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Assessing the Feasibility of an Aerotropolis Around Cleveland Hopkins International Airport, Technical Report

Claudette Robey

Cleveland State University, c.robey@csuohio.edu

Daila Shimek

Cleveland State University, dailashimek@gmail.com

James Wyles

Cleveland State University, j.wyles@csuohio.edu

Brian A. Mikelbank

Cleveland State University, b.mikelbank@csuohio.edu

Jim Robey

See next page for additional authors

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Authors

Claudette Robey, Daila Shimek, James Wyles, Brian A. Mikelbank, Jim Robey, Kevin O'Brien, and et.al.



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Report**



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Michelle Boczek

Economic Development Commissioner, City of Brook Park

Rebecca Corrigan

Executive Director, Berea Community Development Corporation

Shelley Cullins

Economic Development Officer, Grant Writer, City of Parma

John Hoose

Manager, Policy and Research/Acting Development Manager, City of Cleveland,
Department of Port Control

Roseann Jones

Economic Development Director, City of Olmsted Falls

Tom Lehman

Manager, Real Estate and Noise Abatement, Cleveland Airport System

Tracey Nichols

Economic Development Director, City of Cleveland

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ABSTRACT: *This report provides an assessment of the feasibility of developing an aerotropolis around Cleveland Hopkins International Airport, Cleveland, Ohio. The report describes the methodology used to assess the feasibility, notes the needs and expectations of community stakeholders, profiles the challenges and successes of six emerging and potential U.S. aerotropolises, and discusses the operating experiences and challenges of 12 additional U.S. airports. Further, this report describes the demographic and economic aspects of the study cities, and discusses potential target industry opportunities. The findings suggest that it is feasible to develop CLE as an aerotropolis, and that CLE may not be suited for an aerotropolis as practiced at other domestic and international airports. Rather, the concept itself may be the platform for moving forward with a defined, staged strategy for development surrounding CLE and should be viewed as an opportunity to develop the concept to specifically fit the region and its economic circumstance.*

Key Words: *Aerotropolis, airport development, airport city, airport economic development, Cleveland Hopkins International Airport, economic development*

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INTRODUCTION

The term “aerotropolis” debuted with urban planner Dr. John Kasarda, a professor at the University of North Carolina Chapel Hill (UNC). Derived from his years of researching airports throughout the world, Kasarda maintains that airports are economic assets and catalysts for development. Kasarda defines the aerotropolis as “an aviation linked urban form consisting of an airport surrounded by tens of thousands of acres of light industrial space, office space, upscale retail mix, business-class hotel accommodations, restaurants, entertainment, recreation, golf courses, and single and multi family housing.” He views airports as being similar to metropolitan central business districts, with airport cities serving as the central business district of the aerotropolis. Kasarda maintains that there are four basic drivers from which airport cities emerge:¹

1. The airport’s ability to seek revenues from other than aeronautical sources
2. The availability of affordable land for commercial activities
3. The airport’s ability to increase passenger and cargo traffic
4. The airport as a catalyst for and ability to attract business development

On May 9, 2008, Cleveland Hopkins International Airport (CLE) staff introduced the Suburban Mayors Committee to the concept of an aerotropolis. The meeting participants were asked to volunteer a designee to help develop a plan to determine the feasibility of developing an aerotropolis in Greater Cleveland. A second meeting was held in June 2008 at CLE, comprised of designees from the previous meeting. At this meeting, the group decided to take an economic development approach toward developing an aerotropolis, and focus on possibly jointly marketing the airport and the surrounding area to site selectors. The group also agreed that further due diligence was needed before developing and implementing a plan. From this group, an ad hoc Aerotropolis Exploratory Committee was formed to explore funding opportunities for planning efforts and to draft the required proposals. Economic development professionals from Berea, Cleveland, Brook Park, Olmsted Falls, Parma, and CLE volunteered to staff the committee. As such, the cities of Berea, Brook Park, Cleveland, Olmsted Falls, and Parma, and CLE engaged the Center for Public Management, Maxine Goodman Levin College of Urban Affairs at Cleveland State University, to conduct a study to examine the feasibility of developing an aerotropolis around CLE. The Center for Public Management partnered with the Northern Ohio Data and Information Service (NODIS), a Levin College data and technical assistance research center, and Team NEO, a regional economic development organization, to conduct the study. Although these jurisdictions provided representatives who actively participated in the study and served as the advisory group, data for all or part of the jurisdictions of Broadview Heights, Brooklyn, Brooklyn Heights, Fairview Park, Middleburg Heights, North Olmsted, North Royalton, Parma Heights, Seven Hills, and Strongsville were also

considered when assessing feasibility, and are included in the “study area.” Therefore, for the purposes of this research, the study area (see Figure 1) is defined as all or part of the jurisdictions of Berea, Broadview Heights, Brook Park, Brooklyn, Brooklyn Heights, Cleveland, Fairview Park, Middleburg Heights, North Olmsted, North Royalton, Olmsted Falls, Parma, Parma Heights, Seven Hills, and Strongsville. Kasarda’s drivers were considered when assessing feasibility; however, the project team also assessed feasibility based upon legal viability, geography of CLE and the study area, and governance and collaboration.

This report provides an assessment of the feasibility of developing an aerotropolis around Cleveland Hopkins International Airport, Cleveland, Ohio. The report describes the methodology used to assess the feasibility, notes the needs and expectations of community stakeholders, profiles the challenges and successes of six emerging and potential U.S. aerotropolises, and discusses the operating experiences and challenges of 12 additional U.S. airports. Further, this report describes the demographic and economic aspects of the study area, and discusses potential target industry opportunities.

The concept of the airport city as an aerotropolis is presented, along with profiles of the interviews and discussions with representatives of the American airports identified as emerging or potential aerotropolises. Cleveland Hopkins International Airport is also profiled in detail. The report includes a section on best practice models derived from interviews with 12 U.S. airports (in addition to the six emerging aerotropolises) and discussion of their plans for potential aerotropolis development. The demographic and economic profile presents an overview of population changes, as well as the occupational composition, industries and employment, and potential target industries of the study area. Legal challenges to the creation of an aerotropolis are also discussed. A synthesis of the outcomes of focus groups and interviews with stakeholders, assessing their needs and concerns, is presented in the report. The report concludes with observations on the feasibility of utilizing the aerotropolis concept to spur development activity around Cleveland Hopkins International Airport. Several appendices support the research and are published in a separate, companion report. A glossary of terms is also provided in Appendix K to guide the reader in understanding the terminology used throughout the report.

Research Methodology

Literature Review

The project team conducted research on the aerotropolis concept to identify models of emerging aerotropolises across the United States, based on the research of Dr. Kasarda. Six emerging aerotropolises were identified: Dallas-Forth Worth International

Airport (DFW), Denver International Airport (DIA), Detroit Metropolitan Wayne County Airport (DTW), Los Angeles/Ontario International Airport (ONT), Memphis International Airport (MEM), and Piedmont Triad International Airport (GSO). This research included an examination of professional trade journals and publications, academic studies, newspapers, and other modes of media (online and in print). In addition, the research included telephone interviews with representatives from the identified emerging aerotropolises to determine their overall experiences with regard to the development of an aerotropolis. Questions focused on governance, operations, development of a funding model and business incentives, and determination of the overall geography of the aerotropolis. A copy of the interview questionnaire can be found in Appendix A.

Staff also conducted research on 12 U.S. airports (in addition to the six emerging aerotropolises) to identify operating experiences and challenges, and potential plans for developing an aerotropolis. The 12 airports were determined based on input from the advisory group as those airports considered as possessing characteristics comparable to CLE. The 12 airports researched were:

- Atlanta Hartsfield-Jackson International Airport (ATL)
- Baltimore-Washington International Thurgood Marshall Airport (BWI)
- Chicago O'Hare International Airport (ORD)
- Cincinnati-Northern Kentucky International Airport (CVG)
- Port Columbus International Airport (CMH)
- General Mitchell International Airport (MKE)
- Indianapolis International Airport (IND)
- Minneapolis-St. Paul International Airport (MSP)
- Pittsburgh International Airport (PIT)
- Louisville International Airport (SDF)
- Seattle-Tacoma International Airport (SEA)
- Lambert-St. Louis International Airport (STL)

This section of the research also included an examination of professional trade journals and publications, academic studies, newspapers, and other modes of media (online and in print). In addition, the research included telephone interviews with representatives from the 12 airports. Questions focused on airport characteristics, operations and governance, funding models, business incentives, and development plans and activities. A copy of the interview questionnaire can be found in Appendix B.

Stakeholder Expectations

The project team conducted a series of focus groups to solicit input, perceptions, and concerns from citizens on the development of a proposed aerotropolis. These facilitated discussions were used to determine needs and expectations, identify perceived pros

and cons, identify property assets and challenges, and obtain input on strategies from various sectors of the community. A total of seven sessions were held with the following groups: airport tenants, community organizations, planners, freight and logistics companies, businesses (two sessions), and real estate, developers and land owners. The protocol for these sessions is included as Appendices C through H. The project team also conducted an interview with I-X Center President Robert Peterson and Facilities Director Jeremy Levine, as well as with CLE Director of Port Control Ricky Smith and his staff to solicit their input, perceptions, and concerns on the development of a proposed aerotropolis, the current relationship between the I-X Center and CLE, and to identify opportunities that might evolve with the development of an aerotropolis.

An additional facilitated session was conducted with locally-based national site selectors to obtain their experiences on the use of aerotropolises as economic development tools for attracting and retaining business around airports. The discussion included how aerotropolises are marketed and whether aerotropolises are considered more than just new airport development. The protocol for this session is included as Appendix I.

Staff additionally conducted facilitated sessions during regular project meetings with members of the advisory group, who represent the economic development leadership of the study area and CLE. These sessions were also utilized to determine needs and expectations, identify perceived pros and cons, identify property assets and challenges, and obtain input on structure, governance and operations.

Spatial Data Availability and Analysis

The Geographic Information Systems (GIS) products devised by the project team are meant to both provide an overview of the study area and the geographic context of its assets. The analyses are provided to demonstrate the types of questions that are capable of being addressed by analysis of the data. For example, if three-acre parcels were of interest rather than five, or properties that sold for one-half of the community median rather than one-quarter, then these are straightforward modifications. Moving beyond the current feasibility study, the project team envisions GIS analysis playing a critical role in the development of highest and best-use scenarios and in the targeting of economic activity for specific locations.

The spatial focus of the project included Cuyahoga County and the study area, which is the jurisdictions of Berea, Broadview Heights, Brook Park, Brooklyn, Brooklyn Heights, Cleveland, Fairview Park, Middleburg Heights, North Olmsted, North Royalton, Olmsted Falls, Parma, Parma Heights, Seven Hills, and Strongsville. A map depicting the study area is shown in Figure 1. Through an iterative process, the project team worked with the advisory group jurisdictions to determine the study area and the one-mile buffer surrounding the study area.

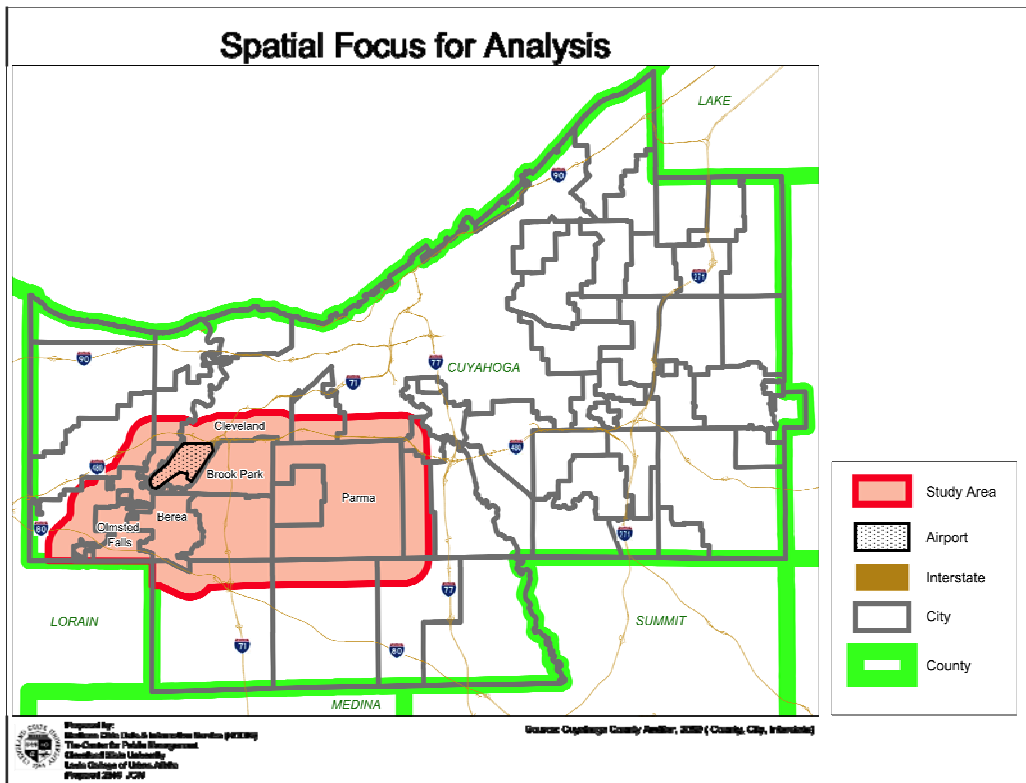


Figure 1: Study area map

The project team created, acquired, and imported spatial data layers and associated attribute databases into the GIS software. These data layers include parcel property, zoning, streets, communities, census tracts, business locations, and elevation contours. Staff digitized the study area, extending one mile outside of the jurisdictional boundaries of Berea, Brook Park, Parma, Middleburg Heights, and Olmsted Falls. The subset parcel property comprises the geography of the study area boundaries. Individual maps were produced of zoning, street network with communities, and elevation contours within the study area.

The project team relationally joined 2008 parcel property polygons to 2009 parcel attribute data acquired from the Cuyahoga County Auditor's office. Key attribute fields include permanent parcel number, owner, address, zoning class, land use code, building value, and address. Data were filtered using attribute queries to identify a subset of potential developable parcel properties from the fields of land use code, delinquency, foreclosure, and sales using the following criterion:

- Vacant: Total building value equals 0 and zoning is residential, commercial, or industrial
- Land Bank: Parcels are owned by a city in special designation (exempt land use code equals 7,000 or the property class equals B)
- Tax Delinquent: Parcels are delinquent in ALL three years (2006, 2007, and 2008)
- Foreclosures: Parcels in active foreclosure as of September 2009
- Sales: Residential one, two, or three family home sales sold at 25 percent of the median sale price for each community

Parcel properties meeting the above criterion were aggregated where the properties share a common border. The adjacent parcel properties were aggregated to form potential sites for development. Only aggregated sites that were greater than five acres were retained and mapped as potential developable sites. The advisory group reviewed the potential sites for their cities (Berea, Brook Park, Cleveland, Olmsted Falls, Parma). Based on the advisory group's detailed knowledge of their city's property, additional sites were added and some were eliminated. The developable parcel data for the remaining cities within the study area was not reviewed to ensure availability for development.

A socioeconomic and demographic profile of the study cities and surrounding counties was created using the following:

- The 5-, 10-, 15-, 20-, and 25-minute drive time areas were generated from the entrance to CLE, based upon the road class of the U.S. Bureau of the Census 2009 street network file
- Businesses are shown within the 5-, 10-, 15-, 20-, and 25-minute drive time areas from the entrance to CLE. Detailed business and demographic tables/report containing aggregates to various drive time areas were also generated
- Estimated population change at the U.S. Bureau of the Census tract level from 1990 to 2014 are shown using Claritas demographic data within the four-county 25-minute drive time
- Estimated median household income change at U.S. Bureau of the Census tract level from 1990 to 2014 are shown using Claritas demographic data within the four-county 25-mile drive time

Demographic and Economic Profile

This section of the report draws on four main data sources. The first source is the U.S. Bureau of the Census (Census) 1990 and 2000 tract-level data. This data set was used to calculate population, median age, average household size, per capita income, and median household income. For additional information about the U.S. Census, see

<http://www.census.gov/>

Claritas was used as the source for the 2009 and 2014 data, as well as the occupation data. Claritas is a set of demographic estimates and projections prepared and updated annually and projected for dates five years into the future. The updated data begins with the estimation and projection of base counts, such as total population, household population, group quarters population, households, and family households. Characteristics related to these base counts are then estimated. Households are estimated by age of householder and income; family households are estimated by income.

Income estimates and projections reflect the Census money-income definition and are produced for current dollar values. First, rates of change in median income are estimated and then 2000 Census income distributions are advanced to reflect the estimated rate of change.

Distributions of 2000 Census income are advanced to the estimated and projected years through a process that estimates the movement of households from one income category to the next based on the specific area's estimated rate of income growth. For more information, see http://en.us.nielsen.com/tab/expertise/segmentation_and_targeting/demographics

Reference USA, an InfoGroup company, was the source used for collecting the business data within this report. Reference USA provides information on small and large businesses throughout the country. The directory provides information on more than 14 million public and private businesses and organizations. Some of the data available are NAICS code, the names of company executives, sales volumes, and number of employees. Each record is examined by hand for quality and completeness. For more information, see <http://www.referenceusa.com/>

Finally, national data were obtained from the American Community Survey (ACS) for 2008 as a reference point: <http://www.census.gov/acs/www/>

Legal and Regulatory Review

The project team reviewed pertinent sections of the Ohio Revised Code to identify any issues that might impact the creation of an aerotropolis within the study area. Staff additionally reviewed the zoning regulations of the advisory group cities (Berea, Brook Park, Cleveland, Olmsted Falls, Parma) to assess potential impediments to developing an aerotropolis. Zoning regulations for the remaining cities within the study area (Broadview Heights, Brooklyn, Brooklyn Heights, Fairview Park, Middleburg Heights, North Olmsted, North Royalton, Parma Heights, Seven Hills, Strongsville) were not reviewed.

The general framework for the legal section was drawn from the legal approach of the Detroit Wayne County Airport Aerotropolis Development Plan authored by Jones Lang LaSalle. The analysis in the Detroit plan contributed to the framing of the development process section of the legal review, addressing general development concerns not specific to any one area or region. The unique characteristics of the Cleveland project were also considered. A review of the Ohio Revised Code revealed options for governance; options were then analyzed and compiled to create the governance section of the legal review. Each of the options provides benefits, as well as a general and broad spectrum of governing options.

To gather a general understanding of relevant community and land use regulations, a review was conducted of local charters and zoning codes of the advisory group cities. These resources provide the legal parameters within which these jurisdictions must operate with regard to local and regional collaborative agreements and any procedural zoning timelines that may impede the development process.

THE AEROTROPOLIS CONCEPT

Airports are more than passenger relays – they are economic engines that pump billions of dollars into local economies. Ohio’s aviation system is comprised of 166 public use airports – 106 are publicly owned and 60 are privately owned. These airports generated more than \$10.5 billion in economic activity in 2004.² Urban planner Dr. John Kasarda considers airports as cities unto themselves and has researched the dynamics of development of large cities surrounding airports.

McKinley Conway, a pilot, aeronautical engineer, and former staff member of the National Advisory Committee for Aeronautics and NASA, is credited with pioneering the idea of the airport city. From his perspective as a pilot, Conway noted a lack of coordination and planning on and surrounding airport properties. He began to visualize airport runways as the main streets of communities (“the fly-in concept”), and in 1970 published his ideas in a book entitled, “The Airport City.”³

Kasarda’s research expands this idea, viewing airports as destinations that attract clusters of business activity, such as conference and exposition centers, hotels, cargo and freight operations, restaurants, business and industrial parks, and various other retail businesses. Airport cities are the result of careful planning, according to Kasarda, developing airports as multi-modal transportation nodes and key drivers of business and commercial activities.

Kasarda conceptually likens aerotropolises to metropolises, with airport cities (the airport including its amenities) serving as the central business district of the aerotropolis (see Figure 2). Aerotropolises, notes Kasarda, have emerged because of the advantages that airports provide in a global economy. Globally competitive businesses utilize the high-speed travel of airplanes for international communication and trade, allowing companies to minimize inventories, source parts globally, and provide fast and flexible responses to customer demands. Airport transportation corridors are also becoming desired locations for regional corporate headquarters, for travel intensive professions, and high tech industries that frequently undertake long distance travel.

Aerotropolis Schematic

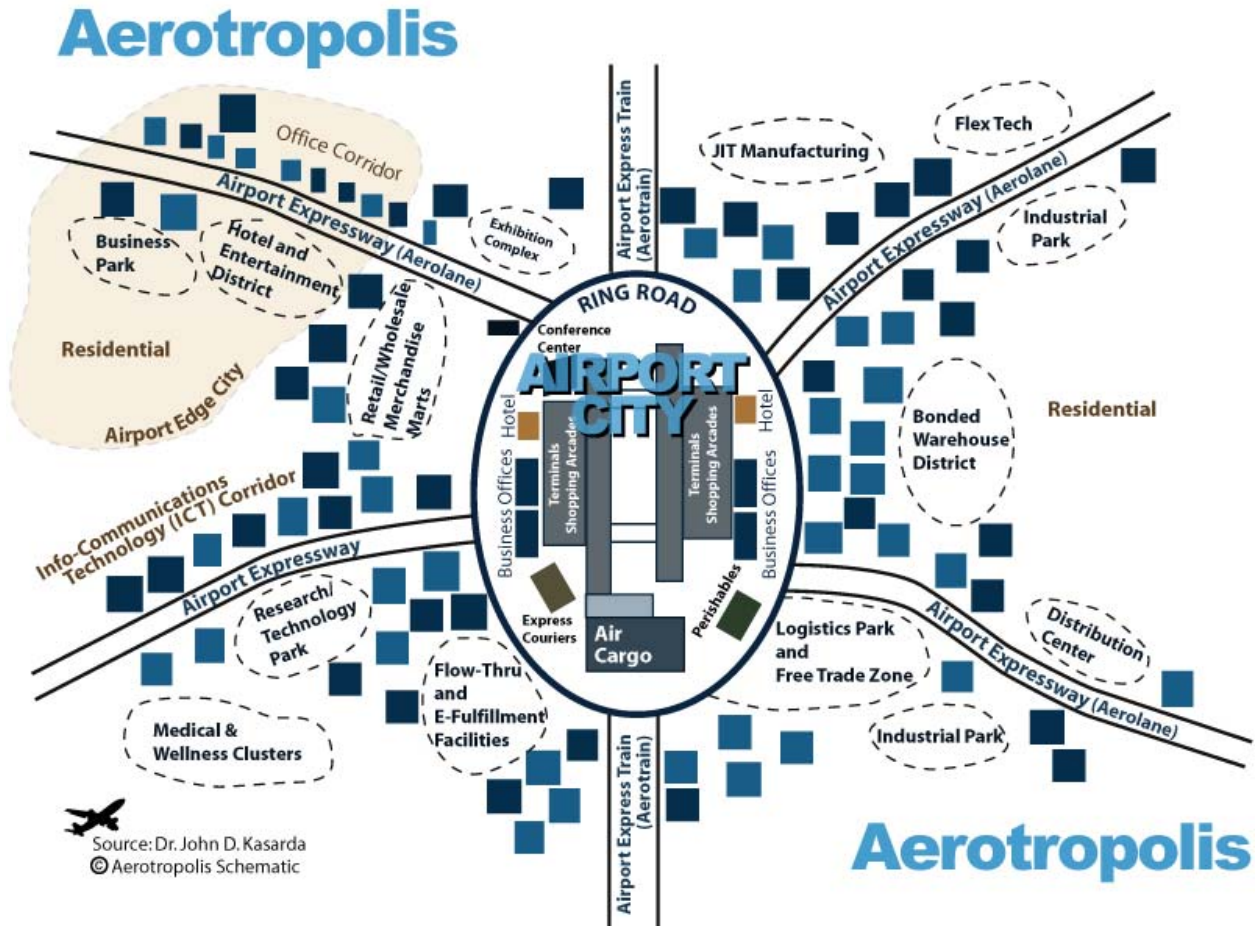


Figure 2: Aerotropolis schematic

Emerging U.S. Aerotropolises

Aerotropolises exist worldwide, with some of the most notable and widely accepted aerotropolises including Hong Kong International Airport, Incheon International Airport, and Frankfurt International Airport. Much can be learned and applied to Cleveland Hopkins International Airport from these aerotropolises, but for the context of this report, a closer examination was given to aerotropolises that exist within the United States. These six airports were either identified by Kasarda as emerging or potential aerotropolises, or self-identified as an aerotropolis. These American locations better represent the issues and challenges facing CLE. American identified, emerging, or

potential aerotropolises profiled in this study are:

- Dallas-Fort Worth International Airport (DFW)
- Denver International Airport (DEN)
- Detroit Wayne County Airport (DTW)
- LA/Ontario International Airport (ONT)
- Memphis International Airport (MEM)
- Piedmont Triad International Airport (GSO)

A summary of the six emerging aerotropolises is provided here, with detailed profiles of each beginning on page 20. Staff utilized data for the most current year available (2008 or 2009). Because three of the six airports have not correlated development activities with the aerotropolis concept in mind, aspects common to all are difficult to assess. However, these airports do share (all or in part) common traits, as seen in Table 1 and Table 2. CLE characteristics are also noted in Table 1 and Table 2, and are outlined in the next section of this report in Table 3, along with those of the additional 12 U.S. airports.

One overarching trait identified as common to all six emerging aerotropolises is the ability of these airports to plan, market, and sustain an ongoing dialogue on connectivity between the airport and its surrounding communities. Whether that dialogue centers on land use and development, communications and technology, traffic and transportation networks, or cargo and passenger accessibility, these airports have continued to collaborate with their communities and strategize for anticipated growth.

Summary

Three of the six airports currently have no formal plans to develop as an aerotropolis – DFW, DEN, and ONT; however, these three airports all have plans for further onsite and offsite expansion and development. All six airports are also the focus of economic development strategies within their regions and all six have available land for development. Aerotropolis development plans are currently underway for DTW, MEM, and GSO. The spatial focus for these three emerging aerotropolises varies. The DTW aerotropolis encompasses 60,000 acres. MEM has defined a 25-mile radius surrounding the airport as its aerotropolis. The geographic scope of the GSO aerotropolis is a 12-county region.

The airport member communities currently provide funding for the DTW aerotropolis, while the MEM aerotropolis is currently supported by grants from the Memphis City Council. GSO's aerotropolis development was funded through a Workforce in Regional Economic Development (WIRED) grant and a current initiative to raise \$7 million in private dollars over the next 30 years.

The six airports have coordinated economic development activities and have identified specific industries for business attraction. Three – DTW, MEM, and GSO – have identified specific industries as part of their aerotropolis development plans. DTW aerotropolis efforts target businesses that focus on transportation, supply chain or shipment services, while targeted industries for the MEM aerotropolis are those relative to tourism and logistics. GSO's approach targets advanced manufacturing, creative enterprises and the arts, health care, logistics, and distribution.

Although having no formal aerotropolis plans, DFW focuses on air cargo distribution businesses, retail, and transit-oriented development. Attraction efforts also include management, business and financial operations, computer and mathematical, and architectural and engineering types of businesses. DEN's strategy targets aviation manufacturing and transportation, aeronautical, renewable energy, and technology types of businesses, while ONT focuses on logistics and distribution industries.

Flight operations were heavy for four of the six airports (DFW, DEN, DTW, MEM) in 2009, with activity at DFW and DEN being nearly three times that of CLE that year (Table 1). DFW, DEN, and ONT have the largest capacity for maximum flight arrivals and departures per hour, yet capacity at DTW and MEM is also significant. DFW ranges from 270-279 arrivals/departures per hour, DEN from 210-219 per hour, and ONT with 200 per hour. GSO follows at 115 arrivals/departures per hour; CLE's maximum capacity is 80-80 arrivals/departures per hour.

Three of these airports operate the largest number of passenger airlines -- DFW operates with 18 airlines, while DEN and DTW each operate with 16 airlines. MEM and ONT operate with nine airlines, as does CLE, with GSO currently at seven. Of the six airports, ONT and GSO do not currently offer international passenger flights; CLE does operate international flights for passenger travel. The FAA ranked DFW and DEN as two of the top five airports in the U.S. (in 2008) for passenger enplanements. DTW ranked 14th that year, with MEM at 36th, ONT at 56th, and GSO at 86th. CLE was ranked just above MEM in 2008, at 34th.

Cargo operations were heaviest at MEM in 2008, ranked by the FAA as first (out of 120 qualifying cargo airports) in the U.S. for landed cargo. Also that year, DFW (ranked 11th) and ONT (ranked 12th) shared prominent FAA rankings in landed cargo. GSO ranked in the top 50 percent at 56th, while CLE ranked 65th of U.S. airports for landed cargo. Of the six airports, all but GSO relay cargo to international destinations. CLE currently does not utilize international flights for cargo transport.

Passenger facility charges – fees assessed to enplaning passengers using the airport – were the same in 2009 at four of the six airports, as well as CLE. DFW, DEN, DTW, ONT, and CLE assessed a \$4.50 per passenger fee, while MEM and GSO did not

assess passenger facility fees. Landing fees varied at each of the six airports and CLE. A landing fee is a fee paid by the airline to the airport per 1,000 pounds every time a plane lands. Landing fees in 2009 were highest at DFW (\$4.37 per 1,000 pounds) and at CLE (\$3.50 per 1,000 pounds). Second highest landing fees of the six in 2009 were DTW at \$2.83, ONT at \$2.76, and DEN at \$2.73. GSO and MEM ranked lowest, with GSO assessing a landing fee of \$1.61 and MEM at \$1.42.

DFW's operating costs in 2008 were highest of the six at \$566 million; operating revenues exceeded costs that year, at \$627.2 million. Operating expenses for DEN in 2008 were \$373.8 million, with the airport yielding revenues of \$570.8 million. DTW's operating expenses exceeded that of revenues in 2008; DTW's expenses were \$360 million, while revenues were \$291 million. This was the same for CLE in 2008; operating expenses were \$129.1 million, with revenues at \$111.4 million. The remaining three airports yielded more in revenues in 2008 than expended in operating costs. MEM's operating expenses were \$51.9 million and revenues were \$111.5 million; ONT's operating expenses were at \$80.4 million, with revenues at \$90.8 million; and GSO's operating expenses were \$21 million, with revenues at \$27.5 million.

Table 1: CLE and airport city operations and financial data

	Total operations per year (2009)	Capacity (arrivals & departures/hr)	FAA cargo ranking (2008)	Cargo, landed weight (2008, million lbs)	International cargo	FAA passenger ranking (2008)	Enplanements (2008, in millions)	Number of passenger airlines	International (passenger) flights	Average landing fees ¹ , 000 lbs (2009, signatory airlines)	Passenger facility charge (2009)	Airport operating revenue (2008, in millions)	Airport operating expenses (2008, in millions)
Operations and financial data													
Cleveland (CLE)	200,272	80-80	65	376	no	34	5.4	9	yes	\$3.50	\$4.50	\$111.4	\$129.1
Airport City													
Dallas/Ft Worth (DFW)	638,782	270-279	11	3,228	yes	4	27.2	18	yes	\$4.37	\$4.50	\$627.2	\$566.0
Denver (DEN)	611,888	210-219	22	1,250	yes	5	24.3	16	yes	\$2.73	\$4.50	\$570.8	\$373.8
Detroit (DTW)	432,589	184-189	35	708	yes	14	17.0	16	yes	\$2.83	\$4.50	\$291.0	\$360.0
Memphis (MEM)	339,007	148-181	1	19,500	yes	36	5.4	9	yes	\$1.42	none	\$111.5	\$51.9
Ontario (ONT)	99,254	200-200	12	2,700	yes	56	3.0	9	no	\$2.76	\$4.50	\$90.8	\$80.4
Piedmont (GSO)	82,186	115	56	463	no	86	1.1	7	no	\$1.61	none	\$27.5	\$21.0

Table 2: CLE and Airport City Characteristics

	Self defined aerotropolis?	Aerotropolis/airport city governance	Size of aerotropolis	Aero targeted industries	Aero funding resources	Number of runways	Runway size (ft.)	Size of airport property (ac.)	Room for expansion?	Airport miles to downtown
Cleveland (CLE)	N/A	N/A	N/A	N/A	N/A	3	6,012; 9,000; 9,856	1,900	Y	10
Airport City	Characteristics									
Dallas/Ft Worth (DFW)	N	N/A	N/A	N/A	N/A	7	1 at 8,500; 1 at 9,000; 1 at 9,300; 4 at 13,400	17,920	Y	24 ¹ ; 26 ²
Denver (DEN)	N	Metro Denver Aviation Coalition (private/public)	N/A	N/A	N/A	6	5 at 12,000; 1 at 16,000	33,920	Y	31
Detroit (DTW)	Y	Aerotropolis Development Corp	60,000 acres	Businesses that focus on transportation, supply chain, or shipment services	Member communities	6	3 at 8,500; 2 at 10,000; 1 at 12,000	6,400	Y	22
Memphis (MEM)	Y	Memphis Aerotropolis Steering Committee	25 mile radius around MEM	tourism and logistics	Grants from Memphis City Council	3	9,000; 9,320; 11,120	3,900	Y	9
Ontario (ONT)	N	N/A	N/A	logistics, distribution	N/A	2	10,200; 12,200	1,700	Y	35 ³
Piedmont (GSO)	Y	Aerotropolis Leadership Board	12-county region	Advanced Manufacturing Enterprises and the Arts Health Care Logistics and Distribution	WIRED Grant, \$7 million in private dollars	3	8,380; 9,000; 10,001	4,000	Y	N/A

¹ to Dallas, TX

² to Fort Worth, TX

³ to downtown Los Angeles, CA

Incentives of Emerging Aerotropolises

Incentives among the six U.S. emerging aerotropolises were reviewed to identify the types of airport-specific incentives that are being used by communities to encourage economic development around airports. Incentives included tax credit programs, tax abatement programs, tax increment financing zones, and enterprise zones. These incentives are not specific to aerotropolis initiatives, but are statewide economic development programs applied within the aerotropolis geography. Many of the airports also used their authority to issue bonds to fund infrastructure projects and economic development efforts. Foreign trade zones (FTZs) were also identified at each

aerotropolis either on airport grounds or within close proximity. Four of the six aerotropolises studied (Detroit, Denver, Memphis, and Piedmont) have created an organization comprising public and private leaders to advocate for their airports and assist with planning and economic development efforts. These organizations also offered “fast track” services to help companies expeditiously obtain permits, zoning variances, and funding.

Three of the aerotropolises studied, Detroit, Dallas, and Memphis offered types of economic development tools specific to airport development. In Detroit, the Aerotropolis Development Corporation is working with legislators to gain the authority to offer tax incentives to businesses. Currently, the Michigan House of Representatives is reviewing legislation that would introduce several new aerotropolis-related concepts into existing economic development incentive legislation for the purpose of attracting and retaining a critical mass of qualified aerotropolis businesses (QABs) around major Michigan airports. QABs are defined as new businesses to the region that focus on transportation, supply chain, or shipment services. Currently, this is the only aerotropolis where this type of specialized economic development legislation was found. The legislation would allow for the creation of up to 10 Next Michigan Development Corporations (NMDCs). The corporations must comprise at least two local governments, one of which must be a county.

In Dallas, the airport has entered into an interlocal agreement with its host cities to encourage economic development at DFW. The agreement provides for sharing of certain tax revenues attributed to property within the airport boundaries. Host cities receive one-third of local property tax revenue from developments, with the remaining two-thirds being shared by the cities of Dallas and Fort Worth. This agreement encourages the surrounding communities to work with the airport on economic development activities and helps to create an anti-poaching environment.

In Memphis, one of the major tools used to cultivate an aerotropolis around MEM is the Memphis-Shelby County Payment in Lieu of Taxes (PILOT) program. This tax incentive program provides approved companies with a property tax freeze. This enables qualifying companies to develop or expand operations, but pay taxes based on the value of the land before it was developed, rather than paying based on the land value with the improvements or additional development. FedEx received this incentive when it expanded in 2005. Tennessee also enacted a bill to exempt from sales taxes aircraft lubricants, repair parts, accessories, and simulators used by airport-related businesses.

Pending Federal Aerotropolis Legislation

At the federal level, legislation was recently introduced on May 6, 2010 by Congressman Steve Cohen from Tennessee. It is entitled the Aerotropolis Act of 2010 (H.R. 5236). Congressmen John Dingell and John Conyers from Michigan cosponsored

the bill. If enacted, the legislation would ensure funding eligibility for aerotropolis transportation system projects under the Federal Highway Administration's Projects of National and Regional Significance Program. The bill defines an aerotropolis transportation system as "a planned and coordinated multimodal freight and passenger transportation network that, as determined by the Secretary, provides efficient, sustainable, and intermodal connectivity to a defined region of economic significance centered around a major airport." For a project to qualify, it does not need to be in a self-defined aerotropolis region. Instead, the project's eligibility is determined by the Secretary of Transportation based on the aerotropolis definition above.⁴ The bill is currently being reviewed by the Subcommittee on Highways and Transit.

Profiles of Emerging Aerotropolises

The six airports are profiled in detail with regard to general descriptive characteristics, governance, structure and operations, funding, business incentives and economic development activities, and characteristics unique to each.

Dallas/Fort Worth International Airport (Dallas-Fort Worth, TX)

- DFW does not currently identify as an aerotropolis, but embraces the concept
- DFW owned jointly by the cities of Dallas and Fort Worth, and is located within four other cities (host cities)
- DFW, its host cities, and the cities of Dallas and Fort Worth signed an interlocal agreement that provides for revenue tax sharing of property within airport boundaries (host cities receive one-third while Dallas and Fort Worth share the remaining two-thirds)
- DFW is operated by a 12-member Board of Directors (seven from Dallas, four from Fort Worth, and one non-voting member from one of the four cities is filled on an annual, rotating basis)
- No one source for tax incentives in the region; incentive packages vary widely by community

Characteristics/Description

The Dallas/Fort Worth International Airport (DFW) is located in Texas between the cities of Dallas and Fort Worth. The two cities are part of the Dallas-Fort Worth-Arlington, TX metropolitan statistical area (MSA).⁵ Because DFW has not identified itself as an aerotropolis, there is no defined aerotropolis geography. DFW is, however, the primary commercial airport serving the metropolitan area. There is one other⁶ commercial airport in the area, Dallas Love Field, as well as multiple general aviation airports.⁷ The Dallas-Fort Worth-Arlington MSA is one of the fastest growing metropolitan areas in the United States (U.S.) according to the Census Bureau. The 2009 population of the MSA

is estimated to be 6.4 million making it the fourth largest metropolitan area in the U.S.⁸ The MSA encompasses 9,104.7 square miles and 12 counties.⁹

DFW is one of the largest airports in the United States at a total of 17,920 acres, and has the largest number (seven) of non-intersecting runways in the world. The airport has five parallel runways running east to west and two diagonal runways. Runway lengths are as follows: four are 13,400 feet; the remaining are 9,300 feet, 9,000 feet, and 8,500 feet.¹⁰ According to DFW's 2007 Business Activity Report, it remains the only airport in the world able to land four aircraft simultaneously.

DFW has 18 passenger airlines, of which 11 are domestic and seven are foreign. There are also 21 domestic and international cargo airlines. DFW has the capacity in optimal weather conditions for between 270 and 279 arrivals and departures per hour.¹¹ In 2009, DFW had 638,782 flight operations (an average of 1,750 per day).¹² There were 27.2 million enplanements and 3.2 billion pounds of landed weight at DFW in 2008. In 2008, the Federal Aviation Administration (FAA) ranked DFW fourth in the U.S. for total passenger enplanements and 11th in the United States for total landed weight.¹³

The "DFW Detail" published by the Dallas Regional Chamber of Commerce in 2009 reported that there were 25 Fortune 500 companies located in the North Texas area and more than 1,500 regional and corporate headquarters.¹⁴ The gross domestic product (GDP) for the region reached \$318 billion in 2008. The civilian labor force of the MSA in 2008 was three million with only a five percent unemployment rate. The report also found that there were a total of 145,000 businesses operating in the region. The top four occupation groups of the MSA are management, business and financial operations, computer and mathematical, and architectural and engineering.¹⁵

DFW is viewed as the economic engine of the MSA. Concentrated development sprawls out from the airport in all directions. When the airport property was purchased in 1966 much of the land between Dallas and Fort Worth remained underdeveloped. With businesses and families now wanting to move closer to the airport, the land between the two cities is being rapidly developed. The two cities have grown into each other and now have intertwined economies and cultures. The once rural cities between Dallas and Fort Worth have benefited from the location of the airport as real estate development and economic development in these communities has exploded.¹⁶

One of the most recognizable developments is Las Colinas, a planned community in close proximity to DFW known for its corporate offices, luxury hotels, and landmark office towers. An economic impact study conducted by the Texas Department of Transportation in 2005 found that DFW has an estimated annual economic impact of \$16.6 billion and an estimated jobs impact of 305,000 in the region with a total payroll estimated at \$7.6 billion.¹⁷ DFW directly employs 60,000 people. There are 100 retail tenants and more than 120 food and beverage tenants at the airport. Also, there are

more than 200 freight forwarders and customs brokers located at the airport.¹⁸

Structure/Operations

DFW is jointly owned by the cities of Dallas (64 percent) and Fort Worth (36 percent) and is operated by the DFW board of directors. The site was purchased by both cities in 1966. The airport is located within the cities of Coppell, Euless, Grapevine, and Irving (host cities). The airport has entered into an interlocal agreement with the host cities to encourage economic development at DFW. The agreement provides for sharing of certain tax revenues attributed to property within the airport boundaries. Host cities receive one-third of local property tax revenue from developments with the remaining two-thirds being shared by Dallas and Fort Worth.¹⁹

DFW's board of directors is composed of 12 members, 11 of who are appointed by the city councils of the airport's two owner cities. Seven members represent the city of Dallas and four members represent the city of Fort Worth, in accordance with each city's ownership interest in the airport. In order to facilitate communication between the airport and its neighbors, a 12th, non-voting board position representing one of the airport's four neighboring cities is filled on an annual, rotating basis.²⁰

The cities of Dallas and Fort Worth purchased excess land for the future expansion and development of the airport. By the mid 1990s, DFW established a real estate division to plan and develop 5,000 acres of land.²¹ Although DFW has not identified itself as an aerotropolis, it is interested in the theory. DFW's CEO stated, "I believe in the concept and the theory of how cities are developed around airports, and the aerotropolis is a valid development...It's an interesting concept, and we're interested in doing it not only to generate airline and cargo business, but all the revenue we generate from non-airline sources lowers our cost structure. That reduces the cost of the airport to airlines."²² DFW is planning and developing its land under the direction of the DFW planning department and the commercial development department.²³

The commercial development department's mission statement is to remain "committed to generating and increasing non-airline revenues by leasing and developing the airport's real estate for aviation-related users and concurrent commercial development. This commitment will assist in expanding economic benefits to the airport's owner cities, Dallas and Fort Worth; enhancing opportunities for disadvantaged/minority and women-owned business enterprise participation at DFW; growing the airport's core business of air service; and producing revenue to offset the airport's costs and lower the cost per enplaned passenger."²⁴

The commercial development department has produced three million square feet of leasable commercial facilities and distribution centers on airport grounds. The commercial facilities and distribution centers are currently leased by 200 freight

forwarders and customs broker companies.²⁵ The commercial development department continues to look for development opportunities. Specifically, it is interested in recruiting air cargo distribution businesses, freeway retail businesses, and transit oriented development. Currently there are four large-scale mixed-use projects planned for the airport: Passport Park, Southgate Plaza, Beer Creek Office Park, and Belt Line Station. The Belt Line Station is part of a larger Dallas Area Regional Transit light rail train project that will connect the cities of Dallas and Fort Worth to the airport.²⁶

The total operating revenue of DFW in 2008 was \$627.2 million. Airline revenue was only 33 percent while non-airline revenue was 67 percent. The main non-airline revenue streams were passenger facility charges, parking, concessions, and commercial development.²⁷ In 2009, the average landing fee at DFW was \$4.37 per 1,000 pounds, and the facilities use charge per passenger was \$4.50.²⁸ DFW is dedicated to expanding its non-airline revenues. In 2007, DFW entered into a natural gas exploration effort with the Chesapeake Energy Corporation. As part of the agreement, DFW received \$186 million in initial bonuses and will continue to receive a 25 percent revenue-sharing royalty on all natural gas produced from the airport's leasehold.²⁹

Texas does not have a personal or corporate state income tax, state property tax, or a unitary state tax. Texas is also a right to work state with only five percent of its workforce unionized.³⁰ The state has several grant, fund, and bond programs for workforce training and job creation. The favorable tax structure and work environment in Texas has helped the region attract and retain 23 Fortune 500 Companies.³¹ Although the state does not assess a property tax, local communities do have the right to assess local property taxes. The local property tax is the largest single funding source for community services in Texas. Local communities will, however, offer tax abatements to eligible properties to encourage businesses to invest and/or expand. Local communities also have the ability to create tax increment financing districts to publicly finance projects. There is no one source for tax incentives in the region. Incentive packages awarded to businesses around DFW vary widely by community. The region is also the grantee of four foreign trade zones, one of which is located at DFW.³²

Denver International Airport (Denver, CO)

- DEN does not currently identify as an aerotropolis, but embraces the concept
- DEN is owned and operated by the city of Denver, with management, operation and control of the airport overseen by the city's Department of Aviation, and guided by an airport manager and the senior management team
- The Department of Aviation has the authority to issue bonds or other financial obligations
- A public/private sector, 47-member group (Metro Denver Aviation Coalition) was

- formed to guide economic development for DEN and surrounding airports
- Metro Denver Aviation Coalition focuses attraction and development for DEN across the seven-county Metro Denver region (DEN and its three reliever airports are included)
 - “Fast track” services are offered to help companies expeditiously obtain permits, zoning variances, and funding

Characteristics/Description

The Denver International Airport (DEN) is located in the city and county of Denver, Colorado. DEN is the largest airport in the United States, encompassing 33,920 acres. DEN has not identified itself as an aerotropolis and has not identified an aerotropolis area. DEN is, however, the primary commercial airport serving the Denver metropolitan statistical area (MSA). There are also three reliever airports in the region, Centennial Airport (APA), Front Range Airport (FTG), and Rocky Mountain Metropolitan Airport (BJC). Metro Denver region includes seven counties across 4,531 square miles, and has a population of 2.83 million.³³ Planners designed the airport in 1990 to have ample room for both airport expansion and commercial development. The airport has six runways including the longest runway in the United States at 16,000 feet. The remaining five runways are 12,000 feet long. Four runways are parallel and run north/south; the others are also parallel and run east/west.³⁴

DEN is home to 16 scheduled commercial passenger airlines, not including regional carriers and charters. The airport offers service to more than 140 destinations with nonstop service to 19 international destinations in Europe, Canada, Mexico, and Central America. DEN also has seven scheduled cargo airlines.³⁵

DEN handled 611,888 flight operations in 2009, or an average of 1,676 flight operations per day. DEN has the capacity in optimal weather conditions for 210 to 219 arrivals and departures per hour.³⁶ In 2008, DEN had 24.3 million passenger enplanements and 1.3 billion pounds of landed weight. That year, the Federal Aviation Administration (FAA) ranked DEN fifth in the U.S. for passenger enplanements and 22nd for landed weight of cargo.³⁷

DEN has made a large investment in its cargo infrastructure. A 39-acre cargo ramp allows cargo planes to park, load, and unload next to airport cargo facilities. The cargo facilities are located at the south end of the airport with a total of 375,000 square feet of operating space in five cargo buildings. The United States Postal Service, DHL, UPS, Fed Ex, and United Airlines lease the five cargo buildings. In addition to these five buildings, there is a joint-use belly-cargo building for passenger airlines that carry cargo. Passenger airlines comprise a significant portion of the airport's air cargo trade. In 2008, 25 percent of DEN's air cargo flew on passenger flights. DEN also has facilities for freight forwarders. West of the cargo facilities are two 50,000 square foot buildings

called WorldPort at DEN. The facilities offer space to freight forwarders, customs brokers, and other businesses that contribute to an efficient air cargo operation in Denver. There are 50 freight forwarders within 20 miles of the airport. The WorldPort at DEN and the five cargo facilities are part of a designated Foreign Trade Zone. DEN also has U.S. Customs and U.S. Department of Agriculture clearance services on airport grounds.³⁸

Aviation is identified as one of the key industry clusters in Metro Denver. In 2008, the Metro Denver Economic Development Corporation (Metro Denver EDC) conducted the “Aviation Industry Cluster Profile.” It defined the aviation industry to include companies that manufacture aircraft and provide air transportation services. More than 800 businesses in Colorado are involved in the aviation industry. Of those businesses, 470 were located in the Metro Denver Region. Aviation companies employ about 1.1 percent of the region’s total employment base. Within the Metro Denver Region, 81.8 percent of the total aviation employment is concentrated in the city and county of Denver. The regional aviation payroll was nearly \$734 million in 2007.³⁹

In 2008, the Colorado Division of Aeronautics completed the “Economic Impact of Airports in Colorado.” The report found that DEN is home to more than 180 tenants. Tenants were grouped into one of three categories: aviation, concessions, or government. Aviation tenants (airlines, ground handling, and fixed-based operators) accounted for 16,037 jobs. Concession tenants (retail stores, food and beverage businesses, rental car companies, parking and ground transportation companies) account for 7,608 jobs. Government tenants, including the FAA, Transportation Security Administration (TSA), and other organizations, accounted for 2,185 jobs. The report found that the total estimated economic impact of DEN was nearly \$22.3 billion. In addition, the airport has an estimated jobs impact of 217,459.⁴⁰ There is over 173,000 square feet of retail space at the airport. In 2008, DEN’s concessions program generated over \$252 million in gross sales.⁴¹ As of March 2009, DEN had 70 food and beverage tenants, 60 retail tenants, and 23 services tenants.⁴²

Denver International Airport was constructed in a largely rural area, so development of residential land uses could be planned in a way that would not restrict airport operations. Denver and Adams County adopted an intergovernmental agreement with the goal of minimizing DEN noise impacts by restricting residential development in the immediate vicinity of the airport and promoting compatible uses. Much of the land surrounding DEN remains rural to this day with agricultural land uses. Besides some development at the entrance to the airport, significant commercial development does not begin until more than six miles away along freeways I-70, I-76, and I-270.⁴³

Structure/Operations

The city of Denver owns and operates DEN. Under the city charter, the management, operation, and control of DEN are delegated to the city's Department of Aviation. The mayor of Denver appoints a manager to direct the Department of Aviation, and the manager reports directly to the mayor. Under the airport manager is a senior management team that is comprised of seven deputy managers. The Department of Aviation has been designated as an enterprise by the city of Denver. As an enterprise, the department has the authority to issue its own bonds or other financial obligations in the name of the city, payable solely from revenues derived or to be derived.⁴⁴

User fees are the sole source of funding for DEN's day-to-day operations and development projects. These funds are principally generated through direct charges such as rents and fees collected from the airlines, tenants, and passengers. Total operating *revenues* in 2008 were \$570.8 million, a two percent increase from 2007. Total operating *expenses* were \$373.8 million, an increase of 29 percent from 2007. The increase in total operating expense is attributable to increases in personnel costs, maintenance costs, train and shuttle expenditures, and construction/repair costs. Total outstanding liabilities in 2008 were \$4.2 billion, mainly in the form of revenue bonds and paper notes.⁴⁵ Landing fees in 2009 were \$2.73 per 1,000 pounds for signatory airlines. The passenger facility charge at DEN in 2009 was \$4.50.⁴⁶

DEN was built on a 53-square mile piece of land to accommodate both future airport expansion and commercial development. Shortly after its opening, the Denver International Airport Partnership (DIA) was formed to promote development opportunities around the airport. Then on January 1, 2008, the DIA consolidated with the Metro Denver EDC to form the DEN Leadership Committee (DENLC). The DENLC worked to advance the economic potential of DEN, as well as to promote aviation-related job growth in the Metro Denver Region.⁴⁷

In 2009, the Metro Denver Aviation Coalition (MDAC) replaced the DENLC. The MDAC is an evolution of the former DENLC with an expanded focus that targets three key areas including the Denver International Airport, Metro Denver's three reliever airports and the general aviation airports, and promoting a public policy conducive to economic development. The MDAC members provide public and private-sector advocacy and support in such areas as job growth planning, route expansion and retention, infrastructure development, and development on and around the airport. The MDAC also informs decision makers and the public about the importance of maximizing the economic potential of Colorado's aviation industry.⁴⁸

The 47-member MDAC comprises a broad spectrum of leaders from both the private and public sectors, including leadership from DEN, the region's reliever airports, Denver economic development officials, and local business leaders. The coalition receives

funding from its parent organization the Metro Denver EDC. Funding for the Metro Denver EDC comes primarily from private-sector investors, as well as participating cities and counties.⁴⁹

The MDAC identified six initiatives for the 2009 fiscal year. The initiatives include supporting international route expansion, identifying and seeking opportunities for facilities development on and around the airport, providing advocacy and support for access and transportation solutions to the Denver International Airport, identifying and communicating aviation-related regulatory issues, educating the public on the MDAC's mission and activities, and actively recruiting and retaining membership.⁵⁰

Although DEN has not identified itself as an aerotropolis, the MDAC has defined its service area as the seven-county Metro Denver region. The MDAC considers not only the Denver International Airport but also its three reliever airports as part of the DEN aviation system. The MDAC is actively attracting aeronautical, renewable energy, and technology jobs to the region in a sustainable cluster development approach.⁵¹

Metro Denver has an array of economic development incentives. In the city and county of Denver there are three foreign trade zones, one of which is located on airport grounds. In addition, the state of Colorado provides incentives that focus on job creation, employee training, tax rebates, expedited permitting and licensing, and infrastructure improvements. Most of the incentives are granted on a case-by-case basis depending on the type of company, the number of employees, wages, and location of the project.⁵²

The state of Colorado provides performance-based incentive payments to qualifying companies that have created net new jobs that pay above average wages, and also offers customized training grants. Local governments offer sales and use tax rebates, personal property tax rebates, and expedited permitting and licensing programs as incentives. Each local government's incentive programs are based on the policies of the individual local jurisdiction. Some local governments, including the city and county of Denver, also administer Enterprise Zones.⁵³

In 2008, Colorado Governor Ritter signed into law a significant economic development package to enhance the competitiveness of Colorado and its top industries. Major components of the package include simplifying Colorado's corporate income tax structure through a single factor apportionment, allowing companies to pay taxes based solely on their sales within the state. The package also raised Colorado's business personal property tax exemption from \$2,500 to \$7,000 over the next five years.⁵⁴

Detroit Wayne County Airport (Detroit, MI)

- DTW identifies as an aerotropolis
- DTW currently defines its aerotropolis geography as a 60,000-acre area, encompassing two airports, a portion of seven cities and townships, and two counties
- DTW is owned and operated by the Wayne County Airport Authority, and managed by a seven-member Board of Directors (four appointed by the county executive, two by the governor, and one by the county commission)
- DTW's aerotropolis development was a staged collaborative process occurring over time –
 - Initially seven local jurisdictions, two counties and the airport authority signed a memorandum of understanding to advance the aerotropolis concept
 - Formed a 35-member task force to take the concept to implementation (representatives from the airports, communities, state, region's businesses); divided into five committees to address aerotropolis goals
 - Currently, nine jurisdictions (seven cities and townships, and two counties) signed the Aerotropolis Development Corporation inter-local agreement; all jurisdictions are within the designated aerotropolis geography
 - ADC completed two of its six identified critical tasks, with remaining four being to develop a business attraction strategy, develop a marketing communications and outreach plan, establish a permanent governance structure, and develop operations processes
- Funding model – members pay a fixed entry fee and annual fee
- Detroit Aerotropolis Development Corporation working with state legislators to offer tax incentives to businesses seeking to locate or expand around major Michigan airports

Characteristics/Description

The Detroit Aerotropolis is located in Southeast Michigan in the Greater Detroit Metropolitan Area. The Detroit Aerotropolis includes two airports, Detroit Metropolitan Wayne County Airport (DTW) and Willow Run Airport (YIP). The two airports are located just seven miles from each other.⁵⁵

The size of the Detroit aerotropolis is evolving. The Detroit Region Aerotropolis Strategic Development Master Plan completed by Jones, Lang, LaSalle in 2008 originally defined the aerotropolis as a 60,000-acre area. The defined area encompassed the two airports in a rectangular shape and followed major roadways. The area includes a portion of seven cities and townships and two counties.⁵⁶ Currently, leaders of the aerotropolis are considering expanding the defined area to include the

entire geography of the seven member cities and villages. If expanded, the Detroit aerotropolis region could cover as much as 162.4 square miles or more than 100,000 acres.⁵⁷

DTW is the primary passenger and cargo airport of the Detroit aerotropolis. DTW has six runways: three of the runways are 8,500 feet long, two are 10,000 feet long, and one is 12,000 feet in length. There are 16 scheduled passenger airlines and two scheduled cargo airlines operating at DTW. In 2009, DTW had 432,589 flight operations or an average of 1,185 per day.⁵⁸ DTW's capacity in optimal weather conditions is between 184 and 189 arrivals and departures per hour.⁵⁹ In 2008, DTW had approximately 17 million enplaned passengers and 707.5 million pounds of cargo (landed weight). That year, the FAA ranked DTW 14th in the U.S. for passenger enplanements and 35th in the nation for total landed weight of cargo.⁶⁰ In 2009, the average landing fee for signatory airlines was \$2.83 per 1,000 pounds, and the passenger facility charge was \$4.50.⁶¹

DTW is comprised of the North Terminal and the McNamara Terminal. The McNamara Terminal, which opened in 2002, has 121 gates and is used exclusively by Delta and its SkyTeam partners. The McNamara Terminal has 42 food and beverage tenants and 48 retail tenants. The North Terminal, which was renovated in 2008, has 26 gates and houses all non-SkyTeam airlines. The North Terminal has 17 food and beverage tenants and 11 retail tenants.⁶²

YIP is being developed as a cargo airport to compliment the operations at DTW. YIP has five runways; the runway lengths are 7,526 feet, 7,294 feet, 6,511 feet, 6,312 feet, and 5,995 feet. There are seven scheduled cargo airlines at YIP. In 2008, YIP reported 78,818 flight operations or an average of 215 flight operations per day. YIP handled nearly 160 million pounds of cargo in 2008 or an average of 438,356 pounds per day.⁶³ YIP is ranked 108th in the United States by the FAA for total landed weight of cargo.⁶⁴ Landings fees at YIP are assessed on a graduated scale with a discount given for larger quantities of landed weight. Landed weights up to 6,499 pounds are free and landed weights 6,500 pounds or more are charged between \$2.79 and \$1.50.⁶⁵

The Jones, Lang, LaSalle report looked extensively at the business climate within the Detroit Aerotropolis. The report found that the employment population of the aerotropolis is approximately 49,500, with 46 percent employed in the service sector, 17 percent in manufacturing, and 11 percent in retail trade. A market analysis of industrial/warehouse facilities located in the Detroit Aerotropolis found that a well-developed market exists within 28.8 million square feet in 598 buildings. An office space analysis found that nearly 1.1 million square feet of Class A office space exists in 87 office buildings. The report concluded that the office market within the region was underserved.⁶⁶

A land use study conducted by the Southeast Michigan Council of Governments

(SEMCOG) in 2000 found significant industrial and commercial development around both airports. The land use between the two airports was mainly residential, active agriculture, or undeveloped.⁶⁷ The official zoning map of the city of Romulus reveals that the land immediately surrounding DTW is primarily zoned industrial. There is a small neighborhood on the southeast corner of the airport that is zoned single family residential. To the immediate north of the airport a two- and one-half square-mile plot of undeveloped land has been designated a “Regional Center.” The definition for regional center zoning is “to promote large scale commercial and office developments which can take advantage of the potential trade of passengers, visitors and employments at the Metro Airport (DTW). It is also recognized that this international air facility will encourage adjacent land uses for conventions, trade centers, educational and training facilities as well as the hotels, motels, restaurants, car rental and parking facilities.”⁶⁸

Economic impact studies have been completed for both airports. The University of Michigan-Dearborn School of Management completed the “Detroit Metropolitan Wayne County Airport Economic Impact Study” in 2006. The report found that DTW has an estimated annual economic impact of \$7.6 billion and an estimated jobs impact of 71,695.⁶⁹

The University of Michigan-Dearborn School of Management also completed the economic impact study for YIP. The report entitled, “The Economic Impact of Willow Run Airport” was completed in 2007. The report found that YIP has an estimated annual economic impact of \$214.1 million and has an estimated jobs impact of 2,269.⁷⁰

Structure/Operations

The Wayne County Airport Authority (WCAA) owns and operates DTW and YIP. WCAA was established under a Senate bill and became effective April 24, 2002. The creation of the WCAA combined the management and operations of the previously independent DTW and YIP under one authority. An independent, seven-member board of directors manages the WCAA. The Wayne County executive appoints four members, two members are appointed by the governor, and one member is appointed by the Wayne County Commission. Terms of the appointments range from two to eight years.⁷¹

The idea of a Detroit aerotropolis dates as far back as 1986 when Northwest Airlines chose DTW as its hub of operations. The idea gained momentum in 2000 when Wayne County commissioned John Kasarda to complete a strategic airport assessment and a Pinnacle Aeropark plan. The report provided a game plan for the development of the region as an aerotropolis and a blueprint for the first phase of development, the Pinnacle Aeropark. Then in 2002, the \$1.2 billion McNamara Terminal opened at DTW housing 122 gates. That same year the WCAA was formed combining the management and operations of DTW and YIP. Then in 2003, the WCAA attended the Pittsburgh Airport Cities Conference to educate and energize the staff around the idea of a Detroit

aerotropolis. In that same year, the WCAA completed the site assembly of 1,300 acres for the Pinnacle Aeropark.⁷²

Starting in 2005, the local governments and the WCAA began meeting to discuss forming what is now known as the Aerotropolis Development Corporation (ADC). Then, in 2006, 10 entities including seven local governments, Wayne County, Washtenaw County, and the Airport Authority signed a memorandum of understanding to advance the aerotropolis concept. In 2007, a 35-member task force was formed representing the airports, their surrounding communities, the state, and the region's business interests to move the concept from vision to implementation. On June 17, 2009, nine government entities signed the Aerotropolis Development Corporation inter-local agreement. The nine government entities include seven cities and townships, and two counties. All nine-member communities fall within the aerotropolis region.⁷³

The executive committee is comprised of a chairman and a vice chairman. The chairman is the Wayne County Executive. The vice chairman is a private sector leader and CEO of Walbridge Construction Company. Under the guidance of the executive committee, the ADC project director directs the day-to-day operations. The task force is separated into five committees that are addressing and completing the aerotropolis' goals. The five committees include the Governance Committee, Development Plan Committee, Business Attraction Committee, Marketing/Communications Committee, and the Technical/Planning Committee.⁷⁴

The mission of the ADC is to enhance the environment for business activity, market and develop the area, and coordinate planning and development processes to better serve businesses and citizens. The ADC defines its aerotropolis as "an emerging type of urban form comprised of aviation-intensive businesses and those businesses that need to be readily connected to their customers. These businesses, and related enterprises, extend outward from a major airport." The ADC believes that it holds strategic assets that it can leverage as it continues to grow as an aerotropolis. The assets include the manufacturing infrastructure of the region, its proximity to Canada, the skilled labor force, the transportation capacity, the dual airport system, and the large amount of developable land in the region.⁷⁵

The ADC development strategy has identified six critical tasks. The first two tasks have been completed and the task force is actively working to complete the remaining four. The first task was to complete a master development plan, which was completed by Jones, Lang, LaSalle in 2008. The second task was to complete a Detroit region aerotropolis benchmarking report. John Kasarda completed this report in 2008. The remaining four tasks are to develop a business attraction strategy, develop a marketing communications and outreach plan, establish a permanent governance structure, and to develop operations processes. The operations processes include uniform design and development guidelines, a consistent and expedited permitting process, and a site

selection process for potential developments.

A funding model was developed for the ADC. The ADC will have a budget of around \$500,000. Members will pay a fixed entry fee in addition to an annual fee. The fixed entry fee for all parties is \$50,000. Local government members must pay \$25,000 annually per seat and county members must pay \$50,000 annually per seat. In return for their membership, the municipalities and counties will receive the benefits from the marketing and economic development efforts of the ADC. The nine original members of the ADC did not pay an entry fee, but will begin paying the annual fees. The ADC is also exploring other funding sources.⁷⁶

Detroit is the grantee of a Foreign Trade Zone (FTZ). The zone has been designated to include the greater Detroit region, which includes 21 active general purpose zones that serve 36 firms. Only one of these zones is located at DTW and was awarded to Northwest Airlines (now part of Delta Airlines) in 1995. Northwest Airlines has operated a FTZ exclusively for the storage of aviation fuel for its aircrafts.⁷⁷

The ADC is working with legislators to gain the authority to offer tax incentives to businesses. Currently, the Michigan House of Representatives is reviewing legislation that would introduce several new aerotropolis-related concepts into existing economic development incentive legislation for the purpose of attracting and retaining a critical mass of qualified aerotropolis businesses (QABs) around major Michigan airports. QABs have been defined as new businesses to the region that focus on transportation, supply chain, or shipment services. This is the only aerotropolis where this type of specialized economic development legislation has been found. The legislation would allow for the creation of up to 10 Next Michigan Development Corporations (NMDCs). The corporations must be comprised of at least two local governments, one of which must be a county. The NMDCs would be able to offer economic development incentives to QABs. The economic development incentives include the creation of tax increment financing (TIF) districts and renaissance zones to attract QABs, as well as real property tax and personal property tax abatements.⁷⁸

Since the ADC was formed, it has faced many successes and challenges. Successes include DTW moving from near last in customer satisfaction to second in the JD Powers customer satisfaction rankings. Willow Run has become the nation's leading on-demand cargo airport. Over \$670 million worth of development has been committed to the region. New direct flights by Northwest/Delta and China Southern to China have been added. Wayne County has committed \$20 million for infrastructure improvements on sewers and roads to ready the area for development. One of the greatest challenges the ADC has faced is the continued economic challenge related to the downsizing of the automotive and related industries. The ADC has also faced challenges related to the passage of the QAB legislation. The legislation was denied the first time it was introduced due to concern from opponents that the legislature's special consideration of

the aerotropolis would hamper development elsewhere in the state. Since then the legislation was rewritten and the ADC is working urgently to pass the legislation as competition grows from other airports exploring the aerotropolis concept.⁷⁹

Los Angeles Ontario International Airport (Ontario, CA)

- ONT does not currently identify as an aerotropolis
- ONT is owned by the city of Los Angeles and operated by the Los Angeles World Airport System (LAWA), a department within the city
- LAWA is governed by a seven-member Board of Directors
- ONT is the nucleus of the city of Ontario's economic development initiative, "The Ontario Plan"

Characteristics/Description

The Los Angeles/Ontario International Airport (ONT) is located in Ontario, California approximately 35 miles east of downtown Los Angeles in the center of Southern California. It is part of the Los Angeles World Airport (LAWA) system. The airport campus covers more than 1,700 acres. It is located at the crossroads of major interstate highways 1-10 and 1-15 and near the Burlington Northern Santa-Fe intermodal rail yards.⁸⁰ There are two runways at ONT: one is 12,200 feet long and the other is 10,200 feet. The lengths of these runways provide the airport flexibility in the weight and size of planes that can land at ONT.⁸¹ In optimal conditions, ONT is able to handle 200 arrivals and departures per hour.⁸²

The airport underwent dramatic changes over time. ONT started as a 30-acre tract surrounded by agricultural land. During World War II, ONT was dedicated as an Army training and operating base. Commercial service began in 1949 and a terminal was constructed in 1951. From the 1990s to 2008, the city of Ontario's population grew from 133,179 to an estimated 171,691.⁸³ As the city and airport grew, officials made sure to zone adjacent tracts for industrial use to enhance airport activity.⁸⁴ Today, 97 million square feet of industrial space surrounds the airport. Because the land around ONT is zoned for industrial rather than residential use, the airport can operate 24 hours a day, seven days a week.⁸⁵ The city of Ontario plans to attract more businesses and industry to the airport area by zoning more land for mixed-use and industrial and business parks.⁸⁶

In 2008, ONT ranked 56th with three million enplanements.⁸⁷ That year, more than 19,000 passengers used ONT each day.⁸⁸ There are currently two passenger terminals. When passenger traffic at ONT reaches 10 million for two consecutive years, a third terminal will be constructed.⁸⁹ However, due to the economic downturn, ONT's passenger service has dwindled. ExpressJet and JetBlue stopped flying at the airport in

September 2008.⁹⁰ Compared to November 2008, passenger traffic at ONT declined by 16.17 percent in November 2009.⁹¹

Cargo operations dominate ONT. In 2008, the airport ranked 12th in the nation for cargo with nearly 2.7 billion pounds landed.⁹² Before the recession, ONT was projected to be one of the United States' top 10 cargo airports by 2015.⁹³ ONT is served by major U.S. air freight carriers such as United Parcel Service (UPS) and Federal Express. Other freight carriers include Ameriflight, Kalitta Air, Miami Air International, Inc., Sierra Pacific Airlines, Air Transport Int'l, Arrow Air, Inc., Empire Airlines, IFL Group, Inc., and USA Jet.

UPS is the linchpin of ONT's cargo operations. In 1992, UPS moved its west coast hub to ONT in order to escape crowded conditions at LAX.⁹⁴ The carrier believed ONT would better accommodate its long-term growth needs.⁹⁵ Today, UPS is the largest employer on airport grounds with more than 3,000 people working at the 156-acre west coast air distribution center. The UPS facility accounts for 70 percent of all cargo moved at ONT. UPS's taxiways alone cover a 17-acre area.⁹⁶ Each week, UPS's 25 aircraft embark on 116 flights from ONT. Since 2001, the airport has served UPS's gateway to Asia with direct flights to three cities in China. FedEx is ONT's second-largest carrier handling 25 percent of cargo – or 131,269 tons – in 2007. ABX Air Inc. is the third-largest carrier, handling only three percent of ONT's cargo.⁹⁷

In 2007, LAWA further enhanced ONT's future cargo capacity when it approved a 40-year lease with Aero Ontario RFP, LLP. The Pacific Gateway Cargo Center will be managed by Maryland based developer AeroTerm. Eventually, the center could be as large as one million square feet.⁹⁸ Although cargo traffic is down at ONT,⁹⁹ Aero Ontario plans to build 400 truck docks, more than 1,200 parking spaces, 16 aircraft parking places, and more than 95 acres of sites that can accommodate different building configurations. The project will be built in four phases over the next decade.¹⁰⁰

Because there is no defined aerotropolis area, there are no actual aerotropolis tenants. However, within ONT there are 11 restaurants and 10 gift shops.¹⁰¹ In addition, ONT underwent an expansion in 1998 with the addition of \$270 million 265,000 square-foot twin terminals. Since 1998, 10 million square feet of logistics and distribution space has been added around the airport along I-10 and I-50 interstates.¹⁰² As a result, there is currently only a six percent vacancy rate among industrial buildings in Ontario.¹⁰³

Developments continue to spring up around ONT, including Ontario Mills and Victoria Gardens, commercial developments that contain retail and restaurants.¹⁰⁴ In August 2007, PGP Partners and Deutsche Asset Management broke ground on the mixed-use Ontario Airport Towers, located along the San Bernardino (I-10) Freeway. The towers will eventually be the region's largest office complex.¹⁰⁵ Majestic Realty is developing three separate projects on a 235-acre industrial park: Archibald Business Center,

California Commerce Center IV, and Hofer Ranch. The industrial park is located immediately south of ONT. Tenants include AIWA America, Inc., DisCopy Labs, International Paper Company, National Distribution Centers, Nordstrom, Inc., Sanyo Logistics, Staples, Inc., and Target Corporation.¹⁰⁶ Pepsi Bottling Group is leasing nearly half of a 135,000-square foot building in the 25-acre Archibald Business Center.¹⁰⁷ ProLogis Park Ontario Airport development is adjacent to the airport and the Pacific Gateway Cargo Center. The distribution park is owned by commercial real estate developer Lee and Associates and has seven buildings that total two million square feet.¹⁰⁸ In November 2009, Home Depot decided to locate one of its six California distribution centers in Ontario.¹⁰⁹

Structure/Operations

Both Kasarda and the California Department of Transportation have referred to ONT as an emerging aerotropolis/air logistics airport, but ONT currently does not have an aerotropolis plan. However, much of the city and region's economic development activity is centered on the airport, which generates close to \$6 billion for the region's economy annually.¹¹⁰ The economic development strategy around ONT is based largely on the expectation that air cargo carriers such as UPS will require more space as LAX begins to reach capacity.¹¹¹ In 2001, the city of Ontario commissioned an air cargo market study. The study found that ONT was indeed poised to be the single-most viable air cargo alternative to LAX because of its access to the Los Angeles market, the population growth of surrounding communities, and the fact that ONT has already established passenger and cargo service.¹¹² The study's authors encouraged Ontario, as well as the Southern California Association of Governments (SCAG), to create "the greatest possible mix of operators, frequencies, and direct destinations—essentially a gateway" at ONT rather than distributing economic growth among other regional airports such as San Bernardino International Airport.¹¹³

The city incorporated these findings into "The Ontario Plan," which was adopted by city council in February 2009. One of the plan's key components is to cultivate further development of the logistics industry, which already has a strong presence in the area. According to a draft of the plan, one of the city's goals is to create "a true multi-modal transportation system...that facilitate(s) an exceptional degree of movement and connectivity for people and goods to, from, and within Ontario."¹¹⁴ The Urban Land Institute recommended that the city develop a parcel of empty land (called the Meredith Property) into a 250-acre transit plaza. The Metro Gold Line, which is part of Southern California's public transportation system, would extend through the property to ONT.¹¹⁵

However, the economic downturn and several factors have stalled the airport's development and further implementation of "The Ontario Plan." First, the 1998 expansion forced the airport to raise landing fees. When JetBlue and ExpressJet left, those fees were increased further as costs were spread among fewer airlines. Second,

the region's economy is driven by both real estate and logistics, two industries hit hard by the recession.¹¹⁶ "We had really thought ONT was going to grow," said Michael Armstrong, aviation program manager for Southern California Association of Governments. "It's still going to be our second international airport. We thought LAX would reach its capacity constraints. Eventually it's going to happen but it's a lot further down the road than we had thought."¹¹⁷

Governance

ONT is owned by the city of Los Angeles and operated by LAWA, a city department. The city also owns Los Angeles International Airport (LAX) and Los Angeles International Airport/Van Nuys (VNY). A seven-member board of airport commissioners governs LAWA. The commissioners are community leaders appointed by the Los Angeles mayor and approved by the city council. LAWA is a department of the city of Los Angeles. Some Ontario city officials worry that LAWA focuses on the far larger LAX at ONT's expense. The city of Ontario is investigating the possibility of assuming ownership of the airport.¹¹⁸

The city of Ontario lies at the heart of the region called the Inland Empire, which is comprised of San Bernardino and Riverside counties. Ontario is also part of the San Bernardino/Southern California marketplaces.¹¹⁹ A number of regional and municipal governmental organizations are involved in planning development in and around ONT including the San Bernardino County Association of Governments, Western Riverside Council of Governments, and the Southern California Association of Governments.

Funding

LAWA is a self-sustaining operation. Revenues are derived from landing fees, leases, and concession fees from airport tenants.¹²⁰ ONT's landing fees are \$3.45 per 1,000 pounds for non-signatory airlines and \$2.76 for signatory airlines. Passenger facilities charges are \$4.50.¹²¹

However, there are no pre-determined sources of funding for economic development around ONT. Infrastructure improvements or projects around the airport are currently funded by the federal, state, and local governments.¹²² Private developers invest in their respective economic development projects.

Incentives

The state of California offers a number of corporate tax incentives. For example, the Work Opportunity Tax Credit provides eligible businesses with a credit of up to \$2,400 per employee. The credit is based on the amount of hours worked by employees hired

from “target groups” such as recipients of Temporary Assistance to Needy Families (TANF).¹²³ A company that utilizes on-the-job training incentives may be reimbursed for up to 50 percent of new hires’ wages paid during the training period.¹²⁴

California has also established priority economic development zones such as Local Agency Military Base Recovery Areas (LAMBRA), Manufacturing Enhancement Areas (MAEA), and Targeted Tax Areas (TTA).¹²⁵ Although none of these programs are available within the city of Ontario, they lie within Kasarda’s geographical definition of an aerotropolis. The Agua Mansa Recycling Market Zone (RMDZ), which also serves as an Enterprise Zone (EZ), is just 15 miles west of ONT. EZs are designated by the State Department of Commerce. Businesses within the 26,422-acre Agua Mansa zone could receive small business administration loans, funds from community development block grants, or industrial development bonds (IDB). Additionally, California offers qualifying businesses employer hiring credits, as well as sales and tax credits.¹²⁶ Because the area is also a Recycling Market Development Zone (RMDZ), businesses that use recycled materials to manufacture products may be eligible for loans, technical assistance, and free product marketing. The RMDZ is jointly administered by the cities of San Bernardino, Colton and Rialto, and San Bernardino and Riverside Counties.¹²⁷ The area surrounding the San Bernardino International Airport is a designated LAMBRA. Businesses within the area are eligible for benefits similar to those within EZs. The San Bernardino LAMBRA is located in the city of San Bernardino and is about 23 miles from ONT.¹²⁸

The Inland Empire is also home to the Desert Communities Empowerment Zone in Riverside County. Empowerment Zones are administered by the U.S. Department of Housing and Urban Development and are established only in the nation’s most distressed areas. Employers that hire or retain employees who live in the area may be eligible for a number of grants, credits, and deductions from the federal government.¹²⁹

Although none of these economic development zones abut ONT, the Ontario foreign trade zone helps facilitate the airport’s international cargo activity. For example, FTZ 50-1 encompasses ProLogis Park Ontario Airport.¹³⁰

Memphis International Airport (Memphis, TN)

- MEM identifies as an aerotropolis; the airport city is defined as the area within a six-mile radius of MEM, with the aerotropolis geography encompassing a 25-mile radius around the airport
- MEM aerotropolis boundaries include two counties in Mississippi and one county in Arkansas
- Memphis Aerotropolis Steering Committee formed to oversee planning and

economic development for the aerotropolis; comprised of 21 members from the public and private sectors

- MEM Aerotropolis day-to-day activities are overseen by a paid executive, who serves as vice president of logistics and aerotropolis development
- MEM is owned and operated by the Memphis-Shelby County Airport Authority, comprised of a seven-member Board of Commissioners; the Board of Commissioners appoints a president/CEO, whose staff must be approved by the board
- The Memphis-Shelby County Payment in Lieu of Taxes (PILOT) program is used to help spur development within the MEM Aerotropolis
- Tennessee enacted a bill to exempt aircraft lubricants, repair parts, accessories, and simulators used by airport related businesses from sales tax

Characteristics/Description

An airport city is evolving around Memphis International Airport (MEM), which is located nine miles southeast of downtown Memphis. The 3,900-acre airport is surrounded by Interstates 55, 240, 22, and 69 – also known as the NAFTA highway. The airport city is considered to be the area within a six-mile radius of MEM.¹³¹ The aerotropolis encompasses a 25-mile radius around the airport.¹³² Aerotropolis boundaries include Shelby County, Northern DeSoto and Tunica counties in Mississippi, and Western Crittenden County in Arkansas.¹³³

Perhaps the most important characteristic of the Memphis Aerotropolis is the confluence of multimodal transportation. Located on the Mississippi River, the city is the United States' fourth largest inland port.¹³⁴ Memphis is also both the third busiest trucking corridor and the third largest rail center in the nation. More than 200 trains per day run through Memphis. The city is home to five Class-1 railroads, including the Burlington Northern Santa Fe (BNSF), which opened its expanded 185-acre intermodal facility in 2009.¹³⁵

Shelby County's most current (2006) zoning map shows that roughly two to three square miles immediately surrounding the airport are zoned for industrial use. Directly to the west, the land is zoned primarily for residential use with several areas zoned for industrial use. Residentially zoned land abuts the airport's southern border. Beyond that, additional areas are zoned for both industrial and agricultural use. A portion of land directly to MEM's east is also zoned for agricultural use. The remaining portion of the MEM's eastern border is abutted by land zoned for residential use. About two miles east and southeast of MEM is a large area of land also zoned for industrial use. Some portions are zoned for heavy industry; others are zoned for light industry. One area is zoned for agriculture in this area and one small area is zoned for residential use. The Burlington Northern Railroad runs through this area, which also is home to Tennessee

Yards. The Caterpillar Tractor Company, Chrysler Parts Depot and the Ford Tractor Division are located here. Further east is the “industrial distribution corridor.” This portion of land is about three to four miles from the airport. It is bordered by land zoned for industrial use to the east.¹³⁶

MEM’s four runways allow the airport to handle high volumes of both passenger and cargo traffic. Each runway is 150 feet wide. They are 8,946, 9,000 feet, 9,320 feet, and 11,120 feet in length, respectively. Work was recently completed on the fourth runway (8,946 feet), which runs east/west.¹³⁷ The Federal Aviation Administration’s (FAA) most recent capacity benchmark report found that in optimal weather conditions, MEM could handle 148 to 181 flights per hour; this does not take into account the additional capacity brought in with the fourth runway.¹³⁸

In 2008, MEM ranked 36th in passenger traffic with nearly 5.4 million enplanements.¹³⁹ More than 10 million passengers use MEM each year and 27,297 use the airport each day.¹⁴⁰ Six domestic and international airlines serve MEM: Delta/ Northwest, KLM, AirTran, American Airlines, Continental, United Airlines, and US Airways. MEM is a passenger hub for Delta.¹⁴¹ Although most of the flights coming through MEM are connections, the airport offers international flights to a variety of destinations including, Amsterdam, Toronto and locations in South America.¹⁴²

While MEM has a strong passenger service base, it is mainly driven by air cargo. In turn, the airport acts as an economic driver for the region. In 2007, air cargo resulted in an estimated \$12.8 billion in direct spending and 208,319 jobs.¹⁴³ According to a study by the University of Memphis, the airport had a \$28.6 billion impact on the metropolitan economy, \$27.1 billion of which was generated by air cargo activities.¹⁴⁴ For the 18th consecutive year, MEM ranked as the world’s busiest cargo airport in 2009 by the FAA with 3.7 million metric tons – or 81 billion pounds – handled.¹⁴⁵ According to the FAA’s measurements, 19.5 billion pounds of cargo landed at MEM in 2008.¹⁴⁶ Memphis is a key hub in FedEx’s three-hub strategy – Paris serves as the European hub and Guangzhou, China serves as the Asian hub.¹⁴⁷ FedEx operates direct international flights to many cities around the world including Winnipeg, Guadalajara, Panama City, Bogota, Sao Paulo, London and Osaka, Japan.¹⁴⁸

More than 93 percent of all MEM’s cargo is generated by FedEx Corp.¹⁴⁹ FedEx was founded in Memphis in 1973 when the company built a sorting facility and an administration building on the airfield. Today, FedEx employs more than 30,000 people in Memphis.¹⁵⁰ One of the reasons behind the company’s success is that FedEx’s extended hours allows products to be shipped much later in the day than is permitted in other cities.¹⁵¹ Meanwhile, FedEx guarantees that the products will arrive early the next day. This has increased FedEx’s capacity and benefitted other businesses.¹⁵² MEM is also the southern regional hub for UPS.¹⁵³

MEM will expand its cargo capacity with the construction of “Cargo Central.” The facility will eventually feature approximately 1.4 million square feet of ramp area. After the completion of the first of five phases, Cargo Central now occupies 36,000 square feet of building space. Each additional phase will add 61,500 square feet. The center is designed to meet cargo companies’ needs such as high security, carpentry shops, high-bay warehousing space, cold storage, and hazardous materials storage.¹⁵⁴

MEM is one of the region’s most powerful economic engines, generating more than 220,000 jobs including those directly employed by the airport.¹⁵⁵ Although many of the jobs are tied to the air cargo industry, MEM also employs people at its nearly 50 shops and restaurants.¹⁵⁶ Many are typical airport businesses such as newsstands and novelty shops, but it also has mainstream retail stores such as Best Buy, PGA Tour and Godiva Chocolates. Chain restaurants such as Starbucks and Einstein Bagels are also present at MEM. The airport caters to the Memphis tourism industry with Memphis-themed restaurants like Backyard BBQ and Memphis City Blues Wine Bar. While awaiting their flights, passengers may enjoy performing arts or three different art exhibits as part of MEM’s art program.¹⁵⁷

Because MEM is integral to the regional economy, nearly half the area businesses believe their economic futures are tied to the airport and many local businesses are airport related.¹⁵⁸ Memphis has become the dominant city in the United States’ logistics industry. Eighteen percent of the nation’s logistics workforce is located here.¹⁵⁹ The airport city area contains more than 100 million square feet of logistics space.¹⁶⁰ The city is home to huge warehouses such as Patterson Warehouses Inc.’s two million square foot facility.¹⁶¹ Because of FedEx’s extended hours, medical device and biotech companies such as Medtronic Inc. are building logistics and distribution facilities near the airport.¹⁶² 3PL Mallory Alexander International Logistics is also based in Memphis. Other logistics companies around MEM include Blue Streak Logistics, Tech Logistics, Centrix Logistics Inc, Katt Worldwide Logistics, UPS Supply Chain Solutions, and Vantage Logistics.¹⁶³ Moreover, major consumer companies including Williams-Sonoma, Nike, and Hewlett-Packard have located their distribution centers in Memphis.¹⁶⁴

Although the logistics presence provides MEM with an advantage, there are problem areas around the airport. The Brooks Road corridor is notorious for adult entertainment establishments, seedy hotels, prostitution, and crime.¹⁶⁵

An important component of the Memphis Aerotropolis is based on tourism – especially tourism related to the late singer, Elvis Presley.¹⁶⁶ Elvis Presley Enterprises (EPE) plays a significant role in this industry. The Presley estate Graceland is a major attraction for the city of Memphis; more than 600,000 people visit the home each year.¹⁶⁷ In addition to Graceland, EPE also includes the global licensing of all Elvis related ventures and the

development of Elvis related music, video, film, television and stage productions. It also oversees Elvis's Internet presence and the management of music publishing assets.¹⁶⁸

Structure/Operations

Kasarda identifies MEM as an aerotropolis because it is both a passenger and cargo hub and has a disproportionate economic impact on the region. He also points to the convergence of roads, rail, air and an inland port as a defining characteristic of the emerging aerotropolis.¹⁶⁹ In 2006, Kasarda spoke to the Greater Memphis Chamber and encouraged business leaders to cultivate an aerotropolis in Memphis.¹⁷⁰ The Greater Memphis Chamber commissioned Kasarda to help craft the aerotropolis strategy.¹⁷¹ Using Kasarda's model, the chamber defines an aerotropolis as "a city or an economic hub that extends out from a large airport into a surrounding area that consists mostly of distribution centers, office buildings, light manufacturing firms, convention centers, and hotels—all linked to the airport via roads, expressways, and rail lines."¹⁷²

Following Kasarda's 2007 recommendations in the Memphis Aerotropolis Report, the chamber created the Memphis Aerotropolis Steering Committee to oversee aerotropolis planning.¹⁷³ Tom Schmitt, CEO and president of FedEx Global Supply Chain Solutions, chairs the committee, which is comprised of 21 members from both the public and private sectors.¹⁷⁴ Within the committee, there are four work groups comprised of senior level volunteers from the Memphis community: Access and Transportation, Corridor Development, Gateways and Beautification, and Marketing/Branding. These work groups represent the developing priorities for the aerotropolis.¹⁷⁵ Day-to-day functions of the aerotropolis initiative are overseen by one paid executive, who serves as vice president of logistics and aerotropolis development. Moreover, the chamber has rebranded MEM and the surrounding region as "America's Aerotropolis: Where Runway, Road, Rail & River Merge." Before calling itself "America's Aerotropolis," Memphis marketed itself as "America's Distribution Center."¹⁷⁶

The Memphis Airport Area Development Corporation (MAADC) also plays a role in fostering economic development around MEM. MAADC was founded in 2008 and is a privately funded not-for-profit corporation. The organization has taken the lead in redeveloping the Airport West corridor. Founding member companies include Elvis Presley Enterprises, FedEx, Medtronic, the Memphis and Shelby County Airport Authority, Memphis Area Transit Authority, and the Memphis Chamber.¹⁷⁷

Governance

MEM is owned and operated by the Memphis-Shelby County Airport Authority (MSCAA). MSCAA also owns MEM reliever airports, General DeWitt Spain Airport, which is located north of downtown Memphis, and Charles W. Baker Airport in Millington.¹⁷⁸ The authority is comprised of a seven-member board of commissioners,

five of whom are appointed by the mayor of Memphis and confirmed by the city council. The remaining members are nominated by the Shelby County mayor and approved by Memphis' mayor and city council.¹⁷⁹ The board of commissioners appoints an airport authority president/CEO. Although the CEO is able to hire his/her own staff, the board of commissioners must approve each position.¹⁸⁰ The airport authority is deeply involved with the aerotropolis initiative. In fact, the authority's mission is "transforming America's Distribution Center into America's Aerotropolis."¹⁸¹

Although Shelby County and the city of Memphis control the actual airport, the aerotropolis initiative casts a much wider geographical net. The Memphis Aerotropolis includes not only the seven cities within Shelby County, but also Northern DeSoto and Tunica counties in Mississippi and Western Crittenden County in Arkansas.¹⁸² As a result, the Aerotropolis Steering Committee also crosses state lines. For example, the Transportation and Access Work Group has members from Mississippi.¹⁸³

The Greater Memphis Chamber has five "ultimate goals" for the aerotropolis strategy:

- Business attraction, retention, and job creation
- Improve connections to airport from business parks, residential areas, and downtown
- Infrastructure improvements and congestion mitigation
- Increase airport cargo and passenger activity
- Improve internal and external perceptions of Memphis as a place to live, work, and do business¹⁸⁴

Funding

In 2008, MEM's total operating revenue was more than \$111.5 million.¹⁸⁵ The airport is a self-sustaining operation that is supported by landing fees and tenant rents. In 2009, MEM's landing fees were \$1.42 per 1,000 pounds.¹⁸⁶ Memphis does not charge a passenger facility fee.¹⁸⁷

The Memphis aerotropolis initiative, on the other hand, has just begun to secure funding. In 2008, the Tennessee Department of Transportation awarded the Aerotropolis Steering Committee's Beautification Work Group two grants for "visual enhancements" in the airport west area.¹⁸⁸ Additionally, the Memphis City Council recently approved \$1.6 million for the beautification of Plough Boulevard, which leads to the airport from Interstate 240. The entire project is expected to cost \$3.3 million. Chamber and city officials plan to seek federal, state, and private money to cover the remaining costs.¹⁸⁹

Although the Memphis City Council has provided some assistance, securing funding

has proved to be the biggest challenge for the Memphis Aerotropolis. Greater Memphis Chamber Vice President of Logistics and Aerotropolis Development Jim Covington says the economic downturn has hindered the initiative's progress. He said state, city, and county governments simply do not have room in their budgets to help fund necessary projects. However, Federal stimulus money has helped by providing funding for improvements to I-269, which circles around the city of Memphis.¹⁹⁰

Incentives

One of the major tools being used to cultivate an aerotropolis around MEM is the Memphis-Shelby County Payment in Lieu of Taxes (PILOT) program. This tax incentive program provides approved companies with a property freeze. This enables qualifying companies to develop or expand operations, but pay taxes based on the value of the land before it was developed, rather than paying based on the value with the improvements or additional development. FedEx received this incentive when it expanded in 2005.¹⁹¹ PILOT assistance has also been employed to assist local expansions: Delta Metals, International Paper, and Quebecor. In 2005, more than 550 Memphis-area companies were operating with PILOT incentives.¹⁹² In addition, Wright Medical Technology Inc. was granted a 12-year PILOT to move to Memphis.¹⁹³

The Memphis Chamber of Commerce lists many incentive programs available to companies locating to or expanding in the aerotropolis area. For example, the Tennessee Valley Authority (TVA) Economic Development Loan Fund is a multimillion-dollar revolving loan program that helps finance industrial development projects. Loans may be made for up to \$2 million, depending on the project. The Memphis and Shelby County Industrial Revenue Bond (IRB) Program issues industrial development bonds to finance industrial facilities and manufacturing operations. The Development Loan program is a financial incentive program designed to foster commercial real estate upgrades within the Central Business Improvement District. Companies may receive up to \$90,000 in low interest loans from the Center City Development Corporation.¹⁹⁴ FedEx has also benefitted from the Tennessee Industrial Infrastructure Program (TIIPS) and IRBs.¹⁹⁵

Much of the area surrounding the airport qualifies as a Renewal Community as designated by the U.S. Department of Housing and Urban Development (HUD).¹⁹⁶ Renewal Communities are a federal tax incentive program designed to stimulate economic development and job growth through public and private sector partnerships in poor communities; the Memphis Renewal Community became the nation's first in 2002. The designation lasts for eight years and is expected to have a \$300 million impact.¹⁹⁷ Businesses that locate within the Renewal Community receive a number of incentives and benefits. For example, businesses that hire new employees who live and work in the zone receive a \$1,500 credit against federal taxes per employee per year. Businesses may also receive a deduction of either one-half of qualified revitalization

expenditures or all revitalization expenditures depending on when the building was placed in service. State and local governments are able to issue zero-percent interest Qualified Zone Academy Bonds (QZABs) to finance public school programs. Private businesses must contribute services, money, or equipment equal to 10 percent of the bond proceeds. These contributions are qualified as a charitable contribution. The Federal government pays interest to the insurance companies, banks and lending corporations that hold the QZABs in the form of a tax credit.¹⁹⁸

In addition to the incentives previously mentioned, Memphis is home to two Foreign Trade Zones: FTZ 77 and FTZ 223. FTZ 77 has four locations.¹⁹⁹

Piedmont Triad International Airport (North Carolina)

- GSO identifies as an aerotropolis; its geographic scope includes 12 Triad counties and 22 municipalities, with the airport city encompassing a five-mile radius around GSO
- The Piedmont Triad Airport Authority is governed by a seven-member Board of Directors, each serving without compensation for a three-year term
- Aerotropolis Leadership Board formed to guide aerotropolis and economic development activities; comprised of 37 volunteer executives from the region and managed by the Piedmont Triad Partnership managing director of the aerotropolis project

Characteristics/Description

Piedmont Triad International Airport (GSO) is located at the center of North Carolina in Guilford County. The 4,000-acre campus is between the cities of Greensboro, Winston-Salem, and High Point, where I-40, I-85, and the future I-73 and I-74 will converge.²⁰⁰ The N.C. 68 Connector will eventually become part of I-73, extending the interstate from West Virginia to Myrtle Beach, with GSO at its center. Construction of these roadways is set to begin in 2014.²⁰¹ In addition, the Triad region benefits from The Piedmont Triad Inland Terminal — a regional intermodal terminal that connects the region to east cost ports such as Wilmington, Charleston, Norfolk, and Savannah. Norfolk Southern, CSX Transportation and several short line companies provide the region with rail service.²⁰² More than 4.5 million people live within a 90-minute drive of GSO and more than 1.5 million people live in the Triad region.²⁰³ The region is slightly east of Central North Carolina and extends from the state's northern border with Virginia to just above the South Carolina border.

Most of the land around GSO is zoned for either industrial or commercial use. To the airport's southeast is a large area of land zoned for heavy industrial use. Land along the airport's western border is zoned for a corporate park. West of the corporate park is an

area zoned for commercial use. The land to GSO's north and northeast is zoned for single-family and multifamily-housing.²⁰⁴ The airport is surrounded by undeveloped and vacant land. Airport officials hope the many empty warehouses near GSO can be put to airport-related use.²⁰⁵

The FAA considers GSO a small hub, reporting 68 daily aircraft arrivals and 82,186 aircraft operations annually in 2009.²⁰⁶ GSO, however, increased its flight capacity with the addition of a new 9,000-foot runway, which was completed January 2010.²⁰⁷ The newest runway is separated by one mile and runs parallel to a 10,001-foot runway. GSO also has a 6,380-foot crosswind runway.²⁰⁸ The maximum flight capacity at GSO is 115 operations per hour.²⁰⁹

In 2008, GSO ranked 86th for enplanements at 1.1 million.²¹⁰ Also that year, 6,000 passengers a day, or 2.2 million annually, travelled through GSO. The airport is served by seven passenger airlines: Allegiant, American, Continental, Delta/Northwest, United, and US Airways. The commercial passenger terminal building is 300,000 square feet with 24 gates.²¹¹

The focus of the emerging Triad Aerotropolis is the \$300 million FedEx Express East Coast sorting hub on the GSO campus. The hub is part of the airport's \$600 million expansion that includes the construction of the new 9,000-foot runway.²¹² The hub, built to handle 18 to 23 flights per day, was completed in June 2009. However, due to the economic downturn, it is currently handling about eight feeder aircraft and large airbus flights daily. The hub was built with the capability to expand. The airport authority hopes to double the hub's size so it can handle up to 63 flights per day in 15 years.²¹³ FedEx began sorting operations in June 2009, but progress has slowed due to the economy. In addition, FedEx Ground recently purchased a tract of land near GSO for a new ground hub.²¹⁴ Currently five cargo companies have operations at GSO: Caribbean Transportation Services, Federal Express, TradeWinds, UPS, and U.S. Postal Service. The U.S. Postal Service has a bulk mail service at GSO. According to the FAA, GSO was 56th for cargo volume with 463 million pounds landed in 2008.²¹⁵ While there are neither passenger nor cargo international flights from GSO, the airport expects to add international cargo flights in the long-term future.²¹⁶ The airport offers some international charter flights to and from the Caribbean.²¹⁷

GSO is a major economic driver for the region. Fifty companies employing 4,500 people are located at the airport.²¹⁸ Many aviation-related businesses have sites at GSO. Honda Aircraft Co. opened its world headquarters and engineering center at GSO for the HondaJet aircraft in 2009.²¹⁹ The GSO campus is also home to TIMCO Aviation Services Inc., which runs a 600,000-square-foot facility that services Boeing, McDonnell Douglas, Lockheed, and Airbus aircraft. Cessna Aircraft Corporation operates its 46,000-square-foot maintenance center at GSO. Comair opened a maintenance base

for its regional jets at GSO in 2006.²²⁰ In addition to aviation-related companies, a Marriott Hotel is located near the passenger terminal. The commercial passenger terminal building is 300,000 square feet with 24 gates.²²¹

The new FedEx hub has attracted companies to the Triad. For example, the Polo Ralph Lauren distribution center in High Point, N.C. and the air conditioning division of Rheem Manufacturing Co. in Randleman, N.C. moved to the area to gain access to the new hub.²²² In addition, 3,000 logistics companies are located in the Triad.²²³

Structure/Operations

The aerotropolis is a key component of the Triad's plan to recoup the loss of about 35,000 jobs, experienced largely in the textile, furniture, and tobacco industries. The process began in 2004 when the Piedmont Triad Partnership conducted a study to determine the region's most viable industry clusters. As a result, the partnership decided to focus economic development efforts on four areas: advanced manufacturing, health care technology, creative enterprises and the arts, and logistics and distribution. The partnership submitted its development proposal to the United States Department of Labor's Workforce Innovations and Regional Economic Development (WIRED) program. In 2006, the Department of Labor awarded the partnership a \$15 million grant to create a comprehensive economic development and workforce development strategy.²²⁴ As a result, the partnership created the Global Logistics Task Force and the Logistics and Distribution Roundtable. These groups, in conjunction with the Center for Global Logistics at Guilford Technical Community College, formed the Aerotropolis Leadership Board, which aims to make the Triad a major east coast logistics and distribution center. The Aerotropolis Leadership Board is comprised of 37 executives from the region and is managed by the Piedmont Triad Partnership managing director of the aerotropolis project.²²⁵

Plans to build a FedEx hub at GSO encouraged community leaders to explore how to further leverage the airport's economic development potential. The task force contracted Dr. John Kasarda, director of the Kenan Institute of Private Enterprise at the University of North Carolina's Kenan-Flagler Business School, to conduct two studies on the Triad region's ability to develop as an aerotropolis. The first study analyzed the feasibility of developing a Triad aerotropolis. The second discussed how the region should proceed in creating it.²²⁶ In Kasarda's report, "Leveraging Piedmont Triad International Airport and Other Regional Assets for Piedmont Triad Competitive Advantage," he suggests that while GSO will never reach the scale of the Memphis hub, that "it will grow and attract ...time sensitive goods processing facilities. It is also likely that a Triad aerotropolis will form around GSO and outward along nearby interstate highways."²²⁷ Kasarda argues, "The region's mid-Atlantic location, its five interstate highways and the new FedEx hub gives the region a competitive advantage. Planned, developed and marketed effectively, GSO will not only grow and prosper in its own right but with

coordinated region-wide planning and action, GSO will serve as a powerful engine for Piedmont Triad job creation economic development for many decades to come.”²²⁸

Because the Triad Region is comprised of 12 counties and 22 municipalities, working together with one mission was perhaps the greatest challenge to developing an aerotropolis plan. In order to educate all parties involved, the Piedmont Triad Partnership’s Global Logistics task force gave two to three presentations a week, held many discussion forums and panels, and invited members from even the smallest communities to offer feedback.²²⁹

Operations and Governance

GSO’s governing structure reflects the regional nature of the aerotropolis initiative. A seven-member board of directors governs the Piedmont Triad Airport Authority. Two members must be resident voters of the city of High Point, two must be resident voters of Greensboro, one must be a resident voter of the City of Winston Salem, and two members are selected at-large from Guilford County and Forsyth County, respectively. Each member serves without compensation for a three-year term.²³⁰

Similarly, the group charged with spearheading the aerotropolis initiative is comprised of community leaders who serve on a volunteer basis. The Global Logistics task force formed the Aerotropolis Leadership Board. The group’s 37 members are drawn from the public and private sectors including FedEx. Currently, the managing director acts as the aerotropolis liaison. The aerotropolis project has become the partnership’s preeminent logistics organization. The Global Logistics Task Force and the Logistics and Distribution Roundtable were rolled into the initiative.²³¹ Eventually, the Aerotropolis Leadership Board will decide how the aerotropolis will be governed.²³²

Although there is not yet an official aerotropolis mission statement, the partnership’s unofficial goal is to make Piedmont Triad the “East Coast center for global logistics.” For marketing purposes, the partnership is trying to avoid the term “aerotropolis” because more and more airports are using it.²³³ All 12 of the Triad’s counties and 22 of its municipalities will fall within aerotropolis boundaries. The airport city will encompass a five-mile radius around GSO.²³⁴

Funding

While funding for aerotropolis research and planning was provided by a Workforce Innovation in Regional Economic Development (WIRED) grant, the airport is a self-sustaining operation that generates revenue from landing fees and tenant rents. No local tax dollars are used to finance airport operations.²³⁵ GSO charges \$1.61 per 1,000 lbs. in landing fees. The terminal rate is \$32 per square foot. The apron rate is \$29,042 per year, per apron.²³⁶ However, the FAA has provided GSO with several

grants for improvement and expansion. For example, GSO received a \$6.5 million grant to construct a second taxiway for the new FedEx hub. In addition, the federal government provided \$11.5 million to assist in the hub's construction.²³⁷ The construction of the new 9,000-foot runway is a \$150 million project that has been financed through federal grants and \$30 million from the airport authority.²³⁸

The WIRED grant that funds the Triad region's cluster development project is set to expire in June 2010. Newly appointed chair of the Piedmont Triad Partnership and president and CEO of BB&T Corporation Kelly King spearheaded an initiative to raise nearly \$7 million in private dollars from 30 investors over the next five years. The aerotropolis project will be funded through this initiative as part of the logistics and distribution cluster. At that point, the separate logistics task forces and roundtables will be a single organization under the Aerotropolis Leadership Board.²³⁹

Incentives

The Piedmont Triad Region is using a number of tax incentives to retain and attract businesses. For example, FedEx received a \$115 million tax credit to build its hub at GSO. Greensboro and Guilford counties also provided the company with sewer and water infrastructure.²⁴⁰ HondaJet received an incentives package valued at \$1.3 million from the Piedmont Triad communities of Greensboro, High Point and Guilford County, and \$6.7 million from the state.²⁴¹ In April, Greensboro area legislators filed bills to exempt some equipment used by airport related businesses from sales taxes. The governor signed the bill into law in August.²⁴² Last year, Guilford County commissioners approved an incentives package of \$952,500 for FedEx Ground to locate there.

The state of North Carolina has a number of programs that could be used to draw businesses to the Triad region. The Job Development Investment Grant (JDIG) is available to a limited number of new and expanding businesses that will offer economic benefits to the state, and depend on the grant to operate in North Carolina. This program benefited the Triad region in 2008 after Mack Trucks was awarded a grant worth up to \$8.5 million for the promise of creating 493 jobs in Greensboro and investing \$17.7 million over three years.²⁴³ Polo.com also received a JDIG in 2006.²⁴⁴ For each year Polo.com meets its agreement with the state, North Carolina will provide a grant equal to 65 percent of the state personal income withholding taxes derived from the creation of new jobs. If the company creates all of the jobs called for under the agreement and sustains them for 10 years, Ralph Lauren Media could yield a maximum benefit of \$1.52 million.²⁴⁵

The Piedmont Triad Area is also home to FTZ 230, which has a variety of industrial sites in Alamance, Davidson, Davie, Forsyth, Guilford and Surry counties. GSO has 2,723 acres of airport property that is part of FTZ 230. Nearby, an additional 71 acres of industrial property in western Guilford County are also part of FTZ 230. There are six

other FTZ sites throughout the Piedmont Triad Region.

CLE AND COMPARABLE AIRPORT DEVELOPMENT PERSPECTIVES

Twelve U.S. airports were reviewed to identify models of best practices that could be helpful to CLE and the study cities in developing an aerotropolis. CLE is profiled here in detail, but only summaries of the 12 airports are presented in this section. Detailed profiles of the 12 airports are included in Appendix M. The 12 airports are:

- Atlanta Hartsfield-Jackson International Airport (ATL)
- Baltimore-Washington International Thurgood Marshall Airport (BWI)
- Chicago O'Hare International Airport (ORD)
- Cincinnati-Northern Kentucky International Airport (CVG)
- Port Columbus International Airport (CMH)
- General Mitchell International Airport (MKE)
- Indianapolis International Airport (IND)
- Minneapolis-St. Paul International Airport (MSP)
- Pittsburgh International Airport (PIT)
- Louisville International Airport (SDF)
- Seattle-Tacoma International Airport (SEA)
- Lambert-St. Louis International Airport (STL)

Cleveland-Hopkins International Airport

Characteristics/Description

Cleveland-Hopkins International (CLE) Airport's 1,900-acre campus is located in the city of Cleveland, Ohio, about 10 miles south of downtown, near State Route (S.R.) 17, S.R. 237, Interstate 71 (I-71), and I-480. To its northwest, there is the NASA Glenn Research Center and the cities of Fairview Park and North Olmsted; to its west, the Cleveland Metroparks and Olmsted Township; and to its south and east, the city of Brook Park.²⁴⁶ East of CLE, on Brookpark Road (S.R. 17), there are several hotels, restaurants, small businesses, and adult entertainment establishments.²⁴⁷ Just to the airport's north along I-71 and I-480, the Cleveland Business Park houses research and development, manufacturing, industrial, office, and retail establishments. The park will eventually encompass 267 acres. The first phase of construction has already been completed and the park currently contains five buildings: a 125,280 square foot distribution center, a 99,355 square foot flex/distribution center, an 87,460 square foot warehouse/distribution center, a 57,070 square foot office/flex building, and a 42,333 square foot distribution center.²⁴⁸ Also to the north is the airport's car rental center and employee parking areas.

Although the CLE campus is zoned for industrial and retail use, it is surrounded by land zoned for industrial and residential use.²⁴⁹ Beyond the industrial zoning, there is land (about one-half square mile) zoned for mixed use to the northeast (see Figure 8 on page 85). To the north of CLE, there is a small area (less than one square mile) that is zoned for commercial use.²⁵⁰

CLE's airfield has two parallel northeast/southwest runways that measure 9,956 and 9,000 feet in length, respectively; and one 6,012-foot runway, each with all-weather capabilities (see Figure 3). Development projects in close proximity to the airfield need to be pre-cleared with (1) the FAA for airspace determinations of height-hazard-obstruction to airport operations; (2) the State Division of Aviation for consistency with the provisions of the Ohio Airport Protection Act within the Ohio Revised Code; and (3) the City of Cleveland Department of Port Control for consistency with the airport master plan.

In theory, it is possible for CLE to operate 24 hours a day, however there is currently little demand for aircraft operations between 12:00 a.m. and 5:00 a.m. Demand for departures is also diminished after 9:00 p.m. and before 6:00 a.m., as is demand for arrivals between 12:00 p.m. and 7:00 a.m. As a result, the airport's operating day is usually about 16 hours long from 6 a.m. to 10 p.m. The airfield can accommodate maximum daily volume of 1,300 to 1,400 flights.²⁵¹ According to the FAA's 2004 capacity benchmark report, in optimal weather CLE's benchmark capacity is 80-80 arrivals/departures per hour. In marginal weather, the benchmark decreased to 72 to 77 flights per hour.²⁵²

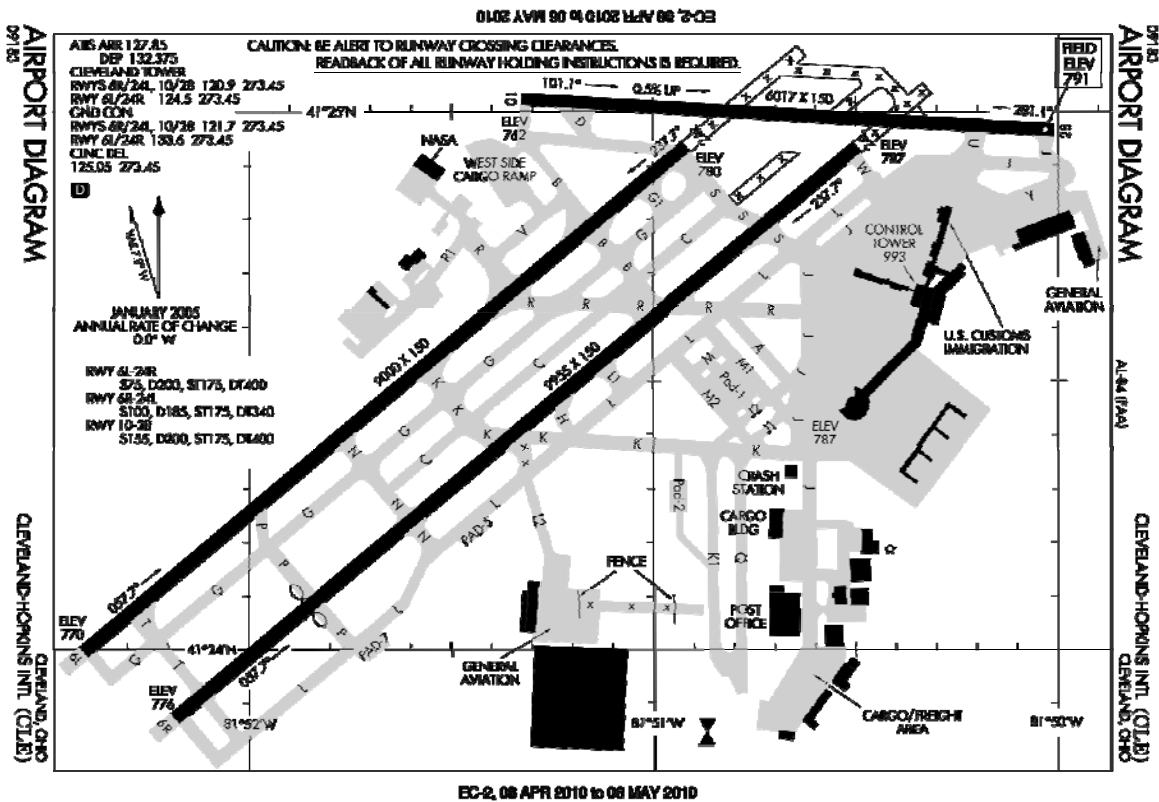


Figure 3: CLE Airport Diagram

The airport currently serves as a hub for Continental Airlines. In addition to Continental and Continental Express, CLE offers service from eight other branded passenger airlines: Air Canada Jazz, American Eagle, Delta and Delta Connection, Midwest Connect, Southwest Airlines, United and United Express, USA3000, and US Airways and US Airways Express.²⁵³ There are six international nonstop destinations from CLE: Punta Cana (Dominican Republic), Montréal (Canada), Toronto (Canada), Quebec City (Canada), Cancun (Mexico) and Nassau (the Bahamas).^{254, 255} CLE was ranked 34th in enplanements with 5.4 million in 2008. In 2009, there were 11 million passengers that year – or more than 30,000 per day.²⁵⁶

Significant development is occurring on and around the airport grounds. In 2008, the city of Cleveland awarded a 10-year contract to BAA USA Inc. to create an “Airmall” similar to those at Logan International Airport in Boston and Pittsburgh International Airport. At least seven companies have signed contracts with BAA Cleveland Inc., including electronics store I-Tech X-perience, Johnston & Murphy, jewelry store Taxco Sterling, a Crocs shoe store, Villa Fresh Italian Kitchen, Green Leaf’s...Beyond Great Salads, and Bananas Smoothies & Frozen Yogurt. The Rock and Roll Hall of Fame and Museum has also opened a store at CLE.²⁵⁷ When it is complete, CLE’s AirMall will occupy 76,000 square feet of retail space.²⁵⁸

Cleveland is looking to attract businesses to the area around the airport. In 2007, Mayor Frank Jackson announced plans to develop 600 acres around CLE into a center for logistics and aviation related businesses.²⁵⁹ In April 2009, Jackson announced plans to construct a “brand-name gas station and fast food restaurant” on city-owned property near CLE to generate revenue for the airport and help lower landing fees.²⁶⁰

Structure/Operations/Governance

The Cleveland Airport System is owned and operated by the city of Cleveland. In 2006, the mayor appointed Ricky Smith as director of port control. Smith manages operations of Cleveland’s Divisions of Harbors, Cleveland Burke Lakefront Airport (BKL), and CLE.²⁶¹ Under Smith, Khalid Bahhur serves as commissioner of both Burke Lakefront Airport and the Division of Harbors. Fred Szabo serves as the commissioner of CLE and oversees the airport’s operations.²⁶² Smith and Jackson recommend airport policy, but policies must receive approval from the Cleveland City Council Aviation and Transportation Committee.²⁶³ Although there are approximately 9,000 people who work at CLE, only about 400 of these are directly employed by the city of Cleveland’s airport system.²⁶⁴

“The Cleveland Airport System’s 2007-2010 Strategic Plan” outlines Mayor Jackson and Director Smith’s goals for CLE. In the plan’s introduction, Mayor Jackson stated “the plan is designed to use the Airport System as an economic engine for Cleveland and the region to spur investment in and around our airports.”²⁶⁵ The plan is being marketed as “Destination Cleveland Airports’ – Change, Forward Motion, Vision!” The Department of Port Control’s vision is “to be the best performing organization in the industry.” The mission is “to manage the city of Cleveland’s airports and waterfront properties in a safe, secure, efficient, and courteous manner”.²⁶⁶

Funding

Because the Cleveland Airport System is financed and operated similarly to a business, an enterprise fund has been set up to account for the airports’ operations. Therefore, the airport system is a self-sustaining operation (i.e., costs are recovered through user fees), and income generated by the airports must be spent exclusively on the airports. In 2009, CLE’s cost per enplaned passenger (CPE) was estimated at \$10.72 and landing fees were \$3.50 per 1,000 lbs.²⁶⁷

Tax dollars do not fund airport system projects. Rather, CLE is funded by non-aviation related revenues such as concessions and parking, plus aviation-related revenues such as rents and landing fees, federal grants, and passenger facility charges. The annual operating revenues were about \$111.4 million in 2008, with operating expenses around \$129.1 million.²⁶⁸

Incentives

There are several incentives that encourage economic development around CLE. This includes the Ohio Job Creation Tax Credit Program that provides a refundable tax credit of up to 75 percent of the company's state income tax withholdings for new employees as measured against the company's commercial activity tax (CAT) liabilities for up to 15 years.²⁶⁹ Businesses that maintain at least 500 full-time equivalent employees at the project site for the entire term of any agreement with the Authority may be eligible for the Job Retention Tax Credit – a non-refundable tax credit that may be applied against participating companies' tax liabilities (CAT, corporate franchise or income tax).²⁷⁰ The credit is equal to portions of state income taxes withheld from eligible existing full-time employment positions. Businesses that invest in "qualified research expenses" may be eligible for the Ohio Research and Development Investment Tax Credit. Businesses would receive a credit of up to seven percent of the amount of qualified research expenses; the credit is applied against their CAT, as well.²⁷¹

The state, city, and county offered a major incentive package to Continental when it announced plans to expand operations at CLE in 2007. The total package was valued at more than \$16 million. Continental was to receive a \$900,000 Outreach grant, an Ohio Investment in Training Program grant valued at up to \$550,000, and a 70 percent job creation tax credit over a 10-year period.²⁷² The Ohio Department of Job and Family Services would have also provided employment pre-screening, testing, and recruitment services.²⁷³ However, due to the economic downturn and decreased passenger traffic, Continental essentially cancelled the expansion.²⁷⁴

Local Incentives

The study area jurisdictions each offer incentives for business retention and attraction efforts, in addition to those of the county and state (see Figure 4). Berea, Brook Park, Middleburg Heights, Parma, Fairview Park, North Olmsted, Strongsville, Broadview Heights, and Brooklyn each have a designated Community Reinvestment Area (CRA). The CRA programs offer up to 100 percent real property tax abatement on new building construction and for improvements to existing buildings. Under the terms of the CRA program, the tax abatement can only apply to the increase in assessed valuation associated with the real property improvements. The maximum term for the abatement is 10 years.

Berea, Brook Park, Parma, North Olmsted, and Broadview Heights each offer a job creation payroll tax incentive program. In Brook Park, a payroll tax rebate of up to 50 percent for up to five years may be awarded to eligible businesses for creating new jobs. In Parma, a payroll tax rebate of up to 50 percent for up to 15 years can be awarded to businesses based upon projected payroll increases over the term of the

agreement. In Berea, 1.2 percent of two percent total payroll incentives are paid quarterly, a minimum of five new jobs and \$100,000 new or increased payroll. In North Olmsted, a company must create a minimum of \$500,000 in additional payroll over three years to qualify. The length of the grant and the amount of the grant is determined on a case-by-case basis. In Broadview Heights, a business must have an annual payroll of at least \$4 million to qualify. The grant will equal between five and 40 percent of estimated tax revenue and is determined on a case-by-case basis.

Berea, Brook Park, Cleveland, Parma, Parma Heights, Fairview Park, and North Royalton have storefront renovation programs. These programs offer either a rebate or a grant to assist business owners with improving their storefronts. In Parma, business owners may receive a grant or a rebate of up to 50 percent of eligible project costs. In Berea, Parma Heights, Fairview Park, and North Royalton business owners may receive up to 40 percent of project costs back as a rebate. In Cleveland, the amount of the grant is based on the scope of the project. In addition, the city of Cleveland offers low interest loans to help business owners fund storefront renovation projects.

Berea, Cleveland, Parma, Parma Heights, and Fairview Park offer an economic development loan program (suburbs offered through county development office). These programs are targeted at for-profit corporations that are creating new jobs. Businesses are awarded low interest loans for property acquisition, equipment purchase, and/or new construction costs. In Cleveland, to be eligible for the program, one new, full-time job must be created for every \$35,000 loaned.

Berea and Cleveland have vacant properties programs. In Berea, businesses locating and investing in buildings that have been vacant two or more years and are in designated target zones are eligible to receive income tax rebates corresponding to the level of investment. In Cleveland, the program was designed to overcome barriers in the full reuse of abandoned, idle, or underutilized commercial and industrial properties. Eligible properties can receive low interest and forgivable loans, depending on the level of investment.

Berea, Brook Park, Cleveland, Olmsted Falls, Parma, North Olmsted, Strongsville, and North Royalton have enterprise zones. Approximately 90 percent of Olmsted Falls has been designated as an enterprise zone and the entire city of Cleveland is an enterprise zone. In Parma, the northwest quadrant of the city has received the designation. Enterprise zones allow businesses either locating or expanding within the zone to receive tax exemptions on eligible new investments. A tax exemption of up to 75 percent can be applied to real and/or personal property for up to 10 years.

Berea has a building improvement program. The city offers assistance to eligible businesses for building improvements or equipment purchase. The amount of assistance awarded to a project corresponds with the overall renovation project

commitment. This program is citywide and has limited funds.

Berea also has a rent reimbursement program. This program offers a rent reimbursement for up to 12 percent of the monthly rent for a new retail business. The award period cannot exceed one year, and the city's 12 percent portion of monthly rent cannot exceed \$360. This program is citywide and funds are limited.

Cleveland has three unique grant programs to attract new businesses or retain businesses that are looking to expand. The Green Technology Business Grant Program is designed to promote the use of green building design principles and attract new green technology business to the city. Cleveland targets these grants toward companies with proprietary technologies that have strong growth indicators and can meet the unique needs of the energy, transportation, and electronic industries. Approved companies would receive up to \$50,000 per year for three years, based on 50 percent of new city of Cleveland income taxes generated. The program is available to new and existing green technology businesses that create five or more new jobs.

The second grant program offered by Cleveland is the Technology Business Grant Program. The city of Cleveland designed this program to attract new technology businesses. Projects are screened and selected based on job creation prospects, viability of intellectual property, and prospects for the successful commercialization of the technology. Approved companies would receive up to \$50,000 per year for three years, based on 50 percent of new city of Cleveland income taxes generated. The program is available to new and existing technology businesses that create five or more new jobs.

The third grant program offered by the city of Cleveland is the Citywide Business Grant Program. The Citywide Business Grant Program is designed to attract new and/or expanding businesses in the city. Grant assistance can be applied to both new and existing businesses creating five or more new jobs within the first year. Companies are eligible to receive grants of up to \$50,000 per year for three years, based on the amount of new income taxes generated.

Berea, Brook Park, and Cleveland offer Tax Increment Financing (TIF). TIF is an economic development tool that allows a municipality to re-direct new incremental real property taxes for the purpose of investment or improvement to the property. "A TIF works by locking in the taxable worth of real property at the value it holds at the time the authorizing legislation was approved. Payments derived from the increased assessed value of any improvement to real property beyond that amount are directed towards a separate fund to finance the construction of public infrastructure defined within the TIF legislation."²⁷⁵

Berea, Brook Park, Brooklyn, Cleveland, Fairview Park, Parma, and Parma Heights are

part of the Advanced Energy Special Improvement District (AESID). The AESID makes energy efficient retrofits affordable. It allows property owners in the district to voluntarily finance the costs of an energy improvement project through their property taxes. The AESID allows property owners in participating communities to install and operate energy efficiency systems (including solar, geothermal, wind, and other technologies) and repay the costs over 20 years through a special voluntary tax on their property bill. The AESID is a self-financing program where the energy cost savings will be greater than the costs of the energy improvements.

The matrix below (Figure 4) represents only local incentives offered by each municipality. In addition to these local incentives, the municipalities have access to economic development programs offered by Cuyahoga County. Cuyahoga County has several programs to assist in brownfield redevelopment. The county has several bond programs to provide low-cost financing for private projects that serve a public purpose. There are several community development programs that provide targeted investment in communities including a storefront renovation program. In addition to the economic development programs mentioned above, the county has several funds to encourage economic development such as the Grow Cuyahoga County Fund and Economic Development Fund.

	Advanced Energy District	Business Grant Program	Technology Business Grant Program	Green Technology Business Grant Program	Tax Increment Financing	Rent Reimbursement Program	Building Improvement Grant Program	Enterprise Zone	Vacant Properties Program	Economic Development Loan Program	Storefront Renovation Program	Job Creation Payroll Tax Program	Community Reinvestment Area
Berea	X					X	X	X	X	X	X	X	X
Broadview Heights		X										X	
Brook Park		X			X			X				X	
Brooklyn		X											X
Cleveland			X	X	X			X	X	X			X
Fairview Park		X	X										X
Middleburg Heights		X											
North Olmsted		X					X						
North Royalton			X				X						
Olmsted Falls							X						
Parma		X	X	X			X						X
Parma Heights			X	X									X
Strongsville		X					X						

Note: The communities of Broadview Heights, Olmsted Township, and Seven Hills currently do not offer local incentives in addition to that of the county or state, so are not listed in the matrix.

Figure 4: Local Incentives of Study Area Jurisdictions

Comparable Airport Incentives

A review of the 12 case study airports' tax incentives revealed that two, Columbus and Louisville, offer special airport incentive programs. In Columbus Ohio, the Columbus Regional Airport Authority (CRAA) created a new agreement with the airport's signatory airlines to share 75 percent of its annual net operating income (after debt service) and capital fund requirements. The revenue sharing will be in the form of rent credits, which will lower the airlines' cost of doing business at CMH.

In Louisville, Kentucky, a 3,000-acre zone south of SDF was established as a tax increment financing district to fund infrastructure improvements that would encourage industrial improvements. The Louisville Renaissance Zone Corporation (LRZC) was created to oversee development in the 3,000-acre zone. The LRZC and the Louisville Regional Airport Authority (LRAA) are separate organizations, but the members of their respective boards of directors are the same. In 2006 when UPS was looking to expand operations at SDF, the airport authority board approved the sale of 434 acres of surplus property for \$4.1 million to the LRZC. That same day, the LRZC approved the sale of 60 acres of that land to UPS at a cost of \$36,000 an acre.

Foreign Trade Zone

Cleveland is also home to a Foreign Trade Zone (FTZ), which is overseen by the Cleveland-Cuyahoga County Port Authority. CLE's FTZ includes the airport, the International Exposition (I-X) Center, the Snow Road Industrial Park in Brook Park, and the Brookpark Road Industrial Park, also in Brook Park.²⁷⁶ FTZs are secure areas created by the United States Foreign Trade Zones Board (FTZB) to provide special customs procedures to businesses engaged in international trade-related activity. FTZs are located in or near customs ports of entry and are the United States' version of what is known internationally as free trade zones.²⁷⁷ The intent is to help offset customs advantages available to overseas producers who compete with domestic industry.²⁷⁸

There are several advantages to using a FTZ. Because these zones are considered to be outside of the U.S. Customs Territory (for the purpose of customs duty payment), goods entering FTZs are not subject to customs tariffs until they leave the zone and are brought into the U.S. market for sale. In addition to benefitting items coming into the country, merchandise shipped from FTZs to a foreign country is exempt from duty payments. Companies importing parts used to manufacture finished products that will be exported may find this provision particularly useful.²⁷⁹ Thus, the FTZ benefit to a business exists only if there is an import and export component involved; only exporting does not trigger the FTZ benefit. There is no limit on the length of time items can be stored inside FTZs, and certain items held in FTZs may be exempted from state and local inventory taxes. This allows firms to minimize their costs while the products are awaiting shipment. In some cases, quota restrictions are waived on items entering a

FTZ.²⁸⁰

Foreign and domestic merchandise may be moved into zones for operations including storage, exhibition, manufacturing, relabeling, repackaging, testing, and processing. Manufacturing, processing, and any other activity that results in a change of the tariff classification must be specifically approved by the FTZB, which comprises representatives from the U.S. Departments of Commerce and Treasury. Retail trade is prohibited in FTZs.²⁸¹

Authority for establishing FTZs is granted by the FTZB. FTZ activity must not conflict with United States trade policy or harm domestic industries. The FTZB requires that FTZ activity result in a significant public benefit and a net positive economic effect. The U.S. Customs and Border Protection (USCBP) supervises the day-to-day activities at FTZs and ensures that all customs and FTZB requirements are met.²⁸²

There are two types of FTZs: general purpose zones and subzones. General purpose zones are usually located at ports or industrial parks. General purpose zones must be open to multiple users. Although manufacturing is permitted within general purpose zones, the most common uses are warehousing and distribution. Subzones are special-purpose zones, usually at manufacturing plants. A subzone of a general purpose zone can be approved if the company is unable to relocate existing facilities into the general purpose zone. Subzones are approved for use by one company and for a specific activity.²⁸³

Applications for new FTZs are made by public or public-type corporations. If the zone is approved, this organization is referred to as the “grantee.” The grantee has the authority to operate in the facilities or lease the space to public or private firms. The grantee may apply for expansions to the zone, special manufacturing/processing authority, or subzone authority on behalf of interested companies. The application process for creating a new general purpose zone, subzone, or expansion takes approximately 10 to 12 months. Application fees range from \$1,600 for a FTZ expansion, \$3,200 for an additional general purpose zone, and up to \$6,500 for an additional special purpose subzone.²⁸⁴ Those interested in applying for a FTZ should assess the level of international trade in the area to determine if there is a need for zone services.

In addition to individual tariff benefits received by the companies, FTZs provide numerous public benefits to the surrounding community. They help to facilitate and expedite international trade, encourage and facilitate exports, attract offshore activity, and encourage retention of domestic activity. Lastly, FTZs assist state and local economic development efforts and create employment opportunities.^{285, 286}

Freight and Logistics

More than 950 million tons of freight worth more than \$1.8 trillion moves in and out of Ohio annually. One-third of the freight traffic passes through Ohio while the remainder is evenly distributed among inbound, outbound, and internal movements.²⁸⁷ How freight travels—either by water, rail, truck, or air—is a function of its weight and value. Each form of transportation has unique service and price characteristics. Generally heavier, bulkier, and low value-to-weight goods move by slower forms of transportation (water and rail); lighter, smaller, and high value-to-weight goods move by faster forms of transportation (truck and air). Cuyahoga County has water, rail, truck, and air infrastructure in place to move goods in and out of the region. In 2009, Cuyahoga County ranked in the top 10 counties in Ohio for total freight by weight originating/terminating in any county by water, rail, freight truck, and air.²⁸⁸ There are currently 298 process and logistics companies and 70 freight transportation companies operating in Cuyahoga County.²⁸⁹

Air Cargo

Each week, more than 2,200 flights (both passenger and cargo) leave CLE.²⁹⁰ In 2008, 376 million pounds of cargo landed at CLE; the FAA ranked CLE 65th in cargo that year, and third in Ohio for landed weight.²⁹¹ FedEx and UPS operate daily wide body cargo service through the airport.²⁹² In 2009, FedEx landed 100 million pounds of cargo at CLE and UPS landed 42 million.²⁹³ In addition to FedEx and UPS, CLE has had service from eight different cargo airlines, including the United States Postal Service.²⁹⁴ Toledo was ranked first in Ohio with 940.8 million pounds of landed weight, followed by Columbus with 730.5 million pounds.²⁹⁵ There are eight airlines that have cargo operations at CLE including Continental, DHL, Federal Express, Servisair Global, Southwest, UPS, United States Post Office, and World Wide Flight Services. CLE has a cargo area on the south side of its property that contains 10 buildings. In addition to the cargo area, both FedEx and UPS operate out of their own facilities located at the airport.²⁹⁶

Goods that have high value-to-weight ratios or are time sensitive typically travel by air. Some of the most common are perishable goods, medicines, electronics, and express mail. Air cargo is transported from airport to airport and relies on local distribution sources to deliver goods to final destinations.²⁹⁷

Rail

Ohio's freight rail system consists of about 5,300 miles of rail routes—the fourth largest in the country. Thirty-four rail companies operate the rail systems. Two railroad companies in particular, CSX and Norfolk Southern, own and operate 78 percent of the total mileage. In 2005, Ohio's railroads handled 316 million tons of freight. Intermodal terminals are significant points in the rail system because cargo is broken down here and transferred from rail cars to trucks as it moves toward its final destination. The Ohio

Department of Transportation identified 14 of these facilities in 2007. Three of these facilities are located in Cuyahoga County: the Norfolk Southern Container Port, the Conrail Interstate Terminal Warehouse, and the Conrail Intermodal and Flexi-flo Bulk Terminal.²⁹⁸

Rail is the most energy efficient form of transportation. Rail has the ability to transport large amounts of weight over great distances. Bulk goods such as steel, wood, coal, ore, and grain and are the most common goods transported by rail. Containers have increased the efficiency of transporting non-bulk goods by rail. The use of containers allows for the intermodal transportation of goods by ship, rail, and truck. Rail transportation has lost market share to commercial transportation because it lacks flexibility in origin and destination points.²⁹⁹

Commercial Transportation

Ohio has the nation's fifth highest volume of truck traffic. Commercial transportation accounts for 60 percent of Ohio's overall freight shipments by weight (566 million tons) and 74 percent by freight value (1.3 trillion). Freight truck traffic is heavily concentrated on Ohio's principal roadways—the interstate highways. Today, 83 percent of the freight truck travel in Ohio is on the Interstate highway system. In addition, 94 percent of freight truck travel is on Ohio's designated macro-highway corridors. The major import/export corridors are I-80, I-70, I-71, I-75, and I-76.³⁰⁰

Commercial transportation is either designated as truckload (TL) or less-than-truckload (LTL). TL shipping is the movement of large amounts of cargo, generally enough to fill a semi-trailer or container. LTL shipping generally mixes freight from several customers on one trailer. LTL shipping is generally delivered with various other shipments and is usually not delivered directly to a destination, whereas TL shipping is delivered directly to a destination. Many types of goods can be shipped using commercial transportation including multi-modal containers, parcel mail, hazardous waste, liquid goods, refrigerated goods, and supermarket groceries.³⁰¹

Port

The Port of Cleveland is the major facility for water transportation in Cuyahoga County. The total annual tonnage at the Port of Cleveland is 12.5 million tons. Break bulk, which is packaged materials, accounts for 500,000 tons. Dry bulk or loose materials, such as limestone and grain, accounts for 12 million tons. The primary inbound cargos are steel, heavy machinery, and liquid/dry bulk. The primary outbound cargos are machinery and steel. Ninety percent of all cargo entering and leaving the Cleveland-Cuyahoga County Port Authority is produced or consumed within a 75-mile radius.³⁰²

The port includes five general cargo facilities operated by port-approved contractors.

The five facilities include both open dock and two-berth facilities with capacity for lifting up to 150 net tons and direct rail access. In all, the Port of Cleveland docks have approximately 6,500 linear feet of dock space, 420,000 square feet of warehouse space, and 12 acres of open storage for general cargo operations. Docks are maintained at a full seaway depth, which is 27 feet.³⁰³

Summary of Comparable Airports

A summary of the 12 airports is presented here, with detailed profiles of each contained in Appendix M. Data for the most current year available (2008 or 2009) were used for this research. Table 3 provides an overview of CLE and these airports, with regard to certain characteristics, operations, and finances.

Just as with the six emerging aerotropolises, one overarching characteristic is common to all but one of these 12 airports – **their ability to collaborate to plan, market, and sustain an ongoing regional or multijurisdictional dialogue on airport development.** Other than what was reported by MKE in Milwaukee, **collaborative planning across multiple jurisdictions was the key to successful airport development.** These collaborative efforts spanned multiple states, counties, and cities. MKE reported the lack of a unified economic development strategy and struggles to maintain coordinated, regional economic development collaboration among jurisdictions.

Atlanta Hartsfield-Jackson Airport (ATL)

Atlanta Hartsfield-Jackson Airport's (ATL) 4,700 acre campus is located about 10 miles south of downtown Atlanta between Interstates 85 (I-85) and 75 (I-75). ATL was the nation's busiest passenger airport and the 14th busiest cargo airport in 2008.³⁰⁴ ATL views Charlotte-Douglas International Airport, Dallas/Fort Worth International Airport, and Orlando International Airport as its main competitors.³⁰⁵ More than 20 regional airports also serve the Atlanta area, including six that are designated as reliever airports for ATL.³⁰⁶ More than 2,700 flights arrive and depart ATL each day. ATL serves 156 national destinations and more than 80 international destinations in 50 countries.³⁰⁷ According to the FAA's "2004 Air Capacity Benchmark Report," in optimal weather conditions, ATL is capable of handling 180 to 188 arrivals and departures per hour. The airport is able to accommodate this demand because of its five runways: three are 9,000 feet, one is 10,000 feet, and one is 11,889 feet.³⁰⁸

Since the airport authority has not formally adopted an aerotropolis strategy, it does not have an aerotropolis board. However, Dr. John Kasarda visited ATL in 2008 to discuss the airport's role in regional economic development. He encouraged the formation of a public/private partnership. While ATL does not oversee any development beyond airport boundaries, the airport supports the aerotropolis concept.³⁰⁹

Currently, the name "Aerotropolis Atlanta" appears to be a branding strategy employed by Jacoby Development Inc., a firm that specializes in sustainable, mixed-used projects. Aerotropolis Atlanta will be feeding off the momentum of Jacoby's "live-work-play" community in Midtown Atlanta, Atlantic Station, which was built on the site of the former Atlantic Steel plant. Many credit the development with rejuvenating midtown Atlanta.³¹⁰

Like other airports, ATL has been negatively effected by the economic downturn and has had to grapple with a drop in both passenger and cargo traffic. The sluggish economy presents the biggest challenge to the airport at this time.³¹¹ International traffic declined by five percent in 2008 and overall traffic dropped by three percent that year.³¹² In 2008, ATL met its goal of increasing efficiency at security checkpoints. The airport once suffered a reputation for long lines. To address this problem, ATL embarked on a \$26 million expansion that increased the number of security checkpoint lanes from 22 to 32. Passengers now have no more than a 10 to 20 minute wait in line at peak times.³¹³

Since ATL was redesigned in the 1980s, planners have focused on efficiency. The five parallel runways and parallel concourses allow planes to land on the airport's north side and taxi to the south side for take-off without crossing the paths of other planes. There are no cross runways at ATL. For example, in 2007 the airport opened the world's first end-around taxiway. Instead of having to cross paths with planes about to take off, planes that have just landed on the northernmost runway simply travel to the end of the runway, take a left and proceed on a taxiway that dips about 45 feet below runway level. Therefore, planes ready for take-off are not forced to share runway space with planes that have landed.³¹⁴

Baltimore/Washington International Thurgood Marshall Airport (BWI)

Baltimore/Washington International Thurgood Marshall Airport (BWI) is located in Glen Burnie, Maryland. BWI is owned and operated by the Maryland Aviation Administration (MAA). The MAA also operates Martin State Airport (MTN), which serves as a general aviation airport. Baltimore is part of the larger Baltimore-Washington combined statistical area (Baltimore-Washington CSA).³¹⁵ The Baltimore-Washington CSA is the fourth largest CSA in the United States, with a population of over eight million people.³¹⁶

There are two other commercial airports in the Baltimore-Washington CSA: Ronald Reagan Washington National Airport (DCA) and Washington Dulles International Airport (IAD). The Metropolitan Washington Airports Authority operates both DCA and IAD. In 2009, IAD was the busiest airport in the CSA based on number of passengers, followed by BWI and then DCA. BWI acts as the low cost carrier airport in the region.³¹⁷ BWI considers DCA, IAD, PHL, and to a lesser extent Harrisburg International Airport (MDT) to be its main competitors.³¹⁸

BWI encompasses 3,596 acres. There are four runways at the airport. Three of the runways intersect at their midpoint forming an asterisk shape. The runway lengths are 10,502 feet, 9,501 feet, 6,000 feet, and 5,000 feet.³¹⁹ The passenger terminal at BWI is approximately two million square feet with five concourses (four domestic, one international) and 69 gates.³²⁰

The MAA works closely with the community to encourage economic development at the airport and in the BWI area. BWI's work with the Anne Arundel County Commission and BWI/Linthicum Small Area Plan has created a blueprint for growth in the area. The MAA also works with the BWI Business Partnership (BWIBP) to encourage planning and development in the BWI area. Although BWI is actively working to encourage development around the airport, it currently does not have plans of becoming an aerotropolis. Interestingly, Mitch Weber, president of Heffner & Weber Companies, a design and construction firm in Baltimore, has begun to use the term aerotropolis in some of his proposed development projects around BWI.³²¹

Chicago O'Hare International Airport (Chicago, IL)

Chicago O'Hare International Airport (ORD) is located in Chicago, Illinois. ORD is owned by the city of Chicago and operated by the Chicago Department of Aviation (CDA). The CDA operates a second commercial airport in Chicago called Midway International Airport (MDW). There is a third airport, the Gary/Chicago International Airport (GYI), which is located in Gary, IN that also serves the Chicago metropolitan statistical area (MSA).³²² The three airports collectively serve the commercial airline industry in the Chicago MSA, which is the third largest metropolitan area in the United States.³²³ A regional collaboration effort between the states of Indiana and Illinois produced the Gary/ Chicago Regional Airport Authority (GCRAA), which oversees the growth of the three airports individually and the airport system as a whole.³²⁴

ORD encompasses 7,627 acres, and currently has seven runways, five of which intersect. The runway lengths are 10,005 feet, 8,075 feet, 7,967 feet, two at 13,000 feet, and two at 7,500 feet. ORD is currently undertaking an extensive infrastructure project called the O'Hare Modernization Program that will reconfigure ORD's intersecting runways into a more modern, parallel layout. The \$6.6 billion program is estimated to reduce weather-related delays by 95 percent and overall delays by 79 percent. The new

configuration will have eight runways, six running parallel east to west and two running parallel northeast to southwest. The runway lengths will include three at 7,500 feet, and one each at 8,071 feet, 10,600 feet, 11,245 feet, 11,600 feet, and 13,000 feet.³²⁵

ORD has not currently defined itself as an aerotropolis; however, DuPage County has studied the development around the airport and looked at future economic development opportunities. The report, entitled the “West O’Hare Corridor Economic Development Study,” was completed in 2006. The report acknowledges that significant development is occurring around ORD and looks to maximize the economic benefit of the airport. The report focuses on transportation infrastructure, economic impacts, land use, and implementation strategies. A total of 11 opportunity zones were identified in the report for future industrial, office, and mixed-use developments. These zones include undeveloped and underdeveloped properties, highly visible properties at key intersections (intersections with high traffic volumes, potential for development or redevelopment), and land that could be affected by the addition or expansion of roadway and transit lines.³²⁶

Cincinnati/Northern Kentucky International Airport (Hebron, Kentucky)

The Cincinnati/Northern Kentucky International Airport (CVG) is located in Hebron, Kentucky. Although Hebron is located within Boone County, CVG is owned and operated by the neighboring Kenton County. Kenton County is also located in Kentucky. CVG is the primary passenger and cargo airport for the Cincinnati metropolitan statistical area (Greater Cincinnati). Greater Cincinnati includes counties in Ohio, Kentucky, and Indiana.³²⁷

CVG encompasses 7,000 acres and has four runways. Three of the runways are parallel and can accommodate simultaneous landings. These three runways are positioned north/south at lengths of 8,000 feet, 10,000 feet, and 11,000 feet. The fourth runway is positioned east/west and is 12,000 feet long.³²⁸

CVG is located in the southwest corner of Greater Cincinnati. According to Landrum and Brown, the area surrounding the airport on the western side is predominately agricultural with a small amount of single-family residential development. The east side of the airport has predominately commercial, industrial, and single-family residential land uses.³²⁹ Boone County has zoned the majority of the land surrounding the airport as either business park, commercial, or industrial.³³⁰ Although CVG is landlocked to the east by development, the airport has the ability to expand to the west due to the amount of undeveloped land.³³¹

CVG has not currently defined itself as an aerotropolis. The Boone County Planning Commission has, however, recognized the development that is occurring around the airport and included recommendations for the future development around the airport in

its 2005 Boone County Comprehensive Plan. The report states that industrial growth in Boone County has been the strongest around the airport, and that the benefits of the airport should be optimized to promote economic development. The report also states that industrial development should be encouraged to locate near the airport and that new residential development shall not occur in areas with existing or proposed day/night noise levels of 65 decibels from aircraft.³³²

Port Columbus International Airport (Columbus, OH)

Port Columbus International Airport (CMH) is located in Columbus, Ohio. CMH is part of the Columbus Regional Airport Authority (CRAA). The CRAA includes CMH, which acts as the primary passenger airport; Rickenbacker International Airport (LCK), which acts as the primary cargo airport; and Bolton Field (TZR), which acts as a reliever airport for the system. Development around the airport is overseen by a separate organization called the Port Columbus Area Development Partnership (PCADP). The PCADP, which comprises the four communities adjacent to the airport, has identified 6,000 acres surrounding the airport for strategic planning and economic development.³³³

CMH comprises 2,185 acres and has two parallel runways measuring 8,000 feet and 10,125 feet. CMH is served by 10 scheduled commercial airlines. There are 160 daily departures and more than 30 nonstop destinations flying out of CMH.³³⁴ CMH does not have any nonstop flights to Europe or Asia, but does offer regularly scheduled nonstop international service to Toronto, Canada and seasonal nonstop service to Cancun, Mexico.³³⁵ Southwest Airlines is the largest carrier at CMH with 26 percent of the market share, followed by US Airways with 16 percent. In 2008, CMH had 6.9 million passengers, a 10.5 percent decrease from 2007.³³⁶ The FAA ranked CMH 52nd in the U.S. for annual passenger enplanements with 3.4 million (9,300 passengers per day).³³⁷ CMH handled 731 million pounds of cargo in 2008. CMH handles only seven percent of the total cargo handled at LCK.³³⁸

CMH has the advantage of being the largest commercial passenger airport in central Ohio. CMH views Cincinnati/Northern Kentucky International Airport, Dayton International Airport, and Akron-Canton Airport as its main competitors for passenger traffic. CMH works to keep its fares as low as possible to retain its customer base and attract customers from competitor's markets.³³⁹

Although the PCADP is encouraging business development around the airport, CMH currently does not have plans that include developing into an aerotropolis.³⁴⁰ The product of the PCADP working group is the PCADP Joint Economic Development Strategy. The document identifies a 6,000-acre area surrounding the airport for strategic planning and economic development, and specifically 15 opportunity sites within that area for future development. The area encompasses four government entities including the cities of Columbus, Gahanna, and Whitehall, and Mifflin Township. PCADP

identified aeronautical, professional/scientific/technical, accommodations/ food/retail, manufacturing, and wholesale trade as the business types most appropriate for locating around CMH.

General Mitchell International Airport (Milwaukee, WI)

General Mitchell International Airport (MKE) sits on a 2,180 acre (3.405 square miles) plot in Milwaukee County, about five miles south of Milwaukee, Wisconsin's central business district. The airport is bounded to the north by Layton Avenue, to the east by Canadian Pacific (CP) Railway, to the south by College Avenue, and to the west by Howell Avenue and the CP Railway. The airport serves as the primary commercial airport of Milwaukee, Southeast Wisconsin, and Northern Illinois.³⁴¹

In 2009, MKE's total aircraft operations totaled 169,693 flights. The airport has five runways (9,690 feet, 8,012 feet, 5,868 feet, 4,800 feet, and 4,183 feet) upon which, in 2008, it serviced nearly 3.9 million (enplaned and deplaned) passengers,³⁴² and, according to 2006 FAA Advisory Circular 150/5060-5 methodology calculations, with a maximum capacity of 110 arrivals and departures per hour.³⁴³ Domestic passenger flights operate out of a single 777,000 square-foot terminal housing 42 aircraft gates servicing 15 national and regional airlines, including Air Canada, AirTran, American Eagle, Continental Express, Delta/Northwest, Frontier, Funjet Vacations, Great Lakes, Midwest Express, Skyway, Southwest Airlines, United Express, US Airways, and US Airways Express. International travelers are serviced through a single gate in a separate 5,000 square-foot terminal.³⁴⁴ According to the ACAIS, MKE's cargo operations ranked 45th largest in the country, with a total landed weight of about 558 million pounds of cargo in 2008.³⁴⁵ The airport's cargo facilities are comprised of two multi-tenant buildings, 38,000 square feet and 126,000 square feet, as well as 63,300 square yards of aircraft parking. FedEx, UPS, and the United States Postal Service operate out of these facilities, in addition to several smaller cargo operators, freight forwarders, and the cargo operations of several passenger airlines.³⁴⁶

Although continued development of the airport is contained within the airport's planning efforts, it is not currently engaged in plans to develop an aerotropolis.³⁴⁷ Though certain areas surrounding the airport are designated as potential expansion areas, the availability of the land is uncertain, slowing planning and development initiatives until this can be resolved. The airport also considers the region's lack of an economic development strategy to be one of its greatest weaknesses. This has slowed the process of development around the airport, as issues regarding transportation, infrastructure, land use, and economic development have been halted by what is considered to be a "somewhat disjointed and uncoordinated" regional economic development collaboration among the many jurisdictions in the metropolitan Milwaukee area.³⁴⁸

Indianapolis International Airport (Indianapolis, IN)

The Indianapolis International Airport (IND) is located in Indianapolis, Indiana. IND is the largest airport in Indiana (7,700 acres) and is the primary commercial and cargo airport serving the greater Indianapolis region.³⁴⁹ IND is owned and operated by the Indianapolis Airport Authority (IAA). The IAA also operates five general aviation airports in the Indianapolis region including Eagle Creek Airpark, Hendricks County Airport, Metropolitan Airport, Mt. Comfort Airport, and the Indianapolis Downtown Heliport.³⁵⁰

IND recently completed a major \$1.1 billion airport project in which the IAA closed its former terminal and opened a new airport complex. The project included a new terminal, an attached parking garage, two surface parking lots, a new apron, and new air traffic control tower, as well as a new I-70 interstate entrance and roadway system. The new terminal, named in honor of Colonel Harvey Weir-Cook, consists of two concourses, each containing 20 boarding gate areas.³⁵¹

IND is served by 10 airlines averaging 154 daily nonstop departures to 37 destinations. IND has nonstop scheduled service to two international destinations: Toronto, Canada and Cancun, Mexico. In 2009, aircraft operations at IND were 171,322. IND handled 4.1 million passengers (enplaned and deplaned) in 2008. The FAA ranked IND 46th in the U.S. for passenger enplanements and sixth for cargo landed weight. IND had 5.1 billion pounds landed weight in 2008 (an average of 14 million pounds per day).³⁵² IND serves as a hub for FedEx Express and is a focus city for AirTran Airways.³⁵³ FedEx remains the largest contributor of cargo volume at the airport (97.3 percent), followed by Trade Winds (2.4 percent), and Cargolux (0.2 percent).³⁵⁴

In January 2010, John Kasarda met with the IAA board, key airport staff members, and a select group of business and civic leaders. The IAA is exploring best practices for strategically leveraging its airport system for maximum economic advantage in Indianapolis and throughout central Indiana.

Lambert-St. Louis International Airport (St. Louis, MO)

Lambert-St. Louis International Airport (STL) sits between I-270, I-170 and I-70, 11 miles north of downtown St. Louis, MO. The airport is owned by the city of St. Louis and operated by the city of St. Louis Airport Authority. The airport is largely sited on unincorporated St. Louis County property and is not contiguous with the city. Airport property extends into several municipalities including Bridgeton, Hazelwood, St. Ann, Kinloch, Berkeley, and Edmundson. STL encompasses 1,845 acres within its fenced area and 2,125 acres outside the fenced area.³⁵⁵

STL has four runways, three of which are 150 feet wide and one that is 200 feet wide. The 9,003 foot and 11,000 foot runways are parallel and the intersecting runway is

7,602 feet long. The newest runway, which measures 9,000 feet, is also a parallel runway; it is located to the northwest of the others.³⁵⁶

With more than 6.7 million enplaned passengers, STL was ranked 31st in the U.S. in 2008 in terms of passengers served. Thirteen passenger carriers serve STL: Air Canada, Air Choice One, AirTran, American/ /Eagle, Cape Air, Continental/Continental Express, Delta/Delta Connection, Frontier Airlines, Midwest Connect, Southwest Airlines, United/United Express, US Airways/US Airways Express, and USA3000.³⁵⁷ Until 2001, STL was a hub for TWA, which was purchased by American Airlines. This has presented the airport's greatest challenge. American implemented a program to dismantle the passenger hub. The loss of hub flights resulted in a rapid decrease in air traffic. In 2000, STL hit its peak for passenger traffic at 30.6 million annual passengers.³⁵⁸ By 2009, the airport's passenger traffic dropped to 12.8 million passengers annually.³⁵⁹ By mid-year 2010, the American Airlines hub at STL was expected to be gone, with the airport becoming a spoke on the American Airlines system.³⁶⁰ When STL was still a TWA hub, the airport had 10 to 12 international destinations. Today international flights primarily consist of travel to Canada and vacation destinations to Mexico or the Caribbean.³⁶¹

The St. Louis Airport Authority is currently developing a master plan study to forecast aviation demand over the next 20 years. The plan focuses on air cargo opportunities, long-term terminal needs, and improvements to support growth in aviation activity. In addition, the plan will identify new ways to spur economic growth.³⁶² STL completed an earlier master plan in the mid-1990s that focused on airport expansion and increasing capacity.³⁶³ According to STL Airport Planning Manager Dana Ryan, STL has not yet developed a branding strategy, aerotropolis or otherwise. After the master plan is complete, STL will likely turn to marketing. Ryan said if the airport is able to retain properties that had been purchased for the noise abatement program it could explore developing a strategy similar to the one used by the Dallas Fort Worth International Airport.³⁶⁴ Ryan also said the airport's primary competitors are airports that are able to provide scheduled heavy lift air service and "there is a direct desire line between St. Louis and Chicago."³⁶⁵

Louisville International Airport, Louisville, KY (SDF)

Until 1937, the Louisville International Airport (SDF) was a large field in the middle of farm land. Today SDF's campus has grown to 1,200 acres. The airport, which is owned and operated by the Louisville Regional Airport Authority, is located 10 minutes from downtown Louisville at the intersection of interstates 264 and 65.³⁶⁶ SDF is just eight miles from the Ohio River.³⁶⁷ SDF compares its fares with Cincinnati/Northern Kentucky International Airport (CVG), Indianapolis International Airport (IND), and Blue Grass Airport, Lexington (LEX). SDF also benchmarks for seats, destinations, and passenger statistics against Evansville (EVV) and occasionally Columbus (CMH),

Dayton (DAY), and Nashville (BNA).³⁶⁸

According to the Louisville-Jefferson County map, SDF is located within a large tract of land zoned primarily for commercial use. To SDF's south and west are large tracts of land zoned for industrial use.³⁶⁹

SDF has two parallel runways and one crosswind runway. Runway lengths are 7,250 feet, 8,580 feet, and 11,890 feet. In addition, the airport has more than 62,000 linear feet of taxiways.³⁷⁰ In 2009, take-offs and landings at SDF totaled 146,492. The airport is capable of handling a maximum of 109 arrivals and departures per hour.³⁷¹

Primarily because the airport is home to the United Parcel Service's (UPS) sorting hub (Worldport), SDF is the third largest cargo airport in North America and ninth largest in the world. In 2008, 10.4 billion pounds of cargo landed at SDF.³⁷²

In his research, Kasarda argued that a major distribution network emerged in Louisville because of UPS and Worldport.³⁷³ However, no formal aerotropolis initiative has currently formed around SDF. Nevertheless, the airport is a major economic engine for the region. The metro chamber of commerce, Greater Louisville Inc., plays an important role in marketing SDF.³⁷⁴ That organization, along with Louisville-Jefferson County and Bullitt County's economic development departments, has taken the lead in cultivating airport-related development projects.³⁷⁵

Minneapolis St. Paul International Airport (Minneapolis, MN)

Minneapolis St. Paul International Airport (MSP) sits on a 3,400-acre (5.31 square miles) plot of land. The majority of the airport's property is located in an unincorporated section of Hennepin County, MN, while a small portion of the property falls within the city limits of Minneapolis.³⁷⁶ Although not within the boundaries of these cities, the airport is surrounded by Minneapolis, St. Paul, Bloomington, Eagan, Mendota Heights, and Richfield.³⁷⁷ Freeways and a state park surround MSP. iRoute 62 borders airport property to the north, Route 77 to the west, Route 5 to the south and east, and Fort Snelling State Park and Pine Island State Park to the east and northeast.³⁷⁸

The airport operates four runways (11,006 feet, 8,200 feet, 10,000 feet, and 8,000 feet) and two terminal buildings—Lindbergh Terminal and Humphrey Terminal.³⁷⁹ Each terminal houses its own parking facilities. There is no pedestrian access between the two terminals; the only access is through light rail service. The 2.9 million square-foot Lindbergh Terminal houses 17 gates, while the smaller Humphrey Terminal houses 10 gates in 398,000 square feet.³⁸⁰ These two terminals process about one half-million landings and take-offs per year including traffic from air carriers, air taxis, general aviation, and military landings, or about 1,370 per day. Its passenger operations rank as the 16th largest in the U.S. and 30th in the world, with about 16.4 million travelers served

(enplaned and deplaned) in 2008 on 15 airlines, including Air Canada, Air Tran, Alaska Airlines, American Airlines, Continental Airlines, Delta/Northwest Airlines, Frontier Airlines, Icelandair, Midwest Airlines, Southwest Airlines, Sun County Airlines, Unites Airlines, and US Airways.³⁸¹ In addition to passenger traffic, the Air Carrier Activity Information System (ACAIS) ranks MSP as the 23rd largest cargo airport in the U.S., processing about 1,123 million pounds per year.³⁸²

According to MSP, general development around the airport has not been substantial and there is very little vacant, developable land. One of the airport's biggest weaknesses is its difficulty to expand. The airport is landlocked, and a much of the land surrounding the airport is developed as residential. The airport is currently not engaged in plans to develop an aerotropolis, yet there has been some attempt by neighboring cities to address airport-related development but this has been independent of MSP. The city of Bloomington, for example, has examined what type of industry or development is best suited for airport land use planning.³⁸³

Pittsburgh International Airport (Findlay Township, PA.)

Pittsburgh International Airport (PIT) is 16 miles west of downtown Pittsburgh. Most of the airport's 8,840-acre campus is in Findlay Township; however, PIT's northern portion extends into Moon Township.³⁸⁴ PIT sits between the split of Business Route 60 and newly designated Interstate 376. It is also easily accessible from interstate routes 76, 79, and 279. PIT is just two hours southeast of CLE. The airport's catchment areas overlap; therefore, PIT sees CLE as one of its major competitors.³⁸⁵

When PIT was constructed in 1992, it was built to the specifications of US Airways, then the hub airline at PIT. As a result, PIT has four long and wide runways of 11,500 by 200 feet wide, 9,708 by 150 feet, 10,502 by 150 feet, and 8,101 by 150 feet.³⁸⁶ The airport plans to eventually build a fourth parallel runway.³⁸⁷ On average, 168 cargo and passenger flights depart from PIT per day.³⁸⁸ According to the FAA's 2004 Airport Capacity Benchmark Report, in optimal weather conditions PIT can handle 152 to 160 flights per hour.³⁸⁹

Unlike other airports that are constrained by residential developments, large tracts of undeveloped land surround PIT. The land immediately surrounding PIT in Findlay Township is primarily zoned for heavy industrial use, but there is also some zoning for business parks, mixed-use, and light industrial use.³⁹⁰ In Moon Township, the land surrounding the airport is zoned for business parks.³⁹¹

Although PIT currently lacks a formal aerotropolis initiative as defined by Kasarda, there is a coordinated regional economic development strategy around the airport. The Allegheny County Chief Executive, the Allegheny County Airport Authority, and the Allegheny Conference on Community Development formed the ad hoc Airport Market

Area Task Force in 2002. Leaders from academia and the public and private sectors serve on the task force as volunteers.³⁹² The task force's main accomplishment was contracting the Urban Land Institute (ULI) to analyze development opportunities in the three-county area around PIT.³⁹³ In order to fully maximize the airport's potential, ULI called for better regional cooperation, improvements to the transportation infrastructure around PIT, and the formulation of a regional water and sewer infrastructure plan. The institute also claimed that a dearth of "ready-to-go" business sites in the airport vicinity stymied regional economic development.³⁹⁴ ULI's recommendations became the basis of the economic development strategy around PIT.³⁹⁵ After the study was completed, the task force dissipated but gave rise to the Tri-County Airport Partnership (T-CAP) of Allegheny, Beaver, and Washington Counties, which formed in 2003.³⁹⁶ As members of T-CAP, each county agreed to support development around the airport, regardless of location.³⁹⁷

Seattle-Tacoma International Airport (SeaTac, WA)

Seattle-Tacoma International Airport (SEA) is located on 2,500 acres (3.905 square miles) in SeaTac, Washington, 16 miles south of downtown Seattle, Washington and 20 miles north of Tacoma, Washington.³⁹⁸ The airport's three runways vary in size, the largest of which is 11,500 feet long. The others are 9,425 feet, and 8,500 feet.³⁹⁹ SEA is owned and operated by the Port of Seattle, which oversees four operating divisions, including an aviation division, a capital development division, a real estate division, and a seaport division.

In 2009, SEA's operations included 317,873 air carrier, air taxi, general aviation, and military flights. During that same period, it serviced more than 15.8 million passengers (domestic, international, enplaned, and deplaned).⁴⁰⁰ More than 60 carriers operate at SEA; however, 10 carriers account for the majority of activity (Alaska Airlines, Horizon Airlines, Southwest Airlines, United Airlines, Delta/Northwest Airlines, American Airlines, Continental Airlines, United Express/Skywest, and U.S. Airways).⁴⁰¹

The airport's air cargo operations are the 19th busiest in the country, with direct international cargo flights to Seoul, Beijing, Taipei, Tokyo, London, Paris, Frankfurt, Amsterdam, and Luxemburg. The cargo operations are housed within 900,000 square feet of warehouse, airmail, and office space and handle 290,653 annual metric tons (640.1 million pounds) of international cargo. Additionally, the airport offers 1.5 million square feet of aircraft parking that includes multiple positions for wide-body and nose-loading 747-F.⁴⁰² The size and continued growth of the airport's cargo operations is due to the market in which the airport is located, serving as a major export venue for high value produce (cherries), sophisticated electronics, and medical and pharmaceutical products. Import demand is also high, concentrated in the areas of consumer products (clothes, I-Pods), and the globalization of manufacturing (outsourcing by manufacturers such as Boeing). With growing demand for both passenger and freight, SEA has an

Feasibility of an Aerotropolis

internal department solely dedicated to increasing freight and passenger services.⁴⁰³ Although SEA continues to grow to accommodate increased demand, it is not currently engaged in plans to form an aerotropolis.

Table 3: Case study airports' characteristics, operating data, and financial data

Airport	Number of runways	Runway size (ft.)	Size of airport property (acres)	Room for expansion?	Miles to downtown	Total operations per year (2009)	Capacity (arrivals & departures/hr.)	FAA cargo ranking (2008)	Cargo, landod weight (2008, in million lbs)	International cargo	FAA passenger ranking (2008)	Enplanements annually (2008 in millions)	Number of passenger airlines	International (passenger) flights	Average landing fees/1,000 lbs (2009, average signatory airlines)	Passenger facility charge (2009 average)	Airport operating revenue (2008, in millions)	Airport operating expenses (2008, in millions)
Cleveland (CLE)	3	6,012; 9,000; 9,956	1,900	yes	10	200,272	80-80	65	376	no	34	5.4	9	yes	\$3.50	\$4.50	\$111.4	\$129.1
Atlanta (ATL)	5	3 at 9,000; 1 at 10,000; 1 at 11,889	4,700	very little	10	970,258	180-188	14	2,344	yes	1	43.8	17 mainline, 12 regional, 3 charter	yes	\$1.00	\$4.50	\$386.2	\$181.7
Baltimore (BWI)	4	5,000; 6,000; 9,501; 10,502	3,596	yes	13 ³ , 34 ⁴	268,016	106-120	57	456	yes	23	10.2	14	yes	\$3.71	\$4.50	\$170.4	\$167.3
Chicago (ORD)	7	2 at 7,500; 7,967; 8,075; 10,005; 2 at 13,000	7,627	no	19	827,899	190-200	8	4,207	yes	2	33.7	53	yes	\$4.91	\$4.50	\$684.3	\$579.3
Cincinnati (CVG)	4	8,000; 10,000; 11,000; 12,000	7,000	yes	17	222,791	120-125	93	207	yes	32	6.6	18	yes	\$3.53	\$3.50	\$105.3	\$66.8
Columbus (CMH)	2	8,000; 10,125	2,185	no	8	146,064	N/A	34 ¹	731	yes	52 ²	3.4	10 commercial	yes	\$3.40	\$4.50	\$80.3	\$54.8
Indianapolis (IND)	3	7,280; 10,000; 11,200	7,700	yes	14	171,322	N/A	6	5,128	yes	46	4.1	10	yes	\$1.95	\$4.50	\$157.8	\$170.9
Louisville (SDF)	3	7,250; 8,580; 11,890	1,200	yes	7	146,492	109	3	10,455	yes	66	1.8	9	no	\$1.48	\$3.00	\$63.3	\$57.7
Milwaukee (MKE)	5	4,183; 4,800; 5,868; 8,012; 9,690	2,180	limited	5	169,693	110	45	558	yes	50	3.9	15	yes	N/A	\$4.50	\$64.9	\$53.4
Minneapolis (MSP)	4	8,000; 8,200; 10,000; 11,006	3,400	limited	7	432,604	114-120	23	1,123	yes	16	16.4	15	yes	\$2.24	\$4.50	\$241.6	\$126.7
Pittsburgh (PIT)	4	8,101; 9,708; 10,502; 11,500	8,840	yes	15	148,135	152-160	46	491	yes	43	4.3	12 mainline	yes	\$2.83	\$4.50	\$131.9	\$85.0
Seattle (SEA)	3	8,500; 9,425; 11,500	2,500	limited	16	317,873	80-84	18	1,494	Yes	17	15.8	60+	yes	\$2.96	\$4.50	\$358.3	\$195.2
St. Louis (STL)	4	7,602; 9,000; 9,003; 11,000	3,970	yes	11	209,313	104-113	62	426	no	31	6.7	13	yes	\$7.96	\$4.50	\$134.6	\$141.0

¹ Rickenbacker
² Port Columbus
³ to Baltimore
⁴ to Washington, D.C.

PHYSICAL PROPERTY REVIEW

A spatial analysis of the physical property characteristics of the study area was conducted to provide both an overview of the study area and the geographic context of its assets. This analysis also contributed to determining feasibility for the concept of an aerotropolis utilizing CLE as the nucleus. The spatial focus of the project included Cuyahoga County and the study area, which is all or part of the jurisdictions of Berea, Broadview Heights, Brook Park, Brooklyn, Brooklyn Heights, Cleveland, Fairview Park, Middleburg Heights, North Olmsted, North Royalton, Olmsted Falls, Parma, Parma Heights, Seven Hills, and Strongsville.

Road Network

Secondary, major, and interstate street networks are displayed in Figure 5 in or near the study area. The study area encompasses all or parts of the jurisdictions stated above. Two interstates – I-480 (running east/west) and I-71 (running north/south) – traverse through the study area. Exit and entrance ramps from both interstates are located just outside of the northeastern portion of the airport. Also, access to the east/west oriented Ohio Turnpike is located approximately six miles south of CLE.

Drive Times

Drive time areas at 5, 10, 15, 20, and 25 minutes are displayed in Figure 6 from the airport entrance. For the most part, the jurisdictions within the study area are within the 15-minute drive time to the airport. About 20 percent of Southeastern Parma is within the 20-minute drive time. The drive time polygons were based upon the road class of the U.S. Bureau of the Census 2009 street network file, with the speed limit for each road based on the road class. Traffic signals or stop signs are not included in determining drive time distance.

Businesses are shown in Figure 7 within the 5-, 10-, 15-, 20-, and 25-minute drive time areas from the entrance to CLE. The Demographic and Economic Profile section of this report reflects this in detail.

Zoning and Market Value

Zoning districts indicating permitted uses have been mapped based on data from the Cuyahoga County Auditor as of January 2009. Figure 8 indicates that there is much industrial use in the immediate area of the airport. Along major streets, zoning for mixed

and commercial use is prevalent.

Property market values (based on Cuyahoga County Auditor data) as of December 2008 are shown in Figure 9. Some of the highest property values – ranging from \$20 million to \$360 million – are seen near the airport. These properties are mainly in commercial and industrial use areas.

Elevation Contours

Ten-foot elevation contours within the study area are depicted in Figure 10. Elevation can affect connectivity and developability of parcels. The natural feature of the steep drop off to the Rocky River can be seen trending south to north through Berea and to the west of CLE. The escarpment of Parma also produces a steep slope in the southeastern portion of the city.

Land Opportunities

There are 94,489 parcels within the study area. Many larger parcels are located in areas surrounding the airport toward the west, north, and south in close proximity to the interstate network. The majority of the smaller parcels represent residential needs. Residential use of parcels comprises 56 percent of the total land area, with 18 percent of parcel data being commercial or industrial use.

Forty-six parcels as of March 2009 are city-owned land bank parcels and are in a special designation have an exempt land use code equal to 7,000 or property class equal to B. The land bank parcels within the study area are:

- Brook Park – 3
- Cleveland – 32
- Parma – 9
- Middleburg Heights – 1
- North Royalton – 1

A total of 1,501 parcels were deemed tax delinquent in 2006, 2007, and 2008, with the majority of these parcels being residential. The tax delinquent parcels are evenly distributed throughout the study area, with the total number for each jurisdiction for the three years as follows:

- Berea – 110
- Broadview Heights – 16
- Brook Park – 125
- Brooklyn – 37

- Brooklyn Heights – 27
- Cleveland – 284
- Fairview Park – 16
- Middleburg Heights – 60
- North Olmsted – 32
- North Royalton – 28
- Olmsted Falls – 57
- Olmsted Township – 95
 - Parma – 445
 - Parma Heights – 81
 - Seven Hills – 50
 - Strongsville -- 38

There were a total of 903 parcels in active foreclosure as of September 2009 within the study area. The locations were widely distributed throughout the study area. The total foreclosed parcels within the study area are:

- Berea – 77
- Broadview Heights – 5
- Brook Park – 78
- Brooklyn – 18
- Brooklyn Heights – 7
- Cleveland – 166
- Fairview Park – 9
- Middleburg Heights – 23
- North Olmsted – 12
- North Royalton – 17
- Olmsted Falls – 28
- Olmsted Township – 41
- Parma – 299
- Parma Heights – 80
- Seven Hills – 23
- Strongsville -- 20

As of September 2009, 65 parcels that were classified as residential one, two, or three family property sold at 25 percent of the median sale price for that jurisdiction. The parcels within the study area are:

- Berea – 11

- Broadview Heights – 1
- Brook Park – 8
- Cleveland – 8
- Fairview Park – 1
- Middleburg Heights – 4
- North Royalton – 1
- Olmsted Falls – 2
- Olmsted Township – 4
- Parma – 20
- Parma Heights – 2
- Seven Hills – 2
- Strongsville -- 1

There are 7,117 potentially developable parcels within the study area (see Figure 11). For the purposes of this study, potentially developable parcel is defined as having met any one of the following criteria:

- Vacant – total building value equaled zero and zoning is residential, commercial, or industrial
- Land bank – parcels are owned by the city in special designation, exempt land use code equaled 7,000 or class equaled B
- Tax delinquent – parcels were delinquent from 2006 through and including 2008 (all three years)
- Foreclosed – parcels were in active foreclosure as of September 2009
- Sales – residential one, two or three family home sales sold at 25 percent of the median sale price for that community

A breakdown of the total potential developable parcels within the study area, indicated below, are also shown in Figure 11:

- Berea – 768
- Broadview Heights – 98
- Brook Park – 603
- Brooklyn – 143
- Brooklyn Heights – 102
- Cleveland – 1,028
- Fairview Park – 63
- Middleburg Heights – 496
- North Olmsted – 159
- North Royalton – 159
- Olmsted Falls – 505

- Olmsted Township – 504
- Parma – 1,569
- Parma Heights – 290
- Seven Hills – 281
- Strongsville – 349

The potential developable parcels within the study area were then evaluated to identify those parcels that were greater than five acres. This size was chosen based on feedback from site selectors who indicated it is a targeted minimum size for potential site development. The evaluation included a review for accuracy by the Aerotropolis feasibility study advisory group of the potential sites for their cities (Berea, Brook Park, Cleveland, Olmsted Falls, and Parma). Based on the advisory group's detailed knowledge of their city's property, additional sites were added and some were eliminated. It is important to note that the developable property data for the remaining cities within the study area was not reviewed. Further investigation of these sites could be assessed in a future study. Figure #X depicts the number of potential developable parcels greater than five acres (and total acreage available) within the study area. A map depicting the total number of acres for each site is included in Appendix N.

- Berea – 15 sites totaling 229 acres
- Broadview Heights – 4 sites totaling 33 acres
- Brook Park – 10 sites totaling 83 acres
- Brooklyn – 8 sites totaling 93 acres
- Brooklyn Heights – 4 sites totaling 41 acres
- Cleveland – 6 sites totaling 130 acres
- Fairview Park – 3 sites totaling 24 acres
- Middleburg Heights – 33 sites totaling 33 acres
- North Olmsted – 8 sites totaling 72 acres
- North Royalton – 15 sites totaling 188 acres
- Olmsted Falls – 28 sites totaling 517 acres
- Olmsted Township – 26 sites totaling 587 acres
- Parma – 36 sites totaling 501 acres
- Parma Heights – 3 sites totaling 33 acres
- Seven Hills – 7 sites totaling 73 acres
- Strongsville – 20 sites totaling 302 acres

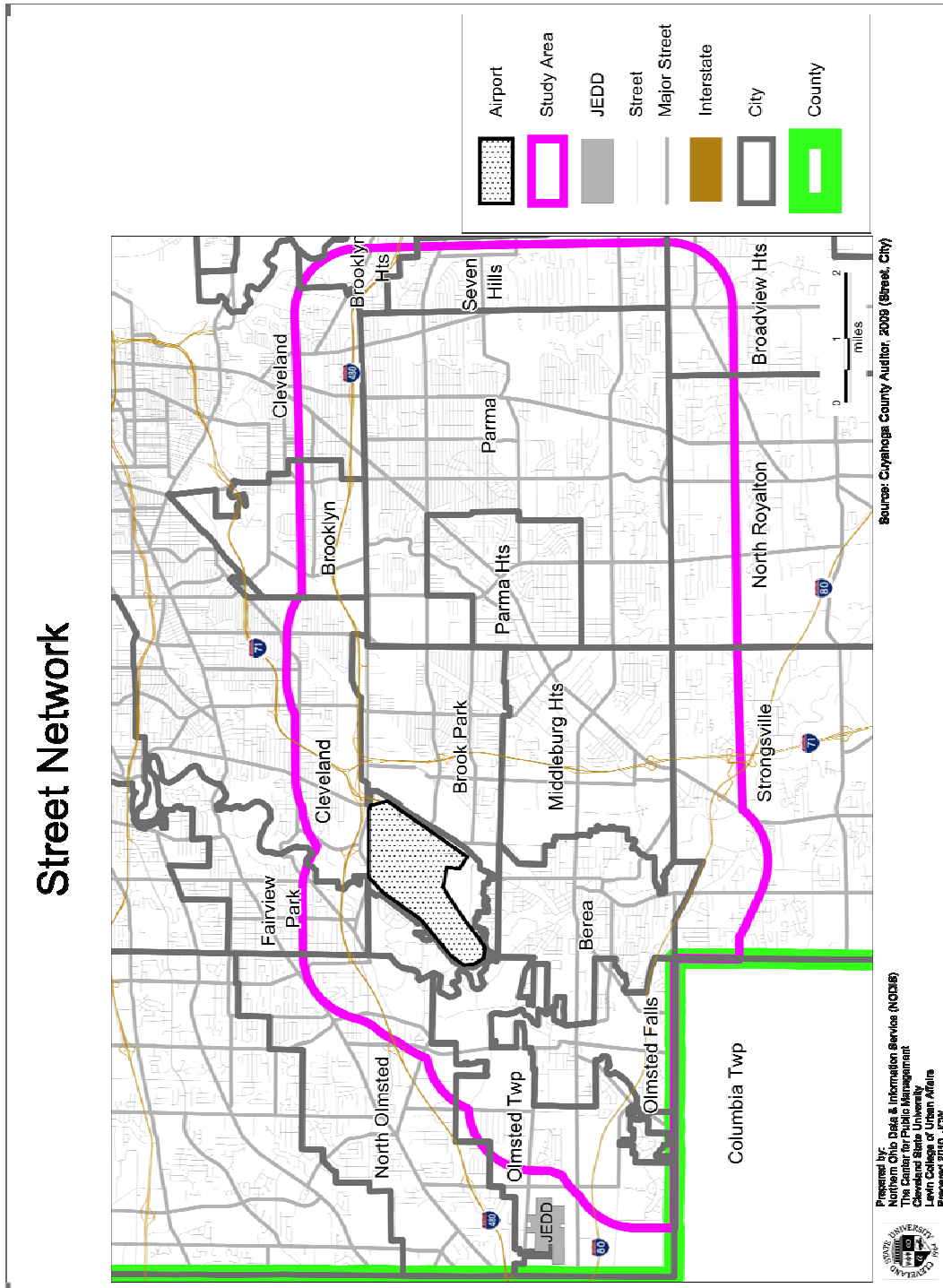


Figure 5: Street network

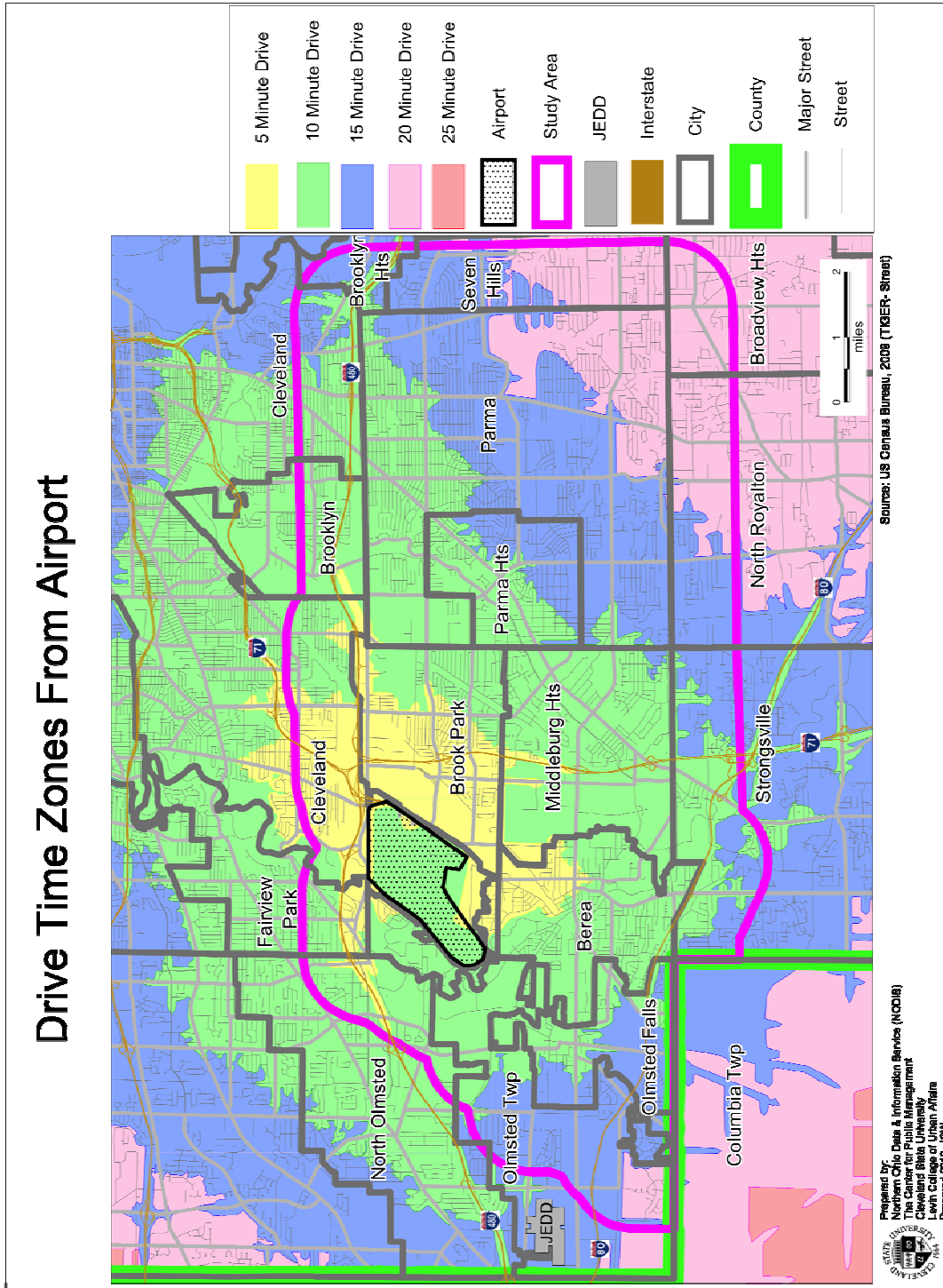


Figure 6: Drive time zones from airport

Businesses Located Within the Drive Time Zones

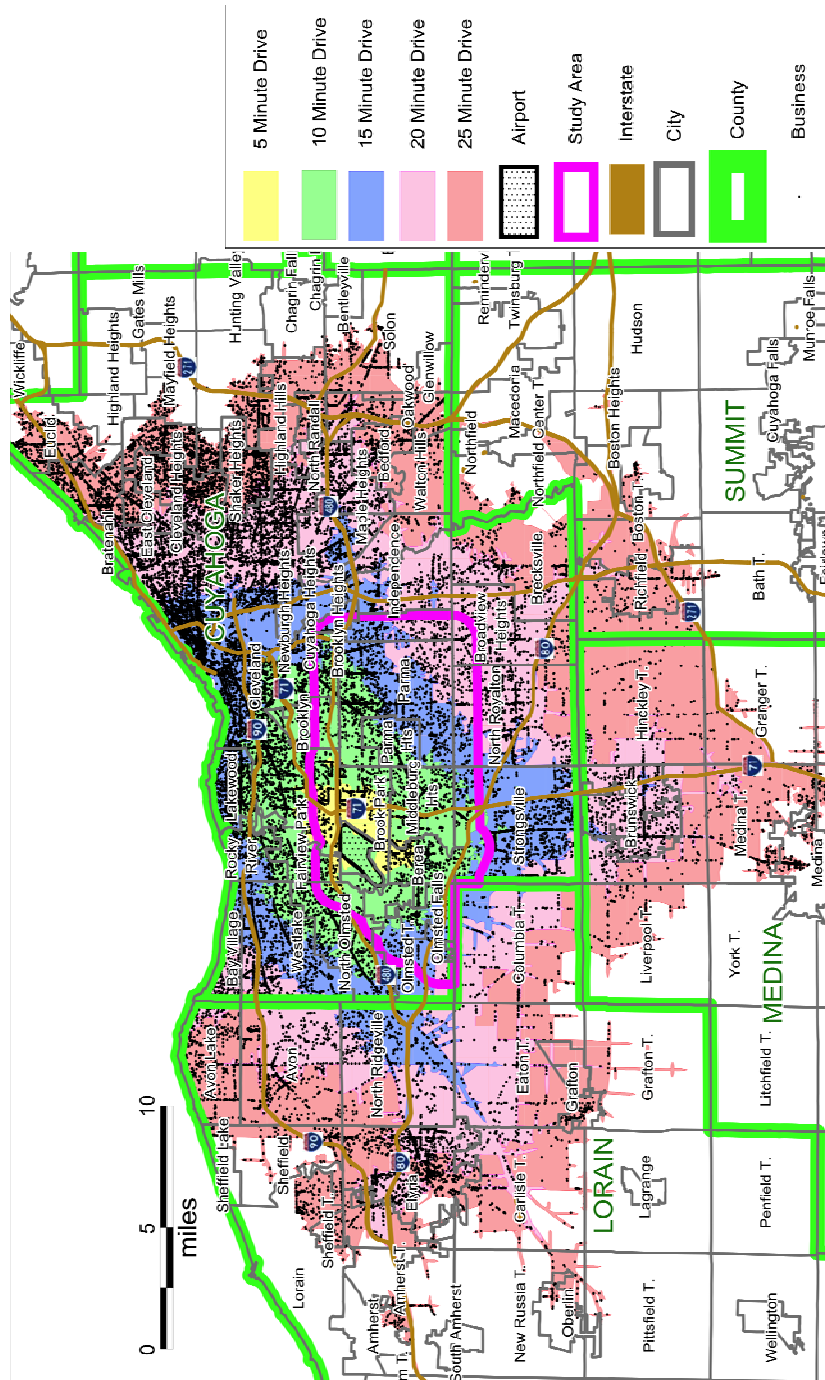


Figure 7: Businesses located within drive time zones

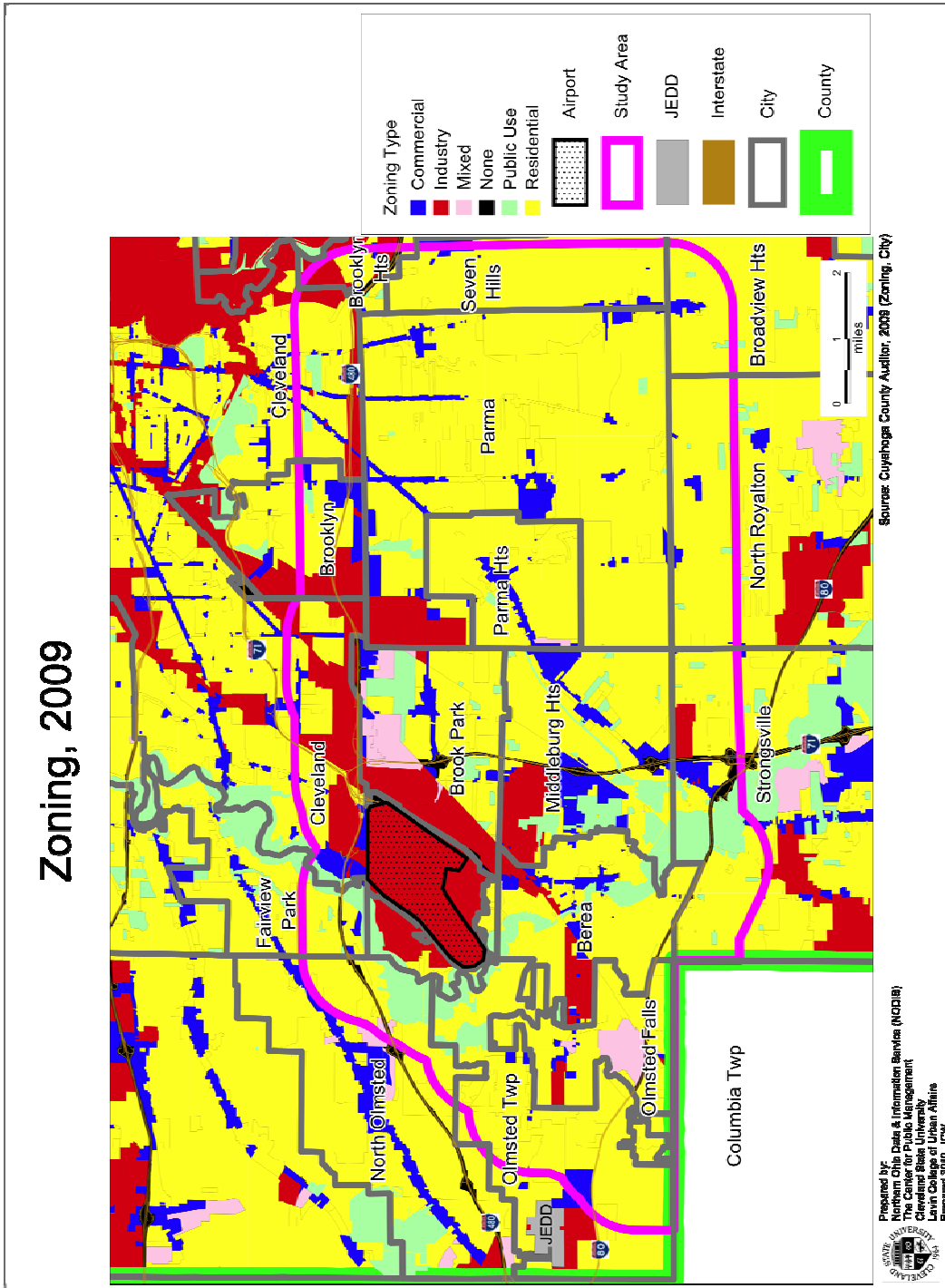


Figure 8: Zoning 2009

Property Market Value, December 2008

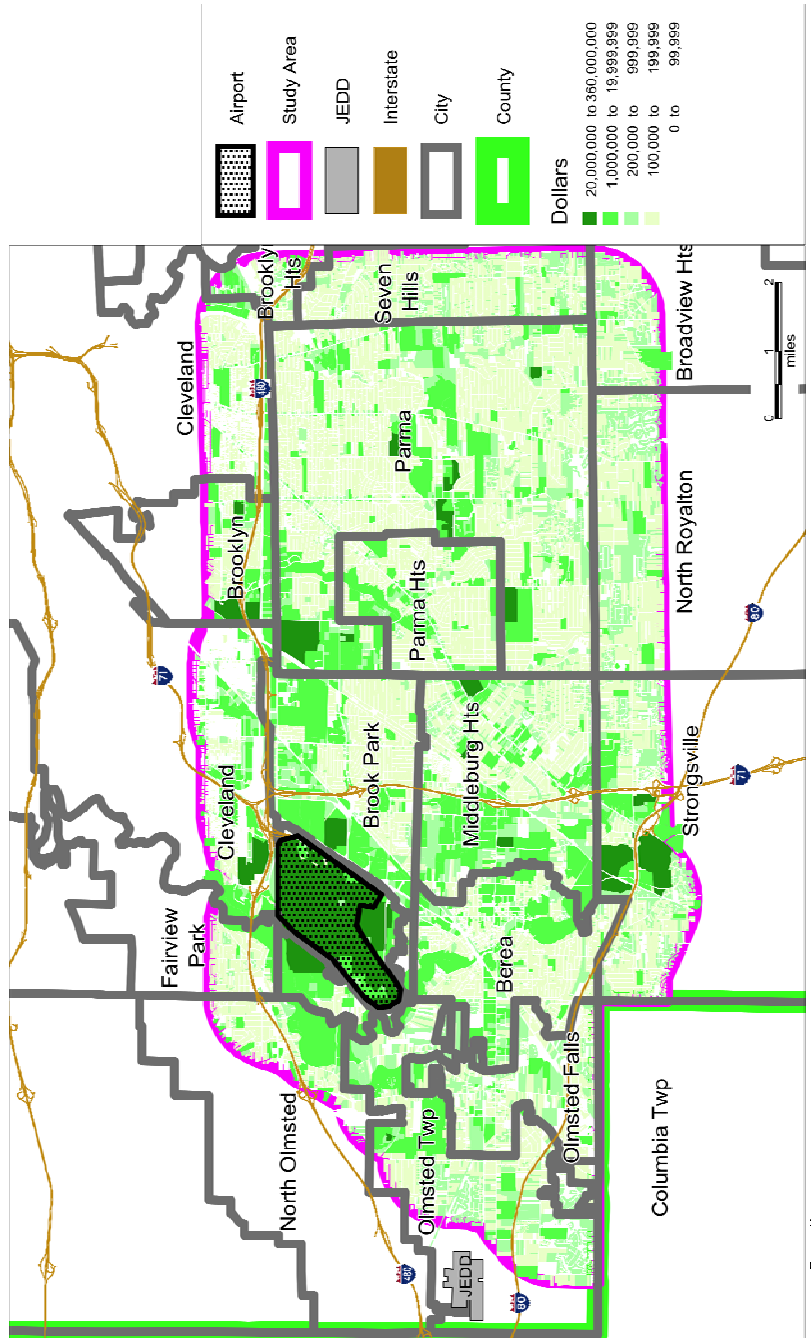


Figure 9: Property market value December 2008

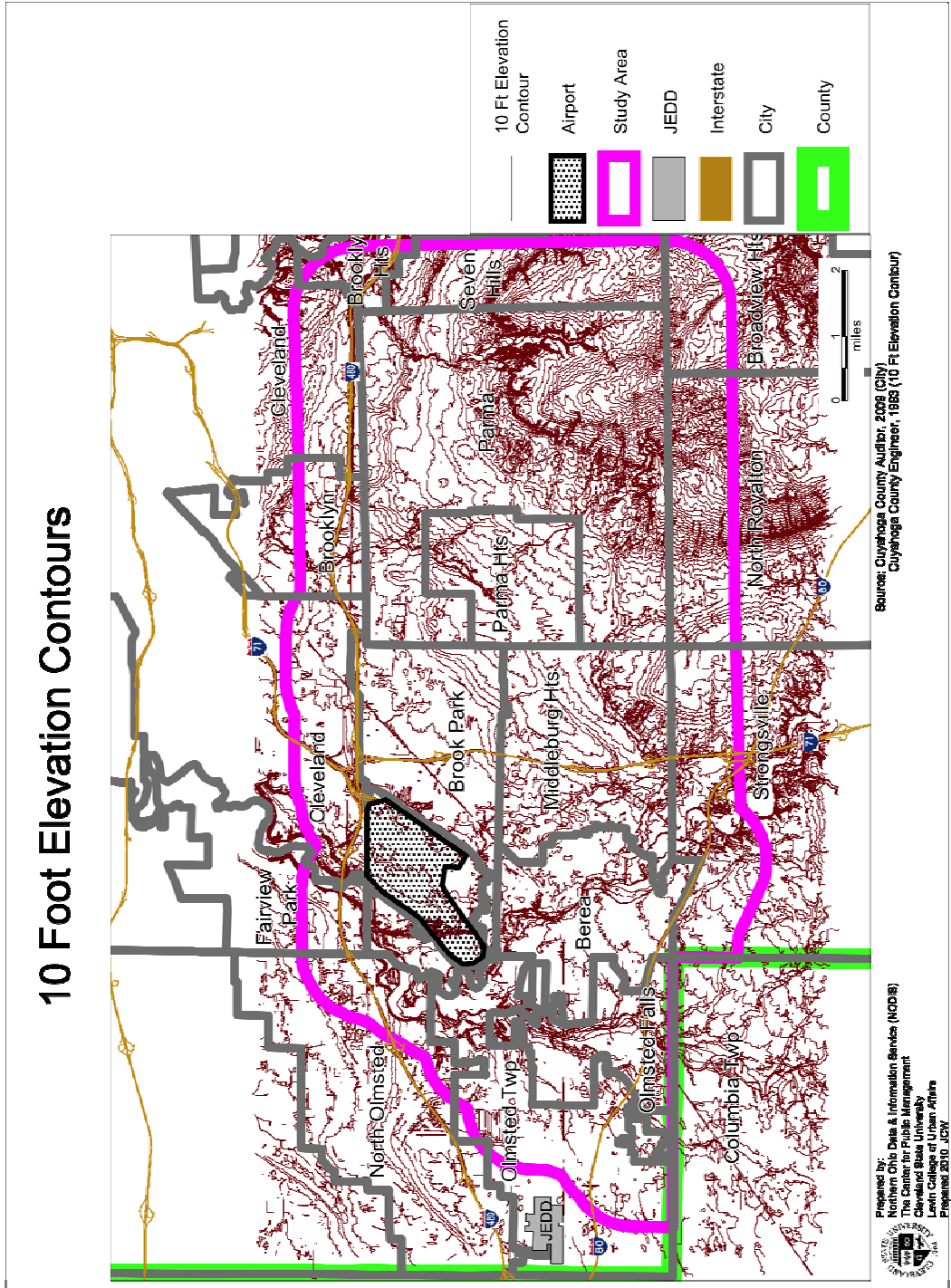


Figure 10: 10-foot elevation contours

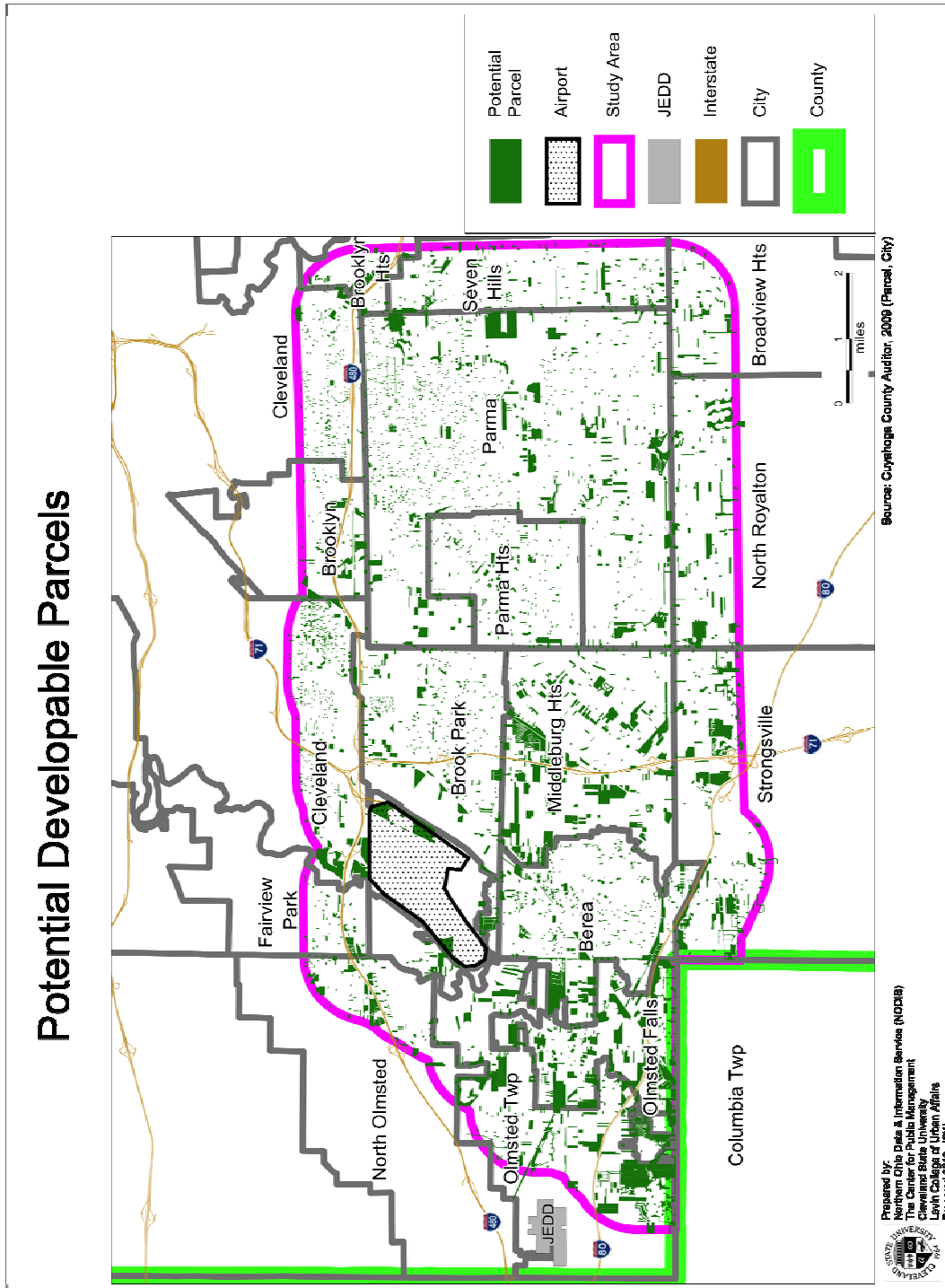


Figure 11: Potential developable parcels

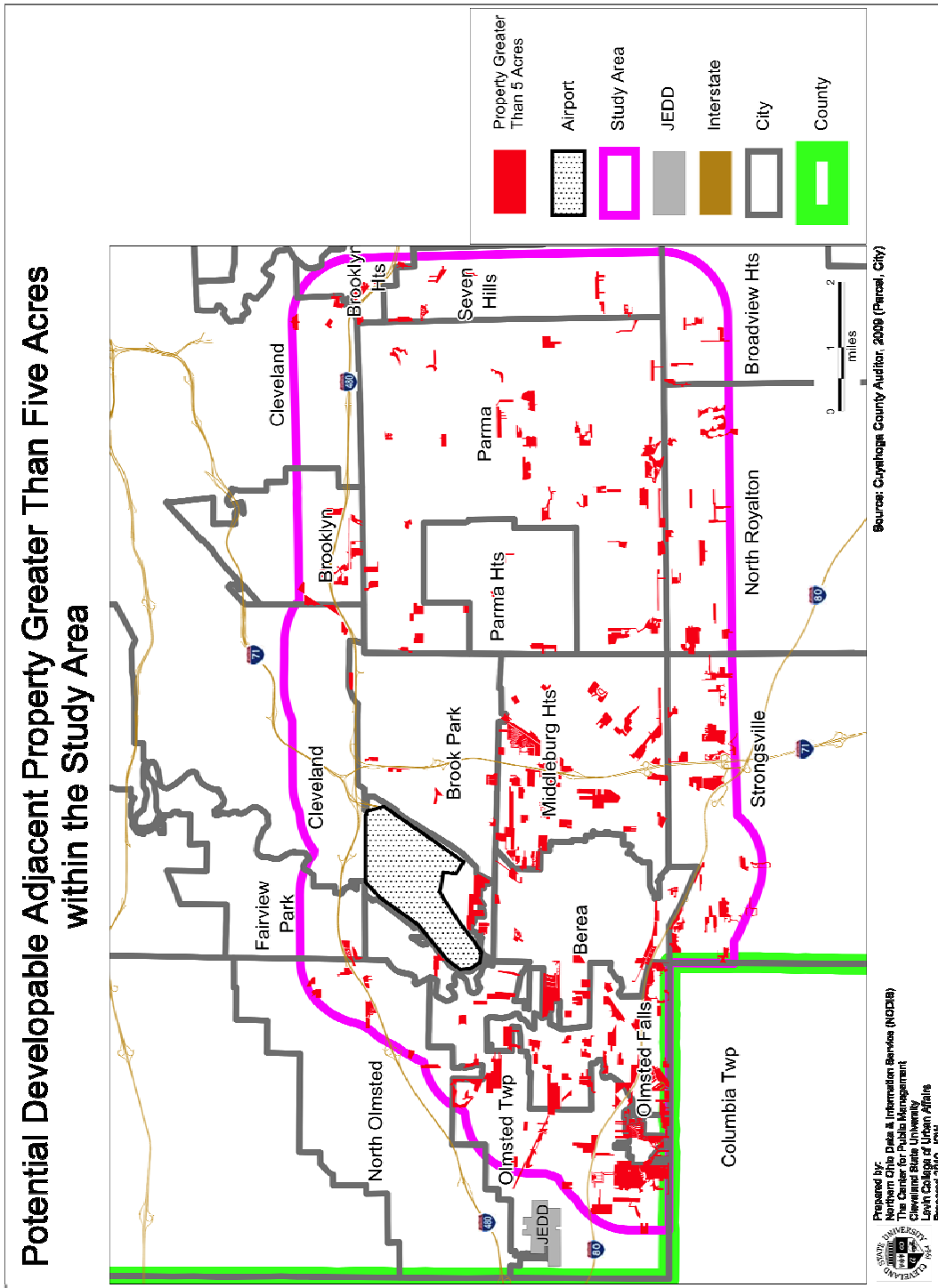


Figure 12: Potential developable adjacent property greater than five acres within the study area

DEMOGRAPHIC AND ECONOMIC PROFILE

This section provides an overview of changes in population demographics for the study area between 1990 and 2014. Because the study area encompasses only portions of some cities, the area of analysis is slightly different for this section of the report. This section provides an analysis of the entire population of Berea, Brook Park, Cleveland, Fairview Park, Middleburg Heights, Olmsted Falls, Parma, and Parma Heights using a series of variables including median age, average household size, per capita income, average household effective buying income, and employment by occupation, which is based upon place of residency.

Household income is commonly used to measure the income of all residents over the age of 18 in each household. Median household income is considered a better indicator than average household income, as it is not dramatically affected by unusually high or low values. The U.S. Census Bureau uses the following definition of median income, “the amount which divides the income distribution into two equal groups, half having incomes above the median, half having incomes below the median.”⁴⁰⁴ For the purposes of this study, median household income is reported as a range of medians by census tracts. Since median income is based on population by census tract, and some census tracts have a very small population relative to the majority, there are outliers that distort the ranges.

For example, the census tracts that comprise the 16-county region of Northeast Ohio have a median household income range between \$10,128 to 500,001. Within that range, approximately 75 percent to 80 percent of the of census tracts have a median income between \$20,904 and \$55,476. This approach eliminated outliers and was applied to the analysis of median household income and median age within the subsequent sections.

The largest spatial unit in this report is the 16-county region of Northeast Ohio (NEO). This unit was selected for analysis because both the business and the philanthropic communities identify these counties as a relevant economic unit for purposes of coordinated policy action and for regional economic development. The 16-county⁴⁰⁵ region has a total population of over 4.2 million. Cuyahoga County is the next largest geographic unit used in this report. Cuyahoga County has a population of slightly more than 1.2 million and is the largest county in the northeast Ohio region. The jurisdictions analyzed in this section of the study, which include Berea, Brook Park, Cleveland, Fairview Park, Middleburg Heights, Olmsted Falls, Parma, and Parma Heights, have a combined population of over 600,000 people.⁴⁰⁶

Northeast Ohio

From 1990 and 2014, the population in the 16-county region, Cuyahoga County, and the study area, are expected to lose total residents. The 16-county region has gained an estimated 85,000 people from 1990 to 2009, but as shown in Figure 4, the aggregate of the counties are projected to lose 39,000 people between 2009 and 2014. The median age of the population of the 16-county region of Northeast Ohio is also older relative to the U.S. population. The median age in the majority of the census tracts ranges from 35 to 46 years, while the median age for the U.S. in 2009 is estimated to be 36.7 years.

Over time, the 16-county region has seen a steady increase of 49 percent in real median household income between 1990 and 2009. The total range of median income by census tracts is between \$10,128 and \$500,001, but as stated previously, this includes outlier census tracts with comparatively small populations that skew the numbers. The majority of census tracts, approximately 75 percent, have a median household income that ranges between \$20,904 and \$55,476. Per capita income has also increased for the entire NEO region from \$13,265 to \$23,248 in 2009. It is estimated to grow slightly by 2014, to \$24,931.

The NEO workforce is heavily concentrated in Office and Administrative support occupations, which account for over 18 percent of the workforce. Production-related occupations form the second largest sector, with Sales and Related occupations a close third.

Table 4: Population demographics within 16-county region of NE Ohio (2009\$)

	1990	2000	2009	2014
Population	4,129,750	4,240,450	4,214,758	4,175,758
Median age	17-71	15-70	17-70	19-71
Average household size	-	2.48	2.43	2.4
Per capita income	\$ 13,265	\$ 19,939	\$ 23,248	\$ 24,931
Median household income	\$ 4,999 – 127,083	\$ 9,999 – 275,000	\$ 10,128 – 500,001	\$ 10,409 – 500,001
Average Household Effective Buying Income (real \$)	\$ -	\$ -	\$ 38,632	\$ 40,544

The educational attainment of the NEO population at the high school completion rate is strong as compared to the U.S. As indicated in Table 5, slightly more than 37 percent of the region’s population had completed high school as their highest level of education. This compares with 29 percent for the U.S.⁴⁰⁷ Approximately 54 percent of the NEO population, age 25 and over, has at least a high school diploma, while the U.S. is just above 43 percent. The source of the data, Claritas, estimates similar high school graduation rates for 2014, about 54 percent. In a globally competitive environment, an educated workforce is of crucial importance.

About 25 percent of the NEO population currently falls in the “associates or some college” category. This compares with almost 29 percent of the U.S. Similarly, and unfortunately, NEO’s rate for “college and above” is only about one in five or 20 percent of the population, in comparison to almost 27 percent for the U.S. Those with at least a bachelor’s degree are expected to increase slightly to 20 percent between 2000 and 2014.

Table 5: Share of population 25+: Educational attainment, 16-county region of NE Ohio

	2000	2009	2014
No HS diploma	17.32%	17.15%	16.97%
HS diploma	37.42%	37.41%	37.37%
Associates/some college	25.45%	25.48%	25.53%
College and above	19.80%	19.96%	20.14%

Occupational Classifications

The occupation classification Office and Administrative Support is the largest, with 364,957 employed persons, within the 16-county region (see Table 6). Production-related occupations employ 307,612 – the second-largest occupation category for the region. Additionally Sales and Related occupations employed an estimated 259,889 people in 2009. This is also one of the few occupations estimated to increase in regional employment by 2014 according to the Claritas data. A fourth major occupational category stands out with more than 186,000 workers in the Management Occupations group, likely due to a strong showing of headquarters located in NEO.

Table 6: Occupations by place of residence within 16-county region of NE Ohio

Occupation classification	2000	2009	2014
Management Occupations, Except Farmers and Farm Managers	180,666	186,315	187,859
Farmers and Farm Managers	9,647	10,466	10,728
Business Operations Specialists	40,625	41,296	41,375
Financial Specialists	45,358	45,918	45,865
Computer and Mathematical	37,490	38,308	38,494
Architecture and Engineering	45,238	46,770	47,086
Life, Physical, and Social Science	15,940	16,236	16,268
Community and Social Services	33,854	33,745	33,516
Legal	20,993	21,296	21,289
Education, Training, and Library	115,476	117,589	117,842
Arts, Design, Entertainment, Sports, and Media	32,772	33,030	32,988
Healthcare Practitioners and Technical	118,430	120,839	121,152
Healthcare Support	53,161	52,603	52,102

Occupation classification	2000	2009	2014
Protective Service	41,062	40,736	40,429
Food Preparation and Serving Related	123,492	123,114	122,362
Building and Grounds Cleaning, and Maintenance	73,612	73,304	72,779
Service: Personal Care and Service	55,164	55,482	55,290
Sales and Related	256,604	259,889	260,044
Office and Administrative Support	362,763	364,957	364,011
Farming, Fishing, and Forestry	8,587	8,960	9,083
Construction and Extraction	113,899	116,571	117,185
Installation, Maintenance, and Repair	92,176	93,809	94,163
Production	305,872	307,612	306,790
Transportation and Material Moving	168,373	168,888	168,101

Cuyahoga County

Looking at Cuyahoga County as a separate geographic category, the population change follows the same trend as seen in the study area. The total population declined by 118,669 people to a level of about 1.28 million, a reduction of an estimated 8.5 percent between 2000 and 2009. Between 2009 and 2014, the population is expected to decrease by 67,241 people. Since 1990, the county has lost 9.7 percent of its population, as shown in Figure 13.

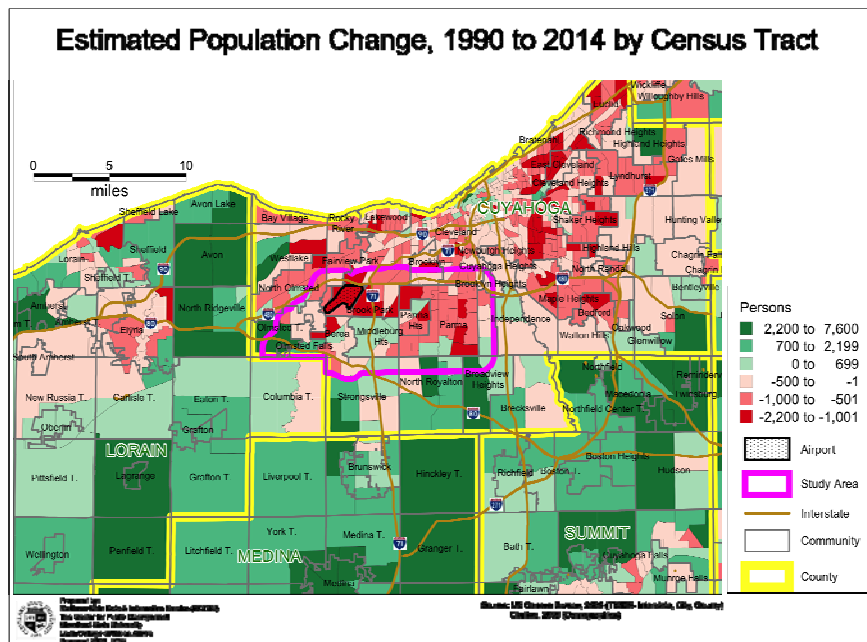


Figure 13: Estimated population change between 1990 and 2014

For the majority of census tracts in the county, the median age is expected to increase. In 1990, the range in median age – for most census tracts – was 26 to 39. This is expected to rise, for the majority of census tracts, to 36 to 47 in 2009, and will continue to trend upward in the future. Claritas estimates that the majority of the census tracts in the county will have a median age between 36 and 47 by 2014.

The real dollar per capita income has increased 16 percent since 2000 (Figure 15), from \$20,563 to \$23,940 in 2009. From 1990 to 2014, the estimated increase in per capita income is 84 percent, from \$13,929 to \$25,637.

Table 7: Population demographics for Cuyahoga County (2009\$)

	1990	2000	2009	2014
Population	1,412,125	1,393,150	1,274,481	1,207,240
Range in Median Age	17-73	15-70	17-70	19-71
Average Household Size	-	2.39	2.35	2.34
Per Capita Income	\$ 13,929	\$ 20,563	\$ 23,940	\$ 25,637
Median Household Income	\$ 4,999 – 127,083	\$ 9,999 – 275,000	\$ 9,999 – 263,158	\$ 9,999 – 328,947
Average Household Effective Buying Income		\$ -	\$ 37,911	\$ 39,806

Between 2000 and 2009, real median household income rose, on average across the region by \$6,468. There is a wide range of incomes across tracts in the region, ranging from \$20,904 to \$55,586. Claritas is forecasting an increase in the median household income for the county of an average of 5.8 percent, from 2009 to 2014. The estimated change in household income between 1990 and 2014 can be seen in Figure 14. The highest estimated increases in household income for Cuyahoga County are projected at the outskirts of the county, while the city of Cleveland and inner ring suburbs are estimated to have only a slight increase in household income.

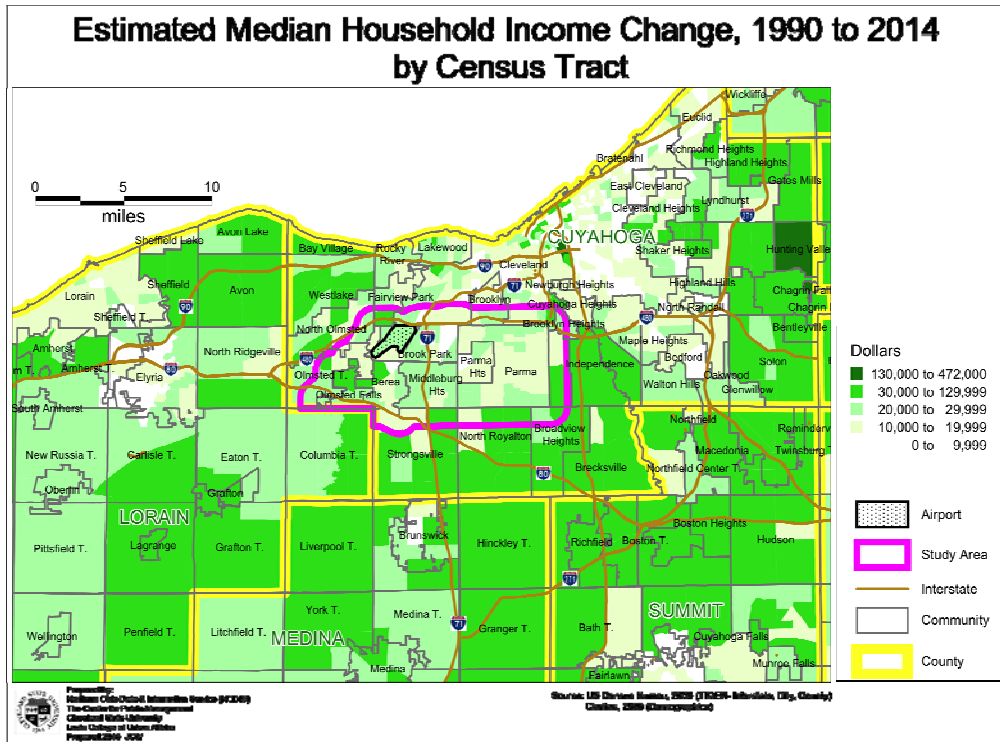


Figure 14: Estimated change in household income between 1990 and 2014

Overall educational attainment in Cuyahoga County is slightly higher than that of the study area (see Table 8). In 2009, almost 30 percent of the population age 25 years and over had earned a high school diploma. Claritas estimates relatively flat changes in [high school] educational attainment for the county through 2014. When compared to the NEO region, the county has slightly higher numbers for high school graduations, but the county fares better for those with some college, an associate’s or bachelor’s degree, and higher.

Table 8: Educational attainment for Cuyahoga County

	2000	2009	2014
No HS diploma	18.37%	18.25%	18.12%
HS diploma	30.05%	29.95%	29.88%
Associates/some college	26.43%	26.43%	26.43%
College and above	25.14%	25.37%	25.57%

Occupational Classifications

The largest occupational fields of the 16-county region are also the largest fields for all residents in Cuyahoga County. Office and Administrative Support occupations account for 17 percent of the workforce in Cuyahoga County. However, 11 percent of Cuyahoga County workers are in the Sales and Related occupations, compared to about 10 percent of the study area. The percentage of those in the production field is slightly less, nine percent, than the study area. Finally, slightly less than nine percent of the county workforce is estimated to be in Management occupations.

Table 9: Occupations by place of residence for Cuyahoga County

	2000	2009	2014
Management Occupations, Except Farmers and Farm Managers	54,640	52,198	50,186
Farmers and Farm Managers	124	120	118
Business Operations Specialists	14,198	13,368	12,784
Financial Specialists	18,443	17,497	16,782
Computer and Mathematical Occupations	14,365	13,658	13,126
Architecture and Engineering Occupations	12,586	12,030	11,561
Life, Physical, and Social Science Occupations	5,799	5,457	5,242
Community and Social Services Occupations	10,713	9,950	9,486
Legal Occupations	9,674	9,210	8,846
Education, Training, and Library Occupations	32,753	30,862	29,574
Arts, Design, Entertainment, Sports, and Media Occupations	11,637	10,943	10,503
Healthcare Practitioners and Technical Occupations	35,797	33,946	32,559
Healthcare Support Occupations	14,394	13,395	12,748
Protective Service Occupations	12,853	11,960	11,467
Food Preparation and Serving Related Occupations	31,147	29,000	27,634
Building and Grounds Cleaning, and Maintenance Occupations	20,650	19,182	18,237
Service Occupations: Personal Care and Service Occupations	15,436	14,446	12,770
Sales and Related Occupations	71,536	67,505	64,651
Office and Administrative Support Occupations	110,212	103,121	98,420
Farming, Fishing, and Forestry Occupations	606	568	548
Construction and Extraction Occupations	22,507	21,127	20,231
Installation, Maintenance, and Repair Occupations	19,663	18,408	17,610
Production Occupations	57,526	53,377	50,844
Transportation and Material Moving Occupations	36,660	34,093	32,476

Study Area

It is important to note that the study area is slightly different for this section than that of the report. This section provides an analysis of the demographic characteristics of the entire population of Berea, Brook Park, Cleveland, Fairview Park, Middleburg Heights, Olmsted Falls, Parma, and Parma Heights. The total population of these communities is estimated to have declined between 2000 and 2009, from 695,153 to an estimated 602,122, or about a 13 percent decline. Between 2009 and 2014, the estimated population change is expected to decrease by another 34,096 people, a decline of about six percent.

As with the 16-county region, the median age in the study region is increasing; the majority of tracts the study area have a median age between 30 to 40. This is expected to increase to a range of 31 to 48 by 2014, from 26 to 37 in 1990. This is noteworthy from the standpoint that the median age in the study region is generally about three years lower than that for the county or the NEO region. This may be good news as the cooperative study area works to recruit business to the area; a slightly younger workforce in close proximity to development sites is an attractive asset.

According to the Census 2000 and data from Claritas, real per capita income (2009\$) has increased 18 percent over the past nine years, from \$15,106 in 2000 to \$17,758 in 2009. Comparatively, the study region has a lower per capita income than either the county (\$23,940) or the region (\$23,248), as estimated for 2009. The lower per capita income reflects the relative difference in the occupational mix of the study region relative to both the county and the region. As noted in Table 10, the study region has relatively smaller shares of residents in higher earning occupations, such as Management, Architecture and Engineering, Education, and Health Care. In contrast, the study region has a larger share of residents employed in Production, Food Preparations and Serving, and Office and Administrative Occupations – typically lower paying jobs – than either the county or the NEO region.

From 2000 to 2009, the “real” (adjusted for inflation) median household income for the majority of census tracts in the study area rose from a range of \$16,839 to \$33,341 to a range of \$18,320 to \$38,984 (an average increase of \$5,363), according to Claritas. In comparison, the 2009 median household income for the majority of census tracts in the NEO region ranged from \$23,386 to \$54,885 versus \$21,874 to \$55,476 in the county. Household income is forecast to grow at about one percent per year between 2009 and 2014, to a real dollar (2009\$) value of \$33,785.

Table 10: Population demographics for study area (2009\$)

	1990	2000	2009	2014
Population	695,153	666,160	602,122	568,026
Range in Median Age	17-73	15-70	17-70	19-71
Average Household Size	-	2.38	2.36	2.36
Per Capita Income (2009\$)	\$ 10,109	\$ 15,106	\$ 17,758	\$ 19,058
Median Household Income (2009\$)	\$4,999 – 66,696	\$9,999- 61,099	\$9,999 - 187,500	\$9,999 - 175,00
Average Household Effective Buying Income (2009\$)	\$ -	\$ -	\$ 28,826	\$ 29,971

Table 11 indicates the share of residents by educational attainment. The largest share of residents has earned a high school diploma, with almost 34 percent at that level. The next largest group (27%) is residents 25 and over who have not earned at least a high school diploma. About a quarter of residents have either some college or an associate’s degree, while slightly less than 14 percent have a college degree or higher.

Table 11: Educational attainment for study area residents age 25 and over

	2000	2009	2014
No HS diploma	26.52%	26.39%	26.36%
HS diploma	34.18%	34.02%	33.92%
Associates/some college	25.57%	25.53%	25.51%
College and above	13.74%	14.06%	14.21%

When the educational level of the study area is compared with the other geographies analyzed in this section of the report, the region tends to have lower levels of educational attainment than the county, the NEO region, or the U.S. (Table 12). The percentage of the study-area population with less than a high school diploma is nearly twice that of the U.S., while the share with college and above is reversed. It is nearly half that of the U.S. and significantly below both that of the NEO region and the county.

Table 12: Comparative educational attainment

	Study area	Cuyahoga County	Northeast Ohio region	United States
No HS diploma	26.36%	18.25%	17.15%	15.10%
HS diploma	33.92%	29.95%	37.41%	28.50%
Associates/some college	25.51%	26.43%	25.48%	28.80%
College and above	14.21%	25.37%	19.96%	27.70%

It is important to note that lower educational levels of study-area residents do not necessarily limit the economic development potential of the region. As seen in Figure 15, the commuting shed for workforce for any airport-related development goes far beyond the boundaries of study area. As such, while the educational attainment of the region is more likely to impact the potential for economic development within the aero-area, the current levels of lower educated and lower skilled residents in the study area adversely affects local income levels and so city revenues.

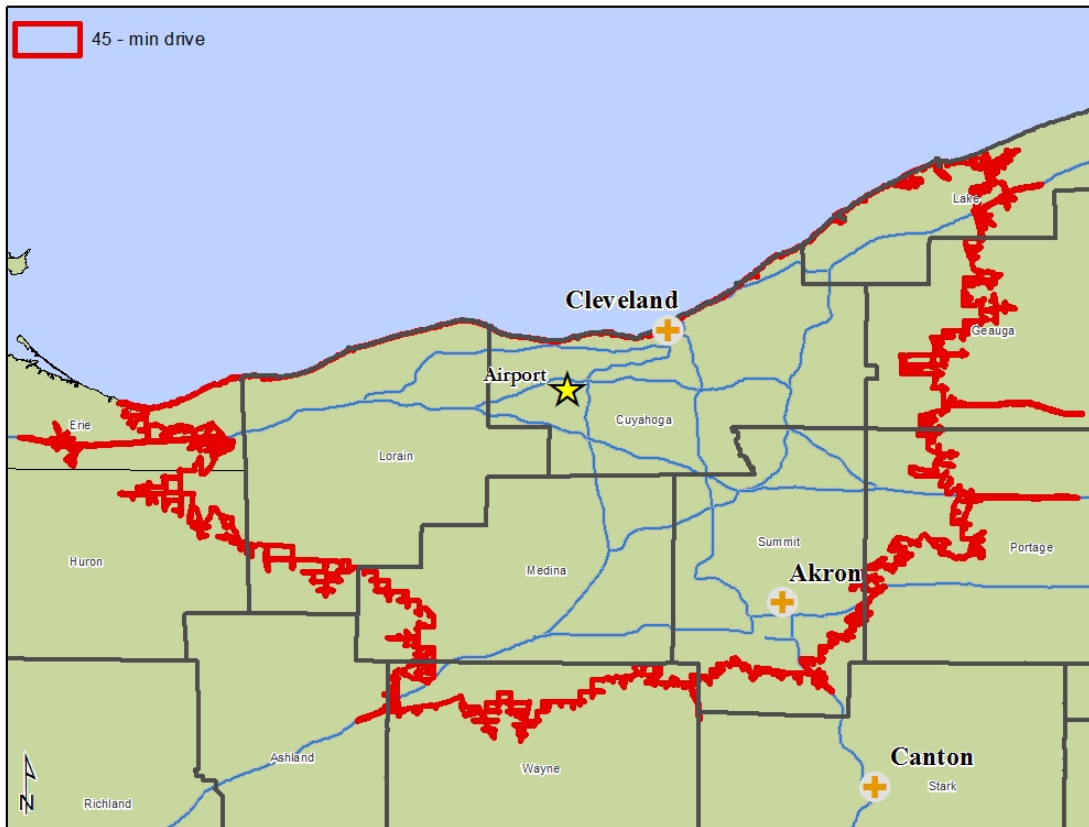


Figure 15: 45-minute community labor shed from CLE

Occupational Classifications

The share of largest employment by major occupational groups is the same for all geographic areas. Within the study area, Office and Administrative Support comprises about 18 percent of the workforce. The next largest category, which makes up 12 percent of the workforce, is Production-Related Worker. The third largest occupation, Sales and Related Occupations, makes up 10 percent of the workforce.

Other notable occupations include Food Preparation and Serving Related Occupations and Office and Administrative Support Occupation.

Table 13: Occupational makeup of study cities

	2000	2009	2014
Management Occupations, Except Farmers and Farm Managers	15,898	14,781	14,152
Farmers and Farm Managers	46	43	42
Business Operations Specialists	4,547	4,193	4,004
Financial Specialists	6,017	5,584	5,333
Computer and Mathematical Occupations	5,087	4,787	4,616
Architecture and Engineering Occupations	3,789	3,535	3,371
Life, Physical, and Social Science Occupations	1,767	1,667	1,604
Community and Social Services Occupations	4,396	4,049	3,851
Legal Occupations	2,344	2,214	2,132
Education, Training, and Library Occupations	10,845	10,070	9,645
Arts, Design, Entertainment, Sports, and Media Occupations	3,703	3,459	3,322
Healthcare Practitioners and Technical Occupations	11,113	10,273	9,804
Healthcare Support Occupations	8,329	7,669	7,275
Protective Service Occupations	7,177	6,580	6,267
Food Preparation and Serving Related Occupations	15,462	14,182	13,436
Building and Grounds Cleaning, and Maintenance Occupations	12,135	11,120	10,513
Service Occupations: Personal Care and Service Occupations	7,212	6,629	6,303
Sales and Related Occupations	27,161	25,045	23,863
Office and Administrative Support Occupations	50,710	46,675	44,349
Farming, Fishing, and Forestry Occupations	287	265	259
Construction and Extraction Occupations	11,315	10,416	9,906
Installation, Maintenance, and Repair Occupations	9,972	9,144	8,691
Production Occupations	32,884	30,112	28,537
Transportation and Material Moving Occupations	20,403	18,666	17,680

Table 13 identifies differences in occupational makeup between the study area and both the county and the NEO region. As noted earlier, shares of higher skilled and higher earnings jobs currently tend to be under represented in the study area, while some of the lower skilled and lower earnings occupations, such as Buildings and Ground Maintenance and Office and Administrative Support, tend to be over represented relative to the region.

It is important to note that within each city, notable clusters of high wage and/or high skilled occupations may exist, but are not represented. The intent of this section of research is to discuss the region as a unified set of geographies.

Table 14: Shares of occupation by region

	Study area	Cuyahoga County	Northeast Ohio region
Management, Except Farmers & Farm Managers	5.75%	8.77%	7.84%
Business Operations Specialists	1.63%	2.25%	1.74%
Computer & Mathematical	1.85%	2.29%	1.61%
Architecture & Engineering	1.36%	2.02%	1.97%
Legal	0.82%	1.55%	0.90%
Education, Training, & Library	3.89%	5.18%	4.95%
Healthcare Practitioners & Technical	3.97%	5.70%	5.08%
Healthcare Support	3.12%	2.25%	2.21%
Protective Service	2.64%	2.01%	1.71%
Building & Grounds Cleaning, & Maintenance	4.54%	3.22%	3.08%
Sales & Related	9.86%	11.34%	10.93%
Office Administrative Support	18.61%	17.32%	15.35%
Construction & Extraction	4.14%	3.55%	4.90%
Production	12.26%	8.96%	12.94%
Transportation & Material Moving	7.62%	5.73%	7.10%

Industry Data

Table 15 provides both the number of companies by the North American Industry Classification System (NAICS) code and the total employment within that category. The NAICS is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

The following data are given for three geographic categories: the study area, a 10-mile radius, and 25-mile radius from the airport. The data for the 25-minute and 10-minute radius categories were derived from Geographic Information Systems (GIS) drive-time calculations. These estimates are based on a starting point located at the front entrance of Cleveland Hopkins International Airport. The times are based on road classifications and qualities (e.g., number of lanes, cross streets, etc.), but do not allocate for variations caused by stoplights, time of day, or traffic congestion.

Currently, the largest industry sector in the NEO region is the Other Services sector. The Professional, Scientific, and Technical Services sector represents the second largest industry. The third largest industry within the participating cities is Retail Trade.

Among the largest employers within a five-mile radius of the Cleveland Hopkins Airport are NASA Glenn Research Center, Sysco Food Services, Ford Motor Company, Amerimark Direct, and Industrial Security Services.

Table 15: Business and employment by industry within study cities

NAICS Code	Study area	
	Companies	Employees
11 - Agriculture, Forestry, Fishing, & Hunting	44	158
21 - Mining, Quarrying, Oil & Gas Extraction	24	2,707
22 - Utilities	23	448
23 - Construction	1,751	11,957
31-33 - Manufacturing	1,657	44,839
42 - Wholesale Trade	1,293	16,063
44-45 - Retail Trade	2,869	20,188
48-49 - Transportation & Warehousing	712	13,389
51 - Information	476	10,116
52 - Finance & Insurance	1009	24,420
53 - Real Estate, Rental & Leasing	994	8,272
54 - Professional, Scientific, & Technical Services	3120	31,309
55 - Management of Companies & Enterprises	51	295
56 - Administrative & Support, Waste Management & Remediation	1574	20,873
61 - Education Services	426	28,348
62 - Health Care & Social Assistance	1,890	65,440
71 - Arts, Entertainment, & Recreation	337	3,765
72 - Accommodation & Food Services	1,128	18,484
81 - Other Services (except Public Admin)	3,183	17,802
92 - Public Administration	273	30,917
Totals	22,834	369,789

Table 16 contains data on business and employment around the study area. The 10- and 25-minute bands do not include data from the study area, but companies and employees counted in the 10-minute zone also are also included in the counts for the 25-minute zones.

When considering like-industry targets that would benefit from proximity to an Aerotropolis, several types already have significant representation. Such target establishments could include:

- Manufacturing

- More than 1,500 companies are located within the geography of the study cities
- Another 800-plus companies are within the 10-minute zone of the study area
- Professional, Scientific and Technical Services
 - More than 2,800 companies are located within the study area
 - More than 1,300 companies are located within the 10-minute zone
- Management of companies, essentially headquarter locations
 - 45 companies are located within the study area
 - 22 companies are located within the 10-minute zone
- Administrative and Support, possible back office and call-center types of locations
 - Nearly 1,400 companies are located within the study area
 - Nearly another 900 companies are located within the 10-minute zone

One thing that most companies locating near CLE would be looking for would be support (i.e., access to air cargo) and visitor services. Both the study area and the 10-minute zone have significant representation of both potential business-to-business services as well as guest amenities. Such industries and associated establishments would include:

- Administrative and Support, possible back office and call center types of locations
 - Nearly 1,400 companies are located within the study area
 - Nearly another 900 companies are located within the 10-minute zone
- Arts, Entertainment, and Recreation
 - Within the study area: 310
 - Within the 10-minute zone: 161
- Accommodation and Food Services
 - Within the study area: 1,012
 - Within the 10-minute zone: 1,390

Table 16: Business and employment by industry within 10- and 25-minute radius from study cities

NAICS Code	10-Minute Radius		25-Minute Radius	
	Companies	Employees	Companies	Employees
11 - Agriculture, Forestry, Fishing, & Hunting	30	94	255	1,106
21 - Mining, Quarrying, Oil & Gas Extraction	4	11	49	3,426
22 - Utilities	14	208	60	2,107
23 - Construction	1,074	5,590	5,541	34,747
31-33 - Manufacturing	813	25,584	4,068	129,098
42 - Wholesale Trade	704	6,895	3,726	43,295
44-45 - Retail Trade	1,756	20,251	7,523	69,603
48-49 - Transportation & Warehousing	403	9,730	1,621	26,748
51 - Information	234	8,897	1,241	24,549
52 - Finance & Insurance	667	4,192	3,274	41,512
53 - Real Estate, Rental & Leasing	552	3,978	3,039	21,841
54 - Professional, Scientific, & Technical Services	1,350	7,164	8,523	59,019
55 - Management of Companies & Enterprises	22	170	111	554
56 - Administrative & Support, Waste Management & Remediation	891	6,718	4,903	44,921
61 - Education Services	196	8,139	1084	54,415
62 - Health Care & Social Assistance	1,124	21,757	5,400	113,460
71 - Arts, Entertainment, & Recreation	161	1,791	920	9,717
72 - Accommodation & Food Services	621	9,996	2,568	46,134
81 - Other Services (except Public Admin)	1,390	7,746	7,118	39,461
92 - Public Administration	85	10,322	681	52,816
Totals	12,091	159,233	61,705	818,529

As of 2010, the Other Services industry makes up about 14 percent of employers within the study area and is the largest industry sector in terms of number of establishments, at 2,966. The Professional, Scientific, and Technical Services sector, with 2,820 establishments, represents the second largest industry. The third largest industry within the study area is retail trade. Retail trade accounts for just over 12 percent of the employers, with 2,615 establishments.

Trends in total employment by industry are slightly different from those in the largest industry sectors. The Healthcare and Social Assistance industry is the largest employment industry within the study area, employing more than 17 percent of the total

workforce. The second largest employment industry is Manufacturing, which employs 43,519 people or slightly less than 13 percent of the workforce. Professional, Scientific and Technical Services industry is second largest industry in terms of number of establishments, but is the third largest employer with 29,449 employees.

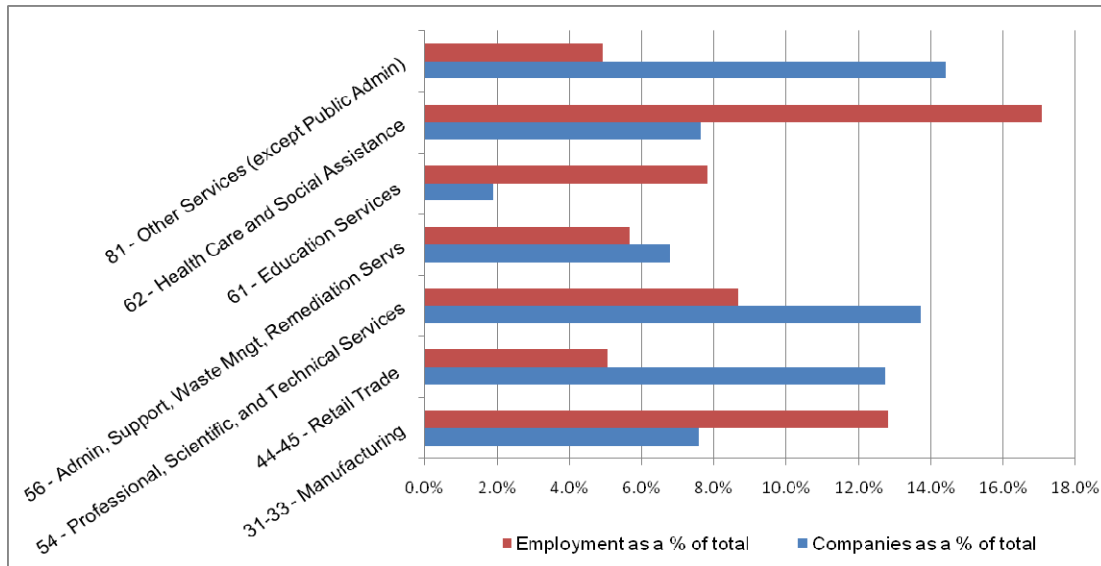


Figure 16: Industry county and employment within the study-cities area

At the five-minute drive geographic scale, the Manufacturing sector, Public Administration sector, and Transportation and Warehousing sector are among the top employers. Manufacturing is overwhelmingly the largest employer and represents the largest industry in terms of total number of establishments. There are 188 manufacturing establishments employing 6,323 people. The Manufacturing industry accounts for 13 percent of the establishments and 21 percent of the employees within a five-mile radius of the airport.

Other Services is the second largest industry, with 167 establishments or 12 percent of the total, but only employs four percent of the workforce. The third largest industry, 11 percent, is the Retail Trade industry with 158 companies. Again, though this is the third largest industry, it employs only five percent of the workforce.

The third largest employment industry is Transportation and Warehousing. This industry employs 3,430 people and accounts for 12 percent of the workforce. Wholesale Trade represents the fourth largest employment industry within five miles of the airport. There are 132 establishments employing nine percent of the workforce.

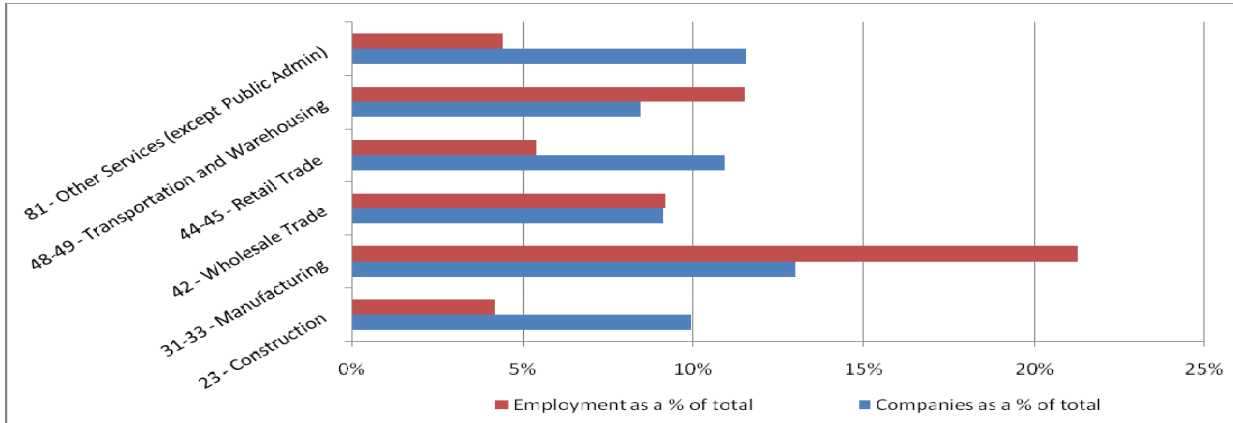


Figure 17: Industry count and employment within five-minute radius

LEGAL AND REGULATORY REVIEW

If an aerotropolis concept were pursued in the study area, there are some regulatory issues that would need to be addressed among the participating communities, including developing a formal mechanism for collaboration and assessing and addressing impediments to development (both within and across jurisdictional boundaries). Cleveland's unique characteristics, principally the inclusion of an (as yet) unspecified number of municipalities, create a level of legal and regulatory complexity with the compilation and aggregation of land within the boundaries of the study area. This same multi-jurisdictional inclusion also presents Cleveland with several governing options. Further, Cleveland's proximity to the Cleveland Metroparks and the river add further dimensions to the analysis, requiring mention of those federal and state organizations that must be included in any potential development plans. This section describes potential legal and procedural impediments and mechanisms available for collaboration.

Collaboration

Because aerotropolis development plans would likely include multiple jurisdictions, continued collaboration among the leaders of those jurisdictions would be essential in establishing an aerotropolis. The Ohio Revised Code (ORC) defines several options for municipalities that are available to encourage the continued collaboration and economic development efforts currently ongoing around Cleveland Hopkins International Airport. The creation of a community development corporation (CDC), a community improvement corporation (CIC), the creation of a tax increment financing district (TIF district), and payments in lieu of taxes (PILOT), or a special improvement district are a few of the options. State law also outlines options for formal collaborative agreements, including joint economic development zones (JEDZs), joint economic development districts (JEDDs), regional council of governments (COGs), and cooperative economic development agreements (CEDAs). Each of these agreements provides its own set requirements, as well as a distinct set of powers and benefits to the contracting parties.

CDCs and CICs are similar in organizational structure and operation. Their purpose is for "advancing, encouraging, and promoting the industrial, economic, commercial, and civic development of a community or area."⁴⁰⁸ CDCs and CICs allow multiple government entities to come together under one corporation and work toward a common purpose. This is of special importance as the communities around CLE come together to encourage development around the airport. These two types of organizations have the legal authority to engage in the "reclamation, rehabilitation, and reutilization of vacant, abandoned, tax-foreclosed, or other real property."⁴⁰⁹ In addition, CDCs and CICs can create and manage public service programs and economic development initiatives. They have the power to borrow money for any of the corporation's purposes by means of loans, lines of credit, or by the issuance of

securities, including bonds or notes. A CDC or CIC can be created by submitting the articles of incorporation in section 1702.04 of the ORC to the secretary of state. These corporations must be governed by a board of directors that should accurately reflect the communities which they serve.

Local governments in Ohio can utilize a TIF to finance public infrastructure improvements and, in some situations, residential rehabilitation. “A TIF works by locking in the taxable worth of real property at the value it holds at the time the authorizing legislation was approved. Payments derived from the increased assessed value of any improvement to real property beyond that amount are directed towards a separate fund to finance the construction of public infrastructure defined within the TIF legislation.”⁴¹⁰ The payments, called payments in lieu of taxes (PILOTs), are collected by the county treasurer along with the real estate taxes, and are then directed back to the TIF governing body. The legal definition and governing laws of TIFs are described in Ohio Revised Code Sections 5709.40, 5709.73, and 5709.78. A TIF may be comprised of a specific parcel or a political body may create a TIF district up to 300 contiguous acres. There can be a maximum of 10 years of real property tax exemption, and a maximum of 75 percent exemption, unless school board approval is obtained for a higher rate or longer term. TIF PILOTs result in a semiannual cash flow to the public body and on a delayed basis, that is, after completion of the exempted real property improvements. The public body may want to convert the TIF PILOT cash flows into a lump sum, upfront payment, to pay for construction costs or other expenses. The public body can do this by making a cash advance from its available funds, seeking a state loan and repaying it with the PILOTs, or issuing obligations.⁴¹¹

JEDZs, governed by Ohio Revised Code §715.69, allow “[t]wo or more municipal corporations [to] enter into a contract whereby they agree to share in the costs of improvements for an area or areas located in one or more of the contracting parties that they designate as a joint economic development zone for the purpose of facilitating new or expanded growth for commercial or economic development in the state.” This mechanism is not prohibitive toward the development of an aerotropolis.

JEDDs, governed by Ohio Revised Code §§715.72-715.83, is one way to facilitate cooperative economic development efforts between municipalities and townships. The creation of a JEDD produces “special-purpose districts that are created by a contract between a combination of municipal corporations and townships...allow[ing] for the levying of district-wide income tax and the provision of municipal services in unincorporated areas.”⁴¹² “JEDDs are often used to provide for water and sewer, fire, police and EMS, street maintenance, trash pick-up and planning and zoning services”⁴¹³ including specific economic development initiatives such as job retention and local economic growth.⁴¹⁴ For this type of district to govern an aerotropolis, it requires, at least, the inclusion of a township as a participating party.

COGs, governed by Ohio Revised Code Chapter 167, allow “[t]hat governing bodies of any two or more counties, municipal corporations, townships, special districts, school districts, or other political subdivisions may enter into an agreement with each other, or with the governing bodies of any counties, municipal corporations, townships, special districts, school districts or other political subdivisions of any other state to the extent that laws of such other state permit, for establishment of a regional council consisting of such political subdivisions.” §167.01. COGs are given specific powers articulated by ORC §167.03, which, in general, authorize the COG to take on a planning role with regard to cooperation and improvements among its members.

CEDAs, governed by Ohio Revised Code §701.07, are agreements entered into by the legislative authority of one or more municipal corporations and the board of township trustees of one or more townships. CEDAs are granted a multitude of specific powers under ORC §701.07(C), generally addressing services improvements and the issuance of notes and bonds and other debt obligations. For a list of the specific individual powers, see Appendix L.

Special Improvement districts (SIDs) are created for the purpose of developing and implementing plans for public improvements and public services that benefit the district. A review of the Ohio Revised Code did not reveal any major impediments to the creation of a SID around CLE.

A SID may be created within the boundaries of any one municipal corporation or any combination of contiguous municipal corporations. A district may be created by petition of the owners of real property within the proposed district, or by an existing qualified nonprofit corporation. All territory in a SID must be contiguous.

A SID must be governed by the board of trustees of a nonprofit corporation. SIDs cannot include any church property or the property of any federal, state, or local government, unless that entity requests in writing that the property be included within the district, or unless they are a member of the existing qualified nonprofit corporation creating the district at the time the district is created.

If a SID is to be created by an existing qualified nonprofit corporation, a petition must be signed either by the owners of at least 60 percent of the front footage of all real property or by the owners of at least 75 percent of the area of all real property located within the proposed district. Church property or property owned by the federal, state, or local governments is exempt from the petition. Once the requirements are met, the petition and initial plans are sent to the respective municipal corporations for review. Each municipal corporation with which the petition is filed has 60 days to approve or disapprove the petition.

After the initial plan is approved by all municipal corporations, the district can legally be

created. Once created, each participating subdivision has the authority to levy a special assessment within its boundaries to pay for the costs of the initial plan. The levy can be assessed for up to 10 years.

Development Limitations

Federal, state, county, and local regulatory issues could potentially impact the aggregation and/or development of land within a proposed aerotropolis. The timing of a general development approval process can take months; however, this period can be further increased based on several factors, including the need for zoning variances, as well as building and other permits, the size and scope of the development, the impact on neighboring parties and communities, the speed of local planning departments, and any developer-related delays. The speed of approval may also be slowed if neighboring property owners and surrounding communities oppose development plans that they perceive will decrease their property values or threaten the social capital of their communities. Additional delays and costs can emerge when dealing with environmentally contaminated sites. Impact fees and economic development incentives should also be addressed in establishing the development timeline.

Further delays can occur when approvals from regulatory bodies (such as the Ohio Department of Transportation [ODOT]) for issues related to improvements to vehicle transportation access to and from the airport; the Federal Aviation Administration (FAA) for issues related to development around the airport that may interfere with flight patterns such as building heights; U.S. Army Corps of Engineers for regulating issues involving the nation's water, in particular the Rocky River running along the airport's west side; state and federal environmental organizations, and any other federal, state, or local organization that may have an interest in a particular aspect of an aerotropolis development.

In compiling and aggregating vacant, abandoned, foreclosed and available land and property, consideration should be given to a number of legal and regulatory factors. These include encumbrances on the compiled and aggregated parcels, zoning of the parcels, the area's natural features, and local master plans. Each may impact the aggregation of land, the development and plan approval process, and potential uses of property. Encumbrances may limit the use of property identified for development. Such encumbrances may include mortgages, leases, easements, liens, or additional restrictions, adding to the development process timeline or limiting the potential uses for the property. Current zoning may not match the objectives of the aerotropolis development plans. Such conditions would require zoning variances to establish consistency between existing zoning conditions and the zoning requirements of the development plan.

The existence of natural features within the designated aerotropolis geography may also impede or even prevent certain development objectives due to elevation changes or waterways. Additionally, the existence of protected wetlands may inhibit development or broaden the extent of the approval process. For example, under the Clean Water Act Section 404(b)(1), the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service and National Marine Fisheries Service, and the U.S. Environmental Protection Agency have some regulatory authority over wetlands.⁴¹⁵ Local master plans, which spell out jurisdictions' visions for future development in their communities, may conflict with the planning objectives of an aerotropolis or development within an aerotropolis-designated geography.

Further, the location of each aggregated parcel may be a critical factor, as newly aggregated parcels may fall within the boundaries of two or more municipal jurisdictions. Continued collaborative agreements may help resolve any zoning issues, discrepancies in governing authority, available uses, the governing variance approval process, and the governing taxing authority that may arise from aggregated parcels.

ASSESSING STAKEHOLDER EXPECTATIONS

A series of focus groups and interviews were conducted with community stakeholders to identify and assess needs and expectations on developing an aerotropolis with CLE as the nucleus. The focus groups were comprised of airport tenants, planners, site selectors, real estate and development professionals, landowners, and professionals from freight and logistics companies, businesses, and community organizations. Discussions centered on responses to questions as to how CLE impacts businesses and communities, current and anticipated freight and passenger needs, jurisdictional collaboration, planning and development strategies, expectations for a successful aerotropolis, expected economic benefits, the marketing of airports for economic development utility, and aerotropolises as tools for economic development.

In addition to the stakeholder discussions, interviews were conducted with I-X Center President Robert Peterson and Facilities Director Jeremy Levine, as well as with CLE Director of Port Control Ricky Smith and his staff, to solicit their input, perceptions, and expectations on the development of an aerotropolis. Discussions centered on questions relative to operations and financial management, how an aerotropolis might impact CLE and the I-X Center, current and planned development, and anticipated opportunities resulting from the development of an aerotropolis.

Several themes emerged from these discussions that provide a preliminary set of assessments as to possible strategies and/or next steps for CLE and the study area jurisdictions. While these discussions are “one-moment-in-time” views from the stakeholders, the themes across the separate discussions and interviews offer suggestions for CLE and the jurisdictions to consider so that they may effectively move forward with a collaborative development strategy. From the voices of the stakeholders, the following overall themes emerged:

- Continued collaboration among stakeholders is essential to realizing the development of an aerotropolis with CLE as the airport city
- An independent or quasi-independent group overseeing planning, strategy, and funding for an aerotropolis is needed to move this forward
- A collective vision for CLE is essential, one that includes a well-planned, synchronized economic development strategy
- Preserving Continental Airlines as a hub is vital not only to the development of an aerotropolis, but also vital to business retention and attraction
- Assembling large landscapes of contiguous developable land was viewed as essential to enhancing the development of CLE as an aerotropolis
- Improving connectivity to CLE is viewed as critical to accessing the airport and generating business and passenger activity
- Upgrading the current state of freight operations and facilities at CLE would

enhance the development of an aerotropolis

Collaboration Among Stakeholders

“A collaboration is possible, but there will be some give and take between the member cities.”

“An aerotropolis is a mechanism for all of these communities to work together.”

“If all communities get together, it helps develop the airport, which brings business and expansion.”

Continued collaboration among stakeholders is essential to realizing the development of an aerotropolis with CLE as the airport city. The most prominent theme across all discussions was that communications and cooperation among CLE, the county, partnering cities, and all stakeholders is considered critical to developing an aerotropolis, as well as motivating development around the airport. The participants stated that it was essential that the airport and its partners “find out how to make this work” without individual governments competing against each other. Participants cited some examples in which jurisdictions have worked together in the past, but voiced concerns that these efforts were not enough to sustain an initiative such as an aerotropolis. Several participants mentioned how communities “cannibalized” businesses, using incentives to woo them from jurisdiction to jurisdiction, and viewed these tactics as inhibiting economic progress. The participants indicated that the economic success of a jurisdiction should not be measured by its tax base; rather, that a jurisdiction should measure economic success by the revenue growth of its companies. Audiences felt that if companies are growing, then the tax base would grow as well.

The participants also expressed frustration with CLE due to jurisdictional politics, and felt this may impact the ability of an aerotropolis to move forward. Examples such as interference with airport operations and municipalities agreeing on infrastructure improvements to/from the airport were cited. Our audiences stated that they felt Director Ricky Smith had initiated some positive changes at CLE to lower costs and streamline business operations, and felt that Smith should be allowed more decision-making autonomy in airport operations. There was a consensus among participants that, although Director Smith had made effective changes, there were three issues at CLE where bureaucracy is an impediment to progress:

- The city council procurement process is lengthy and delayed projects moving forward in a timely manner
- Airport management typically changes with each new cycle of government

leadership and poses problems for on-site businesses and external companies doing business with the airport

- Bureaucratic delays in addressing issues, such as parking, on-site fuel stations, mail delivery, employee access, and business meeting facilities make it difficult for businesses to operate within the airport

Additionally, our audiences felt that coordination was needed among local governments in addressing the infrastructure improvements necessary at and surrounding CLE. Participants felt that the basic transportation infrastructure was in place, but that improvements were needed with regard to access for cars, trucks, and bicycles, access to rental cars, and improving road conditions and signage to/from the airport. Synchronizing efforts for these types of improvements, participants felt, would be needed among the communities to stage the development of an aerotropolis.

The audiences further cited a need for continued collaboration among communities and the county in identifying and providing incentives for retention and attraction of business development at and around CLE. Participants indicated that the communities would need to continue to collaborate on compatible zoning across jurisdictional boundaries and across the aerotropolis region, and should consider progressive zoning options across the aerotropolis geography for businesses settling within the vicinity of the airport. Revenue sharing across jurisdictions, and collective marketing and providing common incentives to businesses across the aerotropolis geography were also frequently cited among our audiences as mechanisms for continued collaboration.

Formation of an Independent or Quasi-Independent Aerotropolis Group

“The region would benefit from some collective economic authority that would leverage benefits.”

“There needs to be a body or someone to implement this...there has to be someone ‘driving the train’ to get this done.”

“[We need to] establish a single point of contact for the Aerotropolis project...”

An independent or quasi-independent group overseeing planning, strategy, and funding for an aerotropolis is needed to move this forward. It was the consensus among our audiences that an autonomous group that could speak with one voice with regard to planning, developing and implementing strategy, and securing funding was needed to move this initiative forward. The participants felt that the concept of an aerotropolis offered opportunities for new development and rethinking existing development on and surrounding CLE, but that a collective development authority was

necessary to oversee the implementation of an aerotropolis.

Focus group participants indicated that the aerotropolis initiative would be best served by an independent or quasi-independent group that could speak to the collective, rather than the individual, benefits to each stakeholder community involved – a regional public/private partnership of the communities and business interests focused on airport development. The independent/quasi-independent group could develop a coordinated economic development strategy to propel this initiative forward.

Collective Vision

“Collaboration is needed between all parties – NASA, the airport...all cities have master plans and have to work together.”

“The I-X Center is underutilized...local businesses feel the increase in business when there is an exhibition.”

“The concept of an aerotropolis with the county and communities working together is a very workable concept, can and should be one of the area’s economic development issues going forward.”

A collective vision for CLE is essential, one that includes a well-planned, synchronized economic development strategy. Our audiences stated that CLE and its surrounding communities are guided by individual master plans, but question whether these plans would meld into a unified strategy for airport and community development. Participants cited the need for a mission statement and vision for the planned aerotropolis, and development that would occur within and around it. With regard to a strategy, they spoke of:

- Identifying target industries and determining market demand
- Developing an aggressive marketing strategy that would include the identified target industries
- Coordinating business and planning activities that include resolving zoning issues to accommodate economic development
- Addressing physical infrastructure problems that could deter development of an aerotropolis

Participants viewed the idea of coordinating development at and around CLE as a necessary economic development activity, but one that was multi-faceted. They spoke of the concept of a multi-jurisdictional aerotropolis zone where communities pool resources and strategize together on the type of business climate that should operate within it. Our audiences indicated that although the airport is a key factor in the

development of an aerotropolis, they stated that it is only one part of a long-term strategy. Participants viewed it as necessary to assess the demand and need for the types of business development potential around CLE – to identify a universe of potential companies and the opportunities to attract them.

The participants stressed the need for a more “business friendly environment” on-site at CLE, with amenities catering specifically to business travelers. They indicated that business travelers shouldn’t have to leave the airport when coming into the area for one-day meetings. Participants stated that CLE currently does not have meeting rooms and facilities on-site to accommodate same-day business activities. It was suggested that a one-stop business resource center be established at the airport, one with meeting facilities, technology and video conferencing capabilities, and printing and administrative support services for business events.

Preserving Continental as a Hub

“More direct flights to more cities would be necessary for business expansion [of the company participant works for] around the world.”

“What would hurt the most would be losing hub status; the airport and communities need to make sure we preserve that [hub].”

“We need to keep Continental as a major hub, or it will be hard to attract businesses to come here.”

CLE is currently one of three Continental hubs in the United States⁴¹⁶ – central airports through which Continental routes its flights. Airport hubs allow major airlines to offer more flights per passenger. Community leaders and economic development professionals have recently cited the importance of preserving the Continental hub at CLE. Those interviewed indicated that the loss of the Continental hub would erode northeast Ohio’s competitive edge for attracting corporate headquarters, and would mean fewer non-stop flights and higher fares.

Preserving Continental Airlines as a hub is vital not only to the development of an aerotropolis, but also vital to business retention and attraction. The importance of maintaining Continental Airlines as a hub was a key sentiment across all audiences. Participants felt that it would be difficult to bring new business to the region without the Continental hub, and that business and passenger travel would be negatively impacted by the loss.

Participants felt that there is a strong demand for business travel in/out of CLE. The participants saw the demand for air travel increasing in the near future, citing a need for

increasing the number and frequency of flights, particularly non-stop flights, to more cities (both domestic and international destinations). They emphasized the importance of CLE increasing the number of flights overall – day/evening and international/European – for passenger travel, and viewed a hub as key to this occurring. Participants stated that direct flights offer the convenience of one-day round-trip travel for meetings, as well as expedient connectivity to cities for multi-day business activities. The participants also viewed a major airline hub as offering opportunities for expansion to wide-bodied planes that could also provide cargo transportation, a capability not currently available on the fleets of narrow bodies and regional jets.

The site selector audience indicated that the relevance of an airport in site location is dependent upon the needs of the client and varies from project to project. According to the site selectors, CLE is currently well positioned to attract new businesses because of its Continental hub; direct flights are important to corporations that need to reach their customers and have their customers reach them. Typically, the airport is a secondary factor in location decisions; rather, the amenities and resources – both on-site and surrounding the airport – are primary factors. For example, costs coupled with accessibility and proximity are compelling factors for companies, and a hub contributes to competitiveness.

Developable Land

“The first thing that strikes me is that there are no large developable sites.”

“The airport submarket is competitive; the usefulness of vacant land depends on where it is.”

“We want to develop properties that will create jobs for the city and region and have synergy with the airport.”

Assembling large landscapes of contiguous developable land was viewed as essential to enhancing the development of CLE as an aerotropolis. According to our audiences, geographic limitations surrounding CLE, such as scattered and non-contiguous parcels of land, pose challenges for business development. Participants indicated that although on some levels an aerotropolis might be feasible, they stressed that current land constraints would limit full advantages and/or development of an aerotropolis. They pointed out that the ability to aggregate vacant land might offer attraction opportunities for large distribution and corporate headquarters.

With an aerotropolis, audiences saw an opportunity to begin clustering types of business activity around the airport. On-site businesses such as cargo and warehousing facilities could be clustered in one location, with convenient access for trucks and rail to

these facilities. Participants suggested that stakeholders examine what exists and strategize on best uses for these properties. They stated that large parcels of land would ease planning and development around this concept. Further, participants said that the availability of quality buildings (more modern and updated) should also be a key component of this strategy.

Residential areas and environmental issues, such as cleanup of brownfield sites, were also cited as possible obstacles for the development of an aerotropolis. They discussed that these obstacles could be overcome as stakeholders continue to collaborate and come to some “common ground” upon development.

Connectivity to CLE

“A client’s priorities play a large part in site location; often multi-modal access – not just the airport – is important.”

“I’m curious to see the future of this project...the road is in an awful state. Easing the pain of getting out of the I-X Center and heading south would be helpful; infrastructure improvements are needed.”

“An aerotropolis is a fancy word, but for me it’s another core business district and a core business district needs vitality and transportation and logistics and needs businesses to go there without impacting residential areas.”

Improving connectivity to CLE is viewed as critical to accessing the airport and generating business and passenger activity. The participants indicated that proximity to an airport is important for moving goods and passengers, and that CLE was easier to travel in and out of than many larger airports, such as DTW, DFW, and DEN. Participants tended to measure proximity in terms of time rather than in distance to/from the airport, citing the need for efficiency in moving goods and getting clients in and out of CLE.

One thing that stood out among participants was the sentiment that CLE is an asset and should be viewed as such. Further, the participants cited the I-X Center and NASA as assets to CLE and an aerotropolis, although they felt that these assets were underutilized. They spoke of a need for improved connectivity between CLE and the I-X Center for the convenience of business travelers for conventions, trade shows and expositions, and the need to work with NASA to identify possible spinoffs of high-tech businesses.

Frequently cited among participants were infrastructure situations such as the need to address flooding and storm water issues, alter and coordinate traffic patterns, designate

access lanes for freight carriers, and generally improve access to/from CLE and airport amenities. Participants indicated that an aerotropolis should be supportive of all modes of transportation and that any strategy should focus on improving transportation networks to not only the airport, but also to the I-X Center, freight facilities, and other airport amenities. The success of an aerotropolis for this area could rely on addressing the capacity for infrastructure at and surrounding the airport.

Cargo Operations and Facilities

“Cargo facility is old and antiquated. If they want to entice a cargo carrier, improvements HAVE to be made.”

“Distribution out of Cleveland is easy. There’s easy access to cities around here if freight were delivered to Cleveland.”

“A wide-body coming into CLE would help...shipping costs are increased because they have to ship by truck to nearby freight airports.”

“If there was access to Europe, it would make a huge difference.”

“Don’t separate warehousing by roads...make it one area.”

Upgrading the current state of freight operations and facilities at CLE would enhance the development of an aerotropolis. There was a mixed sense among our audiences as to whether it is practical to transport cargo in/out of CLE. Some felt that the potential demand for cargo could be great if modifications were made to facilities and wide-bodied planes were present at CLE to support freight. Others suggested that Burke Lakefront Airport could be utilized as a cargo airport and included as part of the aerotropolis plan, with CLE primarily serving passenger travel.

Just about anything can be shipped by air – animals, refrigerated produce, technology, vehicles, construction equipment, and much more. There are a variety of planes capable of carrying the various types of freight, from passenger planes to super cargo planes. According to Continental, its larger planes currently flying in/out of CLE are capable of carrying up to 250 pounds of cargo. The participants stated that wide-bodied planes are capable of carrying up to 10,000 pounds of cargo, but that there is currently little demand at CLE for utilizing wide-bodied planes.

Our audiences indicated that there is currently little freight activity at CLE. The participants felt that most freight “passes through” CLE or is delivered by truck. They stated that other nearby airports within one day’s travel of CLE – ORD, DTW, CVG, and EWR for example – are preferable receivers of freight, particularly because of direct

international flights. Participants expressed that Cleveland is a hub to ship via truck because of its one-day or less access to large cities and to the East coast. Further, they said that these and other airports utilize wide-body planes capable of carrying tons of freight (along with passengers) to both domestic and international destinations, while wide-body planes seldom fly into CLE. Because of this, participants felt that very few customers utilize CLE to transport freight. They also pointed out the need to increase the number of flights at CLE, particularly night flights, because cargo typically travels by night. Participants also stated that the proximity of residential use to the airport also presents a problem with night flights for transporting cargo.

Participants voiced that current cargo facilities at CLE are inadequate and in dire need of improvement, and that the current infrastructure is not configured to accommodate cargo operations. Existing cargo and warehousing facilities, according to our audiences, are aging and in need of updating. They also said that cargo facilities should be “reconfigured” and organized into one area, with designated access for trucks and rail.

FEASIBILITY ASSESSMENT

The development of CLE as an aerotropolis is feasible and a successful leadership model will ensure and sustain this effort. What is clear from analysis is that CLE has potential as an aerotropolis, but its particular challenges require the development of a strategy that fits the Cleveland area's unique strengths and needs. While there are challenges – such as retaining the Continental Airlines hub, upgrading and reorganizing air cargo facilities, improving infrastructure access and connectivity, and land constraints – these challenges *do not prohibit* moving forward with planning the development of CLE as an aerotropolis.

The determination of feasibility, for the purposes of this study, was based on legal viability (can this be achieved within existing statutes), the capacity for development at CLE and within the geographic context of the study area, and the ability of CLE and the surrounding jurisdictions to continue to build upon their collaborative efforts and implement a strategy to move this forward. Consideration was also given to how airport constituents (airport tenants, Continental Airlines, businesses off-site linked to the airport) and community stakeholders perceive the demand for this type of development and whether they felt this should move forward. Through our analysis, we learned that:

- There is no legal prohibition to moving forward with the development of CLE in the context of an aerotropolis
- The stakeholder communities and businesses want to move forward with this initiative
- There is an opportunity to build upon the collaboration that already exists among the study area jurisdictions
- There is some available property within a reasonable distance from CLE that can serve as a foundation for new development opportunities

A vibrant airport – one that links the region to the global economy by connecting northeast Ohio-based companies to their U.S. and international operations and connects international and domestic businesses to activities in Northeast Ohio – is a foundational concern for the region. Research throughout this study indicates that the concept of an aerotropolis is feasible for CLE. It is logical to take small steps to begin this initiative, **the first step being to develop a formal agreement for establishing a collaborative group** that could begin to frame a strategy for moving forward with the development of an aerotropolis, with CLE as its nucleus.

A preliminary scan of the Ohio Revised Code did not yield anything that would prevent the development of an aerotropolis. There are, however, historic land use and zoning practices that could potentially impact the aggregation and/or development of land.

Extended delays due to reviews by one or more local planning, building and engineering departments, and requests for zoning variances are some examples, yet fast-tracking and other issues could be addressed in an aerotropolis development strategy.

Stakeholders within the communities believe the concept of an aerotropolis is viable at CLE. CLE's airport campus is viewed as an asset and a viable site for development opportunities to occur. The stakeholders' vision of an aerotropolis for CLE may not be the Kasarda-defined aerotropolis as practiced at other domestic and international airports (due to density and land constraints); rather, the sentiment was that the concept itself may be the platform for moving forward with a defined, staged strategy that would enable economic growth, with CLE as the nucleus. The fact that a CLE aerotropolis may not exactly fit the Kasarda geographic footprint should be viewed as an opportunity to develop the concept to specifically fit the region and its economic circumstance.

From our interviews and discussions with community stakeholders, an aerotropolis is viewed as an opportunity to spur development at and around the airport. CLE is viewed as an asset that must be capitalized upon. A unique asset base exists with CLE management, NASA Glenn, the I-X Center, and currently a Continental hub that should be collectively utilized in an aerotropolis development strategy. The existence of the Continental hub currently provides affordable airline services for travel. Further, it is important to note that CLE continues to be a major market with heavy origin and destination traffic. The airport was ranked 34th in 2008 by the FAA for passenger enplanements, surpassing MEM, ONT, GSO, and other U.S. airports.

There is a question of onsite parcel development/redevelopment surrounding the vicinity of the airport and the perceived lack of large landscapes of contiguous available land. While CLE itself is currently limited in this regard, there are developable parcels – both greenfields and areas available for redevelopment – within the study area. Initially the potential for success may lie in a narrower geography around CLE (the study area) rather than in the Kasarda geographic definition of an aerotropolis. **A second step in the short-term would be defining a geographic area in which to pilot the aerotropolis development.** Working with the communities within the study area, we believe, is of sufficient scale to pilot an aerotropolis geography.

Freight operations and facilities on the campus of CLE are currently in significant need of improvement; however, there is a strong desire among the stakeholders to develop cargo operations at CLE. Moving freight is part of a strategy to lure wide-bodied planes to CLE, meaning that demand for cargo would need to be substantial. The current and future demand for businesses to utilize CLE to transport cargo is unknown and should be included as a component of the aerotropolis strategy. Without an assessment of the business community's need for this type of service, the aerotropolis development strategy would be incomplete.

Moving Forward

The geography of economies and the benefits of economic development transcend political boundaries. The development of an aerotropolis at and around CLE represents a relatively narrow geography within a larger, regional economy; therefore, the needs, the benefits, and the actions of such a development activity exceed the boundaries of any individual city. Continued collaborative leadership will sustain and guide this effort.

We find that aerotropolises in the U.S. are successful because they developed as a multi-jurisdictional compact focused on development at and around the airport as a key component of a partnership that promises new and strategic development. The stakeholders indicated that jurisdictions working together to begin a staged strategy for development at and around the airport is essential to bringing this concept to fruition. It is the same with the six emerging aerotropolises researched – the ability to plan, market, and sustain an ongoing dialogue relative to connectivity between the airports and their surrounding cities continues to drive success. With 11 of the case study airports as well, the ability to collaborate on planning and marketing across multiple jurisdictions remains a key factor to airport development.

Collaboration is not new to the study area jurisdictions, as they currently collaborate in a number of activities. For example, through initiatives with the First Suburbs Consortium, the Northeast Ohio Mayors and City Managers Association, and the Cuyahoga County Mayors and City Managers Association, as well as regional dispatch consolidation efforts. This region also has a long list of public/private partnerships that lends itself well to collaboration, such as Build Up Greater Cleveland, the regional Metroparks model, and developing the sports stadium projects. The continued collaborative dialogue of these public/private partnerships is key to their success. These partnerships required decision-making across jurisdictional boundaries and with private organizations that identified strategies across the region for development and recreational opportunities. It is this type of continued approach that could make an aerotropolis successful here.

Short-Term

Based on research conducted for this study, **the project team recommends as a next step, developing a formal agreement for establishing a collaborative group** that could begin to frame a strategy for moving forward with the development of an aerotropolis, with CLE as its nucleus.

It is feasible that the **second step be to devise a strategy for planning this initiative, one that includes defining a geographic area in which to pilot the aerotropolis development.** A small geography around CLE could first be identified and then expanded as needed over time.

The aerotropolis is a model for continued collaboration. Over the long-term, collaboration will include building coalitions and identifying, involving, and sustaining partners key to this initiative. An aerotropolis is not a multi-mission initiative, but one with a focused vision and planned over the long-term. Engaging stakeholders in envisioning the development they would like to see at and around CLE will assist the collaborative group in building upon the strengths of the airport campus and of its surrounding geographic footprint.

As the group begins to devise its strategy, consideration should also be given to operating and funding this type of activity. A management and revenue model will be needed to operate and sustain the aerotropolis initiative. Financial models were incorporated by three of the six emerging aerotropolises – DTW, MEM, and GSO – and these or variations of these models could be adopted for use here.

Longer-Term

As a future step, **a framework is also needed for staging development on and around the airport over time.** An aerotropolis is not a short-term activity; rather, it is a long-term strategy for accomplishing development. This long-term *aero-based plan for growth* should consider land use and the regional economy, identify challenges and opportunities, and determine the geography for a multi-jurisdictional aerotropolis zone where communities pool resources and together strategize as to the type of businesses that would operate there. Planning activities should include looking at zoning across jurisdictional boundaries and across the aerotropolis geography, as well as development that complements and doesn't compete with downtown business activity. The communities should work together to expedite/streamline planning and development approval processes so as to make document submission requirements similar across jurisdictions. One way to begin might be to have each community include the aerotropolis as part of its master plan.

Along these lines, the plan should include mechanisms to begin aggregating parcels and land for clustering business activity and enhancing development opportunities on and around the airport campus. The plan should address improving and reorganizing cargo facilities, as well as improving transportation networks to support these activities. Infrastructure at and around CLE would need to be addressed. Further, improving connectivity (access) to/from the airport in relation to transit, rail, the port, and highways, as well as to its onsite amenities (e.g. I-X Center, NASA, Sheraton Hotel), should be a focus of the plan.

An economic development strategy that includes a marketing plan is necessary to guide development and focus business retention and attraction potential on and surrounding the airport. This strategy should begin with a targeted industry sector study, one that

assesses the demand for the type of business development potential at and around the airport. Targeted industry studies were conducted at DTW, MEM, GSO, DFW, DEN, and ONT, and are part of the coordinated economic development activities of these airports. The Demographic Profile section of this report identifies possible like-industry targets that would benefit from the proximity of locating within an aerotropolis as Manufacturing, Professional, Scientific and Technical Services, and Management of Companies (headquarters locations), and Administrative and Support (possible back office and call center types of locations).

The strategy should also focus on preserving Continental as a hub at CLE and working with Continental to assess market demand for increasing the number of domestic and international flights. Having a successful airline as a partner in this initiative is critical to elevating market growth at CLE. An aggressive marketing strategy that includes attracting businesses identified in the target industry study, and working with Continental to increase flights and develop non-stop flights to new destinations is an essential element to the economic development strategy.

Another important component to the strategy is creating a more business friendly resource center at the airport, external to airport security, with meeting rooms and facilities for business activities. Other items would be assessing the capacity at CLE to handle an increase in passengers and flights, assessing whether the labor pool exists to support newly generated business activities, coordinating utility with other airports in the region, and the ongoing coordination and evaluation of capital improvements.

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