R-25L to 10,500 would be a good choice since the approval process is likely to go smoother and 7R-25L fits best with the expansion of AirCommerce Park (Phase II). Runway 2-20 can be extended to 11,500 perhaps in the 10-20 year out timeframe as market demand warrants.

As noted in guidelines for the business plan, the most likely initial tenants will be those that can put their operations on line quickly and relatively inexpensively by utilizing Newport News/Williamsburg International Airport's existing infrastructure and facilities. A modern heavy aircraft maintenance facility should be considered given large projected demands for such facilities on the East Coast. International air express and air cargo carriers should also continue to be recruited since they can be up and running almost immediately. During this first stage, feasibility analysis and master planning should commence for upgraded highway connectors, the ring road, a rail link and intermodal rail yard, inland port, the advanced telecommunications systems required in later stages, as well as the possibility of a spec cargo facility (that can be designated to serve trucks as well as aircraft) and an on-site distance education and training center.

Stage II

Stage II (estimated to be a 2 to 5 year period following Stage I) will involve the commencement and/or expansion of integrated air express and international air cargo service at Newport News/Williamsburg International Airport, a critical step to the development of a successful ALH. Service providers would include air express carriers (e.g., FedEx, UPS, DHL), heavy lift charter cargo carriers (Atlas Air, Polar Air, Cargolux, Evergreen, etc.) along with freight forwarders supporting cargo airlines and shippers. At this stage, the ALH would serve primarily as an air express sort facility, cargo handling and perishables transshipment center, with limited on-site pick and pack consolidation and break-down, kit assembly, and cold storage.

The Peninsula ALH can move beyond a basic passenger and air cargo airport once a number of requisites are implemented during Stage II to attract new businesses and industry. These include expedited customs clearance technology and pre-clearance procedures, in-transit bonded facilities and improved multimodal surface transportation linkages to the site and to the Hampton Roads ports.

One of the critical paths to attracting new manufacturing and distribution tenants to the Peninsula ALH will be by offering tenants and users quicker, cheaper and more efficient customs clearance, including pre-clearance procedures and paperless electronic data interchange (EDI), as well as rapid cargo security clearance. The Peninsula ALH must also provide an expanded commercial environment (Foreign Trade Zone) for export processing without duties and customs clearance requirements. Its enterprise zone should also be complemented by in-transit bonded warehouses and production (assembly) status at or near the ALH.

As noted, multimodal surface connectors are critical to moving the ALH to the manufacturing-assembly stage and should be implemented during Stage

II. These include a new exchange at I-64 and Bland Boulevard and upgraded regional highway and rail links to the ALH and Hampton Roads Port. Containerization should be standardized to allow quick and efficient transfer among modes and handling by automated equipment at the ALH and other intermodal sites.

It is during this stage that the Central Cargo Facility, inland container yard, and intermodal rail/truck facility should also be developed. Other infrastructure to be implemented during Stage II include a cold storage/perishables center and an a state-of-the-art distance education and worker training facility allowing specific skills transfer to firms locating at or near the ALH from virtually any location in the world.

Stage III

During Stage III (at least five years and possibly as much as ten years from project commencement) third party logistics providers (3PLs) will set up operations at the ALH to serve growing cargo movements to and from and through the ALH. Internal roads and utility connections must be developed or extended throughout the ALH (an automated cargo transfer system described in the ultimate ALH development stage will not likely be justified at this stage based on its high cost). A ring road and all surface transportation links should be completed, including those to the port. Rail links will also be extended during this stage and overall Hampton Roads regional highway systems should be improved by this time.

Stage IV

Stage IV (the full-scale ALH) will be reached when sufficient manufacturing and distribution tenants and multimodal transportation and third party logistics providers reach a critical convergent mass so that production and

logistics becomes fully integrated. At this stage, estimated to be in the 10- to 15-year time frame, all the elements of the ultimate ALH will be put in-place, including a fully functioning central cargo facility, intermodal yard and inland container port with truck and rail connections to the Central Cargo Facility providing off-ramp and off-site manufacturers and distributors with air freighter access.

Exhibit 4.1 illustrates the overlapping four-stage phased sequence of infrastructure and industrial development envisioned at the Peninsula ALH. Each of these overlapping stages will be accompanied by cumulatively increasing and more sophisticated industrial, logistics, and cargo activity.

III. Providing Appropriate Investor Incentives

The Peninsula ALH will be designed to attract and grow industry. Therefore, incentives will play an important role. To date, the State of Virginia has provided generous financial incentives through which investors enjoy tax advantages and certain promotional privileges. All states are in the incentive game, so the relative advantage is declining. New incentives to attract and grow industry must be pursued. The ALH can be one of the most powerful incentives. This is because operational incentives will be at least equally important, and in the longer term likely even more significant than tax incentives in attracting goods-processing and distribution industries.

What the ALH is designed to accomplish is to provide Peninsula industrial investors with speed and agility in their supply chain management, unmatched at other locations. Key to this on the international commerce front is customs, as industry group after industry group around the world has argued. Components of products assembled in Virginia are often manufactured in several other countries and imported on a just-in-time basis. Likewise, international orders for these products are also increasingly time-definite

requiring that assembled goods flow out rapidly and efficiently. At many large international airports, massive amounts of freight arrive from abroad, are broken down, sorted, or consolidated, then often again shipped abroad quickly and seamlessly.

According to the US-ASEAN Business Council, “The productivity and profitability of a manufacturing plant depends in large part on cycle time – that is, its ability to process inputs into outputs as quickly as possible. Decreased cycle time leads to lower inventories, with correspondingly lower inventory costs. In order to support world-class manufacturing, customs clearance time must be measured not in weeks, or even days, but in hours. Any customs administration that can provide reliable, timely customs clearance, or immediate release based on pre-clearance, creates an enormous competitive advantage in attracting manufacturing.”

As stage II in the ALH development cycle progresses, expedited, paperless customs procedures must be put in place. The Peninsula ALH must not only have implemented an automated customs environment, but also, as noted previously, have in place a quick and efficient cargo security system.

Apropos the above, it was proposed that the Peninsula Airport Commission should begin actively recruiting international air express and air cargo firms and commence with plans for runway expansion to handle fully-loaded wide-body air freighters.

Along with encouraging open skies agreements for air cargo, two other government incentives should be encouraged to attract international air freight service providers. These are change of gauge rights and co-terminal rights. Unlimited change of gauge rights will permit aircraft of any size to fly into Newport News/Williamsburg International Airport and for cargo to continue its journey on smaller aircraft of the same airline. For maximum effectiveness, there must be no limits on the number of flights, the timing between arrivals and

departures, aircraft gauge, or the cargo carried. Unrestricted change of gauge rights are particularly important to international hub and spoke type operations that the ALH would be eventually suited to serve.

Unlimited co-terminal rights would permit carriers to stop at any point in the U.S. to drop off shipments which originated outside the U.S. or to pick-up shipments for points outside the U.S. In order to maximize payload and in order to effectively operate an international air logistics hub, it is important that foreign carriers be given such rights without restriction. This will ensure the carriers have the flexibility needed to operate out of alternative airports were Newport News/Williamsburg International Airport ever to be closed for weather or other reasons. This is an important incentive, given the time-definite services offered by the integrated air express carriers.

Finally, it is recommended that the Peninsula Airport Commission maintain the incentive of low landing fees for air cargo carriers, topped at \$40. Air freight is a highly cost-competitive industry and such an incentive (at least for a fixed period such as the initial ten years) could be a differentiating inducement for an air express or major air cargo firm to select Newport News/Williamsburg International Airport as a hub. This low landing fee incentive is a wise investment. Once substantial air express service is provided at Newport News/Williamsburg International Airport, it operates as a magnet for time-sensitive industries, as numerous prior experiences have shown. As just one example, FedEx has transformed the once-sleepy Memphis into a center of international business, attracting billions of dollars in investment in manufacturing and distribution facilities in the vicinity of its airport. More than 200 foreign-owned firms from 22 countries employing over 20,000 workers have been drawn to Memphis since the 1980s. Companies such as Nike, Apple Computer, SquareD, Disney Stores, and Starter Corporation, among many others, have similarly established new manufacturing and distribution centers

near Memphis International airport. Nearly all these companies pointed to the FedEx hub as a key attraction.

Similar patterns of industrial attraction hold where other air express and air cargo hubs have formed around the world. The message is clear, landing an international air express service provider is a powerful magnet in its own right that will draw many modern high value industries to the vicinity. Every incentive should be pursued by the Peninsula Airport Commission to attract such a service provider.

V. Coordination and Harmonization with Similar Facilities Elsewhere

If parts, components, and finished goods are to flow rapidly and seamlessly between Newport News/Williamsburg International Airport and other transportation facilities within Hampton Roads and between Newport News/Williamsburg International Airport and facilities abroad it is essential that their information technologies and materials handling systems be harmonized. This requires using standardized EDI messages with compatible or open architecture software systems, as described in the prior chapter.

Containerization, as also noted, must also be standardized across shipping modes so that containers arriving by vessel at Hampton Roads Ports can be transferred efficiently to truck or rail and be moved to the inland container yard at the ALH. Since at a future point, some of these containers may also be air freighted via heavy-lift aircraft from Newport News/Williamsburg International Airport, they must also be made compatible with materials handling equipment for loading on all-cargo aircraft. Multimodal materials handling harmonization will require close coordination between the Peninsula ALH and other modal points.

When purchasing material-handling equipment, and building key infrastructure such as the central cargo facility or the inland port, careful

consultations should be made with major air cargo, sea cargo, and surface cargo handlers throughout the U.S. and, indeed, the world. It would be a terribly expensive mistake not coordinate design of facilities at the Peninsula ALH with the predominant technologies, materials handling equipment and space utilization standards at major ports and airports which will serve as Virginia's trading partners.

In terms of recruiting major air cargo service providers to Newport News/Williamsburg International Airport, it is recommended that the Peninsula Airport Commission work with 3PLs and visit major air cargo hubs at Memphis, Louisville, Ontario California and Cincinnati, to examine state-of-the-art systems being put in operation there. Though Newport News/Williamsburg International Airport will not have the volume and scale of these major air cargo centers, an excellent vision can be obtained of the direction that air cargo handling is taking with a variety of automated and semi-automated cargo operations as well as other processes and procedures being implemented at these airports to speed the flow of goods through the airport.

It should also be noted that air express companies like FedEx have their own facility design firms. Contact should be made with these companies and advice received before any facility development contracts are signed. As a special incentive to a prospective air express or air cargo firm locating at the Peninsula ALH, the Peninsula Airport Commission or other local public agency may wish to offer to build a cargo facility to suit with a long-term lease-back contract. The key point is that the extent to which Newport News/Williamsburg International Airport's cargo processing facilities are designed to be harmonized with potential user facilities elsewhere, the chances of attracting these users are increased substantially.

VI. Institutional and Management Plan for the Peninsula ALH Development and Operation

Considerable thought and work has been done to date on appropriate institutional and management plans for developing and operating a multimodal air logistics hubs. Most pertinent is work done for planning the Global TransPark (GTP) in North Carolina. In this case, it was recommended that a special Authority be established to develop, market, and operate the GTP. For the Peninsula ALH, such an organization might be chaired by a senior executive likely to be recruited from among Peninsula or greater Hampton Roads regional public and private-sector leaders. This organization would be autonomous and have authority to control and coordinate all planning, infrastructure development and facility construction to ensure timely completion of the project.

The advantages of this institutional option (Option 1) include the following:

- A single organization such as an ALH Authority should be better able to coordinate and manage all aspects of the development of the project.
- A single line of authority would perform agency coordination, contact with engineers, designers, construction contractors, construction contractors, tenants, users and suppliers to the Peninsula ALH.
- The development of the project could be constructed in a series of phases which reflect market demands with limited multiple organizational conflicts.
- The organization would closely coordinate with all public agencies on work accomplished to date.

- The creation and hiring of staff and management positions can be flexible according to need, recognizing that some political clout will be necessary to accomplish all Authority objectives.

The disadvantages of this option include the following:

- Adding another layer of government bureaucracy will likely be resisted.
- Special enabling legislation may be required to set up the new organization that could take some time.
- The new organization might be staffed by recruiting qualified personnel away from other agencies; and the stewardship role of the Peninsula Airport Commission would be compromised.
- There is no element of privatization, other than some private-sector representatives so government funds would be utilized for a most development.

Option 2: Private Enterprise Builds, Operates then Transfers the ALH to the Peninsula

A private enterprise could build and temporarily operate the Peninsula ALH for a stipulated concessionary period (say 30 years) then, in accordance with an agreement with appropriate public sector agencies maintain concessions but transfer ownership of the ALH back to these public bodies. This option would eliminate the requirement for the Peninsula Airport Commission to undertake the initial construction with its own or borrowed resources. The Commission would provide an exclusive contract with a private enterprise to design, build and operate the ALH complex for a given period of time.

In this option, the private sector could develop the air logistics hub using private-sector financing with or without government involvement. They would operate the complex, collect income from the operation and pay a limited concession fee to the government for a determined period of time before transferring the ALH back to the Peninsula Airport Commission.

With Option 2, onsite construction would be performed by the private sector and offsite infrastructure (i.e., highways, electricity lines) and utilities (i.e., water lines, telecommunications services) would be provided by the appropriate government agencies. This may require a mandate from the government to related agencies to provide full cooperation to the project.

The advantages of Option 2 include the following:

- The project would be implemented by private enterprise, which may be more efficient, flexible, responsive and productive than government agencies.
- The timing of the development of the project could be accelerated to meet market demand.
- No legislation would be needed and no new organization would have to be established.
- There would be no requirement for local public sector or other government financial resources to the project other than to support the provision of offsite services and external infrastructure.

The disadvantages of Option 2 include the following:

- The private sector could have difficulty securing adequate financing for development and operating cash flow due to the size and complexity of the project.

- The private sector would expect to make an adequate return on its investment prior to the transfer back of the complex, leading to high service fees and long concessionary periods.
- The appropriate government agencies might not be able to provide adequate offsite infrastructure to facilitate the operation of the complex.

Option 3: Public Sector Builds and Transfers to Private Enterprise

This option is a reversal to the previous alternative. The Peninsula Airport Commission would be responsible for the construction of the project and would then transfer it to a private enterprise for operation and maintenance. Government resources finance initial development of the project but would then utilize the market-driven expertise and related financial strength of a private enterprise to market and operate the ALH.

The advantages of Option 3 include the following:

- Public resources can be used to immediately jump-start construction of ALH facilities.
- No special legislation would be needed and no new organizational structure would have to be established.
- The private sector would not be required to secure significant financing for the construction phase of the project.
- The specific expertise of local public agencies such as the Peninsula Airport Commission would be employed in the design and construction phase.
- These agencies would have only limited responsibilities for marketing or operating the ALH.

The disadvantages of Option 3 include the following:

- Extensive up-front public resources would have to be allocated to the project.
- An appropriate public agency beyond the Peninsula Airport Commission might have to be organized and prepared to coordinate and manage the planning, design and construction of the ALH.
- It would be difficult to construct the project as a phased development. There could eventually be conflict between the private developer and the public agency if construction continued after transfer.
- The need for close and significant coordination during the design and build phase between the private developer and public agencies could create delays and added costs, which in turn could create problems during the transfer process.
- The efficiency, flexibility, relative high productivity and responsiveness of the private enterprise are utilized only during the operating phases of the project.

Getting the Peninsula ALH Started

As initial steps the Peninsula Airport Commission should conduct an appropriate feasibility study which would include assessing the merits of contracting with a third party to build and operate the ALH. The Commission would prepare the Terms of Reference and supervise the feasibility study. Assuming the ALH was found feasible and development recommended, the Commission would do the following:

- Prepare and issue Terms of Reference necessary for Peninsula ALH design.

- Draft bid and tender documents for the design.
- Market the procurement opportunities.
- Select the Peninsula ALH design consultant.
- Negotiate and award a contract to the consultant.
- Initiate dialogue and possibly put out to bid for potential private sector developers and operators of the Peninsula ALH.
- Create and approve the arrangements for private sector and Commission participation predicated on the development and management options selected.
- Tender the proposals for Peninsula ALH development and operation.
- Select a successful tenderer.
- Prepare finalist contracts and concessionary arrangements.
- Coordinate closely with all Peninsula area and greater Hampton Roads government and business leaders to insure that all the above are consistent with infrastructure and facility harmonization and with development planning for the Peninsula and the greater Hampton Roads region.

As the primary governing organization, the Peninsula AirCommerce Commission must determine the best public, private or public-private venture structure to build, operate, and manage the Peninsula ALH as well as work to create effective logistical synergies throughout the greater Hampton Roads.

VII. Summary Recommendations and Action Steps

The Virginia Peninsula and greater Hampton Roads region have numerous assets and comparative strengths. These assets, described in Chapter

1, provide a remarkable foundation upon which to build a 21st century economic development catalyst providing businesses operating in the area with the key advantages of speed, agility and connectivity. Below, I present a set of recommendations and action steps for the Peninsula Airport Commission and regional leaders to meet the business challenges of the 21st century and recapture regional competitive advantage.

1. It will be increasingly difficult in the future for the Virginia Peninsula and the greater Hampton Roads region to attract new industry and generate quality job on cost factors and traditional government incentives. Competitive advantage will come through strategic foci on connectivity, speed, and agility. These should become the region's new competitive weapons.
2. Competitive advantage fostering connectivity, speed and agility requires a new economic engine. The engine proposed is an air logistics hub (ALH) at Newport News/Williamsburg International Airport that will cornerstone and help drive a Hampton Roads fast-cycle logistics network. This multimodal logistics hub will integrate air, highway, rail, and sea transportation modes with advanced telecommunications, sophisticated materials handling systems, and state-of-the-art support services to provide tenants and users unmatched capability to respond rapidly and flexibly to changing markets worldwide. Upgraded local highways, additional interstate exchanges, and new and extended rail lines (including those to the Port of Hampton Roads) are required to integrate the ALH with regional business clusters and major national and international transport modes. Similarly, state-of-the-art broadband, fiber optics, and satellite uplinks and downlinks are needed for the region's companies to trace, track, and control product movements, which in the future will increasingly be monitored and managed through RFID (radio

- frequency identification), GPS (Global Positioning System), and intelligent software agents (via computer chips imbedded in products, parcels, and containers).
3. Just as today's most successful business are innovative, flexible, and rapidly responsive, so too must infrastructure and facility planning and design at the Peninsula Air Logistics Hub (ALH). The ALH thus should not be so much a fixed physical plan as it is a flexible framework for accommodating a wide variety of tenants, users, facilities and layouts that can be modified when new technologies, industries, and infrastructure emerge. For example, the Central Cargo Area of the ALH should employ a modular layout for maximum flexibility and phased development. On-site cargo processing facilities should employ flex-tech principles and be reconfigurable to allow for expansion (or even contraction) as demand warrants. Ground transportation systems should incorporate redundant routings to minimize impact of congestion or accidents both within the ALH and connecting transport systems. Peninsula ALH management itself must be agile, prepared to respond rapidly and creatively to evolving tenant and user needs and to coordinate "one-stop-shop" support from a variety of government and institutional sectors.
 4. The ALH's intermodal transportation infrastructure should be designed to allow seamless and flexible flows of materials among convergent transportation modes and AirCommerce Park and other commercial facilities both in the core and peripheral areas of the ALH. A cargo transfer system must be planned linking the multi-use Central Cargo Facility (CCF) to cargo related tenants as well as to an on-site intermodal rail facility at midfield and a much larger intermodal rail facility and inland port off-site. The CCF would provide off-ramp tenants and off-site production facilities, warehouses, and distribution centers with efficient

sorting capability, customs clearance, and air freighter access. At full development, the entire ALH should be served by a ring road encircling it, providing quick access to all parts of the complex to local and regional highway systems and to the intermodal rail facility. Internal roads should likewise be designed connect the Central Cargo Area and ALH commercial tenants and users to the ring road.

5. AirCommerce Park can provide a propitious jumpstart to the Peninsula ALH. The former's proposed three phases of development must be carefully planned and all facility construction on it consistent with the master plan. Success of AirCommerce Park will rest on functions and facilities described in the planning guidelines for the ALH and inconsistent short and long-term uses should be discouraged. While it may seem prudent by some to sue the ramp and land reserved for AirCommerce Park for alternatives to which it was envisioned, such use would damage prospects for successful ALH development.
6. Related to the above, small tenants (1 to 2 acres) should be prevented from locating facilities at AirCommerce Park. This could preclude much larger projects down the road. Likewise, if a small aircraft are left parked on the existing AirCommerce Park ramp (even though it is currently vacant), this could well detract from marketing to future tenants for which AirCommerce Park was designed.
7. Experience of North Carolina's Global TransPark shows that even with little or no air cargo service, cargo facilities can be profitably filled. After appropriate demand analyzed, the Commission may wish to consider constructing a flexible (convertible) cargo facility at AirCommerce Park on spec that would initially serve primarily truck-derived cargo and transfers but could be easily be converted to air cargo once cargo airlines begin to serve NNWIA.

8. There is growing evidence of increased future needs for heavy aircraft maintenance facilities on the east coast. Such facilities create high paying jobs and do not require cargo service to get up and running. Since this type of facility is consistent with ALH design and could be located immediately at AirCommerce Park without substantial additional logistical or infrastructure support, it should be an early industry target.
9. The Peninsula ALH must be planned as much more than a multimodal logistics infrastructure supporting AirCommerce Park. Its full potential and ultimate success rest on creating a total business environment that will substantially improve sourcing, production, and distribution activities of all its tenants and users. This includes ultimately an automated customs environment operating 24/7 with open architecture electronic data interchange (EDI) capability, and an on-site distance education and worker training facility, one-stop-shop investment support, and an enhanced complement of high quality, reliable utilities throughout the ALH.
10. Mechanization of materials handling should be targeted, incremental and implemented only as cargo demand warrants. ALH facility design should assume that in early phases much material handling would continue to be performed with relatively low-tech materials handling equipment (e.g., forklifts, motorized tags, pallet jacks). As cargo demand grows over time, periodic evaluation of costs and benefits of automated equipment and facilities can be conducted and enhancements implemented as cost/benefit analysis justifies. Stated simply, you do not need all the bells and whistles in the earliest ALH phases.
11. Planning for the Peninsula ALH should give high priority to aesthetics and quality of life. Newport News/Williamsburg International Airport must support not only logistics activities but also regional recreation

activities and tourism, along with business travel. To the extent possible, logistics, manufacturing, trucking, and cargo handling should be physically separated from flows of business and leisure travelers. High quality design standards should be maintained at and surrounding the ALH for buildings, landscaping, and site improvement. Entrance ways and signage should be aesthetically pleasing. Since first impressions are often enduring, physical appearance is extremely important. Therefore, to the degree feasible, the ALH and immediate surrounding areas should be designed to look more like a university campus or research park than a traditional industrial or logistics park.

12. Strong efforts must continue to attract additional passenger and air cargo service to NNWIA, including eventually international flights. Airlines must be viewed not just as companies, but more as basic transportation infrastructure, no different from roadways and rail. Airlines, like public infrastructure, are shared by all (business, tourists, etc) providing “highways in the sky” that rapidly connect the region to the world. These highways in the skies are “public good” infrastructures that do not have to be maintained by public money as do roadways and much other public infrastructure. Public support for the Peninsula Airport Commission’s low aeronautical user charges to airlines must be maintained.
13. Likewise, the Peninsula Airport Commission should continue to develop incentives to draw additional low-cost passenger service to the airport. There is little doubt that low-cost carriers will take on much greater shares of the aviation market in the U.S. And, as stated above, air routes are critical components of a region’s transportation infrastructure, serving and benefiting a wide range of businesses and travelers. The Peninsula Airport Commission should partner with regional economic development agencies and with local governments and business groups to generate the

market conditions that would attract additional airline service. For example, elsewhere in the U.S., local businesses and governments have worked together to guarantee a certain number of seat purchases annually on new airline service routes, while airports have reduced (or even eliminated) landing fees for additional route service by existing air service providers and new airlines alike.

14. To compensate for its low aeronautical fees (costs to airlines, including landing fees, gate leases, fuel, aircraft parking, etc.), the Peninsula Airport Commission should explore further non-aeronautical revenue sources. Following *airport city* and *aerotropolis* principles, NNWIA must be thought more in terms of a commercial entity. This would involve developing more revenue generating activities in the terminal ala Pittsburgh, Detroit, Amsterdam Schiphol or London Heathrow, possibly bringing in a private-sector operator such as BAA to promote and manage on-site and airport-linked commercial real estate development, and generating other non-aeronautical revenues. Innovative revenue-generating relationships might also be developed with off-site businesses and industries that would substantially benefit from expedited passenger and air cargo airline service.
15. Strong efforts have been made by the Commission over the years to convince an integrated air express carrier (e.g., FedEx, UPS, DHL) to set up a regional hub or mini-hub at NNWIA. This is wise since air express accounts for 70 percent of U.S. air cargo and such service would provide the region's time-sensitive goods-processing industries with a marked speed advantage. Lacking success here, an alternative strategy recommended would be to get all major air express carriers to provide non-stop service from NNWIA to their primary U.S. hubs for rapid one-stop distribution virtually anywhere in the country and much of the

- world. Non-stop express service should include Memphis (FedEx), Louisville (UPS), Cincinnati (DHL), and Miami (all three integrators) for Latin and South America.
16. Marketing of the Peninsula ALH should emphasize the importance of its logistics-based capabilities in attracting time-sensitive goods-processing businesses. Such businesses will certainly continue to seek traditional investment incentives such as tax relief, investment offsets for land or facilities and workforce training. However, as noted above, as the competitive priorities of connectivity, speed and agile market response grow in importance, the relative power of traditional government incentives will lessen. Increasingly, firm siting decisions will be made at least as much on the basis of logistical capabilities of the site and access to global networks as on traditional government incentives. Such logistics-based marketing must be based in realities of the Peninsula ALH, though, and phased, predicated on its stage of logistics capabilities. In each phase, the marketing effort should be designed to attract a targeted segment of ALH tenants and users based on capabilities offered at the phase which, in turn, would serve as a catalyst to attract additional complementary firms to the complex.
 17. Attracting time-sensitive manufacturing and distribution industries will also require a thorough understanding of modern supply chain management principles and the fast-cycle logistics. To offer a truly marketable competitive advantage, the Peninsula Airport Commission, with the assistance of regional economic development agencies, should bring together experts in logistics and supply chain management, multimodal infrastructure development and information technology to help design specifications that would properly integrate and leverage all ALH elements for fast-cycle logistics. Few locations in the U.S. are doing

this, so the Peninsula ALH can have a first-mover advantage in attracting high tech and other time-critical industries if it takes the lead in seizing this opportunity.

18. The Peninsula Airport Commission should establish a close working relationship with major corporate relocation and site selection consultants, making them aware of the Peninsula ALH's and region's assets and regularly updating them on development progress. In most cases, large companies looking to expand or relocate rely on site selection specialists to provide them with a short-list of potential locations to choose from, along with their strengths and weaknesses. Likewise, major commercial real estate firms such as Colliers International, CB Richard Ellis, Hines, and Jones, Lang, Lasalle and REIT's such as Prologis and AMB properties often work closely with corporations in their site selection and eventual commercial development. By taking an indirect marketing approach via major site selection consulting firms and large corporate commercial real estate firms, a far broader range of likely potential tenants can be reached.
19. It is recommended that a good part of the initial marketing focus on attracting "big name" or "trophy" logistics service provider as Peninsula ALH tenants. Once a couple of these are landed, it sends out a market signal to other 3PLs and freight forwarders that the ALH is a choice location. Since smaller fish tend to like big fish as neighbors, landing a big fish will be a significant long-term marketing advantage for the ALH in its own right.
20. Because entry appearance, project architecture and other symbols also send an important message, all Peninsula ALH gateway entrances should receive special emphasis in design and image appearance. These entries must set the tone for the development within which the ALH's identity will be reinforced through distinctive building architecture, signage,

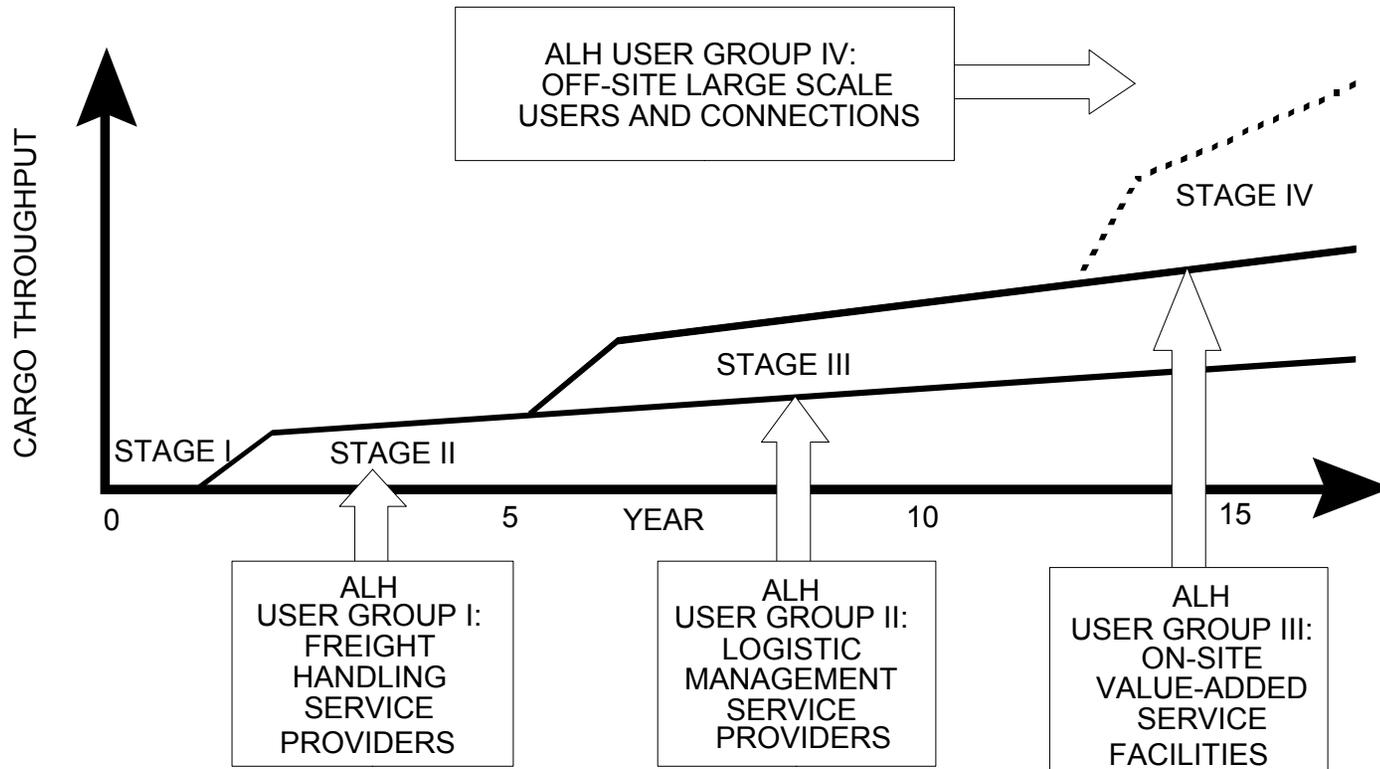
landscaping, and roadway configuration. New electronic art technologies with laser lighting designs might be used to project the airport's and region's image in a futuristic, but non-gaudy manner. Design standards need to be incorporated into surrounding local communities' plans as well as the ALH's site design standards. This "image-making" or branding is a pivotal marketing strategy.

21. There are lessons to be learned by the Peninsula Airport Commission from commercial development approaches around airports in Europe. For example, recognition by local jurisdictions in the Netherlands that Amsterdam Schiphol Airport was at the center of an expanding territorial complex of airport-linked industrial and commercial development led to the establishment of a public-private partnership to oversee the development of available sites near the airport. This organization—the Schiphol Area Development Corporation (SADC)—directly manages some of these projects while coordinating all of them. It operates like a quasi-development authority for the broader Schiphol airport city. It is recommended that the Peninsula Airport Commission and other local economic development agencies take a look at this model.
22. Whereas creating such an inter-jurisdictional authority may not be well received in an area already served by a number of regional development groups, it is recommended that a non-bureaucratic alternative be implemented to improve chances of coordinated efforts. One would be to institute periodic working sessions with local jurisdictional officials and planners in the Peninsula area to inform them better about the nature of airport-linked development and explore how their specific jurisdiction might complement and leverage this new form of development. A larger picture view of the Peninsula Air Logistics Hub and their community's role in its evolution could reduce local jurisdictional competition for

- entering businesses, encourage more effective and mutually beneficial place marketing and branding for business recruitment, lead to more coordinated actions to address airport-induced problems, and realize more beneficial development outcomes.
23. It is recommended that longer-range planning emphasize eventual but smooth transition of existing inconsistent buildings and land use around and near Newport News/Williamsburg international Airport to functions and land uses that better leverage overall ALH productivity and sustainable development. Where feasible, explicit regulations and/or incentives should be implemented to speed this transition process.
24. As to the construction and management of the Peninsula ALH, serious consideration should be given to bringing in an outside firm with successful experience in airport-linked logistics development and operation. Such companies have market contacts that can be leveraged for additional tenant recruitment.
25. A number of airports are beginning to utilize local photos, local architectural and design enhancements, and electronic art to provide arriving international passengers with a positive introduction to the history, culture, and assets of its surrounding region. As noted above, passing through the airport is often the first impression that foreign tourists, business people, and other visitors have of a region. It could pay off handsomely for local economic development agencies to work closely with the Peninsula Airport Commission to provide such thematic branding to new arrivals and improve overall airport aesthetics.
26. The Peninsula Airport Commission may wish to take a bold step by immediately “branding” the Peninsula ALH. To some extent, the media is the message. Such branding could be instrumental in creating “buzz” in marketing to potential outside investors, developers, tenants, and users. It

will also provide an excellent framework for local organizations to promote the Virginia Peninsula and its competitive development future.

EXHIBIT 4.1
PHASED DEVELOPMENT AT PENINSULA ALH
ALH USER FUNCTIONS EVOLVE WITH ALH DEVELOPMENT STATGES



STAGE I - Government provides open skies for air cargo at NNWIA, change in gauge rights and revises customs procedures.
 STAGE II - Air cargo carriers and airfreight services providers are attracted to ALH & expand.
 STAGE III - ALH service providers evolve into total logistics management.
 STAGE IV - Full ALH industrial complex in operation.