APPENDIX F
NON-AVIATION DEVELOPMENT

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STRATEGY 5

Technical Memorandum #1: Site Analysis

Section 1: Introduction and Methodology

This Technical Memorandum is associated with: Task 1 – Preliminary Research; and, Task 2 – Site Analysis; of the Strategy 5 scope of work as contained in the RS&H master contract. It conveys observations pertaining to the general land use, road and street framework, and development character of the area surrounding the airport that can be directly accessed by vehicle. The purpose of this discussion is to provide a physical context for further analysis associated with market support, development opportunities on airport property and nearby land, and assimilation into the team's landside analysis and subsequent recommendations for the Master Plan update. The observations were made during a windshield survey of the area surrounding the airport made by Strategy 5 during the planning kick-off activities, and subsequent map and data review.

Section 2: Reader Orientation / Site Analysis

The discussion that follows is ordered according to a rough circle of highways, roads, and streets that frame the airport at its center. The southern, western, northern, and eastern quadrants are cited as organizing elements for the discussion. The discussion begins with a general orientation as to the location of the airport in the greater Newport News metro-plex, and then focuses at the southern quadrant of the circle (about 12:40 on a clock). It then proceeds clockwise to the west, north, and finally to the east. We have used key identifiers to further place the discussion into context such as street names, commercial centers, residential developments, etc. Please also refer to the map included at the end of this report.

2.1 General Location / Market Orientation

The Newport News / Williamsburg International Airport is located in the northeast portion of the City of Newport News, with Williamsburg and Yorktown further to the north, Hampton to the southeast, the James River to the west of the City, and York County, and the Chesapeake Bay bordering Langley Air Force Base to the east. The City of Norfolk is located to the south. Together these municipalities define an urban center punctuated with military and government installations, industrial centers including shipbuilding and dry dock centers, and substantial residential clusters that all in turn support a significant amount of retail and associated commercial development.

2.2. Southern Quadrant (Interstate 64 / Jefferson Ave. Interchange)

The southern quadrant is important to the contextual discussion as the southwest corner of the airport literally touches, and is otherwise part of, this area. Access to the Aviation Research Park is from this area, and some undeveloped airport property exists near, and

is otherwise oriented toward, this quadrant. The main entrance to the airport is within this quadrant (Bland Boulevard off of Jefferson Avenue) and there are other connective elements that may be important to further market evaluation.

The southern quadrant of the land area surrounding the airport is defined by the cloverleaf interchange of I-64, which is a major north-south transportation corridor, and Jefferson Avenue, which is a primary surface arterial connecting the Hampton peninsula and runs north, northwest from its beginning near Newport News Point that juts into the James River to the south. Jefferson Avenue is also identified as State Route 143.

By virtue of the intersection of these two major transportation routes (I-64 and Jefferson Avenue) the southern quadrant has naturally spawned relatively dense commercial development that includes the Patrick Henry Mall, the Yoder Farms Shopping Center, hotels, chain restaurants, gas stations and convenience stores, and other typical business found at such "gateway" locations. Development in this area has also be induced through it's inclusion in a Virginia Enterprise Zone that affords a range of tax incentives and other benefits to spur investment. Virginia Enterprise Zones and their relationship to market support and potential development opportunities associated with the airport will be further discussed in a subsequent Technical Memorandum.

The southern quadrant, by some extension southward along Jefferson Avenue, could also be considered to include the area known as Oyster Point of Newport News, which is also within a Virginia Enterprise Zone. This district hosts an additional concentration of retail and commercial businesses such as City Center at Oyster Point, but importantly also contains government, academic, and other institutions that need to be evaluated in terms of their relationship (or potential relationship) to the airport and/or development opportunities associated with master plan recommendations. These institutions and facilities include, but are not limited to:

- College of William and Mary Peninsula Center
- The Thomas Jefferson National Accelerator Facility
- The associated CEBAF Center
- Strayer University
- The Enterprise Center
- The EPI College of Technology

This area also hosts light industrial centers such as Ivan's Industrial Park and Port Warwick. Collectively, this mix of institutional, research and commercial facilities constitute a potential demand source for new landside development opportunities at the airport.

2.3 Western Quadrant (Denbigh Boulevard / Jefferson Ave nexus)

The western quadrant of land area bordering the airport is defined by a cluster of light industrial, commercial, healthcare, and other businesses; with a combination of multi-family, single-family, and mobile home residential development encircling it. This area is

best known anecdotally for the Patrick Henry Commerce Center which is located at the center of a Virginia Enterprise Zone that in turn borders the western boundary of the airport.

This quadrant (and the Virginia Enterprise Zone) also contains the mobile home park accessed directly from Bland Boulevard (the airport's main entryway) that is understood to be on airport-owned land. The mobile home park is bisected by Peebles Dr. and crisscrossed by small surface streets such as Westwind Dr., Electra Dr., Viscount Dr. Citation Dr., and Gulfstream Dr. These streets all dead end to the east at the border of the airport facility proper including the main terminal, general aviation sector, Hampton University facility, etc.

The western quadrant also includes the Mary Immaculate Hospital, Denbigh Crossing Shopping Center, the Department of Motor Vehicles, and a supply of remote surface parking that serves the airport. The overall development character is mixed, as suggested by the inventory of commercial and residential components listed above. The building character is also mixed, but is generally of low height (possibly due to restrictions associated with the airport), and value-engineered construction (steel buildings, cement block etc.).

Importantly, this quadrant is heavily influenced by (and influences) many of the airport's landside facilities including access (ingress and egress) parking, terminal circulation, traffic, etc. It is anticipated that this quadrant will be the subject of several of the team's tasks and subtasks associated with these elements. In addition it is likely that potential development opportunity sites for consideration in the master plan will emerge from this quadrant.

2.4 Northern Quadrant (Denbigh Blvd. / Washington Memorial Hwy. / Oriana Rd.)

The northern quadrant of land bordering the airport is bounded by an arc of heavily traveled roads: Denbigh Blvd (Rt. 173) and Washington Memorial Blvd. (RT. 17); bisected by a "rural" highway – Oriana Rd. Together this arc encompasses the Newport News Park, Harwoods Mill Reservoir, undeveloped tracts of York County land, and airside infrastructure. These routes, as they pass through the park, are characterized by heavily treed natural landscapes, access to bike and hiking trails, etc. The Rt. 17 corridor (running north / south) is defined by a mix of aging strip centers, gas stations and C-stores, aging motels, fast food restaurants, etc. punctuated by popular local institutions such as bar-b-que restaurants, sporting goods stores, etc.

The importance of the northern quadrant to the airport and associated master plan update lies in the physical interface of active airport operations (runways) that extend northeastward into the area, penetrating York County land, Newport News Park land, and even extending to the shoreline of the Harwoods Mill Reservoir. The importance of this quadrant in terms of potential development opportunity sites, airside facilities development, and the interface with the surrounding neighborhoods and communities is further evaluated in Technical Memoranda #4 – Conceptual Development Program.

2.5 Eastern Quadrant (Washington Memorial Highway / Victory Boulevard / I-64 – Oyster Point Road)

The eastern quadrant of land area surrounding the airport is defined primarily by Washington Memorial Highway - Rt. 17 – which acts as a dividing line between largely commercially undeveloped land (the Newport News Park, Airport airside facilities, etc) to the west, and large tracts of primarily single-family residential development to the east; the latter reaching toward the Poquoson River and other estuaries of the Chesapeake Bay.

The southern portion of the eastern quadrant hosts an upscale residential development called Villages of Kiln Creek. This project is important to the airport master planning process as it abuts airside operations, the Aviation Research Park, access roads to the Park, and, potentially, development opportunity sites for the airport to consider.

The development also hosts the Kiln Creek Corporate Center, retail and business centers, and other locally serving retail service businesses. It is also bordered by I-64, Victory Blvd, and Rt. 17, all important transportation links that carry heavy volumes of traffic, including vehicles and passengers destine to or from the airport.

Section 3: Summary Conclusions

The Newport News / Williamsburg International Airport is located within a geographical market sphere that includes a wide variety of land uses and development types ranging from dense retail/commercial centers to natural preserves, mobile home parks to upscale single-family home residential neighborhoods, industrial business parks to hospitals, institutions of higher learning and high-tech research centers to aging strip centers. This amalgam suggests both opportunities and constraints for development projects located landside on airport property.

At this writing a definitive inventory of land/property, owned by the airport that could potentially be developed or re-developed has not yet been compiled. However, existing land uses, development character, etc. as summarized in this Technical Memorandum, suggest to the consultant that further market analysis might focus on potentials represented by academic/research institutions (particularly those located in the southern quadrant and airside); and, business/commercial projects potentially including light industrial development. These general market/economic sectors could of course have aviation, avionics, aerospace, aviation support/supply, distribution, or other related disciplines as a natural focus.

The Newport News / Williamsburg International Airport has the locational advantage of nearby access to a major interstate highway (I-64) and also operates at the nexus of heavily traveled state routes including Rt. 17, Rt. 171, Rt. 173, and Rt. 143 (Jefferson Ave.) While surrounding development and preserved park areas represent a substantial "hard edge" constraining future development by the airport, pockets of undeveloped land

on or near the airport may represent key opportunities for new projects that can benefit *from* the existing environment, and conversely contribute *to* the airport and surrounding environment through economic and fiscal benefits that may accrue from development and subsequent business operations and associated activity.

Technical Memorandum #2: Market Scan

Section 1: Introduction and Methodology

This Technical Memorandum conveys observations, findings and recommendations pertaining to market potential for development that may be pursued landside at the Newport News / Williamsburg International Airport. These development opportunities will be considered for assimilation into the Master Plan Update being prepared by the RS&H team, and subject to further refinement and contextual analysis as the planning process continues, financial feasibility thresholds are considered, land availability and land use criteria applied, etc.

The market analysis summarized herein employs both a "top down" approach that evaluates potentials associated with demographic and economic basis and trends; and, a "bottom up" approach that gives greater weight to location, real estate characteristics, orientation to other existing or planned development in proximity to the airport, changes to the market environment that may result from the master plan update, resulting airport policy decisions, etc. One of the foundation elements for the "bottom up" approach was completed by Strategy 5 and submitted as Technical Memorandum #1 – Newport News / Williamsburg International Airport Site Analysis.

Data used in this Technical Memorandum was collected from a variety of primary and secondary sources, including public information available on websites and other on-line sources, direct discussions with stakeholders and officials with various academic institutions, organizations and businesses, newspaper and magazine articles, U.S. Census Bureau, Virginia Peninsula Chamber of Commerce, Hampton Roads Economic Development Corporation, York County Department of Economic Development, City of Hampton Department of Economic Development, Gloucester County Department of Economic Development, City of Williamsburg Department of Economic Development, etc.

Section 2: Market Overview

2.1. Demographic and Economic Basis and Trends

The defense sector has comprised the economic base of Newport News for decades, with the Northrop Grumman (Newport News Ship Building) the largest employer with over 18,000 workers. In addition to ship building, this sector includes military bases, and related support industries that together account for about 33% of all employment in the City and about 25% of the employment in the Norfolk - Virginia Beach - Newport News Metropolitan Statistical Area (MSA).

The technology sector is one of the fastest growing sectors of the Newport News economic base. Technology oriented firms are attracted to the City by its skilled labor force, relatively low cost of doing business, and quality of life amenities. The NASA Langley Research Center and the Thomas Jefferson National Accelerator Facility are high-tech anchors that have added to the attraction for firms such as Cannon, Continental AG, Triumph Aerospace Systems, Alion Science and Technology, and C2 Technologies produce electronic components, precision instruments and machinery, nuclear components, testing equipment, computer systems and software, etc.

Other elements of Newport News' economic base include port activities and distribution, food (primarily seafood) and materials (glass, plastic, rubber) processing, printing. Newport News has the largest share of retail sales in the MSA (approximately $2 billion in sales annually) and of course the Newport News / Williamsburg International Airport is a key economic driver for the City and the region, contributing to support for the hospitality and lodging sector, tourism, and related visitor and business traveler infrastructure.

Employment growth has averaged about 1% annually for the last decade, while population growth has averaged about .5% over the last 20 years. The population of the MSA is projected to be approximately 2.5 million by 2020.

2.2. Potential influence/opportunities associated with the: Economic Gardening"; "Knowledge Economy"; and, "Creative Class" economic development principles.

The Newport News / Williamsburg International Airport is, by virtue of its location amidst a host of university, college, government, research and high-technology facilities; and, it role as a crossroads for application of aeronautical, aerospace, transportation, computer and information technologies, a potential benefactor/cultivator of certain economic development theories and approaches as summarized below.

This introduction to these theories is brief, but intended to provide context for the discussion that follows pertaining to the institutions, agencies, programs, etc. that may represent significant opportunities for partnerships and development opportunities that the airport may choose to pursue landside as part of the Master Plan update.

2.3 Economic Gardening

Economic Gardening is an alternative to traditional economic development strategies, in that it focuses on entrepreneurial alternatives and "growing from within" opportunities. This approach is closely linked to economic development philosophies associated with the "Knowledge Economy" and the "Creative Class" which are summarized in the discussion below. Economic Gardening and these related approaches to economic development are, in turn, related to the interaction between institutions of higher learning (universities, colleges, research facilities, etc.) and the entrepreneurial / business environment. This linkage has potentially important implications for development of landside property at the Newport News / Williamsburg International Airport. The

Economic Gardening approach was created (and the term coined) in Littleton, Colorado in 1987 in response to massive corporate layoffs, and uses high-end corporate level tools and cutting edge scientific concepts to help entrepreneurial growth companies identify markets, monitor competitors, track industry trends, locate customer clusters on maps, and use search engine optimization (SEO), social media, etc. for marketing and specialized research. The model has been picked up by an increasing number of communities including several in Wyoming, Oregon and Florida. The concept is gaining acceptance and momentum in Virginia and the Mid-Atlantic region as well. The Research Triangle in North Carolina (Raleigh, Durham and Chapel Hill) is a well documented example of how this principle is manifested.

The link between Economic Gardening and the Newport News / Williamsburg International Airport Master Plan update is associated with providing landside development opportunity sites to the institutions and organizations summarized in the following section. This based on the fact that there are entrepreneurial, research and technology companies emanating from these sources, and the airport area may provide an especially ambient environment for companies pursuing aerospace, aeronautic, or related business enterprises.

2.4 The Knowledge Economy

The Knowledge Economy is a term that refers either to an "economy of knowledge" focused on the production and management of knowledge in the framework of economic constraints (e.g. land availability, workforce availability, financing availability, etc.) or to a "knowledge-based economy" which refers to the use of knowledge technologies to produce economic benefits including capital investment, job creation, etc. The phrase was coined by economist Peter Drucker in his book *The Age of Discontinuity* and also to economist Fritz Machlup. According to these economists' theories, the essential difference is that a *knowledge economy* is a product, while a *knowledge-based economy* is a tool. Both theories/approaches are highly interdisciplinary and involve economists, computer scientists, engineers, mathematicians, chemists and physicists, and others. Another definition of this economic theory is: It is a concept that supports creation of knowledge by organizational employees and helps and encourages them to transfer and better utilize their knowledge that is in line with company/organizational goals.

The link to the Newport News / Williamsburg International Airport development opportunity potential is that Newport News and the surrounding area is an incubator of the Knowledge Economy, and it may manifest itself in projects, programs and partnerships with the Airport, if the facility and its' management chooses to cultivate these relationships. As with Economic Gardening, the Knowledge Economy is being fostered within the institutions, companies and organizations summarized in the following section. It is a product (Knowledge Economy) and a tool (Knowledge-Based Economy) that the Airport can exploit to its advantage if its landside development policies are crafted accordingly.

2.5 The Creative Class

The Creative Class is a socioeconomic class that economist Richard Florida identified as a key driving force for economic development of post-industrial cities in the U.S. In various books Florida describes the Creative Class as comprising 30% of the U.S. workforce – more than 40 million people – and separates the class into two broad sections: A Super-Creative Core that includes a wide variety of occupations and fields such as science, engineering, computer programming, research and education. According to Florida their primary job function is to innovate, create commercial and consumer goods, to problem solve, and to identify problems. The other class are Creative Professionals. These professionals are workers that include healthcare, business, finance, the legal sector, etc.

While Florida concluded that the Creative Class will be the leading force in growth of the economy, and is expected to grow by over 10 million jobs in the next decade, his theories have sparked much debate and discussion. Still, the general concept or philosophy has context for the Newport News / Williamsburg International Airport in that skilled knowledge-based workers (note overlap in economic philosophies) represent a resource that can lead to synergistic development opportunities on airport land, or nearby, that can enhance the financial / economic base for the facility. Again, it is the strong mix of academic, research, and government institutions and organizations summarized in the following section that provide the real-time foundation for these assertions.

The link with the Airport Master Plan update is the market potential and role in the global economy played by the Creative Class and related socioeconomic dynamics that represent demand sources for building opportunities, partnerships, and other opportunities that can be pursued over time should policy decisions by the Airport be directed accordingly.

Section 3: Economic Drivers

3.1 Introduction

In this section some of the key academic, research, government, and other institutions that provide the foundations for assertions made in the previous sections as to the market potential represented by Economic Gardening, the Knowledge Economy and the Creative Class are summarized. This is not a comprehensive inventory of "feeder" institutions, but rather indicative of the rich mix of largely technology-based universities (or their specific programs/disciplines as noted), facilities, etc. that represent potential development partners for the Newport News / Williamsburg International Airport.

3.2 The Thomas Jefferson National Accelerator Facility

The Thomas Jefferson National Accelerator Facility (Jefferson Lab) is located in the southern quadrant of the proximal area surrounding the Newport News / Williamsburg International Airport (see Technical Memorandum 1). The Lab's mission is "to provide

forefront scientific facilities, opportunities, and leadership essential for discovering the fundamental nature of nuclear matter; to partner with industry to apply its advanced technology, and to serve the nation and its communities through education and public outreach, all with uncompromising excellence in environment, health and safety."

The Jefferson Lab is funded by the U.S. Department of Energy's Office of Science with strong support from the City of Newport News and the Commonwealth of Virginia. As a user facility for scientists worldwide, its primary mission is to conduct basic research of the atom's nucleus at the quark level.

With industry and university partners, Jefferson Lab also has a derivative mission: applied research for using the Free-Electron Lasers based on technology developed at the lab to conduct physics experiments. Additionally, as a center for both basic and applied research, Jefferson Lab reaches out to help educate the next generation in science and technology.

Jefferson Lab is managed and operated for the DOE by the Jefferson Science Associates, LLC. JSA is a limited liability corporation created by Southeastern Universities Research Association and Computer Sciences Corp. specifically to manage and operate Jefferson Lab. The link to the Newport News / Williamsburg International Airport is for potential spinoff ventures that may be attracted to locate on or near airport property, programmatic / research connections that could be cultivated, and basic accommodation of the Jefferson Lab expansion requirements as may be encountered in the future (i.e. office space, sub-labs, etc.)

3.3 College of William and Mary Peninsula Campus

The College of William and Mary maintains its Mason School of Business at the Peninsula Center campus located near the Newport News Airport (see Technical Memorandum 1 – Southern Quadrant). The Mason School of Business offers several MBA programs, and is linked to the Office of Strategic Initiatives, which in turn fosters economic development, entrepreneurial development, and welcomes "revolutionaries." The "Revolutionaries Welcome" program looks for the following elements according to the school (paraphrased):

- Energetic thinkers who have yet to establish their power and authority
- Raw material in the form of open minds
- Desire for the school to become the beta site for young mind development
- To effectively educate and nurture the next generation of business leaders
- To seamlessly meld theory with practice and experience
- Innovate business education through the use of technology, interactions and synergies

The College of William and Mary and the Mason School of business are part of the Virginia Space Grant Consortium which provides Undergraduate Research Scholarships to conduct research in science, technology, engineering and math (STEM) that supports

NASA's mission and the aerospace industry. In addition to the College of William and Mary, the consortium includes the following Member Institutions:

- Hampton University
- Old Dominion University
- University of Virginia
- Virginia Polytechnic University
- Mathematics and Science Center
- Science Museum of Virginia
- Virginia Air and Space Center
- NASA Langley Research Center
- NASA Goddard Space Flight Center – Wallops Island Flight Facility
- State Council of Higher Education for Virginia
- Virginia Community College System
- Virginia Department of Education
- Virginia's Center for Innovative Technology

The link to the Newport News / Williamsburg International Airport is associated with the plethora of interconnecting academic, technology, and other programs and institutions as reflected above – particularly those connected to the aerospace, aeronautics, and flight facilities as noted. There are funding streams and other economic development opportunities embedded in this mix which the Airport and the Master Plan update could choose to cultivate and incorporate into policy and implementation decisions associated with landside development opportunities.

3.4 National Institute of Aerospace

The NIA, with headquarters in nearby Hampton, Virginia is a non-profit research and graduate education institute created to conduct leading-edge aerospace and atmospheric research, develop new technologies for the nation and help inspire the next generation of scientists and engineers. NIA was formed by a consortium of leading research universities including:

- Georgia Tech,
- Hampton University,
- North Carolina State University,
- University of Maryland, t
- University of Virginia,
- Old Dominion University,
- College of William and Mary and the
- The AIAA Foundation (American Institute of Aeronautics and Astronautics)

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NIA serves as a strategic partner with the NASA Langley Research Center and the aerospace community to enable research creativity and expand technology development opportunities. The Institute integrates research and graduate education while creating new government/academia/industry partnerships to solve tomorrow's problems today.

The stated purpose of NIA is to:

- Foster research collaboration among national laboratories, academia and industrial partners to stimulate innovation and creativity
- Provide comprehensive graduate and continuing education in science and engineering via local campus presence and distance learning technologies
- Incubate and stimulate the commercialization of new intellectual property developed through the NIA's research activities
- Promote aerospace science and engineering and provide outreach to the region and nation

The link to the Newport News / Williamsburg International airport is clearly in the crossover between academic institutions, their core areas of study related to aeronautics and aerospace, and the mission/mandate of the NIA to further research and development in this area.

3.5 Hampton University

Hampton University has a physical and programmatic relationship with the Newport News / Williamsburg International Airport in that it maintains a presence in the former main terminal, and offers academic and training programs associated with aeronautics and flight.

According to their official statement: "Hampton University is a comprehensive institution of higher education dedicated to the promotion of learning, building of character and preparation of promising students for positions of leadership and service. Its curriculum emphasis is scientific and professional with strong liberal arts foundation. In carrying out its mission, the University requires that everything it does be of the highest quality."

"The University serves students from diverse national, cultural and economic backgrounds. From its beginnings to the present, the institution has enrolled students from the five continents; North America, South America, Africa, Asia and Europe. In achieving its mission, Hampton University offers exemplary programs and opportunities which enable students, faculty and staff to grow, develop and contribute to our society in a productive and useful manner."

The linkage between Hampton University and the Newport News / Williamsburg International Airport is already established. New and different opportunities for further collaboration may be pursued in the context of the Master Plan update.

3.6 Averett University

Averett University is a private college located in Danville, Virginia that was established in 1859. It offers associate and bachelor's degree programs in approximately 30 majors; and two master's degree programs: Master of Education and Master of Business. The institution maintains the Averett University Flight Center at the Danville Regional Airport. Averett's aeronautics department offers a degree in Aerospace Management with concentrations in:

- Flight Operations
- Aviation Business
- Aviation Maintenance Operations

Averett offers training to students to earn their FAA certificates and ratings in:

- Private
- Instrument
- Commercial
- Flight Instructor
- Multi-Engine
- Instrument Instructor
- Multi-engine Instructor

Graduates of Averett's aeronautics programs find success as pilots, airport administrators, flight instructors and in a range of aviation-related careers. The University leads the state in the development of NASA's Small Aircraft Transportation System (SATS). When fully developed, SATS is projected to revolutionize air travel by linking small, fast aircraft with traffic control technology to provide on-demand transportation.

The link to the Newport News / Williamsburg International Airport is representative of the relationships that can be developed between airports and academic institutions. The opportunity may exist for the Newport News / Williamsburg International Airport to become a "sister" facility for programs and students at Averett.

3.7 Christopher Newport University

Christopher Newport University (CNU) is a young institution located on a 260-acre campus in Newport News. It has earned a spot on U.S. News and World Report's American Best Colleges guide as one of the top ten "up and coming" liberal arts schools. Academic programs at CNU encompass more than 80 areas of study. There has been more than $500 million invested in new buildings and facilities on campus since 1992, and a similar amount is projected to be invested over the next 10 years.

Importantly, CNU maintains a close working relationship with NASA, Langley Air Force Base, and the Jefferson Lab for internships and other programmatic interchange.

The link to the Newport News / Williamsburg International Airport could be in accommodating university growth in an "airport campus" building, programmatic connections, or other opportunities.

3.8 Newport News Public Schools – Aviation Magnet Schools

The Newport News Public School system operates a number of magnet schools, including the Aviation Academy which maintains an "airport campus" in the old terminal at the Newport News / Williamsburg International Airport. The Aviation Academy is a specialized four year program designed to prepare highly motivated and successful high school students for a rewarding and well paying career in engineering technology with an emphasis on aviation and computers.

The Aviation Magnet Program is distinguished by the following characteristics:

- An "airport campus" where students take three to six classes at the NN/W airport. All other classes are conducted at the Denbigh High School
- A "Freshman Aviation Team" that focuses on synergistic academic disciplines
- Aviation classes that begin in the 10th grade with primarily pre-engineering subjects including physics, electricity, materials, fluids, pneumatics, and aircraft design
- An FAA Pilot Ground School course that will prepare students for flying lessons and private pilot licensure
- CISCO networking
- College dual enrollment opportunities

While the students enrolled in the Aviation Magnet Program are not immediate candidates for development or tenancy of landside projects, the link with the Newport News / Williamsburg International Airport is in the future potential that these individuals represent.

3.9 Strayer University – Newport News Campus

Strayer University's Newport News Campus (SUNN) is located in the Technology Center on Diligence Dr. just a few miles from the Newport News / Williamsburg International Airport (See Technical Memorandum 1 – Southern Quadrant). Undergraduate and graduate degree programs in high-demand fields are offered such as: accounting, business, education, health service administration, information systems, etc. are offered to adults at this campus.

Strayer University is primarily an adult education institution which could provide trained employees, entrepreneurs (Knowledge Economy / Creative Class) and other support elements for the Airport in it future growth paradigm.

3.10 ECPI College of Technology

This institution is a for-profit college that serves students in Virginia, North Carolina and South Carolina through on-line and on-campus classes. ECPI's Virginia campuses include those in Virginia Beach, Newport News (See Technical Memorandum 1 – southern quadrant) Richmond, and Manassas/Northern Virginia. In 2007 ECPI won the "Best of Hampton Roads" gold award for Best Technical Training School. ECPI trains students in various areas such as Network Security, Electronics Engineering, Medical Technologies, Business Technology, etc.

The link with the Newport News / Williamsburg International Airport is similar as with other institutions of higher learning as summarized herein. The people, programs, education, entrepreneurial spirit and other outgrowths of this college can serve to support, enhance, and otherwise contribute to the future development potential and economic/financial vibrancy of the facility.

Section 4: Market Influence of the Master Plan Update

The market demand influencing development on or near the Newport News / Williamsburg International Airport will be affected by many factors in the coming years. Among these factors may be the need or desire for institutions, programs, and facilities as summarized in this Technical Memorandum to grow, expand, and further develop. As stated previously, the spin-off demand from businesses, entrepreneurs, elements of the Creative Class, the Knowledge Economy, and use of Economic Gardening principles may also affect demand and the ability of the Airport to supply that demand with space for building and operations development.

The Master Plan will include specific parcels of real estate that may be sold, leased, or incorporated into the Airport's operational / administrative realm. These are treated in Technical Memorandum #4: Conceptual Building Program. Properly marketed, these parcels may appeal to a variety of end-users, some which have been summarized in this Technical Memorandum. Depending on the use (i.e. office, research, etc.) the potential partners identified in this interim report may desire various types of access to the Airport and its airside operations. Policy decisions regarding this type of interaction (or lack thereof) will be further defined in the Master Plan process and assimilated into the update accordingly.

The Newport News / Williamsburg International Airport has a limited amount of landside property that might be put to further development use. It is the professional opinion of Strategy 5 that this finite amount of land, in proximity to the Airport, and existing within the largely built-out confines of the Newport News area, could command an important and high-profile partner that could contribute significantly to the financial base of Airport operations.

Technical Memorandum #3: Yield Analysis

Section 1: Introduction and Methodology

1.1 Geographical and Market Scan Overview

As part of the Master Plan Update process, Strategy 5 LLC conducted a windshield survey of the land surrounding the Airport that could be accessed, or influenced by, the main roads and thoroughfares that are in proximity. These included Jefferson Ave., I-64, Denbigh Blvd. Rt. 17 (George Washington Memorial Highway) and Bland Blvd. This survey recorded building types and densities, relationships between commercial, industrial, retail, lodging and other uses; context/orientation to the Airport, etc.

Four natural land sectors (quadrants) emerged for further analysis: South, West, North and East. Observations, findings and preliminary recommendations associated with the "Proximal Area Context Discussion" were conveyed in Technical Memorandum #1.

- A key finding of the context analysis was the fact that there is a high-density mix of public and private activity surrounding the Airport, and there is limited available vacant land for future development to occur.

The team was also tasked with conducting a market scan in order to suggest possible development opportunities for the Airport's consideration on landside property it owns. A summary of this scan was provided in Technical Memorandum #2. Key findings that emerged from this analysis included the following:

- The Newport News / Williamsburg International Airport is located at the center of a geographic area (3 - 5 mile radius) that includes numerous public and institutional entities that have synergy. These include: The Thomas Jefferson National Accelerator Facility; College of William and Mary Peninsula Campus; National Institute of Aerospace; Hampton University; Christopher Newport University; Strayer University; ECPI College of Technology, etc.

- The interrelationships between these and other entities create a dynamic environment from which the Airport may benefit if it chooses to develop landside property.

- Facilities/organizations currently have limited opportunities for physical expansion, thus making any Airport land that is made available attractive for such growth.

- The underlying drivers of continued prosperity in the area (government, defense, scientific/technology, military) are expected to maintain economic sustainability for the foreseeable future.

- The cited institutions, organizations, agencies and private companies, have extended connections to NASA, the Department of Defense, the Department of Energy, the Department of Homeland Security, all four military branches, and scientific and research facilities around the world.

An important conclusion of the analysis summarized in Technical Memorandum #2, and subsequent analysis by the team, is that in its professional opinion development potential on landside property owned by the Airport will not be limited *primarily* by market demand potential, but rather constrained by the amount of land it can (or wishes) to put toward accommodating development projects.

Therefore, it was determined that conducting a real estate yield analysis might be a useful tool for understanding how much physical building mass could be accommodated on Airport land, leaving type-of-use recommendations to a later date when findings of additional market analysis, land use and facilities analysis conducted by RS&H and input from the client group can be assimilated.

1.2 Introduction to Yield Approach – Floor Area Ratio (FAR)

The approach to yield analysis used in this report is a simple, yet useful tool in understanding development potential when market support is not considered a primary constraint. Real estate being considered for development is, however, subject to a variety of constraints that can limit the amount/mass of building said property can accommodate. These constraints may include, but not be limited to:

- FAA funding and associated requirements for use

- Surface area required for parking and/or accommodation of structured parking.

- Topographic/terrain issues (e.g. steep cliffs, wetlands, etc.)

- Access (e.g. property may be "land-locked" by hard edge constrainers such as interstate highways, rivers, existing dev elopement, rights of way, etc.)

- Zoning and Regulatory Ordinances (e.g. height, density, setbacks, use, design restrictions/requirements etc.)

- Infrastructure availability and cost

- Compliance with Comprehensive Plans and other public policy documents

- Land acquisition and assembly complexities/cost

Conversely, higher yield and associated development opportunities may be facilitated or encouraged due to:

- Ownership/control of a scarce commodity (e.g. land in the case of the Airport)

- Policy decisions that open up or change permitted land-use (e.g. potentially through the Master Plan Update)

- A proactive economic development program that is endorsed by both the public and private sectors.

- Utilization of policies, programs and incentives that encourage building density including "smart growth" initiatives.

At this writing the consulting team and client group are still working to identify, and quantify, land, acreage, locations, parcels, etc. that the Airport owns and may wish to develop. Until development opportunity sites are agreed upon, the yield analysis summarized in this Technical Memorandum has temporarily employed the use of ranges to illustrate the relative potentials involved.

Ultimately, it will be a choice in economic development policies associated with the Newport News / Williamsburg International Airport Master Plan Update that drives the yield, FAR, projects, and other landside plan variables. These policy decisions will be affected by synergistic opportunities presented by associations with organizations, institutions, businesses, etc., that the Airport may proactively pursue, application of FAA regulations, ordinances of the City of Newport News and other jurisdictions with approval authority.

Section 2: Yield Discussion

2.1: Methodology

The yield of a particular piece of property is often expressed by real estate economists as the Floor Area Ratio (FAR). As a formula, FAR equals the total covered area on all floors of a building on a certain parcel, divided by the area of the parcel (TCA / AP). For example an FAR of .25 would illustrate that the total floor area of a building is one quarter of the gross area of the parcel on which it is constructed. The FAR of a building will be influenced by various development opportunities (see previous section) as well as constraints that may be imposed (see previous section).

In this analysis, which as yet does not have input variables such as actual parcels, policy limitations or facilitations, etc. we will reverse the FAR calculation, taking a range of parcel size, reducing them by a percentage to account for parking, streets and roads,

terrain constraints etc. and then applying the maximum floor potential (height) in order to determine the FAR estimate.

2.2 Development / Analysis Assumptions

The Yield Matrix includes seven variables or quantified categories of data that illustrate the relative development density (mass) that can be achieved on Airport parcels. These variables are quantified by employing various assumptions – many of which are necessarily "ball-park" figures at this time. A brief description of each variable used in the Yield Matrix and the assumptions employed therein are as follows:

- **Landside Acreage** – A range of acreage has been employed in the assumptive analysis since no definitive information on potential development opportunity sites is available at this time; and which in fact may be influenced by the Master Plan Update process and the policy and planning decisions that flow from it. We have used a base landside area of 5 acres, and increased the acreage by increments to a maximum of 100 acres used in the analysis. The Airport may have more, or less, land available and/or suitable for development. Landside acreage units as used in this analysis are conceptually contiguous in nature, but could in reality be comprised of smaller parcels that would constitute a constraint on maximum development potential.

- **Equivalent Square Footage** – This number is simply acreage multiplied by 43,560 square feet which comprise one acre of land, and is a common denominator is subsequent calculations.

- **Aggregate Tare** – Tare is technically defined as: "A deduction from the gross weight of a substance and its container made in allowance for the weight of the container." The term is often used in the building and construction industries to describe and quantify portions of structures that are non-revenue generating, such as walls, foundations, roofs, etc. In this analysis we have extended the definition of tare to include portions of land that are required for development, but generally non-revenue generating or used directly for building construction. Expressed as a percentage of Landside Acreage, these would include, but not be limited to, surface parking lots, areas required for access including roads and streets, green space (required or otherwise), circulation and maintenance areas, etc. Aggregate Tare is expressed as a percentage of Landside Acreage / Equivalent Square Footage. An Aggregate Tare of 75% is employed across the board. This percentage is predicated on a rough assumption that best practices in urban design and development will be utilized and/or encouraged by the Airport in any projects that it sanctions. In reality, the relative amount of un-built area will be dictated in part by the zoning codes, ordinances, and other regulatory devices that pertain to individual parcels and the projects that are proposed for them.

- **Net Tare (SF)** - Landside acreage (square footage) minus the amount of land required for parking, streets and circulation, green space, etc.(Aggregate Tare) derived from the assumptions described above.

- **Net Buildable (SF) FAR .25** – Net Buildable - The net amount of landside acreage remaining for accommodation of buildings, support structures, etc. derived from subtracting Net Tare. If built out with a one story structure it would have Gross Building Area equal to the Net Usable acreage, or an FAR of .25.

- **FAR .50 (SF**) – The Gross Building Area (GBA) if all of the Net Usable land area accommodated a two-story building, or its equivalent square footage of covered area would yield a FAR of .50

- **FAR .75 (SF)** – The Gross Building Area (GBA) if all of the Net Usable land area accommodated a three-story-building, or its equivalent square footage of covered area, would yield a FAR of .75.

The relationships between landside acreage, aggregate tare, net tare, net buildable square footage and FAR is illustrated in the Yield Matrix Table.

2.3 Calculations (See Table)

Based on the development assumptions summarized above, input variables as described, and application of basic arithmetic in the subsequent equations that project a range of building yield on different landside acreage, the following key outputs are derived.

Using a minimum Landside Acreage quantity of 5 acres, and an Aggregate Tare of 75%, a Net Buildable land area of 54,450 square feet (1.25 acres) is derived. This means, in theory, that a maximum density single story building of 54,450 square feet (FAR .25) could be accommodated on 5 acres of Airport land.

Applying an FAR of .50 would yield a two-story building of 108,900 square feet; and an FAR of .75 would yield 163,350 square feet of building mass. Viewed differently, the mass could be interpreted as multiple buildings with smaller footprints spread over the total 5 acres. For example, the maximum yield of 163,350 square feet could take the form of about three 54,000 square foot buildings of 3 stories, thus each having a footprint of about 18,000 square feet.

At the maximum range of Landside Acreage used in this analysis – 100 acres, or 4,356,000 square feet - and an Aggregate Tare of 75%, a Net Buildable land area of 1,089,000 square feet is derived. Building this land out with a one-story structure would be the equivalent of an FAR .25 Applying an FAR of .50 would mean that 2,178,000 square feet of building mass in various configurations could be accommodated on the 100 acres. An FAR of .75 would yield 3,267,00 square feet of building mass that could take the form of several 3 – 4 story structures, and so on.

Yield Matrix Table

Newport News / Williamsburg International Airport Yiled Matrix (FAR)

Landside Acreage	Equivalent SF	Aggregate Tare	Net Tare (SF)	Net Usable (SF) FAR .25	FAR .50 (SF)	FAR .75 (SF)
5	217,800	75%	163,350	54,450	108,900	163,350
10	435,600	75%	326,700	108,900	217,800	326,700
25	1,089,000	75%	816,750	272,250	544,500	816,750
50	2,178,000	75%	1,633,500	544,500	1,089,000	1,633,500
75	3,267,000	75%	2,450,250	816,750	1,633,500	2,450,250
100	4,356,000	75%	3,267,000	1,089,000	2,178,000	3,267,000

Source: Strategy 5 LLC, Urban Land Institute, City of Newport News

Section 4: Summary Conclusions

The calculations set forth in this analysis are designed to illustrate the theoretical absolute maximum amount of building mass that can be accommodated on land of various acreage, employing various development and land-use assumptions, including but not limited to building height restrictions. If maximized, Airport land can, in fact, accommodate a significant amount of building mass. The higher the allowable FAR the higher the land value will be. This relationship should be considered as policy decisions regarding development of landside Airport property are formulated as part of the Master Plan Update.

In reality, the parcels of land that the Airport might consider for development may be smaller, or more fragmented than suggested by the Landside Acreage range used in the Yield Matrix. This will likely decrease the Net Buildable parcel square footage for any one project, and incur constraints accordingly. While in this illustrative exercise we have taken as an assumption that market support is not a constraining element, in reality the market *will* comment on location, character of surrounding development, access, and a host of other variables. These will be determined as the planning process continues.

Still, the purpose of the Yield Analysis has been fulfilled pending further available input. Landside acreage can support a significant amount of development, and thus contribute accordingly to the economic development and financial goals and objectives of the Newport News / Williamsburg International Airport.

Technical Memorandum #4

Section 1: Introduction and Methodology

Based on the findings of analyses and work on the Airport Master Plan Update including proximal area site reconnaissance (landside), review of previous plans and reports, a market scan, numerous stakeholder interviews and other steps, the team has prepared a summary Conceptual Development Program (CDP) for use by the client group in understanding alternatives for future projects on landside property.

The team has been provided with five areas of landside property in which to focus development recommendations. These are:

- Area 1: Consisting of 35.2 acres that includes a former mobile home park and General Aviation area located in the northern quadrant of Airport property (see Technical Memorandum 1).

- Area 2: Consisting of 61.6 acres that is a wooded area located in the northern quadrant of Airport property (see Technical Memorandum 1)

- Area 3: Consisting of 253.8 mostly wooded acres located in the western quadrant of airport property (see Technical Memorandum 1)

- Area 4: Consisting of 31.9 acres of green-field land located in the eastern quadrant of Airport property (see Technical Memorandum 1).

- Area 5: Consisting of 97 acres located in the infield "V" created by the Airport's two main runways.

Therefore, the total aggregate land area subject to recommendations included in the CDP is approximately 479 acres.

It should be emphasized that development of Airport property for non-aeronautical use is subject to a host of obligations and restrictions involving, but not limited to the following:

- FAA regulations
- Agreements between the Airport and the United States government
- Terms of an official Land Release Request
- A certified appraisal and estimate of Fair Market Value
- A metes and bounds survey of property intended for non-aeronautical use
- Treatment within the ALP

- Financial statements regarding capabilities in accomplishing the proposed development
- A Deed of Release specifying the means of directing the net proceeds from sale or lease
- FAA Obligations and Best Practices

The CDP summarized herein reflects the professional opinion of the consulting team and will likely be adjusted as plan alternatives are presented to the client group for consideration, future decisions by the development/investment community enter the process, and policy decisions by the Airport Authority, City of Newport News and York County are also assimilated over time. This CDP is intended as an analytical tool to understand how available landside property can be maximized for the benefit of the Airport, in keeping with the "highest and best use principle" for land use.

For purposes of the CDP and the Master Plan Update as a whole, the team recommends a build-out scenario that shows facilities on all available/appropriate parcels; the way in which these facilities are generally accessed, services provided, roughly estimated parking requirements accommodated, etc. Gross Building Area (GBA) square footages are expressed as "order of magnitude" estimates and are rounded to the nearest 5,000 - 10,000.

In the plan diagrams that follow, the proposed building recommendations are suggested by tan geometric shapes – rectangles or squares – while basic access and parking solutions are laid out in pink. The plans do not reflect any sort of architectural or design recommendations, other than the illustration of land use configurations designed to show how a range of uses may best fulfill Airport real estate development goals and objectives and their associated economic and fiscal benefits.

Section 2: Development Concepts for Consideration

2.1 Research and Development / Technology

The market scan completed for landside development associated with the Master Plan Update inventoried a number of key economic drivers located in proximity to the Airport. These included the Thomas Jefferson National Accelerator Facility, the College of William and Mary Peninsula Campus, the National Institute of Aerospace, Hampton University, Averett University, Christopher Newport University, Newport News Public Schools – Aviation Magnet Schools, Strayer University and the ECPI College of Technology.

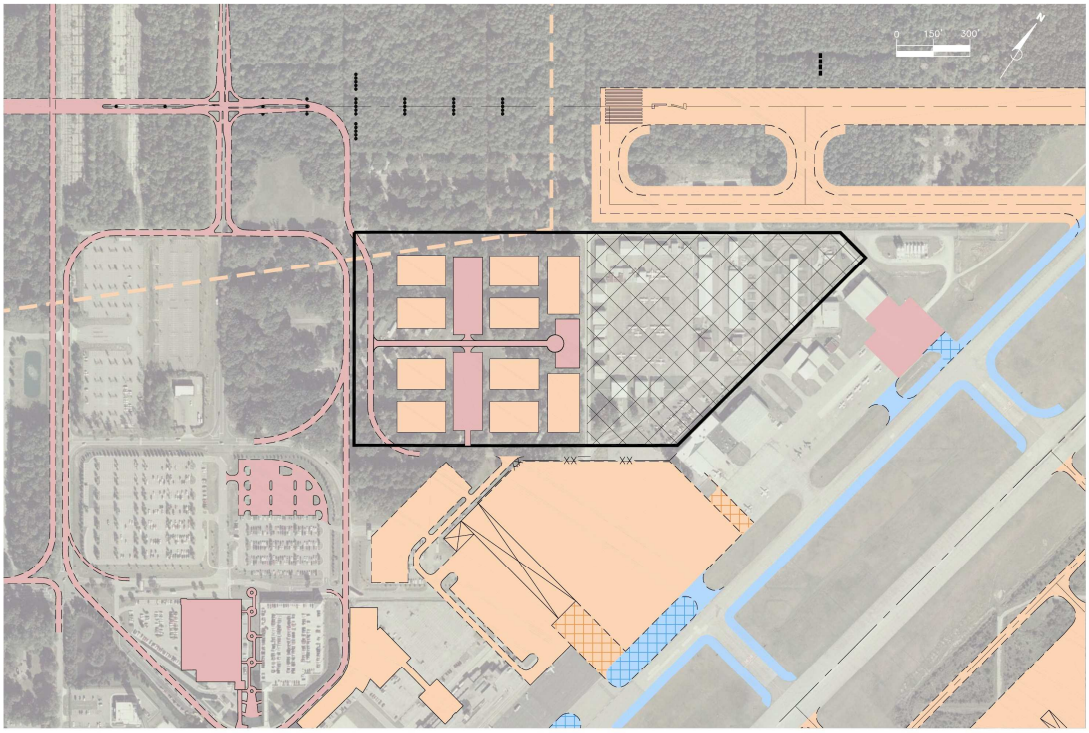
These institutions are in turn connected to a worldwide network of public and private organizations and companies that include the U.S. Department of Energy, the Department of Defense, NASA, a host of universities and colleges, businesses, contractors, suppliers and other enterprises. This extensive network also suggests a link to the interplay of the so-called Knowledge Economy, Creative Class and the principle of Economic Gardening as summarized in Technical Memorandum 1; which may be harnessed by the Airport in the form of development that focuses on research and development and technology.

A "windshield survey" by the consultant, which involved a repeated driving reconnaissance of the Newport News area in which the Airport is located, indicated that there is a very limited supply of buildable land available. Similarly, a review of computer generated aerial views (Google Earth) and physical maps and plans of the area revealed the same result: The Newport News / Hampton Roads area is largely built out. This fact works to the Airport's advantage in the release of landside property for development.

The concentration of economic drivers in proximity to the Airport, coupled with the scarcity of buildable land, suggests that prime landside property can reach its "highest and best use" by accommodating the need for expansion by these drivers and the private sector spin-offs they foster. These demand segments could manifest in an Airport R&D /Technology Park or possible some type of Innovation Center that could be accommodated by a combination of land in Areas 1 and 2.

Depending on variables within each Area, it appears that three story buildings could be constructed given the applicable height restrictions. However, in order to remain conservative in development projections, the CDP holds that a one-story building scenario in Area 1 could accommodate between 200,000 and 300,000 square feet of GBA dedicated for R&D and technology companies – essentially office space – configured in an urban land-type design; while Area 2 could accommodate an additional 150,000 to 200,000 square feet of GBA for this type of use configured in a more suburban office park design. Thus, total GBA dedicated to R&D and technology could amount to between 350,000 square feet and 500,000 square feet spread between Area 1 and Area 2. The balance of land available in Area 2 is further discussed in sub-sections 2.2 and 2.3 below.

Area 1



This conceptual layout for Area 1 depicts an array of 10 buildings with footprints ranging from 25,000 square feet to 30,000 square feet that could accommodate some combination of R&D, technology and office uses. It could offer an urban-type density, fostering an exchange of ideas, innovation, and "mind share" opportunities associated with the economic development principle of the Knowledge Economy - one that is in turn characteristic of the greater Newport News area with it's host of higher educational institutions, aerospace and technology companies and government agencies, and other knowledge-based infrastructure. No building program for the General Aviation area to the right has been proposed at this time given possible FAA-funding related constraints (See Section 1)

2.2 Advanced Manufacturing / Light Industrial

The Airport is located in a region that is concentrated with technology-based companies, government facilities and educational institutions. It also hosts manufacturing and industrial development. The marriage of technology and manufacturing today is often referred to as Advanced Manufacturing. This is a growing business sector worldwide, and could be suited to a portion of landside development at the Airport. The use of sophisticated metals, high-tech processes, and other elements of Advanced Manufacturing can draw on the local / regional knowledge base, coupled with the relative scarcity of vacant/buildable land can combine to the Airport's benefit.

Advanced Manufacturing could probably best be accommodated by utilizing a potion Area 2 (with other portions devoted to R&D, technology, laboratories, etc.). Given the need for large free-span spaces in accommodating machinery, processes, personnel and other elements of the Advanced Manufacturing development type, a light industrial physical building model suggests itself. The team recommends that buildings have a footprint no smaller than 25,000 square feet, and no greater than 150,000 square feet with a total GBA (combined structures) of about 300,000 to 400,000 square feet. Please see the conceptual layout of Area 2 on the following page.

2.3 Warehousing and Distribution

The Airport has served a function as a key infrastructure support element for various warehousing and distribution businesses in the area over time. The desirability of Airport landside property for this type of use remains viable. Recently, the Smithfield meat products company has chosen the Airport as the location for a new distribution facility. Business activity at the nearby Patrick Henry Commerce Center is undoubtedly enhanced by its proximity to the Airport. The market scan suggested that warehousing and distribution businesses have potential for consideration in landside development at the Airport, but also suggested caveats as to the magnitude of such development given various considerations. These considerations included the highly competitive market for airfreight business, and economic factors influencing competitiveness in the Virginia Beach / Newport News / Hampton Roads region (such as the proximity of the Norfolk Airport). Nonetheless, with the Airport's inherent advantages taken into account, the team recommends that a complex of warehousing and distribution facilities be included in the Master Plan Update.

The logical location for this proposed complex would be in the northern and eastern quadrants of landside property (See Technical Memorandum 1) in Area 2 of the Airport Layout Plan. In this CDP the team suggests incorporation of approximately 250,000 to 300,000 square feet of warehousing and distribution-type use, developed over time. This square footage could take the form of 2-5 main buildings that would have to be configured based on further site analysis, individual business plans, etc. For purposes of the CDP lanners should work with a range of building footprints to see the best fit for this portion of the Airport property.

The range could include: two buildings of 125,000 to 150,000 square feet each; three buildings of 85,000 to 100,000 square feet each; four buildings of approximately 60,000 to 75,000 square feet each; and so on. Generally, warehousing and distribution buildings are one-floor, high ceiling structures, allowing for the greatest efficiency in moving freight. Therefore, the range suggested above would reflect footprints, not cubic square footage based on ceiling heights that could exceed 50 or more feet.

If space allows it would be prudent to set aside some landside property for future growth in the warehousing and distribution complex, should that sector make unforeseen gains in the future. In the meantime, the fairly wide range of building sizes should provide the planning team with sufficient flexibility to depict a small area plan that successfully treats access, service requirements, parking, etc.

Area 2

This conceptual layout for Area 2 depicts 14 buildings of various sizes ranging from footprints of 20,000 square feet to 120,000 square feet. In all Area 2, as shown, contains approximately 800,000 square feet of GBA. A mix of Advanced Manufacturing, warehousing and distribution, and some R&D/lab space could provide for synergies between users, and the Airport infrastructure that is close by. This schematic also reflects the potential for an extended Turnberry Road (horizontal line) that would connect to an improved Oriana Road.

2.4 Commercial (Retail, Office, etc.)

While there is a concentration of commercial and retail development in the southern and eastern quadrants of land surrounding the airport, particularly along Jefferson Ave. and in the Oyster Point area, there is comparatively little commercial / retail serving the local population in the northern quadrant. The Rt. 17 corridor contains a number of aging strip centers with a mix of retail and commercial businesses, but there appears to be a good opportunity for the Airport in developing at least a portion of Area 3 (that closest to Denbigh Blvd.) for these purposes.

According to Airport officials, in the future, there may be a City / County initiative to improve, widen, and enhance Oriana Rd. (Old Denbigh Blvd. in the City of Newport News) which arcs to the south and defines the southern boundary of Area 3. With a northern boundary fronting on

busy Denbigh Blvd. and an enhanced southern access, Area 3 would be particularly viable for development of various types.

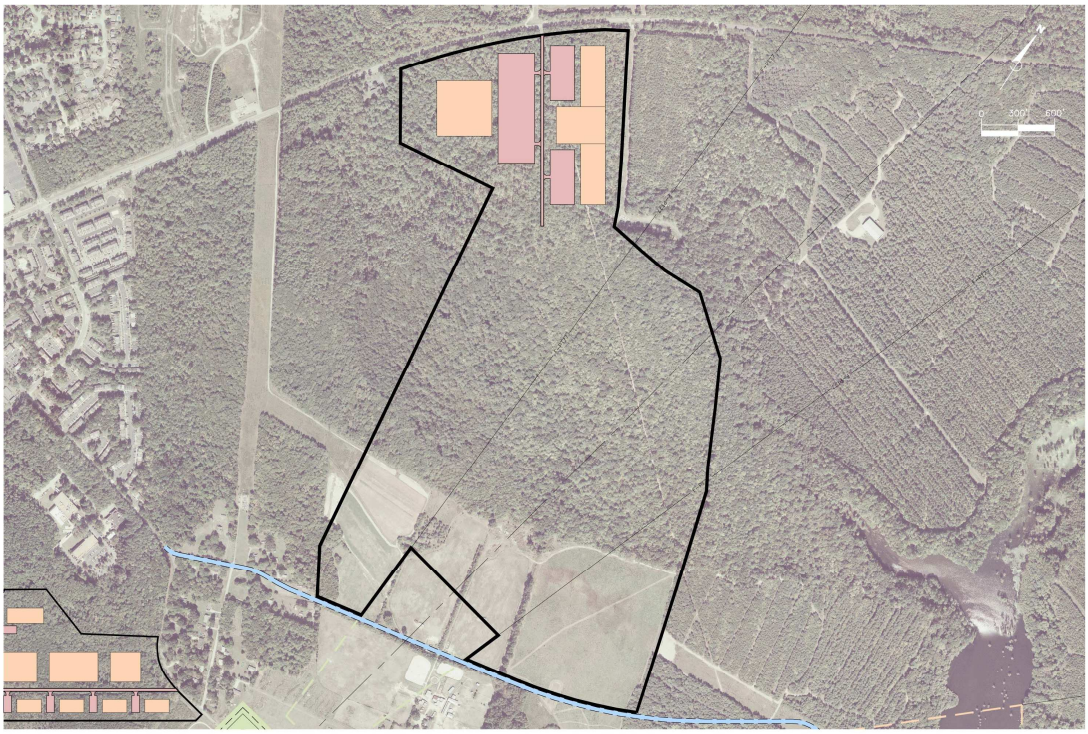
For the CDP it is recommended that the northern third of Area 3 (about 84 of the total 253 acres) be targeted for commercial / retail development in the near to mid term. Long term plans might consider additional land dedicated for these uses. Assuming that the greatest concentration of retail would be appropriately located closest to Denbigh Blvd., we suggest that about 100,000 – 200,000 square feet of retail / commercial development could be accommodated at this location on about 10 – 15 acres of land. If a "big box" retailer (Wal-Mart, Loews, Home Depot, Costco, etc.) could be attracted then the overall retail square footage could probably be boosted by an additional 200,000 - 300,000 square feet or more. The remaining acreage could host various other commercial uses – some that might be support businesses for the local area healthcare industry including Mary Immaculate Hospital, office parks and light industrial or other types of commercial development.

The development program for the southern two-thirds of Area 3 is less definitive. The variables associated with future improved access from Oriana Rd. (possibly), Airport runway and flight path constraints on development, and other factors will affect building opportunities over time. For purposes of the CDP we recommend development of this area for rental storage units, or possibly additional solar installations.

Area 4 is another landside development opportunity location that can accommodate additional retail and other commercial uses. It occupies something of a gateway orientation to the Airport and lends itself to the village retail type of project that can be found nearby in Oyster Point, and in other upscale shopping districts throughout the region. The site also hosts a lake that can serve as a visual amenity for visitors. Based on the site size and configuration Area 4 could host up to about 180,000 square feet of retail / commercial development.

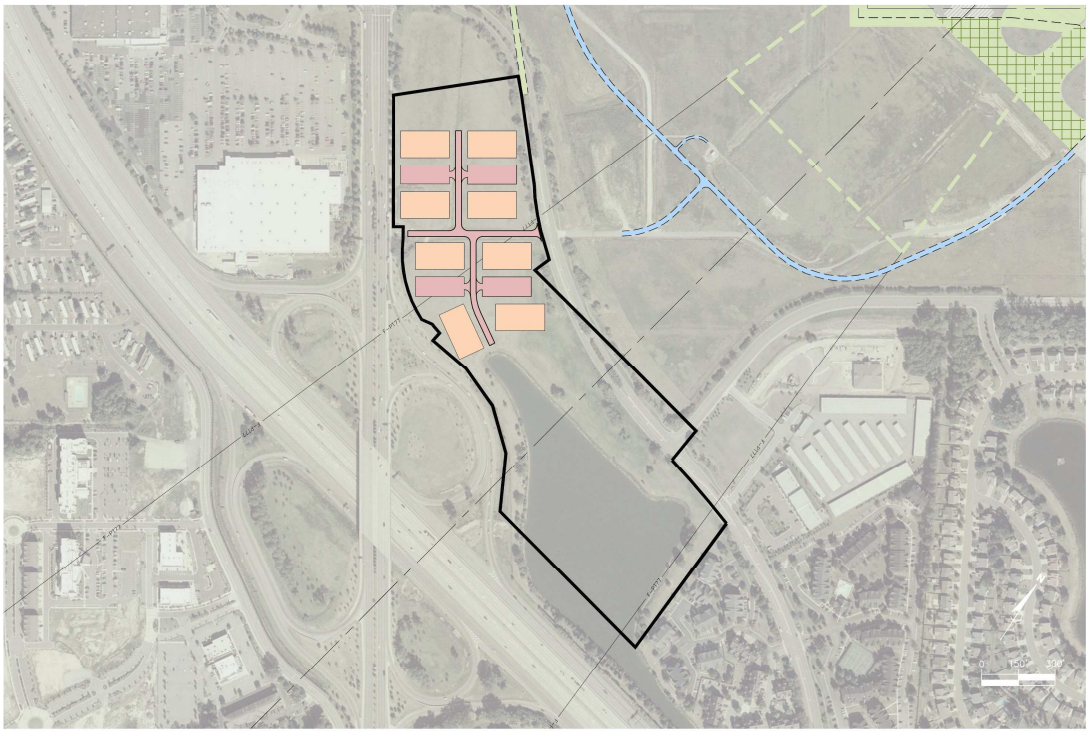
Please see Conceptual Development Programs for Areas 3 and 4 on the following pages.

Area 3



This conceptual layout depicts the natural orientation of future retail to Denbigh Boulevard and reflects the development of a traditional large shopping center with a major anchor in the middle (to the right) and a big box retailer (to the left) bisected by an access road and substantial surface parking. In all, approximately 400,000 square feet of GBA is illustrated in this view. A large portion of Area 3 is left unprogramed with development as other elements of the Airport Master Plan associated with airside improvements may preclude significant building here. Some infill development as summarized in section 2.5 could be accommodated, especially if Oriana Rd. is improved at some point in the future.

Area 4



Area 4 consists of approximately 32 acres of buildable land, oriented toward two major transportation routes, Interstate 64 and Jefferson Ave., and occupying a beneficial location close to other retail centers in Newport News, as well as residential concentrations. This conceptual layout depicts approximately 180,000 square feet of GBA, configured in a retail village format that includes 8 buildings organized around a grid system of streets and parking.

2.5 Solar Installation

There is currently an important development trend manifested in the convergence of airport planning initiatives, economic development efforts, and solar energy installations. The significance of this convergence was illustrated in part by the issuance of an FAA report entitled *Technical Guidance for Evaluating Selected Solar Technologies on Airports* in November 2010. There are approximately 17 -20 airports in the United States that have partnered to develop solar installations and/or are expanding such projects on airside and landside property as well as those integrated with airport buildings and structures. Clearly the FAA and the aviation industry are finding value in renewable energy, which can have both operational and financial returns of invested parties.

STRATEGY 5

A solar installation at the Airport could be accommodated on property located within Area 5 of the Airport Layout Plan that includes approximately 97 acres. Solar energy industry professionals cite a rule of thumb calculation relative to the relationship of land use to megawatts of electric generation. Basically this rule of thumb states that one megawatt of solar power generation requires approximately 5 acres of land. Therefore, the plus/minus 90 acres of usable land located in the Area 5 will support a solar generation facility of about 18 MW and could generate approximately 20 – 30 million KW-hours annually according to industry analysts. This would be the equivalent of supplying approximately 80 - 90 single family homes with clean renewable energy. To put this into further context, most airport solar installations equal between 2 and 10 megawatts, although these projects continue to grow in size, or are being added to in subsequent development phases. These projections have been adjusted for the solar production characteristics of the Newport News area.

Solar installations at airports offer a combination of potential financial benefits including savings on energy, private investment, land leases, power purchase agreements, federal and state tax credits, etc.

Area 5

A solar installation at the Airport could provide economic and financial benefits for both public and private sector partners. The phased array depicted in this plan view suggests a location that is physically feasible, and is consistent with installations at other airports, and FAA guidelines for solar development.

2.6 Storage Units and Other Infill

Rental storage units are a growing commercial sector, particularly in areas with a large transient population such as associated with military and government installations. A market analysis specific to the storage unit industry in the Newport News / Hampton Roads area has not been conducted for the CDP, but the consultant submits that there is a significant amount of both supply and demand currently present in the local market. Nonetheless, long-term planning associated with the CDP suggests that storage units would be an easily developed, and expanded, component that would provide the Airport with revenue, and contribute to the commercial mix and activity level in landside areas.

Self storage units are generally offered in a wide variety of sized and configuration ranging from 32 square feet to more than 300 square feet. If we used an average size of 100 square feet for a prototypical storage unit in the CDP, the acreage / land area they would cover would be a simple multiple. For example, allowing for circulation and parking, the remaining unprogramed 169 acres of Area 3 (253 acres minus 84 acres) devoted to Commercial / Retail and other uses as described in sections 2.3 and 2.4 above) might theoretically accommodate thousands of units, well beyond what the local market is likely to absorb even over decades. Therefore we recommend in the CDP that self-storage units be used as infill development where other types of building construction would be impractical or prohibited. Programming for perhaps 500 – 750 units (about 50,000 to 75,000 square feet of GBA) over the lifespan of the Master Plan Update is probably a reasonable number to consider.

Section 3: Summary Conclusions

The components of the CDP summarized in this Technical Memorandum do not constitute a comprehensive inventory of all projects that may be pursued by the Newport News / Williamsburg International Airport and its public, private and institutional sector partners over time. Rather they represent possible catalyst projects for consideration of inclusion in the Master Plan Update and possible subjects of further analysis and/or implementation.

Taken together, the six categories of projects would constitute significant development on Airport property, and carry with them potentially significant economic and fiscal benefits. A summary of project categories and associated square footage/acreage is listed below:

Development Type / Use	**Square Footage (GBA)**
Research and Development / Technology	350,000 – 500,000
Advanced Manufacturing / Light Industrial	300,000 – 400,000
Warehousing and Distribution	250,000 – 300,000
Solar Installation	90 acres (18 MW)
Commercial / Retail	300,000 – 500,000
Storage	50,000 - 75,000

In all, the Conceptual Development Program depicts a range of Gross Building Area for catalyst projects of between 1,250,000 and 1,775,000 square feet; to be phased in and absorbed over the timeframe associated with the Master Plan – approximately 20 years.

A solar installation such as suggested herein (90 acres) would take the total land area to be developed by the Airport and its partners over time to between about 200 acres and 350 acres. The remaining land allows for future projects that may be unforeseen at this time depending on the advent of new airside infrastructure, changes in the airline industry/economy, and other variables. It should be clearly understood, as stated in Section I, that the Conceptual Development Program should be considered an analytical tool for use in the planning process.

STRATEGY 5

Technical Memorandum #5: Financial Analysis

Section 1: Introduction and Methodology

As a part of implementation for the Newport News / Williamsburg International Airport Master Plan Update, the RS&H team was tasked with preparing feasibility assessments for up to five catalyst projects that could be accommodated on landside property owned by the Airport. The nature of these potential projects at the outset of the planning process was unknown, with findings and recommendations to be based on site analysis, market analysis, and other methodological steps undertaken by the team.

Ultimately, a Conceptual Development Program for landside property was created that included a mix of economic development components, including:

- Research and Development / Technology
- Advanced Manufacturing / Light Industrial
- Warehousing and Distribution
- Commercial (Retail, Office, etc.)
- Solar Energy Installation
- Storage Units and Other Infill

Please see Technical Memorandum #4 – Conceptual Development Program – for discussions of these development sectors and the landside development areas to which they are assigned.

In order to provide the client with the most valuable information for use in conjunction with the Master Plan Update, associated fiscal and budgetary planning comprising a funding and finance strategy for capital and other improvements suggested by the plan, it was agreed that the team would approach feasibility from the perspective of the Airport, not necessarily a project developer.

Feasibility from the Airport's perspective entails highest and best use of available land, synergy with the Master Plan Update and associated goals and objectives, obtainable lease rates and other terms of development agreements, and the economic and fiscal impacts that can be achieved to benefit the Airport. Feasibility from a developer's perspective entails identified market support, projected revenues and expenses, supportable debt and equity, available funding etc.

Based on the findings of the market analysis conducted for the Master Plan Update and related steps, the team found that sufficient proof of "market feasibility" and "economic feasibility" for the types of projects included in the Conceptual Development Program (and as quantified in square footage) that the team recommended was supportable. Please see Technical Memoranda 1, 2 and 3.

In the sections below, a summary of landside components of the Conceptual Development Program is provided, along with certain assumptions that drive revenue and cost projections associated with the Airport feasibility perspective. Data and information sources used in this analysis included historical lease rates and terms for airport tenants, comparative lease rates and terms from other airports, solar energy industry information, FAA information (i.e. that which is included in the FAA Solar Guidelines), and other primary and secondary data and information provided by the Peninsula Airport Commission (PAC), City of Newport News, additional public and institutional entities.

A series of development and other assumptions have been made regarding phasing, absorption, lease rates, etc. These specific assumptions are summarized under each component of the landside development strategy as listed below, and are designed to meet the: "Is it reasonable to assume?" test. The logic, criteria and variables applied in regarding is as follows:

Revenue

- Land area requirements are based on the five Areas for analysis provided by the client, the Conceptual Development Program formulated by the team, and the market analysis including the Yield Analysis provided in Technical Memoranda 2, 3 and 4. The net land area used in calculating lease revenues is highly dependant on final development and design decisions including parking solutions, maintenance of green space, dedication of public areas, the character of buildings including the density, function, final location and other variables. For purposes of this analysis the team has made a series of "best guesstimates" on an order-of-magnitude basis about how many acres will be utilized for various development components, the likely pace of absorption over time and other development assumptions.

- Land lease rates are based on a comparative analysis of other leases maintained by the Newport News Williamsburg International Airport; and, information provided by the PAC as to anticipated leas rates for landside Areas that are currently undeveloped.

- Lease rates are held as constants, although overlapping lease terms, periodic increases to account for changes in the Consumer Price Index (CPI), inflation and other macroeconomic factors will likely take place. The primary revenue stream variables (lease rates) are held as constants because the associated operating and other costs and expenses will rise or fall at approximately the same rate over time. Therefore these are held as constants as well. All currency values are expressed in 2013 dollars.

- Comparisons with lease rates at other airport business/industrial parks and related development types in similar markets, and the likelihood that the Airport will be able to increase rates in the future as demand for Airport parcels rise.

- Absorption / growth assumptions are predicated on a proactive / aggressive marketing effort by the Airport, momentum and increasing demand created by new projects as they serve to create a critical mass of activity, and improvements and other positive benefits

associated with implementing the Master Plan Update. Actual growth and absorption may vary greatly depending on factors including, but not limited to, policy decisions by the PAC and Airport administration, future economic trends, decisions by private developers, financing variables, etc.

- The cash flow pro forma and related models reflect a beginning in "Year 1" of implementation of the landside development program. It should be understood that "Year 1" does not necessarily mean next year, or the year after, but rather starts a count at some point in the future when the development program has been solidified, financed and set in motion.

The assumptions regarding costs and expenses are as follows:

Expenses and Costs

In order to weigh financial feasibility and economic development considerations associated with new landside opportunities, the Airport should account for expenses / costs that may be either one-time "sunk costs" (e.g. investment in infrastructure to provide access and services to currently undeveloped / un-served landside Areas), or ongoing (e.g. maintenance, marketing, etc.). The Airport may not currently distinguish clearly between landside development and airside development from an accounting/administrative perspective, particularly as much of the prospective landside Area does not yield significant revenues (as it is undeveloped) nor does it require significant expense to maintain. Therefore this financial feasibility assessment as it includes dedicated expenses, serves as a tool to help policy/decision makers understand all cost/benefit factors.

Expenses are broken out into traditional departmental categories: Operations; General and Administrative; and, Sales and Marketing. It is understood that these departmental roles would not likely be separated out from the totality of Airport administration, but are presented as such in order to illustrate this aspect of landside development, separated as an analytical tool for decision and policy makers. Operating expense amounts are roughly estimated based on typical percentage relationships exhibited by businesses in various industries using the Statistical Abstract of the United States as a baseline provider of data.

Hard costs as included in this analysis are even harder to project, as the ways in which infrastructure is paid for and constructed can, and will, vary widely depending on the location and the nature of the project. For example, the Airport may choose to induce development and the revenue it brings by constructing critical infrastructure such as streets, water, sewer, gas and electric utilities. Or, the Airport may either place this burden on private developers, enter into a cost sharing arrangement, utilize tax increment financing or other public financing mechanisms as may be available through such vehicles at the Virginia Enterprise Zone (some landside development areas appear to be in this zone currently ad/or the zone might be expanded to include them in the future), FAA funding, City or County funding contributions through the economic development departments, etc.

For purposes of this analysis, hard costs are estimated on an order-of-magnitude unit cost basis forecasting the minimum amount of infrastructure required to facilitate or enable development to occur on landside property.

Summary of Tables

Table 1 places the above set of assumptions, inputs, outputs and projections into the context of a 10-year cash flow pro forma that in turn drives other financial projections that will eventually be merged with the funding and finance strategy for the Master Plan Update. It is possible that some landside development components may not emerge until the second half or end of the Master Plan Update timeframe of 20 years. These contingencies exceed the forecasting model timeframe used in this analysis. Therefore all projects suggested by the CDP are illustrated as being completed in a ten-year period.

Table 2 places the revenue / expense and Net Operating Income projections into calculations of theoretical supportable debt and equity. This would be as if the Airport was acting as a private developer seeking to evaluate how a proposed project(s) would perform in terms of attracting equity capital and traditional debt financing. This is included as another tool that can be used to understand the viability / profitability of proposed landside projects.

Table 3 balances potential hard costs of Airport investment (e.g. infrastructure including streets, etc.) against supportable funds. It also calculates the Residual Land Value based on inputs and outputs of Tables 1 and 2.

Table 4 provides an estimate of FTE construction jobs associated with an investment by the Airport in infrastructure or other improvements that may be required to attract development projects.

Table 5 provides calculations of FTE job creation, and direct and indirect wages and salaries that could be generated by implementing and developing the components of the Conceptual Development Program.

Please see these Tables as included at the end of this Technical Memorandum.

Section 2: Development Program / Feasibility Assumptions Summary

2.1 Research and Development / Technology

The Market analysis and Conceptual Development Program assessed and accommodated the need/demand for a substantial amount of space configured in some combination of office and/or larger floor plate spaces in accommodating a mix of government, institutional and private user groups as suggested in Technical Memorandum #4. The CDP suggested that buildings have footprints ranging between 25,000 square feet and 30,000 square feet. The CDP suggests some buildings may have a height of three stories, while others may best function in a one-story, high ceiling format, with a total gross building area (combined structures) of about 350,000 to 500,000 square feet. This GBA for R&D and technology assumes a portion can be accommodated in Area 1, while another portion could be accommodated in Area 2. This building square footage was translated by the team into the need for approximately 50 acres of landside property in the aggregate.

Feasibility Assumptions:

Development and leasing has been in place within Area 1 for many years as the location for a mobile home park. Over the last several years the Airport has been engaged in a process of gradually eliminating the mobile home leases as owners' transition out of the area. Area 2 is on the axis of existing roads and other infrastructure that could be readily improved if financial resources are available. As land bays are currently opening up, essential infrastructure (i.e. access, utilities, etc.) exists, and the Airport may choose to accelerate the assembly and acquisition process as part of the Master Plan Update, we project that an additional project(s) can be attracted in year 1 of implementation. Utilized acreage is estimated at 5 acres in years 1 and 2, increasing to 10 in years 3 and 4, 20 acres in years 5 – 6, 40 acres in years 7 -8, and reaching build-out at 50 acres in years 7 – 10. Based on input from the Airport, the lease rate is begun at 50 cents per square foot, per acre per year, which is considered somewhat aggressive by the consultant, but probably achievable based on various improvements and investments envisioned to be undertaken by the Airport.

2.2 Advanced Manufacturing / Light Industrial

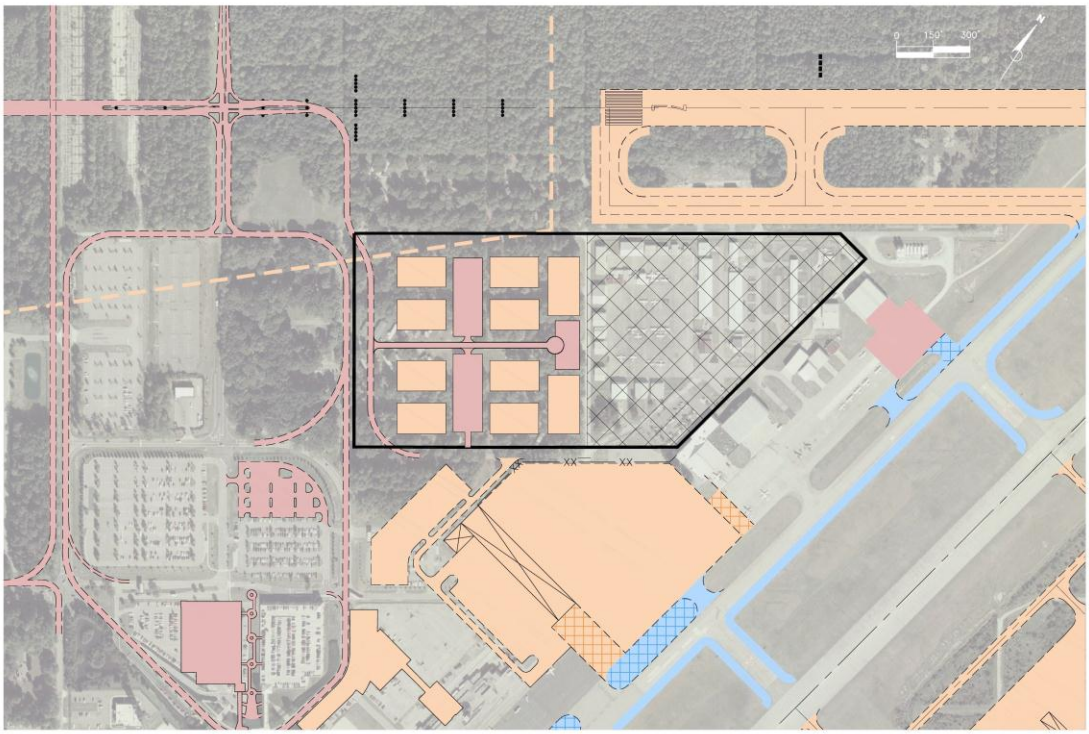
The CDP prepared by the team further treated the likely need/demand for large free-span spaces in accommodating machinery, processes, personnel and other elements of the advanced manufacturing, light industrial sectors. The Program included recommendations that buildings have a footprint no smaller than 25,000 square feet, and no greater than 150,000 square feet with a total GBA (combined structures) of about 300,000 to 400,000 square feet. This building square

footage was translated by the team into the need for approximately 40 acres of landside property at build-out.

Feasibility Assumptions:

Utilized acreage is estimated at 5 acres starting in years 4 and 5 to account for the infrastructure requirements that will need to be implemented, increasing to 10 acres in years 6 to 7, and reaching build out at 40 acres in years 8 – 10. The lease rate is set at 40 cents per square foot, per acre, per year based on a blended rate using portions of Area 1 and portions of Area 2 as further described below.

Area 1



The Airport may choose to purse development of both Research and Development and Technology uses within Area 1 (35 acres as shown above) given its location close to the main Airport facilities, existing access/parcel grid pattern, existing infrastructure, and future synergies with other development opportunities. This development combination could utilize up to 60 acres, aggregating land use in both Areas 1 and Area2.

2.2 Warehousing and Distribution

If complexities with access and project compatibility with existing businesses can be dealt with, the CDP suggests that between 250,000 and 300,000 square feet of warehousing and distribution space might be phased in over time. The logical location for this complex would be in Area 2, co-located with some of the Advanced Manufacturing and Light Industrial uses suggested by the CDP. Based on the associated land-use requirements, the team calculated that the warehousing and distribution complex would require approximately 50 acres of the Airport's landside property.

Feasibility Assumptions:

Development / leasing is projected to begin in year 4 of implementation, allowing time for installation of improvements and expansion of infrastructure in conjunction with preparing Area 2 for it's Manufacturing role as well. Utilized acreage is pegged at 10 acres in years 4 and 5, increasing to maturity at 25 acres in years 5 through 10.

Area 2

Area 2 includes approximately 61 acres as shown above. Potential landside development of warehousing and distribution facilities will benefit from the existence of roads penetrating the Airport property that could be improved, and nearby connections to the Interstate highway system. This development component could utilize up to 25 acres. The incorporation of Research and Development / Technology and other supportable development projects would utilize the balance.

2.4 Commercial (Retail, Office, etc.)

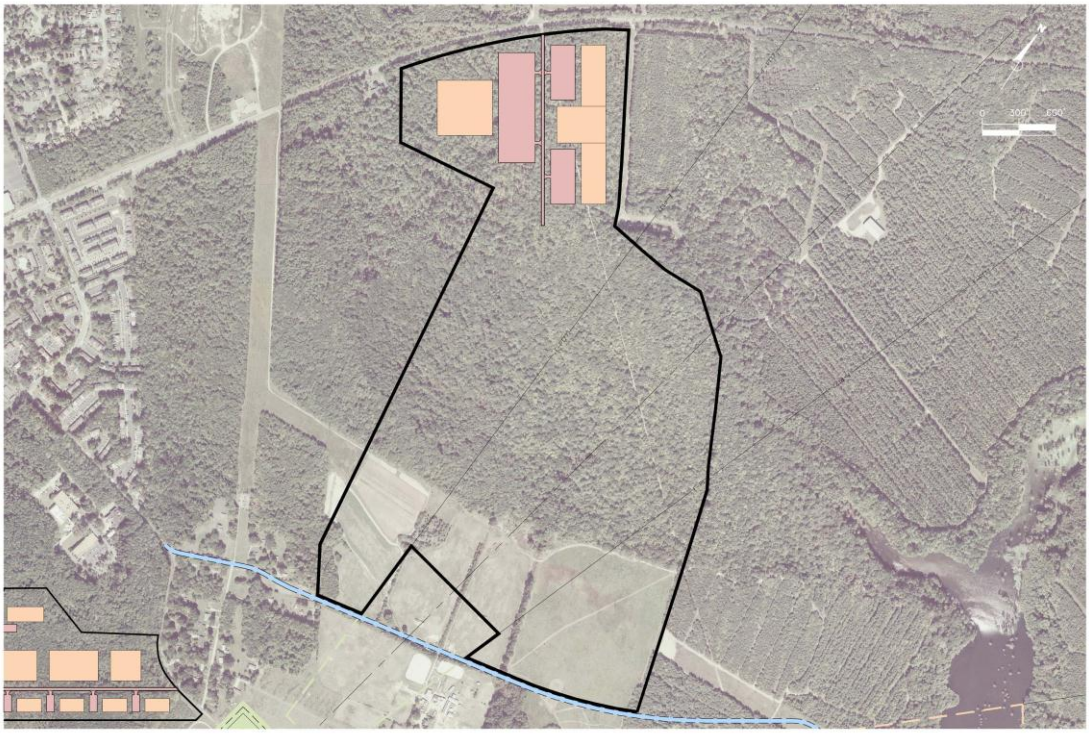
The CDP suggested that a portion of Area 3 (approximately 84 of the total 253 acres) would be a good location for "big box" or other retail and commercial given its orientation to Denbigh Blvd. In addition, about 18 acres out of a total 32 located in Area 4 are considered prime retail locations given the site's proximity to Jefferson Ave. and I-64. Development for this area is envisioned for "village retail" such as found nearby in clusters within the area known as Oyster Point.

Feasibility Assumptions:

For purposes of this portion of the analysis, and given the likely time frame and phasing in terms of development with the two main retail areas, we are assuming that Area 4 will develop first and be leased at the rate of 50 cents per square foot as indicated by the Airport administration. This property is close to infrastructure and could be generating revenue in the relatively near future. Therefore, we have included as an input within the cash flow pro forma leasing in year one of implementation.

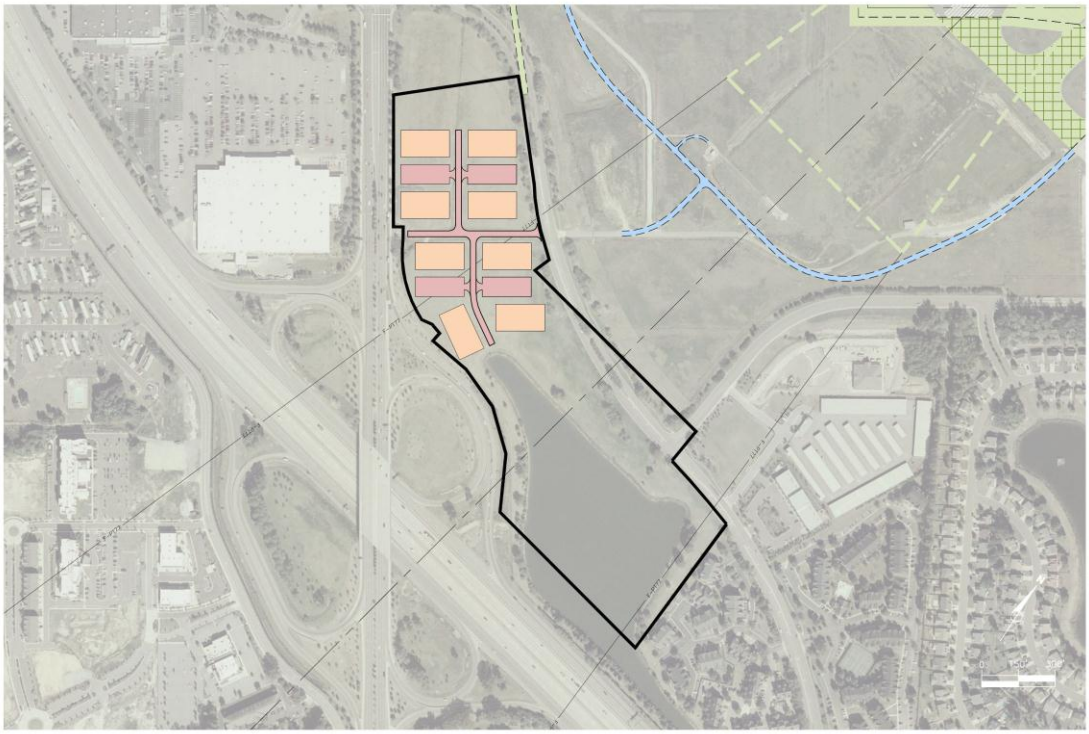
The commercial pads suggested by the CDP in Area 3 will probably take longer to develop, although continued growth along Denbigh Blvd. and future plans for improvements to Oriana Road may hasten developer interest in this location. Therefore, we have included as an input within the cash flow pro forma leasing of half the Area 3 retail property (42 acres) starting in year 5 and the other 42 acres in years 8-10. We have maintained the 50 cents per acre base lease per square foot as the starting point to be consistent with the Area 4 property.

Area 3



Area 3 is comprised of a total 253 acres, with the most feasible and desirable development sites located near Denbigh Blvd. (as shown). Much of Area 3 overlaps with potential future airside expansion and enhancements as included in the Master Plan Update and are thus not shown as generally leasable (revenue generating) property. However, self-storage units or other low density infill projects might be accommodated in there depending on future policy decisions, including but not limited to, the extension and improvement of Oriana Rd. See section 2.6.

Area 4



Area 4 contains approximately 32 total acres, with about 18 being considered suitable for retail development. The existence of a lake (lower center) and other factors constrain total leasable area, although the location is considered prime.

2.5 Solar Installation

The Conceptual Development Program included usage of Area 5, consisting of a total of 97 acres for potential utilization as a solar energy installation. The graphic that follows illustrates usage of 90 of those acres. Solar installations at airports throughout the United States are becoming increasingly popular as they can generate significant revenues or trade-offs, and are also tacitly supported by the FAA if appropriate for a particular facility. Please see Technical Memorandum 4.

Feasibility Assumptions:

A solar installation at the Airport would not necessarily conform to a basic land lease format as with the other components summarized herein. In fact it would almost certainly not. However, a land lease could certainly be part of the feasibility equation from the Airport's perspective. In fact the feasibility equation may be quite complex with consideration such as:

- Is the solar installation Airport owned, developer owned, or a joint public / private joint venture?
- Land lease rate calculated as percentage of production (typically 1% to 2%).
- Role of the Airport as a customer in a Power Purchase Agreement? In-kind power offset
- Use of Renewable Energy Credits that can offset fuel costs for airlines and be passed back to the Airport as revenue.
- Use of Tax Credits
- Use of Government Grants and Rebates
- Bond Authority / Use for Renewable Energy Programs
- Net Metering – Participation in selling energy to the grid.
- Use of covered parking to capture added-value customers / revenues

As reviewed in Technical Memorandum 4, solar energy industry professionals cite a rule of thumb calculation relative to the relationship of land use to megawatts of electric generation. Basically this rule of thumb states that one megawatt of solar power generation requires approximately 5 acres of land. Therefore, the plus/minus 90 acres of usable land located in the Area 5 will support a solar generation facility of about 18 MW and could generate approximately 20 – 30 million KW-hours annually according to industry analysts. This would be the equivalent of supplying approximately 80 - 90 single family homes with clean renewable energy. To put this into further context, most airport solar installations equal between 2 and 10 megawatts, although these projects continue to grow in size, or are being added to in subsequent development phases. These projections have been adjusted for the solar production characteristics of the Newport News area.

For use in the cash flow pro forma we have estimated total combined revenues that could accrue to the Airport on an annual basis – either directly (i.e. land lease revenue), or indirectly (i.e. through a joint venture PPA and/or power sharing agreement, in-kind power offset, energy credits, etc. In total, the aggregate financial benefit is roughly forecast to be somewhat less than $5,000 per acre per year.

Area 5

Area 5 depicts a solar installation encompassing a total of about 90 acres. A solar installation at the Airport could provide economic and financial benefits for both public and private sector partners. The completed array depicted in this plan view will probably be phased in over time, but could be undertaken as a complete installation if the financial considerations and other variables proved favorable to the Airport.

2.6 Storage Units and Other Infill

Although the Conceptual Development Program included in the Airport Master Plan Update originally illustrated the maximum use of Area 3 (see figure) in retail, commercial, office and other uses, ultimately it was decided to scale back development in the location due to future plans and contingencies associated with Airside development. In the context of a 10-year feasibility forecast (and the fact that significant land area is available) we recommend the balance of land (beyond that shown as developed near Denbigh Blvd in Area 3) be considered in the overall financial assessment of land-side development potential. In fact, over 100 acres of land remains “unprogramed” per the Master Plan Update.

STRATEGY 5

Feasibility Assumptions:

This area could accommodate self-storage units or other infill development that is difficult to project in detail as the land use and surrounding development is not expected to crystallize for a number of years. Still, for purposes of the financial assessment we have assumed 5 acres will be leased in years 5 – 7 and 20 acres in years 8 – 10 at a rate of 10 cents, per square foot, per acre per year.

Section 3: Summary Conclusions

The components of the Conceptual Development Program summarized in Technical Memorandum 4 and subject to financial analysis in this Technical Memorandum 5 do not necessarily constitute a comprehensive inventory of all projects that may be pursued by the Newport News Williamsburg International Airport and its public and private sector partners over time. Rather they represent catalyst projects for consideration of in the implementation process, geared toward maximizing the economic development potential of landside property controlled by the Airport and it various partner institutions and agencies.

Summary of Financial Feasibility Results

- Based on the assumptions, inputs and outputs contained in the primary cash flow pro forma (Table 1) the Airport could realize an increasing level of Net Operating Income over a ten year period associated with new development projects on landside property. Net Operating Income is projected at an average of about $300,000 over the first three years as investments in development activities occur and some of the catalyst projects begin generating lease revenue. Then, NOI is projected to increase steadily over the ten-year period to about $4.7 million.

- Based on a proprietary financial model that solves for supportable debt and equity associated with a development project(s) (Table 2), all components phased in over a 10 year period, and contributing projected levels of lease revenues, etc., could generate – in theory – approximately $16.9 million in minimum equity; and, approximately $7.7 million in supportable debt, for a total of $24.6 million of supportable funds.

- Based on the projected level of supportable funds, and an assumption regarding Airport investment in infrastructure or other inducements for developers ($2.5 million) the estimated Residual Land Value of Airport property designated for private development would be approximately $9.6 million. See Table 3.

- Landside development at the Airport can drive significant economic impacts including direct construction jobs associated with infrastructure alone and the annual FTE job wages that they create estimated at about $5.2 million. See Table 4.

- Direct FTE jobs associated with new project operations will also be significant. Conservative estimates of 100 jobs created would yield about $5 million in annual direct wages and salaries. The earning multiplier effect indicates that these wages and salaries would in turn result in $13 million in additional earnings that would accrue from businesses and companies in the local, regional and national economy.

In essence, the financial feasibility of pursuing development of landside property at the Newport News Williamsburg International Airport has not only been shown as viable, but capable of creating significant economic and fiscal benefits. Additional economic impact analysis will be merged with the Implementation Plan.

Findings of the financial feasibility analysis conducted by Strategy 5 LLC for various landside components as included in the Conceptual Development Plan prepared for the five focal areas provided by the Airport should be considered in conjunction with Chapter 7 of the Master Plan Update, which in turn relates to Chapter 5 of the same Plan.

Chapter 7 – Financial Feasibility – provides valuable context for the landside development recommendations involving the Airport's ability to generate future revenues sufficient to exceed projected operating and capital expenses; financial implications for PAC; enabling legislation; potential funding sources; development phasing; key programs; and, a capital projects funding plan.

Depending on a range of policy and other decisions related to the pursuit of landside development, the catalyst projects summarized in this Technical Memorandum and their ability to generate lease revenues and other economic and fiscal impacts can be significant. They can contribute to the broader capital funding plan, add to the activity and economic synergy of property surrounding airside operations, and be a meaningful participant in the future time horizon associated with the Master Plan Update.

STRATEGY 5

Table 1
Conceptual Development Projects

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenues:										
Research and Development / Tech.										
Leased Acreage	5	5	10	10	20	20	40	40	50	50
Lease Rate @ 50 cents sf / acre	$21,780	$21,780	$21,780	$21,780	$21,780	$21,780	$21,780	$21,780	$21,780	$21,780
Revenue	$108,900	$108,900	$217,800	$217,800	$435,600	$435,600	$871,200	$871,200	$1,089,000	$1,089,000
Advanced Manufacturing										
Leased Acreage	0	0	0	5	5	10	10	40	40	40
Lease Rate @ 40 cents sf / acre	$17,424	$17,424	$17,424	$17,424	$17,424	$17,424	$17,424	$17,424	$17,424	$17,424
Revenue	$0	$0	$0	$87,120	$87,120	$174,240	$174,240	$696,960	$696,960	$696,960
Warehousing and Distribution										
Leased Acreage	0	0	10	10	25	25	25	25	25	25
Lease Rate @ 30 cents sf / acre	$13,068	$13,068	$13,068	$13,068	$13,068	$13,068	$13,068	$13,068	$13,068	$13,068
Revenue	$0	$0	$130,680	$130,680	$326,700	$326,700	$326,700	$326,700	$326,700	$326,700
Commercial / Retail										
Leased Acreage	18	18	18	18	60	60	60	102	102	102
Lease Rate @ 50 cents sf / acre	$21,780	$21,780	$21,780	$21,780	$21,780	$21,780	$21,780	$21,780	$21,780	$21,780
Revenue	$392,040	$392,040	$392,040	$392,040	$1,306,800	$1,306,800	$1,306,800	$2,221,560	$2,221,560	$2,221,560
Solar Installation										
Leased Acreage	0	0	30	30	30	60	60	90	90	90
Lease Rate / Other @ 15 cents sf / acre	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534	$6,534
Revenue	$0	$0	$196,020	$196,020	$196,020	$392,040	$392,040	$588,060	$588,060	$588,060
Storage / Infill										
Leased Acreage	0	0	0	0	5	5	5	20	20	20
Lease Rate @ 10 cents sf / acre	$4,356	$4,356	$4,356	$4,356	$4,356	$4,356	$4,356	$4,356	$4,356	$4,356
Revenue	$0	$0	$0	$0	$21,780	$21,780	$21,780	$87,120	$87,120	$87,120
Total Gross Revenue	$500,940	$500,940	$936,540	$1,023,660	$2,374,020	$2,657,160	$3,092,760	$4,791,600	$5,009,400	$5,009,400
Expenses										
Departmental										
Operations	$100,000	$125,000	$150,000	$175,000	$200,000	$225,000	$250,000	$275,000	$300,000	$100,000
General & Administrative	$75,000	$100,000	$125,000	$150,000	$175,000	$200,000	$225,000	$250,000	$275,000	$75,000
Sales & Marketing	$50,000	$60,000	$70,000	$80,000	$90,000	$100,000	$110,000	$120,000	$130,000	$140,000
Annual Total Expenses	$225,000	$285,000	$345,000	$405,000	$465,000	$525,000	$585,000	$645,000	$705,000	$315,000
Net Operating Income										
Total Annual Revenues	$500,940	$500,940	$936,540	$1,023,660	$2,374,020	$2,657,160	$3,092,760	$4,791,600	$5,009,400	$5,009,400
Total Annual Expenses	$225,000	$285,000	$345,000	$405,000	$465,000	$525,000	$585,000	$645,000	$705,000	$315,000
Net Operating Income	$275,940	$215,940	$591,540	$618,660	$1,909,020	$2,132,160	$2,507,760	$4,146,600	$4,304,400	$4,694,400

Source: Newport News Williamsburg International Airport; Strategy 5 LLC; Statistcical Abstract of the United States.

Table 2
Supportable Debt/Equity

Project Cash Flow		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Airport Land Revenue		$275,940	$215,940	$591,540	$618,660	$1,909,020	$2,132,160	$2,507,760	$4,146,600	$4,304,400	$4,694,400
Total Net Operating Income		$275,940	$215,940	$591,540	$618,660	$1,909,020	$2,132,160	$2,507,760	$4,146,600	$4,304,400	$4,694,400
Annual Debt Service		$441,900	$441,900	$441,900	$441,900	$441,900	$441,900	$441,900	$441,900	$441,900	$441,900
Annual Cash Flow		-$165,960	-$225,960	$149,640	$176,760	$1,467,120	$1,690,260	$2,065,860	$3,704,700	$3,862,500	$4,252,500
Supportable Funds											
Supportable Equity:											
Required Developer Return		0%									
Supportable Equity		$16,977,420									
Supportable Debt:											
NOI YEAR 4		$618,660									
Debt Coverage Ratio		1.4									
Debt Service		$441,900									
Interest Rate	4%										
Loan Term	30										
Supportable Debt		$7,713,410									
Total Supportable Funds											
Minimum Equity[1]		$16,977,420	69%								
Supportable Debt[2]		$7,713,410	31%								
Total Supportable Funds		$24,690,830	100%								

[1] The financial model employed in this table solves for a minimum equity requirement based on cash flow after supportable debt service. The actual financing package will likely include significantly greater developer equity which may be structured in the form of loaned capital equal to as much as 30% of the debt required.

[2] The financial model employed in this table uses conventional debt financing. The actual financing package would likely use a combination of short term construction loans, low-interest industrial or economic development loans, and debt that could be structured at more favorable terms within the 30-year span.

Table 3
Financial Summary

Building Hard Costs		**Supportable Funds**	
Infrastructure (linear feet)	15,000	Minimum Equity	$16,977,420
Total Costs @ $1,000 /lf	$15,000,000	Conventional Debt	$7,713,410
Land	$0	**Total Supportable Funds**	$24,690,830
Total Development Costs	$15,000,000	**Project Costs**	$15,000,000
Estimated Project Value	$15,000,000	**Residual Land Value**	$9,690,830

Source: Strategy 5 LLC

Table 4
Airport Landside Development
Direct Development Jobs and Wages

Direct Development Jobs	
Total Development Costs	$15,000,000
Cost per Construction-related Job	$150,000
Total FTE Construction-related Jobs	100
Direct Construction-related Wages	
Total FTE Construction-related Jobs	100
Average Annual Job Wage	$52,000
Total Construction Wages	**$5,200,000**

Sources: The National Council for Urban Economic Development; *Statistical Abstract of the United States; Strategy 5 LLC .*

Table 5
Airport
Project Operations
Indirect Employment and Earnings Impact

Direct FTE Jobs	100
Indirect/Direct Relationship*	1.2:1
Indirect Jobs	120
Direct Wages and Salaries	$5,000,000
Earning Mulitplier*	2.6
Total Additional Earnings	$13,000,000
Total Indirect Earnings	$8,000,000

* Based on RIMS II model.

Source: U.S. Chamber of Commerce; Strategy 5 LLC.