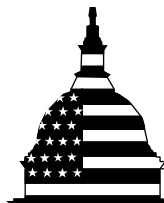


March 2013

# NATIONAL AIRSPACE SYSTEM

## Airport-Centric Development



G A O

Accountability \* Integrity \* Reliability

Highlights of [GAO-13-261](#), a report to congressional requesters

## Why GAO Did This Study

GAO was asked to examine airport-centric development and the activities of airport operators and regional stakeholders to facilitate such development. In an effort to increase airports' efficiency in moving passengers and cargo while bolstering the economies of regions surrounding airports, some airport operators, government officials, and business owners are exploring opportunities to strategically develop airports and the regions around them. This report describes the factors considered and actions taken by airport operators, government officials, developers, and others to facilitate airport-centric development.

To do this work, GAO identified five factors that facilitate airport-centric development from relevant literature, interviews with experts, and observations at selected U.S. airports and their surrounding regions. GAO examined these factors by reviewing relevant documents and interviewing stakeholders, including airport officials, business owners, representatives of development organizations, and federal, state, and local government officials. GAO selected 14 airports for more in-depth study. These airports were selected based on annual passenger enplanements and cargo amounts, and experts' recommendations. The findings from these 14 airports cannot be generalized but provide insights that may be of interest to stakeholders in other regions. GAO is not making recommendations in this report. The Department of Transportation, the Federal Aviation Administration, and others provided technical comments, which were incorporated as appropriate.

View [GAO-13-261](#). For more information, contact Gerald L. Dillingham, Ph.D., at (202) 512-2834 or [dillinghamg@gao.gov](mailto:dillinghamg@gao.gov).

March 2013

## NATIONAL AIRSPACE SYSTEM

### Airport-Centric Development

## What GAO Found

GAO found that airport operators, government officials, real estate developers, and other regional stakeholders are taking actions consistent with five factors when pursuing airport-centric development (development on the airport property to enhance the airport's nonaeronautical revenue and development outside the airport that leverages a region's proximity to the airport).

- **Development at the airport.** Airport operators are developing or enhancing the number and types of services within airport terminals for passengers and visitors such as upscale shops and personal services; they are also developing services for passengers and businesses outside of the terminal areas but on airport property such as hotels and business centers.
- **Air and surface connectivity.** Most stakeholders GAO spoke with noted that a region's ability to connect to a variety of domestic and international destinations by air is important in attracting businesses, tourists, and cargo to the region. In addition to air connectivity, the routes taken by passengers or cargo to and from the airport may be enhanced by efficient highway, rail, and port connections. One example is the Metrorail extension, which will connect Dulles International Airport with downtown Washington DC.
- **Funding sources.** Transportation improvements for airport-centric development may entail large capital-intensive projects that generally require pooling money from different sources. The federal government has a number of programs, such as grants from the Economic Development Administration, designed to support regional transportation-infrastructure development. State and locally generated money—such as state transportation trust funds, dedicated sales taxes, and highway tolls—have been used to match federal funds. Stakeholders in Memphis, for example, were awarded a \$1.26 million grant from the Department of Housing and Urban Development, matched with \$900,000 in local funds and in-kind services, to develop a master plan for their airport-centric development efforts. The private sector may also provide funding through a public-private partnership agreement.
- **Development in the region.** Stakeholders GAO spoke with identified a variety of mechanisms to attract businesses, such as linking airport development to commercial activities in the region; identifying and leveraging unique cultural, tourist, or general qualities of the region; developing industry clusters (groups of complementary businesses); and designing policies or providing incentives to attract businesses to the region.
- **Stakeholder collaboration.** Collaboration among various stakeholders can help achieve specific airport-centric goals. Consultation with residents near the airport and with committee composed of representatives from the airport and the public and private sectors is important; the lack of such consultation can make it difficult to implement development plans. GAO found that multilateral committees representing airport, public-sector, and private-sector groups had been established to promote airport-centric development.

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## Abbreviations

|        |  |
|--------|--|
| ADC    | Aerotropolis Development Corporation                         |
| AFW    | Alliance Global Logistics Hub Airport                        |
| AGBA   | Airport Gateway Business Association                         |
| AIP    | Airport Improvement Program                                  |
| ATL    | Hartsfield-Jackson Atlanta International Airport             |
| BID    | Business Improvement District                                |
| BWI    | Baltimore/Washington International Thurgood Marshall Airport |
| CBP    | Customs and Border Protection                                |
| CTI    | Composite Technology Inc.                                    |
| DART   | Dallas Area Rapid Transit                                    |
| DEN    | Denver International Airport                                 |
| DFW    | Dallas/Fort Worth Airport                                    |
| DOT    | Department of Transportation                                 |
| DTW    | Detroit Metropolitan Wayne County Airport                    |
| EDA    | Economic Development Administration                          |
| EPA    | Environmental Protection Agency                              |
| FAA    | Federal Aviation Administration                              |
| FTZ    | Foreign-Trade Zone   |
| GTP    | Global TransPark   |
| HUD    | Department of Housing and Urban Development                  |
| IAD    | Washington Dulles International Airport                      |
| IND    | Indianapolis International Airport                           |
| LAEDC  | Los Angeles County Economic Development Corporation          |
| LAX    | Los Angeles International Airport                            |
| MAP-21 | The Moving Ahead for Progress in the 21st Century Act        |
| MIA    | Miami International Airport                                  |
| MCEDC  | Morgan County Economic Development Corporation               |
| MEM    | Memphis International Airport (MEM)                          |
| MKE    | General Mitchell International Airport (Milwaukee)           |
| MPO    | metropolitan planning organization                           |
| PFC    | Passenger Facility Charges                                   |
| P3     | public-private partnership                                   |
| STL    | Lambert–St. Louis International Airport                      |
| TIGER  | Transportation Investment Generating Economic Recovery       |
| TIFIA  | Transportation Infrastructure Finance and Innovation Act     |
| YIP    | Willow Run Airport   |

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United States Government Accountability Office  
Washington, DC 20548

March 28, 2013

Congressional Requesters:

In an effort to increase airports' efficiency in moving passengers and cargo while bolstering the economies of regions surrounding airports, some domestic and international airport owners and operators, government officials, and business owners are exploring opportunities to strategically develop airports and the regions around them. (For more information on such international airport activity see app. I.) These stakeholders view airports as a central piece of their development efforts, believing that businesses in close proximity to an airport can use that proximity as a marketing tool. For businesses that seek to satisfy consumer demand for timely delivery of goods and services, this close proximity can be an element of their business plans. Some efforts are also under way in the United States to promote development at airports and in the regions around them.

There have been several efforts in Congress to recognize this type of development (also sometimes referred to as an "aerotropolis") as being eligible for federal funding. The Moving Ahead for Progress in the 21st Century Act (MAP-21), which reauthorized several surface transportation programs, contains a provision that directs the Secretary of Transportation to establish a program to assist states in "strategically directing resources toward improving the efficiency of freight movement, on highways, intermodal connectors, and aerotropolis transportation systems."<sup>1</sup> Other bills to specifically include development at and around airports were introduced in the 112th Congress, but were not enacted.<sup>2</sup>

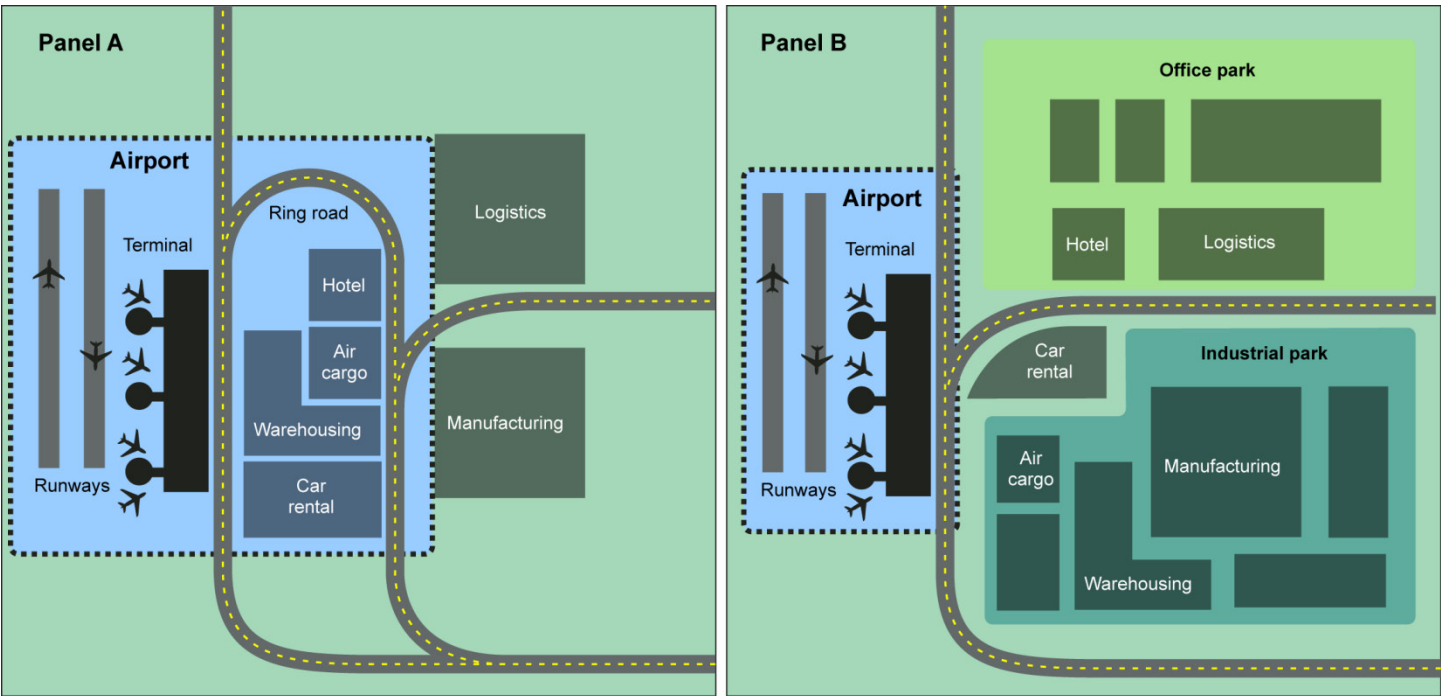
Given the possible economic benefits of airport-centric development, you requested that we examine such development efforts. This report describes factors airport stakeholders identified as considerations for airport-centric development and some of the actions taken by airport operators, government officials, and developers to facilitate airport-centric

<sup>1</sup>Moving Ahead for Progress in the 21<sup>st</sup> Century, Pub. L. No. 112-141, § 1115(a), 126 Stat. 405, 468 (2012), amending 23 U.S.C. § 167(c)(1).

<sup>2</sup>Leading and Expediting Aerotropolis Development Act of 2011, H.R. 1395, 112<sup>th</sup> Cong. (2011); Aerotropolis Act of 2011, H.R. 1371, & S. 1818, 112<sup>th</sup> Cong. (2011).

development. For the purpose of this report, we define airport-centric development as development on the airport property to enhance the airport’s nonaeronautical revenue (see panel A of fig. 1) and development outside the airport that is intended to help the region economically by leveraging its proximity to the airport (see panel B of fig. 1).

Figure 1: Examples of Airport-Centric Development



Source: GAO.

To address our objective, we identified factors that facilitate airport-centric development from relevant literature, interviews with experts, and our observations at selected U.S. airports and regions. We reviewed academic, industry, and government reports and other documents describing the role of the nation’s air transportation system, defining airport-centric development and related concepts, and identifying the key factors relevant for reviewing and understanding the nature and scope of airport-centric developments. From this work, we developed an organizational framework consisting of five factors considered by officials from airports and jurisdictions when pursuing airport-centric development.



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We selected 12 airports<sup>3</sup> with scheduled-airline service for more in-depth study of airport-centric development activities and the regions in which they were located. We selected these airports because of their passenger enplanements and annual cargo-weight landed and based on media releases about regions looking to leverage their airport to promote development, and experts' recommendations. In addition to the 12 airports with scheduled-airline service, we also studied two industrial airports that specialize in cargo and business services. We selected these two industrial airports based on their airport-centric development efforts. (See app. II for profiles of the airports in our study.)

We conducted semi-structured interviews of airport officials, officials from businesses located adjacent to or near airports, representatives of international and national real-estate development organizations, local and regional economic-development specialists, and federal, state, and local government officials. The focus of these interviews was to gather information on airport-centric development efforts from the perspective of knowledgeable stakeholders. As a result, interviews inquired into the officials' activities and motivations and their perspectives on the regional assets they identified as part of their development efforts. In collecting this information, we did not verify the accuracy of stakeholders' statements, but instead used their statements to understand the perspectives of those participating in airport-centric development at the sites we selected. We use the indefinite quantifier, "some" "many," and "most" to inform the reader of the approximate quantity of stakeholder or interviewee type within the regions where we interviewed who agreed with the particular statement or idea (see app. III for an explanation of how these indefinite quantifiers are used). We also reviewed the airports' financial data from about 1997 through 2011, master plans, and other project plans. We analyzed the information obtained from these sources to better understand the context in which the regional stakeholders and airport operators approached airport-centric development.

We conducted our work from June 2011 to March 2013, in accordance with all sections of GAO's Quality Assurance Framework that are relevant to our objective. The framework requires that we plan and perform the engagement to obtain sufficient and appropriate evidence to meet our stated objectives and to discuss any limitations in our work. We believe

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<sup>3</sup>See app. III for more information on our selection methodology.

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that the information and data obtained, and the analysis conducted, provide a reasonable basis for any findings and conclusions in this product. See appendix III for additional information on our objective, scope and methodology.

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## Background

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### Evolution of Airports

The United States has approximately 500 airports served by scheduled airlines. Airports have long served as places for planes to take off and land, consisting of runways, control towers, terminals and other facilities that directly served airlines' passengers and cargo. Airlines play a key role in the functioning of airport systems because they make decisions about which airports to serve and how frequently to provide service. Airlines may consider a number of factors in making these decisions, such as the presence of regional businesses and residents who are potential customers, the market share that can be obtained, the effects on their service network, and the service provided by competing carriers.

Over the last three decades some airports began providing a greater range of passenger and business services and increasing their concessions to increase their revenue stream. Airport operators began to view airports as a destination as well as a place from which to take off and land. By the early 2000s, many airports focused on upscale concessions, such as exclusive restaurants and designer boutiques, and other premium services, such as rental car facilities and parking facilities linked to the airport, to help maximize revenue generation.

John Kasarda, an airport and development expert, along with other researchers, noted these changes occurring at airports, both nationally and internationally, and began researching commercial development on airport property—referred to as the airport city—more than 15 years ago. According to Kasarda and other researchers, development on the airport spills over to the surrounding region and results in a new urban growth form with the airport at its center. (See app. IV for a selected bibliography.) According to Kasarda, this new urban growth form, for which he coined the phrase, “aerotropolis,” is similar to the growth of the traditional metropolis, in which the central city is linked to the suburbs through a surface transportation system.

Studies on growth around airports have found that businesses that require or benefit from air transport seek locations near the airport,

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extending as far as 20 miles. Regional corporate headquarters, information and communications technology complexes, retail, hotel and entertainment centers, manufacturing facilities, trade representative offices, big-box retail stores, health, wellness, and fitness centers, conference centers, and residential developments, for example, are increasingly being established near airports as a part of airport-centric development. Researchers have noted that plans for such development involve arrangements for targeted development to facilitate the efficient flow of surface traffic, attract complementary businesses, and mitigate environmental contaminants usually associated with airports to increase the speed at which airport-centric development occurs. Researchers have also noted that the benefits from the development on the airport property reach far beyond the airport into the surrounding region, which can, in turn, reciprocally benefit the airport.

Globally, aviation and airport systems vary and, in practice, the approaches to airport-centric development have varied. In several European countries and in the United States, airports were established decades ago and commercial development around most of those airports evolved in a piecemeal or ad-hoc way, without centralized planning or the cooperative efforts of airport operators, local and regional planners, and business developers. In the United States, the last large airports serving scheduled airlines that have been newly constructed on previously undeveloped land were the Denver (1995) and Dallas/Fort Worth (1974) International Airports.<sup>4</sup> Operators at airports like Hong Kong and Incheon in South Korea are beginning to incorporate elements of commercial development at their airports and some operators have introduced policies or incentives to encourage targeted airport-dependent land use and development at and around the airports. In countries in which the aviation and airport systems are much newer, such as China and the United Arab Emirates, officials are employing a centralized planning and cooperative approach to rapidly expand commercial development on and around airports.<sup>5</sup>

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<sup>4</sup>Commercial expansion was not the only reason for the development of these two green field airports.

<sup>5</sup>Newly constructed airports built on previously undeveloped land are sometimes referred to as green field airports.

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## Financing Airports

Airport operators at domestic airports with scheduled airline service rely on revenue from two types of activities: aeronautical and nonaeronautical.<sup>6</sup> Aeronautical activities at an airport occur on the airfield or in the terminal areas where airlines operate. For purposes of this report, revenue generated from aeronautical activities includes fees airports charge airlines to operate within the airport and other fees paid or collected by aircraft operators, including Passenger Facility Charges (PFCs), and Airport Improvement Program (AIP) grants.<sup>7</sup>

PFCs<sup>8</sup> are fees, approved by the Secretary of Transportation, but collected by airlines for qualifying airports. Fees of up to \$4.50 for each boarded passenger may be collected for some of the large airports with scheduled airline service controlled by public agencies. Airports may use these fees to fund Federal Aviation Administration (FAA)-approved projects that, for example, make a significant contribution to: improving air safety and security, reducing current or anticipated congestion, reducing the impact of aviation noise on people living near the airport, or increasing air carrier competition.<sup>9</sup>

AIP grants, administered by FAA from the Airport and Airway Trust Fund,<sup>10</sup> are one of the sources of funding for capital projects. The amount of AIP grants distributed to airports is based on the number of passengers handled, weight of cargo landed, airport types, and size and population of states. In addition, FAA awards discretionary AIP grants to specific set-aside categories, such as noise mitigation and military airport conversions and national priority projects. The Airport and Airway Trust Fund is

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<sup>6</sup>FAA also recognizes two additional sources of airport revenue: grant receipts including Airport Improvement Program and state and local grants), and FAA approved Passenger Facility Charges. Stakeholders and experts involved in airport-centric development focused on the comparison between nonaeronautical and aeronautical revenue. We chose to highlight this distinction because of the focus of this report.

<sup>7</sup>According to FAA, both PFC and Airport Improvement Funds may only be used to fund projects that are statutorily eligible and justified for those funds, they are narrower in scope than the broad term “aeronautical revenue” may imply.

<sup>8</sup>The Passenger Facility Charge (PFC) was introduced in 1990, Omnibus Reconciliation Act of 1990. Pub.L. No. 101-508, § 9110, 104 Stat. 1388, codified as amended at 49 U.S.C. § 40117.

<sup>9</sup>49 U.S.C. § 40117(b)(4)(A).

<sup>10</sup>Established under 26 U.S.C. § 9502(a).

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financed through taxes on aviation fuel and passenger airline tickets. Airports may also receive capital funds through state and local sources in addition to federal funds.

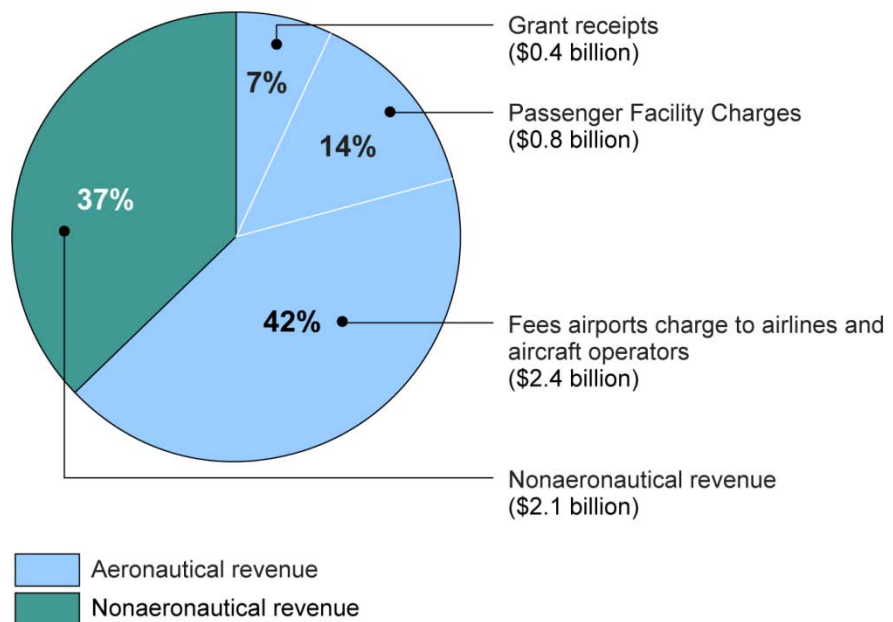
Airport operators may also borrow the funds needed to finance capital projects through municipal bond markets. Airport revenue, including PFCs, may be used to pay debt service on bonds issued for eligible projects<sup>11</sup>. Because funds from bonds are issued based on projected airport revenue, they are not considered by FAA to be a separate source of airport revenue.

Nonaeronautical activities include food and beverage, retail concessions, and parking, automobile rentals, and rent on land and non-terminal facilities, such as manufacturing, warehousing, and freight forwarding. Nonaeronautical revenue may be used to reduce payments by airlines and may also be used to maintain and improve commercial services. (See fig. 2.) At some airports, terminals used by specific airlines are also financed and built through agreements between the airlines and the airports.

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<sup>11</sup>AIP grants are not used for debt payments.

**Figure 2: Relative Contribution of Revenue and Grants at 30 Large Commercial Airports 2012**



Source: GAO analysis of FAA data.

Notes: Non-aeronautical revenue is equal to the sum of nonaeronautical revenues from airport operations (revenue from land and non-terminal facility leases, terminal food and beverage, terminal retail stores and duty free, other terminal services, rental cars, parking and ground transportation, hotel, and other revenues).

Grant receipts includes the amount of AIP, federal, state and local grants received and recorded as revenue during the 2012 reporting period.

Passenger facility charges includes the passenger facility charges received and recorded as revenue during the 2012 reporting period.

Aeronautical revenue is equal to passenger airline aeronautical revenue (all revenue derived from the aeronautical use of the airport by passenger airlines) and non-passenger aeronautical revenue (other aeronautical revenues not associated with the direct transport of passengers).

Some airport operators are pursuing public-private partnerships (P3s) to finance their commercial development efforts, outside of their financial agreements with airlines. P3s are negotiated contractual agreements between public entities, such as an airport, and a private entity such as a contractor or developer. P3 contractual arrangements can allow developers to build and operate a facility and then transfer the facility to the airport, although there are various types of P3 arrangements. Under one of these types of arrangements, the private developer provides all or part of the financing and intends to capture its development or

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management fees. This type of P3 arrangement can provide the airport with the most leverage for commercial development.

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## Five Key Factors That Facilitate Airport-Centric Development

Based on our research,<sup>12</sup> we found that officials from airports and jurisdictions considered the following factors when pursuing airport-centric development:

- (1) development at the airport,
- (2) air and surface connectivity,
- (3) funding sources for development,
- (4) development in the region, and
- (5) collaboration among stakeholders. (See fig. 3.)

“Development at the airport” refers to existing infrastructure already in place and the actions of airport operators to enhance the viability of their airport by focusing on commercial activities to increase airports’ aeronautical and nonaeronautical revenue. “Air and surface connectivity” includes the routes taken by passengers or cargo to and from the airport to and from other destinations that may be enhanced by highway, rail, and port construction and additional airline routes. “Funding sources for development” include the funding for airport-centric developments as well as airport operations. “Development in the region” involves leveraging existing regional assets, expanding existing assets, or attracting new employment opportunities and business activity. “Collaboration among stakeholders” refers to the various actions that stakeholders can take to reach the goals and objectives that may further airport-centric development.

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<sup>12</sup>Our research included a literature review and discussions with experts, airport officials, and regional stakeholders. (See app. III).

**Figure 3: Key Factors That Facilitate Airport-Centric Development**



Source: GAO.

## Development at the Airport

An airport's ability to generate revenue and contribute to the regional economy depends on its ability to attract airline service, passengers, and cargo shipments. Airport operators' development efforts occur on airport property and involve: (1) providing services that directly support airline operations; (2) providing an expanded number and type of services within the airport terminals for passengers and visitors from the region; and (3) developing services for passengers and businesses, including airlines, on airport property but outside of the terminal areas.

## Airline Operations

Officials at most of the airports in our review believed that their ability to attract and retain airlines was necessary to spur airport development. In particular, airline operators pay for their use of airport services ranging from the use of runways and cargo facilities, to the use of gates and ticket counters. Revenue from airlines for these services constitutes an important component of total airport revenue. In an effort to attract airlines and generate additional revenue, most airport operators we interviewed are expanding the number and type of services they offer, and some offer financial incentives. For example, some airport operators have begun offering services such as catering, maintenance, and warehousing that airlines or other third parties previously provided. Miami International Airport officials said that they waive landing fees for international and low



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cost carriers for the first 2 years in which the airlines schedule flights to Miami—forgoing some current airport operational revenue to help increase future airline operations while capturing more nonaeronautical revenue.<sup>13</sup>

#### Services inside Terminals

As airport operators seek to attract revenue from passengers and visitors, they are renovating their terminals or improving their physical designs to improve the flow of people to the shops, concessions, and gates. The operators are also increasing the number and quality of retail and services—such as wine bars, massage spas, health care clinics, and high fashion shops—offered to passengers and, in some cases, visitors from the local area. (See fig. 4.) For example, the Miami International Airport was named one of the top 10 U.S. airports for dining and one of the world's top 10 airports for retail shopping. The new \$1.7 billion Tom Bradley International Terminal at Los Angeles International Airport is to contain 140,000 square feet for premier dining, retail shopping, and airline club lounges. Also, the Atlanta City Council approved a \$3-billion concession contract for 126 food and beverage locations at 24 retail locations at the Hartsfield-Jackson Atlanta International Airport.

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<sup>13</sup>Waiving landing fees is fairly common among airports.

**Figure 4: Examples of Expanded Services Offered in Some Airport Terminals**



Passengers at Dallas-Ft. Worth International Airport use large touch-screen display to locate food and beverage options at the airport. Two-story retail includes sit-down dining, carry-out, and retail shops.



Displays in the terminals of Miami International Airport showcase local artists, accomplishments of 100 local Latinos, and global issues

Sources: Dallas/Fort Worth International Airport and Miami International Airport.

Airport officials we spoke with in Miami and Los Angeles International Airports have cited the importance of passengers who arrive at or depart from their airports for the regional economy rather than those passengers connecting to other flights. Tourism is an important draw to each of these

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regions, and airport officials have improved airport facilities to more efficiently process and admit international visitors and tourists through security and immigration and customs checkpoints.<sup>14</sup> Airport officials at these airports said that Customs and Border Protection (CBP)<sup>15</sup> staffing can be insufficient at peak travel times and were concerned that international travelers might avoid their airports because of screening delays. These officials also believe that improvements to their airports could increase the rate of passenger and cargo processing if a sufficient number of CBP agents were available to staff inspection booths at peak travel times. However, many U.S. airports lack the space to expand their security facilities, and therefore, may need to identify innovative approaches to overcoming screening delays.

#### Services Outside Of Terminals

Many airport operators are also developing airport property outside the terminal area to attract businesses and to use available land to generate revenue. Some have organized their management structures to include development or real estate offices to coordinate with airport management, developers, and public agencies. They are establishing commercial services and activities, such as hotels, parking facilities, and logistics parks, or leasing land for short-and medium-term use until it is needed in the future.

Most airport officials we spoke with said that the amount of available land on the airport property was a factor in their ability to attract commercial activities to the airport. Officials varied in the type and extent of commercial activities or land uses they were pursuing. Airport officials from Hartsfield-Jackson Atlanta International Airport,

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<sup>14</sup>The U.S. Department of Commerce's International Trade Administration reported that travel of tourism-related goods and services by international visitors traveling in the United States totaled approximately \$128.2 billion in 2012. To facilitate tourism, the Obama Administration has increased staffing levels to process visa applications at U.S. embassies and consulates in countries with a high number of potential tourists.

<sup>15</sup>Shortly after its creation, Customs and Border Protection (CBP), within the Department of Homeland Security, began its "One Face at the Border" initiative by combining inspection functions from the Immigration and Naturalization Service, the U.S. Customs Service, and the Department of Agriculture. CBP agents are responsible for screening international passengers and cargo at U.S. ports of entry and exit. CBP also has programs to facilitate international trade, including: (1) the Customs Trade Partnership Against Terrorism program to secure the supply chain through partnerships with international trade companies; (2) the Free and Secure Trade program to expedite processing for pre-vetted, low-risk shipments; and, (3) the Container Security Initiative program to target and inspect high-risk cargo containers at foreign ports before they leave for the U.S.

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Baltimore/Washington International Thurgood Marshall Airport, Los Angeles International Airport, and Miami International Airport said that the amount of land they had available limited their development options on airport property. According to officials in Miami, state law enabled the Florida Department of Transportation and airport officials to obtain land adjacent to the airport property for the development of an intermodal transportation center. This center contains the rental car facility and connections to the Metrorail and TriRail commuter rail systems that service Miami and nearby cities. Airport officials at Indianapolis International Airport partnered with a community college to develop a worker-training program in logistics and distribution at the airport to meet an anticipated growing need for this skill. Officials at Lambert-St. Louis International Airport would like to develop cargo services, including warehouses and cold storage facilities, to attract cargo operations that could generate revenue at the airport. Their goal is to use cargo revenue to lower the cost of passenger flights in an attempt to increase passenger traffic. In addition, airports with land not being used for operation have found ways to generate revenue through temporary or short-term leases of airport property while also reserving the land for future aeronautical needs. We found that Indianapolis and Denver International Airports plan to develop solar energy farms on airport property; Denver International Airport produces more solar energy than any other airport with scheduled airline service in the United States. Officials at Dallas/Fort Worth International Airport have leased a portion of the airport property for oil extraction. See figure 5 for examples of such airport land use and development.



**Figure 5: Examples of Development Efforts on Airport Property Outside of Terminals**



Land at Alliance Airport (near Fort Worth, Texas and Dallas/Fort Worth International Airport) has been leased for agricultural use or converted recreations uses, such as a golf course and walking route.



By moving the airport rental car facility off airport property, Miami International Airport officials freed up space for new development and connect to a larger intermodal facility-with rental cars and a link to the metro system-via the MIA People Mover.

Sources: Alliance Airport and Dallas/Fort Worth International Airport.

In two localities, airport and regional officials indicated that activities in the region were contributing to the commercial viability of the airport. Regional officials told us that, in part, because of the U.S. automotive industry's presence in Detroit, several of the leading Asian automobile manufacturers have established research and development facilities in the Detroit metropolitan area. In addition, these officials said that a vibrant Asian community, the availability of highly skilled engineering workforce,

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and access to institutions of higher education offering degrees relevant to their careers attracted Asian automobile industry researchers. According to regional officials, these activities have increased the traffic at Detroit Metropolitan Wayne County Airport.<sup>16</sup>

Officials from Miami International Airport and the region discussed the symbiotic relationship between Miami International Airport and the Port of Miami. According to an official, the Port of Miami is the busiest cruise port in the world with over 4 million passengers annually. Of these passengers, 60 percent arrived in Miami through Miami International Airport. The construction of rail connections between the port, downtown area, and airport is expected to facilitate connectivity. These officials noted that the expansion of the Panama Canal to accommodate larger ships in 2014 will benefit Miami because large ships can use the Port of Miami and is to help to promote trade with Asia. If this expected growth in cargo operations occurs, then, according to port officials, the Miami region will benefit and, in turn, contribute to the growth of Miami International Airport by expanding its potential passenger and cargo markets.

#### Air and Surface Connectivity

Most stakeholders we spoke with believe that a region's ability to connect to a variety of domestic and international locations by air is key to attracting businesses, tourists, and cargo to the region. Airport and regional officials sought to increase the number and frequency of flights to a variety of locations by establishing new relationships with foreign airports and business groups and offering incentives to airlines for additional destinations by the airlines. For example, airport and regional officials in Atlanta and Paris have begun cooperating on ways to promote their airport areas for business exchanges. Similarly, Miami International Airport officials visited and reciprocally hosted South African business groups to encourage business development and the flow of passengers and cargo between their respective regions. In July 2012, airport operators at the Memphis International Airport began a \$1 million incentive program to attract new, non-stop domestic and international routes.

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<sup>16</sup>Similarly, the inflow of short-term workers by air to the Washington, D.C., area has been identified as one of the factors that contributed to regional growth in high technology industries, although determining the causal direction of this relationship remains problematic. See K. J. Button, and Henry Vega, "The effects of air transportation on the movement of labor," *GeoJournal*, vol. 71 (2008) 67-81.

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Despite efforts by airports to maintain good air connectivity to many locations, it is airlines that make decisions about what routes to fly. Most airport officials noted that the airlines' decisions to change or eliminate routes can sometimes negatively affect the region's level of air connectivity. In recent years, the General Mitchell International Airport in Milwaukee experienced a period of growth followed by a decline because of airline business decisions. According to the airport operator, the presence of three low-cost carriers increased the number of flight offerings, but the subsequent merger of two of those airlines and relocation of the third resulted in fewer flights. Similarly, officials in Memphis were concerned about potential loss of air services after a major airline announced plans to decrease its passenger services at Memphis International Airport in response to low demand making the route uneconomical for the airline. Among our selection of airports, international connectivity varied. For example, as of February 2013, 33 airlines served Dulles International Airport, offering direct flights to more than 40 destinations in Canada, Mexico, the Caribbean, and parts of Europe, South America, Asia, Africa, and the Middle East. By comparison, direct flights from General Mitchell International Airport in Milwaukee were limited to destinations in the United States, Mexico, and the Caribbean. Because cargo may be transported below the passenger decks of airplanes,<sup>17</sup> a decline in international passenger flight offerings may affect a region's potential to directly provide cargo access to international markets for those businesses that rely on air services.

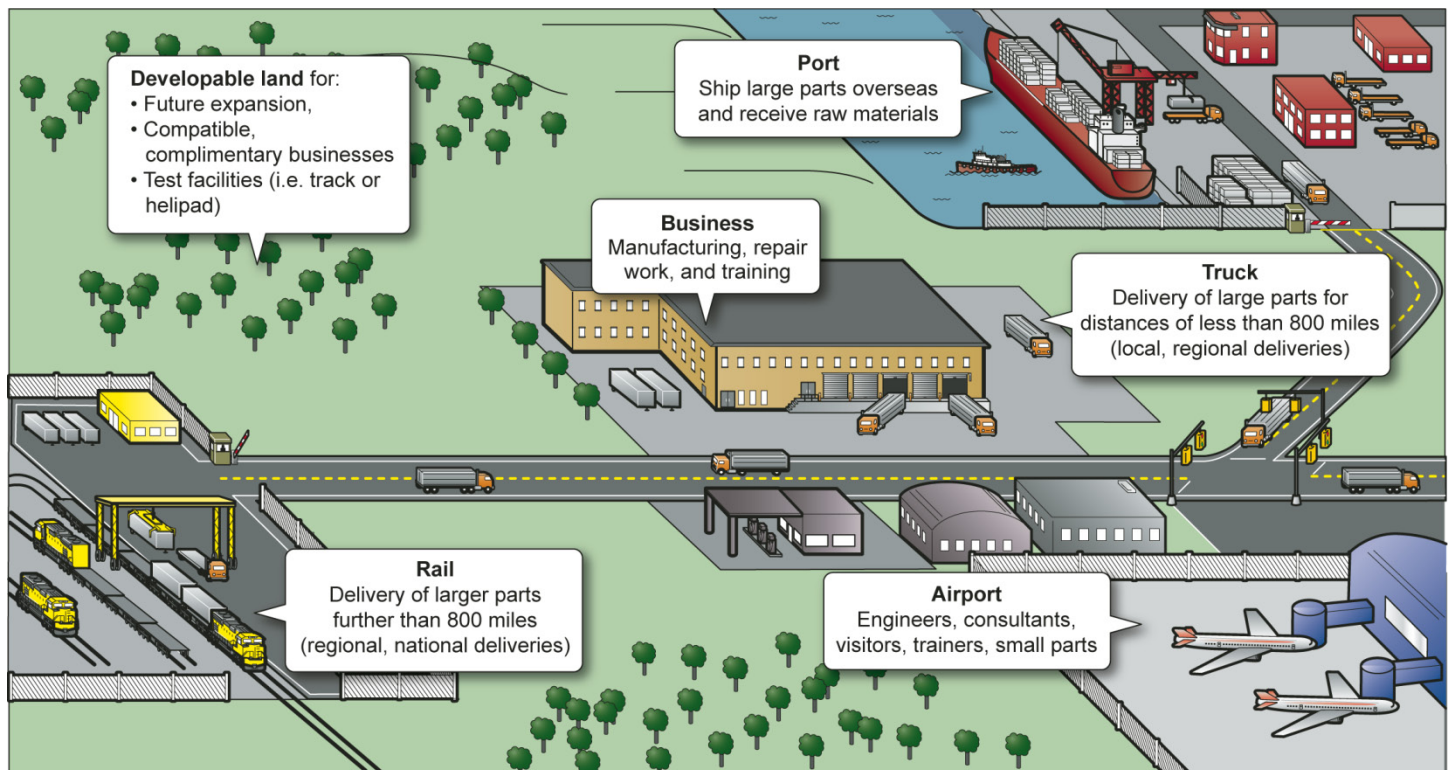
In addition to air connectivity, officials we spoke with discussed the need to improve the connectivity of their surface transportation system to attract businesses, especially those that handle time-sensitive or high-value goods such as perishable items or electronic components. These officials cited the importance of identifying and marketing the various transportation modes of a particular region. For example, as mentioned, officials at the Port of Miami estimated that 60 percent of its cruise ship passengers arrive by air. This, they said, highlights the importance of an efficient connection between the airport and the seaport for moving tourists to and from cruise ships. Miami International Airport officials also

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<sup>17</sup>Approximately 15 percent of domestic air cargo (into and within the U.S.) and 34 percent of international air cargo (departing the U.S. for international destinations) were flown in the belly of commercial passenger aircraft, as measured in total pounds of air cargo flown over the 12-month period from July 2011 through June 2012. The remainder of domestic and international air cargo was flown on dedicated cargo flights.

highlighted the importance of an airport to highway connections for importing and distributing perishable items, including flowers and produce, from Latin America. They noted that many trucks transport cargo from the airport to the federal highway system daily, helping to distribute perishable food and produce imports to the United States. These officials also said that a viaduct dedicated to truck traffic was being built to stem a projected loss of \$1 billion in revenue by 2015 because of congestion on the roads between the cargo area inside the airport and the warehouses and freight forwarders in the nearby city of Doral. At Indianapolis International Airport, officials cited the region's rail and highway connectivity and the presence of FedEx facilities as important infrastructure to support a growing logistics, freight-forwarding, and distribution industry. Airport officials and other regional stakeholders in Memphis market its "Four Rs"—road, river, rail, and runway—to appeal to businesses that may rely on intermodal transportation. Figure 6 illustrates intermodal transportation systems and surface transportation connectivity.

**Figure 6: Example of Air and Surface Connectivity Benefitting Manufacturing, Repair, and Training**



Source: GAO.



With access to multiple modes of transport, businesses can determine shipping routes and methods that are cost-effective and meet customer requirements. (See table 1 for examples of multimodal transportation at airports.) FedEx, for example, determines which mode is the most cost effective based on fuel prices, distance traveled, and time of travel and selects the mode to use. Stakeholders in the Memphis region also noted that the airport's geographic location provides companies with timely access to major U.S. markets and many places around the world. According to a FedEx official, their ability to reach two-thirds of the U.S. population within 12 hours and most international locations overnight was a key factor in locating in Memphis.

**Table 1: Examples of Business Use of Multi-Modal Options at the Airport**

- Spirit AeroSystems, a spin-off of Boeing: (Kinston Airport) will expand operations in the North Carolina Global TransPark (GTP), where the company will manufacture the central fuselage section and leading edge wing spars for Airbus 350 wide-body airliners being assembled in France. The GTP site offers access to two Atlantic seaports from which finished aircraft sections will be transported and assembled in France and Scotland, to rail connections to move the large products to the port, and to an 11,500-foot runway if delivery by air on a heavy-cargo transport jet is necessary.
- Caterpillar Inc.: (General Mitchell International Airport Milwaukee) manufactures large components of mining equipment that undergo final assembly in another country. The equipment is sent on trucks to ships at the port to mine sites around the world where the final equipment is assembled. However, if a problem results during final assembly, a human consultant or a small part can be sent by air.
- Composite Technology, Inc. (CTI), a Sikorsky Aerospace Services Business: (Dallas/Fort Worth International Airport) opened the world's only bi-directional whirl tower at Dallas/Fort Worth International Airport, to repair and dynamically balance helicopter main rotor blades. Although most of CTI's business is trucked in from its North American customers, the company relies on air freight services to receive and send some helicopter parts from other parts of the world (e.g., the United Kingdom and Singapore).

Source: GAO.

Many stakeholders told us that a region cannot fully benefit from an efficiently run airport if the surface transportation needed to access the airport is congested. Surface congestion can increase costs, contribute to system inefficiencies, and delay on-time freight delivery. These stakeholders also considered ways to increase public transportation options to relieve congestion from roads while providing alternate transportation options to travelers and airport workers. Most regions in our review offer local bus services to their airports and many also offer local rail services, or plan to offer new rail connections between the airport and the central business district, downtown, for example, in Miami, Washington, D.C., Los Angeles, and Denver. Alternatively, a well-integrated surface transportation network can provide the basis for an efficient logistics and distribution services within a region. Many experts we spoke to agreed that intermodal networks consisting of highways, rail capabilities, or waterways, linked to the airport may facilitate airport-

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centric development by improving mobility and allowing more people and cargo to access the airport.

Some experts we spoke with, as well as literature sources,<sup>18</sup> discussed advancements in high speed rail and the potential for code sharing across modes of transportation as a way to free up additional capacity at the airport in some congested regions of the country and extend the region served by an airport. Under a code sharing arrangement, integrated air-rail ticketing would allow a passenger to use both modes of travel through one purchase transaction. Some experts believe that high speed rail development could help contribute to the commercial development of airports. California is considering options as it develops its high-speed rail capabilities, with one potential plan to link San Diego through Los Angeles to Sacramento and San Francisco and airport officials in Miami told us that they believed a high speed rail link between Miami and Orlando would increase the number of passengers at Miami International Airport. Other experts, however, believe that high-speed rail could divert demand from air transport and reduce the need for commercial development at airports, especially if high speed rail is not directly linked to airports. Currently, roads and light rail affect airport development more than high speed rail.

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## Funding Sources

Transportation improvements for airport-centric development may entail large capital-intensive projects that generally require pooling money from different sources. Federal funds are often sought, but airport and regional officials also seek other sources of funds for their development efforts, particularly intermodal funding and public-private partnership funding. The failure to obtain adequate funding can prevent or inhibit the growth of these airport-centric projects. Officials from the City and County of St. Louis and the State of Missouri were unable to obtain the funding they needed for airport-centric development after airport and the private sector representatives formed the Midwest-China Hub Commission in 2008. After establishing a freight and commercial logistics facility at the airport, the commission sought to attract regularly scheduled freight service to Asia and Latin America and obtain foreign direct investment. Members of

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<sup>18</sup>Moche Givoni, and David Banister, "Airline and railway integration," *Transportation Policy*, vol. 13 (2006) 386-397. Jan Vespermann, and Andreas Wald. "Long-term perspectives of intermodal integration at airports," *Airport Management*, vol. 4, No. 3, (2010): 252-264.

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the commission visited China, established an office in Beijing, and hosted visitors from China. A Chinese cargo airline began scheduled flights to St. Louis in 2011; however, its operations were not sustainable without financial assistance, according to airport officials at Lambert-St. Louis International Airport. Stakeholders sought to obtain \$480 million in state funding to: (1) subsidize the cost of initially flying goods out of the St. Louis region to China (2) provide tax breaks to companies engaging in foreign trade at the airport, and (3) subsidize the cost of constructing millions of square feet of warehouse and factory space in locations across the region. The commission was unable to obtain state funding and is delaying their airport-centric development efforts while it seeks funding from other sources.

According to an April, 2011, evaluation of the Global TransPark logistics airport-centric effort in Kinston, North Carolina,<sup>19</sup> the TransPark received a total of \$248 million in funding from local, state, federal, and private sources—far short of the estimated \$733 million total cost of the complex. Evaluators found that the TransPark Authority was unable to repay a \$25 million loan that had been made in 1993, because operations at the TransPark did not generate sufficient funds to repay the loan. The balance of the loan—\$39.9 million because of interest accrual as of February 2011—is to be repaid by the state of North Carolina. One expert attributed the Global TransPark’s failure to attract sufficient business activities to recover costs in a timely manner to an original project design that was too optimistic and the financial risks surrounding large-scale projects.

## Federal Funding

As shown in table 2, the federal government has a number of programs designed to support regional transportation infrastructure development, which some regions have leveraged as part of their airport-centric development efforts.

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<sup>19</sup>North Carolina General Assembly, Legislative Services Office, and Program Evaluation Division, *North Carolina Should Weigh Continued Investment in the Global TransPark Authority and Consider How to Repay the Escheat Fund Loan*, Report No. 2011-02 (Raleigh, NC: April. 19, 2011).

**Table 2: Federal Programs That Can Support Airport-Centric Development**

| Program/Sponsor   | Description   |
|---|---|
| Economic Development Administration (EDA)   | EDA awards competitive grants, often for infrastructure, that prioritize innovative projects that address national strategic priorities (for example, global competitiveness), assist economically distressed and underserved communities, and demonstrate collaborative strategies across multiple jurisdictions.  |
| Federal Aviation Administration (FAA)   | A pilot program to fund activities related to the compatible redevelopment of up to four eligible public use airport properties purchased for airport noise compatibility with AIP and PFC funds with certain restrictions. <sup>a</sup><br>A “noise” land disposal program under which airports may sell or lease land that was purchased by FAA for noise abatement purposes if the land is no longer needed for noise abatement; there are restrictions on the use of the funds. |
| New Starts Program/ Federal Transit Administration <sup>b</sup>   | A capital investment program for new fixed guide-way infrastructure, such as rail transit projects, including those that connect to airports. A maximum of 80 percent federal contribution to total project costs can be funded.  |
| Department of Housing and Urban Development (HUD)   | Established in 2009, the Sustainable Communities Initiative offers competitive challenge grants to communities and regions wishing to improve access to affordable housing, increase transportation options, and lower transportation costs while protecting the environment.   |
| Highway Trust Fund  | The Highway Trust Fund is an account established by law to hold federal highway user tax receipts (e.g., receipts for federal excise taxes on fuel and other taxes on commercial trucks) that are dedicated for highway and transit related purposes. It is composed of two accounts: the highway account and the mass transit account.   |
| Transportation Infrastructure Finance and Innovation Act (TIFIA)/ Department of Transportation                    | DOT provides credit assistance under TIFIA for qualified highway, transit, passenger rail, and intermodal projects. Credit assistance includes direct loans, loan guarantees, and lines of credit, and project financing must be repayable in part or in whole from tolls, user fees, or other dedicated revenue sources. <sup>c</sup>  |
| Transportation Investment Generating Economic Recovery (TIGER) program/ Office of the Secretary of Transportation | The TIGER program fosters innovative, multi-modal and multi-jurisdictional transportation projects that promise significant economic and environmental benefits to an entire metropolitan area, a region, or the nation.  |

Source: GAO.

<sup>a</sup>The FAA Modernization and Reform Act of 2012, Pub.L.No., 112-95, § 822, 112 Stat. 95, 129-130.

<sup>b</sup>49 U.S.C. § 5309.

<sup>c</sup>23 U.S.C. §§ 601-609.

## Intermodal Funding

Although federal sources of funding—such as those identified above—can sometimes be used to develop intermodal capabilities at U.S. airports, the primary planning and development responsibilities for these efforts rest with state and local government agencies. State and locally generated money—such as state transportation trust funds, dedicated sales taxes, and highway tolls—have been used to match federal funds. For example, contributions from the Commonwealth of Virginia, the Metropolitan Washington Airports Authority, Fairfax and Loudoun Counties, and toll revenues from the Dulles Toll Road will be used to pay

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for the Washington Metropolitan Area Transit Authority Metrorail connection to Dulles International Airport. A “transportation improvement district”<sup>20</sup> was also established to help fund the Metrorail extension from downtown Washington, D.C. to the airport. States may also have their own credit assistance programs. For example, Florida used funds from its credit assistance bank to provide loans to help develop the Miami Intermodal Center at the Miami International Airport. The Miami Intermodal Center has levied a customer facility charge on car rentals to pay for its consolidated rental car facility.<sup>21</sup>

Some airport operators and an expert with whom we spoke said that FAA’s grant assurances and obligations—that is, requirements on the use of federally administered funds—can limit the airport operator’s ability to fund certain types of intermodal projects. For example, airport operators may use PFCs or AIP grants to fund rail access at airports, if the project is owned by the airport, located on airport property, and used exclusively by airport passengers and employees. PFCs may be used to fund related activities when they are a necessary part of an eligible access road or facility.<sup>22</sup> This requirement on the use of PFCs exists to avoid revenue diversion—the use of airport revenue for other than airport purposes. According to an expert we spoke with, the failure to meet these conditions may preclude an airport from using such funding to connect with a transit line that connects communities on each side to the airport because FAA would require that riders on the transit line begin or end their journey at the airport, rather than bypassing the airport.

There are also federal restrictions on the development and sale of airport-owned land and the use of revenues generated from an airport’s land because of the grant assurances an airport accepts as a condition of receiving federal land or funds. Other funding sources on which airport operators generally rely to improve or commercially develop their airports, such as state grants and bonds, also involve various assurances.

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<sup>20</sup>Transportation improvement districts can be established by local governments as a special tax on businesses in order to capture the value added to a business or property with close access to a rail project. Therefore, those who receive the benefits of increased economic activity or increased property value contribute to the project’s costs.

<sup>21</sup>Customer facility charges are surcharges on car rentals that can pay for the capital and operating costs of a transit system from a consolidated rental car facility.

<sup>22</sup>FAA Notice, 69 Fed. Reg. 6366 (Feb.10, 2004) and FAA Order 5100.38C.

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## Public-Private Partnership Funding

A public-private partnership (P3) for airport-centric development usually refers to a contractual agreement formed between a public airport and private sector developers for the developers to renovate or construct and operate or manage an airport's facilities on airport land.<sup>23</sup> Some airport operators view public-private partnership arrangements to commercially develop airports as an alternative or supplementary funding source to funds that may be limited by federal restrictions or grant assurances. The particular arrangements of public-private partnerships vary considerably, but developers may finance, design, build, operate, and maintain an enterprise (including charging fees) for a specific time period, after which ownership of the enterprise reverts back to the airport in most P3 arrangements.

P3 projects thus involve negotiations between airports and developers.<sup>24</sup> According to officials at one airport, the involvement of federal agencies and other third parties in those negotiations over issues such as the length of the lease and amount of profits to be shared extended the duration of those negotiations. Airport operators must obtain FAA's concurrence prior to leasing airport land or facilities to private developers to help ensure, among other things, that the developer's plans will be compatible with airport operations and that the airport receives fair market value for the use of its property. A developer in Dallas said that lease terms of 40 years are becoming more common at airports but are still relatively short and a potential reason why airports do not see more private investment. Officials at Dallas/Fort Worth International Airport said that they were able to obtain FAA approval to extend lease terms beyond the typical 20-year period, but less than the 99-year lease that the private developers wanted, and that developers often seek in P3 arrangements. According to FAA officials, the FAA does not normally consider leases beyond 50 years; however, FAA may approve these leases on a case-by-case basis. Officials at Miami International Airport said that they were using a P3 to develop their airport city to avoid increasing the amount of

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<sup>23</sup>Airport operators must obtain FAA's concurrence to lease airport land or facilities to developers if the operator has obtained grants from FAA.

<sup>24</sup>The Port Authority of New York and New Jersey partnered with the private sector for the \$1.2-billion expansion of Terminal 4 at John F. Kennedy International Airport, which when it opened in 2001, represented the largest P3 of its kind at a North American airport. In October 2012, the Port Authority issued a request for qualifications for a P3 to replace LaGuardia's main terminal in addition to new roads and taxiways with anticipated construction beginning in 2014.

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debt already incurred to renovate the airport's terminals.<sup>25</sup> We have previously reported on the benefits and trade-offs of P3s and have expressed concern about how the public interest is protected in these projects.<sup>26</sup> The most recent surface transportation reauthorization, MAP-21, requires the Secretary of Transportation to develop standardized P3 agreements, identify best practices, and provide technical assistance to P3 project sponsors.<sup>27</sup>

Denver International Airport illustrates another possible type of public-private funding, although a type that is likely to be of limited use to most U.S. airports. Denver International Airport, as part of the Denver Department of Aviation, receives funds from the sale and development of Denver's previous airport, Stapleton. This land is being zoned as mixed-use and being developed primarily as residential communities. To develop the Stapleton site, a private non-profit corporation established by the city of Denver and the Denver Urban Renewal Authority, had to re-grade the site to provide adequate storm water drainage; install water, sewer, and other utility lines; develop roads and interchanges; plan and develop parks and trails; preserve wetlands; and install community facilities, such as fire stations, a recreation center, a branch library, and schools.

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## Development in the Region

Most local government and private sector officials with whom we spoke promoted their region's existing assets and proximity to the airport to attract or expand businesses that benefit from air connectivity. Officials identified a variety of mechanisms to attract businesses, such as (1) linking airport development to commercial activities in the region, (2) identifying and leveraging unique cultural aspects of the region and promoting tourism or the general quality of life offered by the area, (3)

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<sup>25</sup>Miami International Airport has announced a \$512 million public-private partnership with Odebrecht USA to construct an airport city on 33 acres of airport property. Commercial enterprises in the airport city will include a business center, a hospitality center and a convenience center that will include a dry cleaner, convenience store, gas station, and pet hotel/spa. Odebrecht will finance construction and pay rent and a percentage of the revenues to the Miami-Dade County in return for a 50 year lease.

<sup>26</sup>GAO, *Highway Public-Private Partnerships: More Rigorous Up-Front Analysis Could Better Secure Potential Benefits and Protect the Public Interest*, [GAO-08-44](#) (Washington, D.C.: Feb. 8, 2008).

<sup>27</sup>Pub.L No. 112-141, § 1534, 126 Stat. 405, 584 (2012).

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developing industry clusters,<sup>28</sup> and (4) designing policies and providing incentives to attract businesses to the region.

Local government officials at many localities indicated that activities on airport grounds contributed to development in the region around the airport. Officials at Hartsfield-Jackson Atlanta International Airport told us that based on a 2009 economic impact study of the airport; they expected a new international terminal to increase airport operations and attract businesses and create jobs in the region surrounding the airport. These airport officials noted that regional stakeholders have already established two new hotels, an office building, and the Georgia International Convention Center on property near the airport. The Mayor of Denver has said that development at the Denver International Airport has the potential to spur commercial development in the Denver region for decades, including development along a planned commuter rail corridor that connects the airport with downtown Denver. The Regional Transportation District<sup>29</sup> is building electrified commuter rail to Denver International Airport; airport officials are planning to build the terminal station and, in conjunction with the city of Denver, one or two additional stations to encourage development in the resulting corridor between the city of Denver and the airport.

Cargo service airports can also contribute to regional development. For example, Alliance Global Logistics Hub, an industrial cargo airport near Dallas/Fort Worth International Airport, developed in 1982, has attracted more than \$7 billion in investments and 290 corporate residents, including 50 companies listed on the Fortune 500, Global 500 or Forbes' Top List of Private Firms. Although the North Carolina Global TransPark in Kinston, North Carolina, has not attracted the initial investment or new jobs initially envisioned, some development has taken place. The TransPark has, as of February 2013, attracted 13 tenants. One of the tenants received a Job Development Incentive Grant from the North Carolina Department of Commerce, and is expected to employ more than 1,000 workers by 2014. An official representing the TransPark said that new developments like the TransPark take time to fully install supporting transportation

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<sup>28</sup>Industry clusters are groups of similar or complementary businesses located in close proximity to one another.

<sup>29</sup>This project is funded with New Starts funds (see table 2).



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infrastructure and utilities to attract tenants, but hopes that additional companies will locate at the TransPark.

Officials at Los Angeles and Miami International Airports cited cultural ties to other regions of the world and tourism as important drivers of passengers and cargo traffic. For example, airport officials in Los Angeles said that the city has large Korean and Iranian populations, and Miami airport officials spoke of the city's close cultural ties with Latin America. Officials in Los Angeles said that the large population of Asians in the Los Angeles region has reinforced strong cultural ties to Asian countries and has helped to support trade with these countries. Similarly, officials in Miami said that tourists from Latin America and the Caribbean visit Miami, in part, because of the cultural familiarity, the access to world-class tourist attractions and cruise ships, and the shopping options that may be unavailable in their countries of origin. In both locations, the regional aspects helped to attract visitors who use the airport and spend money in the region. Officials in Memphis said that some of their development efforts, such as developing Elvis Presley Boulevard and the potential redevelopment of downtown Memphis, are intended to increase tourism and attract more passenger flights to the area. They also noted that by drawing visitors to the region, the airport would generate additional revenue and airlines might offer more flights to the region.

In some regions, local officials told us that they were trying to attract complementary businesses to form industry clusters that might benefit from the availability of a skilled and interchangeable, or transferrable, workforce. For example, officials in Miami have been fostering growth in the region's banking, insurance and legal services, by promoting its multicultural and multilingual workforce and its direct air connectivity to Latin America and the Caribbean. Stakeholders involved with business development in the Baltimore region expected that the influx of military jobs at Fort Meade would result in the growth of defense contracting jobs in the region. These officials anticipate that defense contracting jobs will, in turn, lead to additional growth in the region. For example, one regional stakeholder noted that the growing number of government consultants rely heavily on air transportation and area hotels. Executives at a private corporation in Detroit told us that they are trying to attract compatible businesses that could leverage the region's strength in research and development in automobile electronics.

Most local officials we spoke with have implemented state, regional, or local tax-based incentives and land use policies to attract businesses and developers to their regions. For example, airport officials in Indiana,

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Maryland, Missouri, North Carolina, Texas, and Virginia have applied to the U.S. Department of Commerce for foreign trade zone<sup>30</sup> designation at and around their airports to support tax-free manufacturing. Stakeholders in Detroit leveraged state-approved tax incentives to attract businesses that rely on the airport for commerce to a 60,000 acre area around the Detroit Metropolitan Wayne County and Willow Run Airports. Local planning officials have affected particular land uses near airports through planning policies, including policies related to noise, environmental quality (air, water, wetland, species protection), and zoning restrictions. This can help with airport-centric development because it prioritizes limited developable land for uses that are compatible with airport operations and compliant with local, state, and federal requirements. At the Hartsfield-Jackson Atlanta International Airport, a private developer cleaned up an abandoned industrial site east of the airport and sold a portion of the land to the City of Atlanta for the airport's use and sold another portion to a high-end auto manufacturer. The auto manufacturer expressed interest in purchasing more land from the developer to attract another high-end auto manufacturer to develop and share a track on the site to attract prospective buyers to fly into the region to test drive cars.

Airport officials in three of the regions in our study said they have considered the potential to utilize one airport primarily for passengers with a nearby airport for cargo; however, those officials also identified potential challenges to splitting passenger and cargo operations. For example, officials from Los Angeles International Airport told us that it would be inefficient to move their cargo operations to nearby Ontario Airport in the Los Angeles region because much of the cargo passing through their airport travels in the lower deck of passenger planes. Officials at Detroit Metropolitan Wayne County Airport said they use nearby Willow Run industrial airport for air cargo to complement passenger and cargo services offered at Detroit Metropolitan Wayne County Airport, but cited limitations in the airport's runway length and condition. An official at Alliance Global Logistics Hub, on the other hand, said that the passenger services offered at nearby Dallas/Fort Worth International Airport complemented the cargo-only services offered at Alliance Global Logistics Hub because Dallas/Fort Worth International Airport offers

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<sup>30</sup>A Foreign-Trade Zone is an area that provides tax relief on goods and cargo that move through the zone, including light manufacturing such as assembly.

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passenger services most major cities in the United States, Mexico and Canada within 4 hours.

While the economic viability of all-cargo operations at Ontario and Willow Run Airports is not yet known, we have previously identified regional airport planning as one approach to constrained capacity. Some metropolitan planning organizations (MPO) conduct regional airport planning as a part of their activities. In 2010, we found metropolitan-planning organizations that conduct regional airport planning have no authority to determine the priorities of airport improvement projects in their regions; MPOs do have authority over surface transportation projects. As a result, the regional airport plans that MPOs produce have little direct influence over airport capital investment and other decisions.<sup>31</sup> Support and funding of regional airports depend on the FAA's assessment of the project. Thus, GAO recommended that FAA develop a review process for regional airport system planning. According to FAA officials, FAA agreed to review its Airport System Planning guidance and revise or clarify it, if necessary, although the agency believed its current guidance was adequate.

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## Stakeholder Collaboration

Airport-centric development efforts in the regions we studied span multiple jurisdictions and involve stakeholders from the airport, the private sector, and the government sector. Based on our review of literature, our previous work,<sup>32</sup> and discussions with stakeholders in the regions we visited, collaboration among various stakeholders can help achieve specific goals. Consultation with residents near the airport and with city officials representing the interest of their constituents is an important step in the airport-centric development process. Without collaboration or agreement among stakeholders, development plans may be difficult to implement. Los Angeles International Airport officials, for example, would like to further expand the airport's northern airfield to address safety and efficiency issues related to aircraft operations (including accommodating

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<sup>31</sup>GAO, *National Airspace System: Regional Airport Planning Could Help Address Congestion If Plans Were Integrated with FAA and Airport Decision Making*, [GAO-10-120](#) (Washington, D.C.: Dec. 23, 2009).

<sup>32</sup>GAO, *Intermodal Transportation: DOT Could Take Further Actions to Address Intermodal Barriers*, [GAO-07-718](#) (Washington, D.C.: June 20, 2007). GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, [GAO-06-15](#) (Washington, D.C.: Oct. 21, 2005) pp.6-7.

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larger aircraft); however, given the proximity of the airport to residential areas and community opposition to potential noise issues, there has been little public or political support for the airport's expansion. As our previous work has shown early and continuous community involvement is critical to efficient and timely project implementation. For example, some airport operators are using AIP funds for long-term environmental planning; continuously self-monitoring their environmental footprints to help prepare for and address environmental issues; and soliciting community concerns to anticipate and address environmental issues. In addition, several FAA processes have been established to help airports address environmental concerns such as a streamlined environmental review process for airport projects where expansion is critical for handling the growth of air traffic.<sup>33</sup> In the future, as airports like Los Angeles International Airport learn to better manage their environmental impacts, airports may be better able to garner community support for airport expansion.

The stakeholders we spoke with gave examples of the ways in which they collaborated with other stakeholders, such as establishing new groups to promote airport-centric development. Regional stakeholders in Baltimore, Detroit, Indianapolis, Memphis, Milwaukee, and St. Louis formed multilateral committees including stakeholders representing the airport, the public sector, and the private sector. While these committees all had a general focus on airport-centric development, they focused on different aspects of airport-centric development and functioned in different ways, for example:

- The BWI Partnership is a business-development advocacy group, representing the airport and approximately 200 developers, hotels, law firms, banks, and local government members, and focused on supporting business development and efficient transportation in the airport region.
- The Detroit Region Aerotropolis Development Corporation (ADC) is a public-private economic development agency that works to attract businesses that rely on air cargo and passenger services. It is comprised of and funded by stakeholders representing seven local communities, two counties, and the airport. The Next Michigan

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<sup>33</sup>GAO, *Aviation and the Environment: Systematically Addressing Environmental Impacts and Community Concerns Can Help Airports Reduce Project Delays*, [GAO-10-50](#) (Washington, D.C.: Sept. 13, 2010).

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Development Act,<sup>34</sup> a state incentive program, encourages inter-jurisdictional cooperation among local entities and allows them to create tax incentive zones targeted at businesses in the transportation and logistics sectors. According to the ADC the act contains a clause to prevent job displacement from another region of the State of Michigan.

- Airport officials led airport-centric development efforts at and around the Indianapolis International Airport. In their early planning stages, airport officials invited representatives from nine neighboring jurisdictions, including the City of Indianapolis, to sign a nonbinding memorandum of understanding to explore potential targeted airport-centric development opportunities, based on land availability and existing assets and infrastructure, such as warehouses, and rail connections that might be utilized to support airport-centric development; the officials increased the number of stakeholders with whom to collaborate by expanding the area of consideration, from a 5-mile radius to an 8-mile radius; and they began monthly stakeholder meetings. Airport officials also partnered with a local community college to establish a supply-chain logistics and freight-forwarding technical school on airport property to meet the anticipated demand for skilled workers in this trade.
- In 2006, the Greater Memphis Chambers of Commerce created the Memphis Aerotropolis Steering Committee, comprised of public and private sector stakeholders, to coordinate development efforts in selected targeted development areas surrounding the airport. This group has established various work groups to focus on gateways and beautification, marketing and branding, corridor business development, and access and transportation. The City of Memphis was awarded \$1.26 million from the U.S. Department of Housing and Urban Development to partner with the Greater Memphis Chamber of Commerce, the University of Memphis, and Shelby County to develop a master plan for airport-centered economic development efforts. The federal funds were matched with \$900,000 in local funds and in-kind services.

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<sup>34</sup>The Next Michigan Development Act allows local governments to collaborate to establish groups with the authority to create tax incentive zones targeted at the transportation and logistics industry. .

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- The Airport Gateway Business Association (AGBA) was created in 2005 to provide leadership in planning, promoting, and developing the vitality of the area around the General Mitchell International Airport in Milwaukee, marketed as the “Gateway to Milwaukee.” Funding is provided through an Airport Gateway Business Improvement District,<sup>35</sup> managed by AGBA, and stakeholders represent the State of Wisconsin, the City and the County of Milwaukee, the Milwaukee 7 (seven counties united around an agenda to grow, expand and attract world-class businesses and talent), Visit Milwaukee, and the General Mitchell International Airport.

Officials representing customs brokers and freight forwarders in Miami indicated the importance of collaboration between stakeholders. That is, the industry depends on well-established relationships between those responsible for importing and inspecting cargo and those routing it to its final destinations. Infrastructure is also necessary, including refrigerated storage, fumigation facilities, and information technology systems. Another official, representing floral importers of Florida, said that the established infrastructure and relationships needed to support a supply chain are not easy to replicate and help to ensure that Miami International Airport does not lose its position to another airport as the primary gateway for most of the flowers imported into the United States. Officials at Lambert-St. Louis International Airport also explained that freight forwarders serve as “gatekeepers,” determining what route freight takes to get from its origin to its destination.

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## Concluding Observations

Based on our review of studies and discussion with regional stakeholders, we have developed an organizational framework that describes 5 factors—development at the airport, air and surface connectivity, funding mechanisms for development, development in the region, and stakeholder collaboration—to consider when approaching airport-centric development. We could not determine if each of these factors are needed or if one factor could be substituted for another. However, consideration of these factors may be helpful as government officials and private-sector developers develop their plans and analyses when considering

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<sup>35</sup>The City of Milwaukee, Department of City Development, states that property owners in Business Improvement Districts voluntarily collect annual assessments that are spent on streetscape, marketing, recruitment, and other projects to enhance the local business environment.

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undertaking airport-centric development or projects supporting airport-centric development. Some countries enjoy the concurrent green field development of airports, the regions, and the facilities that comprise airport-centric development. In the United States, however, where there are many long-established airports, most airport-centric development is implemented through a series of targeted projects and activities to build upon what already exists. The success of these projects or activities does not ensure the success of an entire airport-centric development. Similarly, the presence of an economically viable airport in an economically successful region does not necessarily mean that targeted airport-centric development efforts were responsible for success.

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## Agency Comments

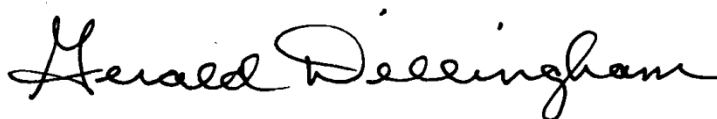
We provided a draft of this report to the Federal Aviation Administration (FAA), the Department of Commerce (DOC), the Department of Housing and Urban Development (HUD), the Environmental Protection Agency (EPA), and representatives from the Airports Council International (ACI), Airlines for America (A4A), the Cargo Airline Association (CAA), and academic experts for review and comment. We invited airport and regional stakeholders to comment on the portions of this report draft that pertained to them. FAA, HUD, and EPA provided technical comments on the various programs under their purview that we incorporated as appropriate. ACI, A4A, CAA, and the academic experts, generally, agreed with the approach and information in the draft. One expert indicated that an evaluative approach would have been more useful for policymakers. Some stakeholders provided technical information that we incorporated as appropriate.

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We are sending copies of this report to the Secretary of Transportation, the appropriate congressional committees, and others. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

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If you or your staff members have any questions about this report, please contact me at (202) 512-2834 or [dillinghamg@gao.gov](mailto:dillinghamg@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix V.

A handwritten signature in black ink that reads "Gerald Dillingham". The signature is written in a cursive style with a large, stylized "G" and "D".

Gerald Dillingham  
Director, Physical Infrastructure



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### *List of Requesters*

The Honorable Bill Shuster  
Chairman  
Committee on Transportation and Infrastructure  
House of Representatives

The Honorable Frank A. LoBiondo  
Chairman  
The Honorable Rick Larsen  
Ranking Member  
Subcommittee on Aviation  
Committee on Transportation and Infrastructure  
House of Representatives

The Honorable Steve Cohen  
House of Representatives

The Honorable John D. Dingell  
House of Representatives

The Honorable Eddie Bernice Johnson  
House of Representatives

The Honorable Henry C. "Hank" Johnson  
House of Representatives

The Honorable Candice S. Miller  
House of Representatives

The Honorable Gwen Moore  
House of Representatives

The Honorable John L. Mica  
House of Representatives

The Honorable Thomas E. Petri  
House of Representatives

# Appendix I: Examples of International Airport-Centric Development

Airport-centric development is occurring in many countries of the world, including the U.S. According to Kasarda, for example, Asia is second to North America (21 versus 40) in the number of airport-centric developments; Europe has 20 airport-centric developments. Globally<sup>1</sup>, Kasarda identified 35 airport cities and 56 aerotropolises (see table 3). Some countries with developing economies, including China, India, South Korea, and the UAE, are building new airports in conjunction with planned cities on the airport property, called “airport cities,” and beyond airport property (“aerotropolises”) to provide services for travelers and shippers.

**Table 3: Global Airport Cities and Aerotropolises**

|              | Developing         | Operational        |
|--------------|--------------------|--------------------|
| Airport City | Africa (0)         | Africa (1)         |
|              | Asia/Pacific (1)   | Asia/Pacific (1)   |
|              | Europe (6)         | Europe (5)         |
|              | Middle East (2)    | Middle East (0)    |
|              | North America (10) | North America (7)  |
|              | South America (0)  | South America (0)  |
|              | Total: 19          | Total: 14          |
| Aerotropolis | Africa (4)         | Africa (0)         |
|              | Asia/Pacific (12)  | Asia/Pacific (7)   |
|              | Europe (1)         | Europe (5)         |
|              | Middle East (1)    | Middle East (1)    |
|              | North America (13) | North America (10) |
|              | South America (1)  | South America (1)  |
|              | Total: 32          | Total: 24          |

Source: GAO analysis of John Kasarda data.

<sup>1</sup> Chaudhuri, Sumana, “Impact of Privatization on Performance of Airport Infrastructure Projects in India: A Preliminary Study.” *International Journal of Aviation Management*, vol.1, no.1&2 (2011): 40-57. Yeung, J.H.Y., Waiman Cheung, Michael Ka-Yiu Fung, Xiande Zhao, and Min Zhang, “The Air Cargo and Express Industry in Hong Kong: Economic Contribution and Competitiveness.” *International Journal of Shipping and Transport Logistics*, vol. 2, no.3 (2010): 299-321. Ishutkina, M.A. and R. John Hansman, “Analysis of Interaction between Air Transportation and Economic Activity (Cambridge, MA: International Center for Air Transportation, MIT, 2011).

# Appendix II: Profiles of U.S. Airport Regions

**Table 4: Alliance Global Logistics Hub Airport (AFW), Ft. Worth Regional Profile**

|   |
|---|
| <b>Airport Characteristics</b>  |
| <p>Alliance Global Logistics Hub, in Fort Worth, Texas, is a 17,000-acre master planned industrial airport, with two runways ranging in length from about 8,220 to 9,600 feet. In 2011, Fort Worth Alliance Airport was the 25th busiest air cargo airport in the U.S. with 898,583,721 pounds of cargo landed, representing a 28.20 percent increase in pounds of cargo landed from 2010. Alliance leverages its proximity to DFW to market the air connectivity to many major cities in the U.S., Mexico and Canada.</p> <p>According to an official at Alliance Airport, the airport hosts one of the largest foreign trade zones in the country and is an economic engine for the region, bringing nearly \$7 billion in private investments and more than \$400 million in public investments to the region. The airport serves 290 corporate residents (including 50 among Fortune 500, Global 500, or Forbes' Top List of Private Firms), and employing more than 30,000 employees. Industry clusters have formed at Alliance, including automotive; aerospace and aviation; logistics; electronics; pharmaceutical and health care; and, consumer goods and services.</p>   |
| <b>Regional Characteristics</b>   |
| <p>With approximately 6.4 million people in the Dallas/Fort Worth-Arlington metropolitan statistical area, the region is fast-growing and contains one of the largest markets in the U.S.</p> <p>According to an official at the airport, BNSF Railway constructed a 735 acre, \$115 million intermodal facility at Alliance Airport. This is in addition to other modal infrastructure identified by the official, including BNSF &amp; Union Pacific (UP) Class I Rail Lines, Interstate Highway 35W, State Highways 114 and 170, a FedEx Sort Hub, and U.S. Customs &amp; Border Protection clearance and security. The airport official said that surface transportation is critical to the success of the airport, as it provides access to markets and also provides airport customers with easy access to the airport. FedEx is beginning to use rail, in addition to air and highway modes of transport, making Alliance's intermodal ground connectivity of interest to FedEx and to manufacturing companies.</p>  |
| <b>Unique Opportunities and Challenges</b>  |
| <p>According to a senior representative from Alliance Texas, stakeholder coordination among private stakeholders, like the Perot family, and the City of Fort Worth was critical to the formation of the Alliance Airport. The airport's early objective was to attract as many cargo flights as possible to raise revenues through landing fees. A notable gain for Alliance was when FedEx established a Southwest U.S. hub at Alliance.</p> <p>The representative from Alliance Texas also said that Deloitte established Deloitte University Leadership Center at Alliance, a more than 700,000 square feet, \$300 million corporate training center with nearly 500 on-site employees and more than 42,000 visiting employees annually. Population growth in the region was accompanied by new development, including medical facilities, luxury apartments, a county college and training center, and a high school that will have an aerospace and logistics academy to train potential workers at Alliance.</p> <p>Tarrant County College includes a corporate training center at Alliance Texas which offers certified logistics associate and technician programs, and customized training for computer, communication, leadership and technical areas. Alliance also hosts annual hiring fairs to match and refer qualified candidates with employment opportunities.</p> <p>According to an executive official from Alliance, I-35 is not wide enough to accommodate the employees, trucks and residents for the Alliance Airport area and will hinder development in the area, if not widened.</p> |

Source: GAO.

**Table 5: Baltimore/Washington International Thurgood Marshall Airport (BWI), Baltimore-Washington Regional Profile****Airport Characteristics**

BWI occupies an approximately 3,600-acre site with four runways ranging in length from 5,000 to about 10,500 feet. Located approximately 10 miles south of downtown Baltimore and approximately 27 miles north of Washington, D.C., the airport is owned and operated by the State of Maryland. As of February 2013, The airport offered direct air passenger services to destinations in the U.S. and 6 international destinations in Canada, Mexico, the Caribbean and the United Kingdom. In 2011, the airport was the 22<sup>nd</sup> busiest passenger airport in the U.S. with 11,067,319 passengers enplaned, representing a 2.02 percent increase in passenger enplanements from 2010. Also in 2011, the airport was the 43<sup>rd</sup> busiest air cargo airport in the U.S. with 484,628,795 pounds of cargo landed, representing a 2.84 percent increase in pounds of cargo landed from 2010. The airport operators have focused on modifying the terminals<sup>a</sup> to prepare for the merger of Southwest and AirTran Airlines.

**Regional Characteristics**

In 2010, the Baltimore-Towson combined metropolitan statistical area contained approximately 2.7 million residents. The airport is considered an economic engine for the state. Also, a representative from the BWI Business Partnership and a developer in the region said that Anne Arundel Mills shopping mall; the Baltimore Washington Medical Center and Fort Meade have contributed to growth in the region and may help to support the airport-centric development.

BWI is connected in the region by major highway routes and public transit systems, including bus and rail systems and is about 10 miles from the Port of Baltimore. A representative from the BWI Business Partnership said that the Partnership<sup>b</sup> has brought stakeholders together in support of business development and efficient transportation solutions to relieve congestion and facilitate movement of goods and people throughout the airport region. A county economic development specialist expressed support for development at and around BWI and has approved mixed-use zoning favorable to development.

**Unique Opportunities and Challenges**

BWI officials said that there is not much developable land available inside the airport fence, requiring airport operators to re-evaluate the best use of land over time and retrofit existing airport configurations, as needed. A developer would like to build a water park resort near the airport but said they are limited in what they can build due to limited capacity of wastewater treatment facilities.

County officials have targeted the BWI Airport Business District and vicinity as a primary growth area for future economic development. According to a representative from the BWI Business Partnership, a recent shift of federal, military and contractor jobs to the region around Fort Meade has resulted in passenger and cargo traffic growth, causing this representative concern that transportation and utilities infrastructure would need to grow alongside regional development.

Source: GAO.

<sup>a</sup>According to a regional business journal, the Maryland Board of Public Works approved and awarded a \$10 million design contract to design a new connection between two of the airport's terminals. Airport officials said that the expansion, which will allow passengers to pass through security checkpoints to access shops and restaurants at the airport's A, B, and C terminals without passing through any further checkpoints, is expected to cost about \$100 million to complete. (Sernovitz, Daniel J., "BWI Airport awarded \$10 million for terminal expansion," Baltimore Business Journal, Baltimore, MD: April 12, 2011), accessed November 14, 2011, <http://www.bizjournals.com/baltimore/print-edition/2011/08/12/bwi-airport-awarded-10-million.html>).

<sup>b</sup>According to the BWI Business Partnership website, the Partnership is a business development and transportation advocacy organization with nearly 175 business and government agency members representing local and regional businesses, and local, state and federal government agencies.

**Table 6: Dallas/Fort Worth International Airport (DFW), Dallas Regional Profile****Airport Characteristics**

The Dallas/Fort Worth International Airport (DFW) occupies 17,207-acre site with seven runways ranging in length from 8,500 to about 13,400 feet. Located about 20 miles northwest of downtown Dallas, the airport is owned by the Cities of Dallas and Fort Worth ("owner cities"). Airport operators said that DFW offers direct air passenger services to destinations in North and South America, Africa and the Middle East, Australia, Asia, and Europe. They also said that they are seeking to establish new routes to major trade corridors, including Australia, Taiwan, Dubai, China, and Korea, and would like to serve as a hub between Asia and Latin America.

In 2011, the airport was the 4th busiest passenger airport in the U.S. with 27,518,358 passengers enplaned; representing a 1.54 percent increase in passenger enplanements from 2010. Also in 2011, the airport was the 9th busiest air cargo airport in the U.S. with 3,064,264,844 pounds of cargo landed, representing a 1.08 percent increase in pounds of cargo landed from 2010.

Airport officials aim to identify, attract and foster the growth of businesses or industries that rely on air services by providing additional needed infrastructure. For example, operations and planning staff at DFW said that they built a \$1 million fumigation facility on the airport's property to increase the importation and distribution of flowers. The Airport officials also manage a foreign trade zone on the airport property and have developed pharmaceutical, aerospace electronics, professional services and logistics facilities on the airport's property. The airport's commercial development group has developed a land use plan which consists of 13 distinct development areas, totaling over 6,000 acres with over 1,200 acres currently leased to 150 unique tenants for industrial, office, hotel, commercial and tourism uses. A developer said that commercially-minded airport leadership is an important consideration by developers.

DFW officials said their land use plan is expected to take about 25 years to be fully realized. Furthermore, they cautioned that airport-centered economic development requires a long time to see plans become fully realized. As it is, the International Commerce Park industrial park at the airport has taken 12 years to be fully built and occupied.

**Regional Characteristics**

In 2010, the Dallas/Fort Worth-Arlington combined metropolitan statistical area contained approximately 6.4 million residents. According to an airport official, DFW sits within part of Fort Worth and within the borders of the suburban cities of Irving, Grapevine, Euless, Coppell, but the airport is owned jointly by the cities of Dallas and Fort Worth. DFW officials said that they negotiated tax sharing arrangements with the municipalities Euless, Irving, and Coppell, whereby those cities retain one-third of the property tax revenue generated by development on airport-owned property within their city limits. The other two-thirds of property tax goes to the owner cities. This arrangement has led to support for airport development from the owner cities, which might otherwise be viewed as competing with development within their own city limits.

According to DFW officials, the airport is governed by a board of directors with representatives from the owner cities and airport officials coordinate with the board, the owner cities, and surrounding cities when planning for development. DFW officials also communicate with local government officials to discuss compatible land uses for land at and near the airport and to develop compatible uses inside and outside the airport fence, and they said that they are able to attract more investors by showing commitment among a diverse group of stakeholders and multiple levels of government.

DFW officials said that access to highways and rail is important to successful development at DFW, and to increase the region that is connected to the airport within an hour travel time. Dallas Area Rapid Transit (DART) received \$5 million in federal funding through DOT's TIGER program. The funds will be used toward a \$429.5 million project to complete the final segment of a 14.5-mile light rail link from downtown Dallas to Dallas/Fort Worth International Airport (DFW), including the Belt Line Station which opened December 3, 2012 and a new station at DFW Terminal A which is under construction and slated to open near the end of 2014. DFW officials said that the Orange Line runs from downtown Dallas through Irving, past the convention center and to the airport; TexRail on the Cotton Belt Line will run from Fort Worth through the community of Grapevine to the airport; and, the Dallas Area Rapid Transit Authority is building a light rail line to DFW, while a commuter rail line from Fort Worth is also being constructed. The North Central Texas Council of Governments (NCTCOG) transportation plan-Mobility 2035-addresses multimodal mobility needs of people and goods through the growing Dallas/Fort Worth region and recognizes DFW as a key regional freight transportation facility necessary to connect the North Central Texas region to national and global markets. The plan also supports clear access to the airports in the region and compatible land use planning.

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According to officials from the City of Irving, some of the industries that are targeted in the region include health care, manufacturing and logistics, in addition to professional occupations that can fill up existing office space. These types of industries include financial institutions, insurance companies and technology firms with complementary business models to accompany existing offices of Microsoft, Fluor and Citibank, and other national and international companies. The City of Irving officials describe North Texas as “business-friendly” with regard to development approval processes, and airport officials cited the region’s low corporate taxes and low cost of living, in addition to the global connectivity the airport provides.

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**Unique Opportunities and Challenges**

Airport officials said that they support the Regional Center and the EB-5 Investment Visa Program—an immigrant visa category that allows foreign entrepreneurs and investors to obtain lawful permanent resident status in the United States for himself/herself, a spouse and unmarried children under age 21, in return for making a qualified investment in a U.S. enterprise.

According to airport officials, they view the proposed merger of American Airlines and US Airways, making DFW Airport home to the largest airline in the world, as potentially providing many future opportunities for growth and development. The officials expect the merger to create an additional employment base, connectivity, and increased global visibility. Airport officials also said that U.S. Customs and Border Protection (CBP) staffing can be insufficient at peak demand periods,

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Source: GAO.

**Table 7: Denver International Airport (DEN), Denver Regional Profile**

**Airport Characteristics**

The Denver International Airport (DEN) occupies a 34,000-acre (53 square-miles) site with six runways ranging in length from 12,000 to 16,000 feet. Located approximately 24 miles northeast of downtown Denver, the airport is owned and operated by the City and County of Denver.

In 2011, the airport was the 5th busiest passenger airport in the U.S. with 25,667,499 passengers enplaned; representing a 1.69 percent increase in passenger enplanements from 2010. Also in 2011, the airport was the 21st busiest air cargo airport in the U.S. with 1,209,106,208 pounds of cargo landed, representing a 2.31 percent decrease in pounds of cargo landed from 2010. Airport officials have said that they are actively trying to attract greater numbers of airlines and passengers, in general, by generating non-aeronautical revenue to offset costs to airlines and passengers.

**Regional Characteristics**

In 2010, the Denver-Aurora-Broomfield metropolitan statistical area contained approximately 2.5 million residents. The airport is connected to downtown Denver by road, and a commuter rail line will be installed to link the airport and downtown Denver.

According to a representative of the Metro Denver Economic Development Corporation (MDEDC) – Denver’s development organization with representatives from the airport, financial institutions, airlines, and the industry sector – the MDEDC is generally supportive of the Denver International Airport airport-centered development plans. The MDEDC representative highlighted several “selling points” of the Denver area, including low sales tax, a highly skilled workforce, an entrepreneurial environment, quality of life, and available land with development potential for future expansion of the airport and associated businesses. The MDEDC representative said that the MDEDC tracks industry data on things such as employment and investment and focuses on attracting and developing 8 core industries, including specialized suppliers in aviation, aerospace, bioscience, and renewable energy.

**Unique Opportunities and Challenges**

According to an airport official, the airport has potential to spur regional development and stakeholders in the region see the airport as the biggest development driver in the state. The Mayor of Denver delivered the keynote address and announced the Airport City plan in April 2012 when Denver hosted the Airport Cities conference. The plan identifies unique markets to be developed at or near the airport, including mixed use commercial development, logistics, aerospace and military operations, renewable energy, biosciences, and other tech industries, food processing, cold storage, agriculture, and warehouse space.

Airport representatives said that although FedEx and UPS operate at the airport, DEN is currently not a big cargo airport. They said they do, however, expect cargo to grow.

A representative from the MDEDC said that DEN was designed for future development but the weak economy has slowed the expected development. The Auditor of the City and County of Denver issued a report that cautioned that insufficient financial resources could inhibit the Denver Airport City plans and that development at and around the airport would require a significant financial investment.

Source: GAO.

**Table 8: Detroit Metropolitan Wayne County Airport (DTW), Detroit Regional Profile****Airport Characteristics**

The Wayne County Airport Authority (WCAA) manages and operates an airport system comprised of Detroit Metropolitan Wayne County Airport (DTW) and Willow Run Airport (YIP) – both located within 25 miles of Detroit. DTW occupies 6,700 acres with six runways ranging in length from 8,500 to about 12,000 feet, and YIP occupies 2,600 acres with 4 runways. According to the Executive Director of the Aerotropolis Development Corporation (ADC), the airport system offers direct air passenger and cargo services to destinations in North and South America, Europe, Africa and the Middle East, and Asia.

In 2011, the airport was the 17th busiest passenger airport in the U.S. with 15,716,865 passengers enplaned; representing a 0.47 percent increase in passenger enplanements from 2010. Also in 2011, the airport was the 38th busiest air cargo airport in the U.S. with 602,804,150 pounds of cargo landed, representing a 9.16 percent increase in pounds of cargo landed from 2010. Additionally Willow Run handles approximately 200 million lbs. of cargo annually making it one of the nation's largest airports for landed air freight flown by exclusively cargo aircraft.

“Commercial and Economic Development” is part of the airport Master Plan Vision, Goals, and Objectives. Specifically, the Master Plan calls for identification of commercial and business development opportunities consistent with land use planning and development objectives of local governments to advance the economic interest of the airport and the region. The Southeast Michigan Council of Governments (the region's Metropolitan Planning Organization) views the airport as a regional asset to be built upon, and views the region's transportation system as “vital to economic development.”

**Regional Characteristics**

In 2010, the Detroit-Warren-Livonia metropolitan statistical area contained approximately 4.3 million residents. According to a county economic development official, the region is a global hub for the manufacturing and engineering research and development (R&D) sectors.

The “Air Trade Area” (the geographical area served by the airport) is among the global leaders in the automotive industry, due to the large number of R&D facilities throughout the region, and is home to 13 Fortune 500 companies-eight of which are part of the automotive industry. The Executive Director of the ADC said that Visteon Corporation, a global automotive supplier that designs, engineers and manufactures climate control, electronic, and interior products for vehicle manufacturers, developed the Grace Lake Corporate Center campus on 260 acres between the airports and consolidated 22 offices in SE Michigan. The ADC representative also said that GE developed its Advanced Manufacturing and Software Technology Center (AMSTC) on the campus in 2010 to work on disruptive manufacturing technologies.

The Executive Director of the ADC and the Chief Economic Development Officer for Wayne County said that the region around DTW is “infrastructure ready” with connectivity among four modes of transport (waterways, highway, rail and air). WCAA and ADC partners are leveraging DTW and YIP to increase airport connectivity by linking the airport cargo movement to the development of supply chain and logistics industry investments throughout the 60,000 acre district around the airports as well as the greater Southeast Michigan region. According to a Wayne County official, Detroit is well positioned to serve as a major trading point with Canada-the US's largest trade partner.

**Unique Opportunities and Challenges**

According to the Executive Director of the ADC, the local government representatives and the airport authority executed an interlocal agreement creating the ADC in 2009. According to the ADC representative, principal funding for the ADC comes from 7 local communities and 2 counties, the State's largest private, non-profit business association, and DTE Energy. The ADC representative also said that the ADC can move quickly to assist in expediting permits, establish tax-free and tax increment financing districts, issue tax abatements and support talent recruitment and training efforts and may award up to 10 renaissance zones for eligible businesses. According to the Executive Director of the ADC, regional stakeholders view the collaborative approach between the airport authority and surrounding communities as a way of sharing the financial burden of the airport-centered development initiative.

Source: GAO.



**Table 9: General Mitchell International Airport (MKE), Milwaukee Regional Profile**

**Airport Characteristics**

According to the Airport Director, the General Mitchell International Airport (MKE) occupies an approximately 2,200-acre site with five runways ranging in length from about 4,180 feet to 9,990 feet. Located 5 miles south of Milwaukee, MKE is owned by Milwaukee County and offers direct air services to about 40 locations in the U.S., Canada, Mexico, and the Caribbean. In 2011, the airport was the 35th busiest passenger airport in the U.S. with 4,671,976 passengers enplaned, representing a 1.85 percent decrease in passenger enplanements from 2010. Also in 2011, the airport was the 42nd busiest air cargo airport in the U.S. with 490,424,335 pounds of cargo landed, representing a 0.96 percent decrease in pounds of cargo landed from 2010.

**Regional Characteristics**

In 2010, the Milwaukee-Waukesha-West Allis metropolitan statistical area contained approximately 1.6 million residents.

According to the Airport Director, there is little cargo that transfers between railroads and airports or between and air and sea or lake ports. However, he said that trucks are important for moving air cargo goods in and out of the airport area. Officials representing the Airport Gateway Business Association (AGBA) said that multiple modes of transportation in the Milwaukee region can be used in an integrated manner. For example, the Milwaukee region has attracted Caterpillar, manufacturers of large pieces of mining equipment that undergo “final assembly” in another country. The AGBA official explained that equipment is sent on trucks or rail to ships at the port and on to mine sites around the world where the final equipment is assembled. However, if a problem results during final assembly, a human consultant or a small part can be sent by air.

**Unique Opportunities and Challenges**

The AGBA officials said that the AGBA formed a Business Improvement District (BID) along the west side of MKE, yielding a real estate tax reduction to 320 commercial properties, equivalent to about \$335,000 in tax benefits to be used for beautification and marketing purposes. The AGBA officials also explained that the BID used \$15,000 in 2009 to start the Aerotropolis Corporation, a nonprofit partnership comprised of MKE airport representatives, public and private sector representatives from the eight municipalities around the airport, county government, the State Departments of Transportation and Natural Resources, the Economic Development Corporation, and the Housing and Economic Development Authority. The Airport Director said that he has a limited role in the airport-centric development efforts outside of the airport fence.

The Airport Director said that most of the airport land is being used for airport operations with very little land available for non-aeronautical purposes. He also said that land around the Milwaukee airport is largely already developed, so new development would likely result from repurposing existing development.

According to the airport Director, MKE had 2 years of unusual growth because of competition between three low-cost carriers that serviced the airport. The officials said that growth came to an abrupt halt because there wasn't sufficient passenger demand to support the flights. The Airport Director explained that one of the airlines is moving its hub in response to increased demand at its new hub airport and the remaining two airlines plan to merge, resulting in less competition at the airport.

AGBA officials said that the City of Milwaukee has designated a foreign trade zone near the airport and would like to develop a shopping district outside of the airport. AGBA officials said that the Aerotropolis Commission would like to attract businesses that rely on time-sensitive deliveries or consulting companies with employees who frequently fly, for example, representatives said that RedPrairie in West Milwaukee does business in 50 countries.

Source: GAO.

**Table 10: Hartsfield-Jackson Atlanta International Airport (ATL), Atlanta Regional Profile**

**Airport Characteristics**

The Hartsfield-Jackson Atlanta International Airport (ATL) occupies a 4,700-acre site with five runways ranging in length from about 9,000 to 11,889 feet. Located 10 miles south of downtown Atlanta, the airport is owned and operated by the City of Atlanta. According to airport officials, Delta's hub at ATL provides connections to 156 domestic cities and 72 international cities. In 2011, the airport was the (1st) busiest passenger airport in the U.S. with 44,414,121 passengers enplaned; representing a 2.98 percent increase in passenger enplanements from 2010. Also in 2011, the airport was the 13th busiest air cargo airport in the U.S. with 2,655,614,700 pounds of cargo landed, representing a 1.05 percent increase in pounds of cargo landed from 2010.

According to airport officials, the airport has been successful due to its central geographic location – within a 2-hour flight of 80 percent of the U.S. population - and its ability to handle large amounts of air cargo, with nine out of the top ten cargo operations serving ATL. ATL's North and South terminals house about 1.1 million square feet of cargo space, which is rented to UPS, FedEx, and other freighter airlines.

**Regional Characteristics**

In 2010, the Atlanta-Sandy Springs-Marietta metropolitan statistical area contained approximately 5.3 million residents.

A representative from the EPA said that there may be potential to reuse facilities freed up by Base Realignment and Closure (BRAC) activities. For example, two facilities in close proximity to the Atlanta Airport offer a total of nearly 1,700 acres with passenger and freight rail connectivity and may be zoned for industrial use.

**Unique Opportunities and Challenges**

The airport officials said that the airport created regional benefits in terms of jobs and dollars and they expect further regional developments to benefit the airport, but there is little airport-owned land left for potential development on airport property. There is some speculation by the airport officials that the opening of the Panama Canal will bring more cargo to the Port of Savannah and may bring extra traffic to the airport, though the potential impact is unknown.

A private developer said he values proximity to the airport to attract investors or businesses to their mixed-use property east of the airport. The developer sees the relocation of a high-end automobile retailer in Hapeville as the "anchor business" for the redevelopment, but also hopes to attract retail, hotels, parking corporate offices, and possibly medical services. He believes that development east of the airport will be financially viable because of the easy access to the international airport terminal servicing worldwide destinations. The developer believes that the reason airport-centric development hasn't occurred around the airport in the past was because it would have been difficult to coordinate, requiring 15 municipalities to coordinate zoning policies. The developer also said that the sheer number of agencies involved with permitting was a challenge. The Environmental Protection Agency (EPA), the Federal Aviation Administration (FAA), and other federal and State agencies have been involved, requiring an ombudsman to mediate between the developer and the various government agencies.

Source: GAO.

**Table 11: Indianapolis International Airport (IND), Indianapolis Regional Profile**

**Airport Characteristics**

The Indianapolis International Airport (IND) occupies an approximately 7,700-acre site with three runways ranging in length from 7,280 to 11,200 feet. Located approximately 7 miles southwest of Indianapolis, the airport is owned and operated by the Indianapolis Airport Authority, a municipal corporation. As of the second quarter of 2012, the airport offered direct air passenger services to 33 destinations, on average, in the U.S., Canada and Mexico. In 2011, the airport was the 50nd busiest passenger airport in the U.S. with 3,670,396 passengers enplaned, representing a 1.56 percent decrease in passenger enplanements from 2010. Also in 2011, the airport was the 5th busiest air cargo airport in the U.S. with 4,813,314,835 pounds of cargo landed, representing a 2.04 percent increase in pounds of cargo landed from 2010.

**Regional Characteristics**

In 2010, the Indianapolis-Carmel combined metropolitan statistical area contained approximately 1.8 million residents. The Executive Director of the Morgan County Economic Development Corporation (MCEDC) identified examples of industries in the region that produce high-value, low-volume goods or services, including cold chain logistics, life science and pharmaceutical firms (including the tenth largest pharmaceutical company in the world), services for cell phone and wireless devices, and an internet marketing firm. According to the MCEDC Executive Director, logistics operations have also begun to settle along I-70, west of the airport in Hendricks County. Additionally, the Airport Authority has partnered with Ivy Tech Community College to train a potential workforce in logistics.

The airport is connected to downtown Indianapolis via highway, and is about 10 miles from the CSX rail yard, location of a class-1 freight railroad serving states east of the Mississippi River. Officials from the MCEDC said that the region would benefit by improving the public transit connections between downtown Indianapolis and the airport.

The Indianapolis Department of Metropolitan Development issued a study titled “Indianapolis Intermodal Freight System Plan,” which aimed to prepare an intermodal freight transportation strategy for the airport area and coordinate transportation improvements among agencies. Also, the Indianapolis Metropolitan Planning Organization’s 2035 long-range transportation plan identified the airport area as one of the more prominent freight distribution regions in the country.

**Unique Opportunities and Challenges**

Officials at the Indianapolis Airport Authority have signed an interlocal cooperation agreement with nine municipal government entities representing communities near the Indianapolis International Airport to form the IND AeroVision Committee. Signatory committee members include the City of Indianapolis; the City-County Council of Indianapolis and Marion County; the towns of Plainfield, Avon, and Mooresville; the townships of Decatur and Wayne; the counties of Hendricks and Morgan; and the Indianapolis Airport Authority. The committee will focus on ways to enhance the benefits created by aviation-related development for the stakeholders in the region around the airport. According to airport officials, the committee may analyze and recommend projects such as:

- design and development principles,
- streamlined or expedited permitting processes,
- infrastructure development, and
- changes to boundaries or size of the Interlocal Geographic Area.

Source: GAO.

**Table 12: Lambert–St. Louis International Airport (STL), St. Louis Regional Profile****Airport Characteristics**

The Lambert–St. Louis International Airport (STL) is owned and operated by the City of St. Louis and is located 11 miles northwest of downtown St. Louis. The airport has four runways ranging in length from about 7,600 to about 11,000 feet and controls approximately 3,970 acres of land, with 2,125 of those acres located outside of the airport fence. In 2011, the airport was the 31st busiest passenger airport in the U.S. with 6,159,090 passengers enplaned, representing a 1.89 percent increase in passenger enplanements from 2010. Also in 2011, the airport was the 57th busiest air cargo airport in the U.S. with 384,332,870 pounds of cargo landed, representing a 3.59 percent increase in pounds of cargo landed from 2010. The airport offers direct air passenger services to destinations in North America.

**Regional Characteristics**

In 2010, the St. Louis-Illinois metropolitan statistical area contained approximately 2.8 million residents. According to airport officials, regional stakeholders have been promoting the region as friendly for five sectors—transportation, higher education, biotechnology, agro-technology and information technology (IT) and have been seeking to attract venture capitalists to invest in the region.

The airport is connected in the region by major highway routes, public bus systems and rail. Regional stakeholders talked about the geographic position of St. Louis in the center of the U.S. population, its connectivity to area surface transportation rail and highway networks, and its underutilized airport capacity—operating at 45% capacity with a brand new runway and space around the airport for development. They believe that the geographic advantage and connectivity to the 2nd and 3rd greatest number of rail connections in the country—at Kansas City and St. Louis—would help to make St. Louis a good location for a distribution center.

According to airport officials, multimodal connectivity is a strength of the St. Louis region, with the option to send freight by air, road, rail or river. The multimodal connections increase the size of the market that can be reached through the airport and increases the region from which goods or people can access the airport.

**Unique Opportunities and Challenges**

According to representatives of the Midwest China Hub Commission, the Commission formed to explore the potential to increase air freight between Midwestern U.S. and Chinese markets. The Commission members said that they view the 9-state area surrounding St. Louis as the “catchment area” for potential import/export businesses. Members of the China Hub Commission estimated that about \$5.7 million had been invested in the China Hub Commission over 4 years. That includes \$4 million funded by the Economic Development Administration (EDA) of Commerce planning grant, matched by a \$1.7 million local match from donations and state funding.

Airport officials said that they are interested in forming a Chinese cargo hub for two reasons: (1) to increase freight operations to expand and diversify the revenue base, and (2) to use the additional non-aeronautical revenue to reduce the landing fees and make the airport more competitive for domestic passenger services.

According to airport officials, it is difficult to enter a new market with frequent and full cargo operations in both directions. This is because trade routes need to be established and freight forwarders need to put cargo on those routes. Freight forwarders serve as “gatekeepers,” determining what route freight takes to get from its origin to its destination. That is, developing an air cargo hub requires airlines, cargo companies and freight forwarders to expand operations simultaneously. According to the STL Airport Director, a Chinese cargo hub would have been difficult to establish without offering incentives because the return flights to China would not have initially had sufficient cargo to make the trip economically viable, hence the proposed incentive program to help ensure sufficient return cargo could be generated.

Representatives from the Midwest China Hub Commission said that St. Louis has a cluster of universities, some of which (Washington University; University of Missouri and Missouri State University) have programs in China, resulting in an increase in Chinese foreign exchange students attending universities in St. Louis and Chinese business people looking for education opportunities for their children.

According to St. Louis County officials, the U.S. Department of Commerce has expanded the Foreign-Trade Zone (FTZ<sup>a</sup>) at STL from 11 acres to 820 acres in 2009 and later approved expansion of the FTZ to cover all of St. Louis City and County. According to a press release provided by the airport, this expansion of the FTZ is expected to also benefit local companies located in the FTZ as they expand into foreign markets. Airport officials hope that the county’s FTZ-designation will encourage manufacturing job growth.

Source: GAO.

<sup>a</sup>According to the Department of Commerce, FTZs are considered to be outside of U.S. Customs Territory for the purpose of customs duty payment. Therefore, goods entering FTZs are not subject to

customs tariffs until the goods leave the zone and are formally entered into U.S. Customs Territory. Merchandise that is shipped to foreign countries from FTZs is exempt from duty payments. This provision is especially useful to firms that import components in order to manufacture finished products for export.

Table 13: Los Angeles International Airport (LAX), Los Angeles Regional Profile

Airport Characteristics

LAX occupies an approximately 3,673-acre site with four runways ranging in length from 8,925 to about 12,100 feet. Located approximately 9 miles southwest of Los Angeles, the airport is owned and operated by Los Angeles World Airports (LAWA), a proprietary department of the City of Los Angeles. LAX offers more than 600 daily flights to 91 domestic cities and more than 1,000 weekly, direct flights to 58 cities in 32 countries on nearly 75 air carriers. In 2011, the airport was the 3rd busiest passenger airport in the U.S. with 30,528,737 passengers enplaned, representing a 5.79 percent increase in passenger enplanements from 2010. In 2011, the airport was the 7th busiest air cargo airport in the U.S. with 4,043,122,100 pounds of cargo landed, representing a 2.23 percent increase in pounds of cargo landed from 2010. According to the 2010 Los Angeles County Strategic Plan for Economic Development, the value of goods exported via LAX is almost as large as the value of goods exported through the Ports of Los Angeles and Long Beach-the two highest volume U.S. container seaports. LAWA is investing billions of dollars in a capital improvement program at LAX, paid for by LAX operating revenues, Capital Improvement Program funds, fees from passenger facilities charges, and airport revenue bonds. The centerpiece of the capital improvement program is LAX's new Tom Bradley International Terminal, a \$1.7 billion project which features 18 boarding gates, with 9 capable of handling new generation aircraft, including the Airbus A380 and the Boeing 787 Dreamliner, and 140,000 square feet of retail, dining and airline club lounges.

Regional Characteristics

In 2010, the Los Angeles-Long Beach-Santa Ana metropolitan statistical area contains approximately 12.8 million residents. LAX is accessible by highway, public buses, and shuttle buses connecting the airport to the metro-rail system. According to the regional transportation coordinator at the airport, LAWA has implemented a rideshare program, to relieve congestion and improve air quality while also encouraging employees to carpool or use public transit (bus). The transportation coordinator said that approximately twenty-seven percent of LAWA's employees participate in the program, saving over 1,000 vehicle trips to LAWA airports every day. Voter-approved Measure R-a half-cent sales tax for transportation projects and programs in L.A. County-helped to raise funds for numerous transportation projects across the county. For example, \$200 million in Measure R tax revenue will be used to connect LAX to the city's Metro Green Line. An airport official at LAX expects that a metro-rail connection will help to relieve congestion on the highways and may increase the catchment area served by the airport. According to the California High Speed Rail Authority, high speed rail will connect Los Angeles to San Francisco, and later to Sacramento and San Diego. The Los Angeles County Economic Development Corporation (LAEDC) produced the county's first strategic plan for economic development, which focuses on five components the LAEDC identified as central to economic development success: Educated Workforce, Business-Friendly Environment, Attractive Quality of Life, Smart Land Use, and 21st Century Infrastructure. The LAEDC considers LAX to be part of the region's critical infrastructure, and also recognizes the region's world class university and research and development (R&D) talent pool stemming from CalTech, the University of California at Los Angeles (UCLA) and the University of Southern California, among other institutions of higher learning.

Unique Opportunities and Challenges

According to officials from LAWA and the LAEDC, there is very limited space for expansion at LAX. Community opposition to expansion of northern runway may limit the ability of the airport to safely land more than one A380 at a time. Furthermore, an official from the Southern California Association of Governments said that the airport is legally constrained regarding the time of day and noise level at which it can operate, according to the Airport Noise and Capacity Act of 1990.

Source: GAO.

**Table 14: Memphis International Airport (MEM), Memphis Regional Profile****Airport Characteristics**

Memphis International Airport (MEM) occupies an approximately 5,000-acre site with four active runways ranging in length from about 8,950 to 11,120 feet. Located approximately 7 miles southeast of downtown Memphis, the airport is owned and operated by the Memphis Shelby County Airport Authority. The airport offers direct air passenger services to locations in the U.S., Canada and the Netherlands, and according to FedEx, which operates its worldwide headquarters in Memphis, it offers direct cargo services to over 220 countries and territories. In 2011, the airport was the 41st busiest passenger airport in the U.S. with 4,344,213 passengers enplaned, representing an 11.90 percent decrease in passenger enplanements from 2010. Also in 2011, the airport was the 1st busiest air cargo airport in the U.S. with 20,303,149,106 pounds of cargo landed, representing a 3.88 percent increase in pounds of cargo landed from 2010.

**Regional Characteristics**

In 2010, the Memphis, TN-MS-AR, combined metropolitan statistical area contained approximately 1.3 million residents.

According to the Vice President of Logistics & Aerotropolis Development at the Greater Memphis Chamber (of Commerce), the Chamber created the Aerotropolis Steering Committee, an organization comprised of public and private sector representatives dedicated to coordinating development in selected targeted development efforts in the area surrounding the Memphis International Airport. Representatives from the Chamber said that the Aerotropolis Steering Committee has formed work groups to address: Gateways and Beautification, Marketing and Branding, Corridor Development, and, Access and Transportation. The Chamber representatives also said that the Aerotropolis Steering Committee has also targeted areas for development—including access routes to the airport and Elvis Presley Boulevard (home to Graceland)—and these representatives said they would like to see the potential redevelopment of downtown Memphis, in an attempt to increase tourism and attract more passenger flights to the area.

According to the Greater Memphis Chamber, the steering committee markets the region's central geographic location and its "Four Rs"—river, road, rail, and runway—which they believe provide access to markets. Highway access and local bus services connect the airport to downtown.

**Unique Opportunities and Challenges**

The stated goals of Memphis' Aerotropolis strategy are:

- Business attraction, retention and job creation
- Improve connections to airports 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 business

An official from the Greater Memphis Chamber said that a \$1.2 million federal grant from the Department of Housing and Urban Development, matched with \$900,000 in local funds and in-kind services, has helped the region create a development plan for the airport and the region around it. Officials also hope to expand upon existing logistics and life science/biotech industries located in the Memphis region because they believe these industries will provide high-paying jobs.

Source: GAO.

**Table 15: Miami International Airport (MIA), Miami Regional Profile****Airport Characteristics**

The Miami International Airport (MIA) occupies a 3,230-acres site with four runways ranging from approximately 8,600 to 13,000 feet. Located 8 miles northwest of Miami, the airport is owned and operated by Miami-Dade County. In 2011, the airport was the 12th busiest passenger airport in the U.S. with 18,342,158 passengers enplaned, representing a 7.78 percent increase in passenger enplanements from 2010. Also in 2011, the airport was the 4th busiest air cargo airport in the U.S. with 6,634,448,852 pounds of cargo landed, representing a 3.92 percent decrease in pounds of cargo landed from 2010.

MIA is the largest gateway for U.S. to Latin America and the Caribbean. According to airport officials, MIA leadership is focused on providing access to emerging economies, including Brazil, Russia, India, China, and South Africa. MIA officials also said they offer incentives to attract new domestic and international routes, for example, by waiving landing fees for the first year of operations, or by offering matching funds for an advertising fund to publicize “premium markets” in Africa, Asia, Europe and the Middle East. Airport officials also said that the airport is the only U.S. airport with nonstop service from seven destinations in Brazil.

According to airport officials, MIA has more cold storage warehouses than the rest of the U.S. airports combined. This is necessary to support the significant amount of imported perishable items, including: approximately 80 percent of imported flowers, more than 50 percent of imported seafood, and more than 75 percent of imported produce. Construction is underway for a new 895,000 square foot air cargo warehouse/office/hangar/ storage facility for the Centurion group of air cargo carriers. The new facility is to accommodate 8 Boeing 747-400 wide-body freighters. This will add to the existing 17 cargo buildings with over 2.7 million square feet.

MIA’s \$6.4 billion capital improvement program is nearly completed, including improvements to the terminals, roadways, cargo facilities, and the airfield. A new South Terminal has added 1.7 million square feet to the existing 3.5 million square feet of space. In addition, according to the airport’s website, the more than 3.8 million-square-foot North Terminal was nearing completion in early 2013. The North Terminal is to house an international arrivals facility with a federal inspection area with 72 gates and the ability to serve 2,000 passengers per hour.

The Miami Intermodal Center (MIC), a \$1.7 billion transportation hub will connect multiple modes of transport-buses, metro and commuter rail, private cars, rental cars, and taxis-at one site. AirportLink is a \$506 million Miami-Dade Transit project to link the metro-rail system and the MIC, connecting the airport to downtown Miami. The \$270 million MIA Mover opened in 2011 with the capacity to transport more than 3,000 people per hour connecting the airport with the MIC. Funding for the MIC, the AirportLink and the MIA Mover was generated from a combination of sources including federal, state, local and other sources, such as customer facility charges and revenues from rent.

The 3.4 million square foot Rental Car Center, opened in 2010, consolidates the operations of 16 rental car companies, with a combined inventory of 6,500 rental cars.

**Regional Characteristics**

In 2010, the Miami -Fort Lauderdale-Pompano Beach combined metropolitan statistical area contains approximately 5.6 million residents. MIA officials cited a competitive advantage of the Miami region, in terms of infrastructure, language, and interpersonal relationships, such as 350 freight forwarders, bilingual English and Spanish residents, and established business relationships with providers in Latin America. The prevalence of Spanish and Portuguese speakers makes Miami a target economy for Latin American businesses. Similarly, an airport official said that business executives from Europe and Asia have moved to the Miami area, because they value Miami’s proximity to the emerging Latin American economies and view Miami as the “northernmost city of Latin America.”

Airport officials credit the region’s climate for helping to assure reliable air services. Roadway improvements are being made to accommodate forecasted growth in the region around the airport. These include widening roads around the airport, including Central Boulevard and expansion of the 25th Street Viaduct to allow for easier access to cargo facilities at the airport. According to an airport official, about 10,000 trucks per day transport cargo from MIA to the federal highway system, helping to distribute nearly 70 percent of the perishable food and produce imported to the U.S.

**Unique Opportunities and Challenges**

According to a senior airport official, one of the issues the airport faces is the limited availability of Customs and Border Protection (CBP) operations staff at the airport, which has lagged behind the growth of the airport and can be insufficient at peak flight times. An airport official said that American Airlines misses about 5,000 passenger connections each month because of insufficient CBP staffing levels to staff existing booths.

According to a senior official at the Miami-Dade Aviation Department, the airport is fiscally constrained for future expansion through bond issuance. The airport uses a “residual cost model,” meaning that airlines collectively agree to pay the costs of running the airport that are not allocated to other users or covered by all other sources of revenue. Because MIA is fiscally constrained, it is considering public-private partnerships as one viable approach to financing future projects.

Source: GAO.

**Table 16: North Carolina Global TransPark (GTP), Kinston Regional Profile**

**Airport Characteristics**

The North Carolina Global TransPark (GTP), located in Kinston, about 75 miles southeast of Raleigh-Durham, in Eastern North Carolina, contains approximately 5,775 acres of land that has been environmentally permitted for development, a foreign trade zone, and a 2,500-acre industrial airport with an 11,500-foot long runway.

**Regional Characteristics**

The North Carolina Global TransPark Authority is a division of the North Carolina Department of Transportation. Its Board of Directors provides guidance for planning, business development, and real estate development activities of the TransPark. According to an official from the State of North Carolina Department of Transportation, the state conducts logistics studies and supports new business development and job development in the region. For example, a GTP official said that the North Carolina Department of Commerce offered performance-based incentives and can make property tax concessions in its land leases. The Department also has a “shovel-ready” program to prepare land for development by completing relevant permits ahead of time. According to state officials, this provides assurance to investors that their projects will not be held up by environmental reviews.

According to an official at the GTP, North Carolina State, the University of North Carolina at Chapel Hill, and Duke University all generate a potential highly-educated workforce. Also, about 10,000 people exit the military in North Carolina each year, with many targeted for employment. The official also said that North Carolina has the country’s third-largest community college system and the state is considering ways to better integrate the its community college system to equip students with the skill bases that Spirit AeroSystems needs. The official also said that Spirit AeroSystems established a composites manufacturing “center of excellence” at GTP to design and manufacture airline fuselages and wings for the Airbus A350.

According to a representative from the North Carolina Department of Transportation, several infrastructure upgrades were provided to attract Spirit AeroSystems to expand operations at the GTP. For example, Spirit AeroSystems requested a number of infrastructure upgrades to help move goods and parts in and out of the GTP. GTP added a 7-mile rail access spur to connect GTP to the North Carolina railroad. GTP also built an airport apron to connect to the runway and made improvements to the internal road network at GTP. In addition to these infrastructure improvements, the North Carolina Department of Commerce offered Spirit AeroSystems a Job Development Incentive Grant, with an expectation that Spirit AeroSystems will employ more than 1,000 workers by 2014.

**Unique Opportunities and Challenges**

An official at the GTP said that there was a significant change in the “economic backdrop” of the region from 1991, when the state Department of Transportation announced the funding availability, to 2002, when the airport at GTP was completed and operational. Specifically, much of the labor-intense manufacturing for which the GTP had been developed had moved offshore, resulting in significantly less demand for the GTP and its associated air services than had first been anticipated. GTP is interested in attracting industries dependent on aviation services and has targeted logistics industries and employment clusters that rely on just-in-time air cargo services, such as the aerospace and aviation industries, the agri-business sector, or defense and federal contracting agencies that complement military operations in North Carolina.

An official from the North Carolina Department of Transportation said that the GTP would like to promote opportunities for local businesses in the state’s 3 leading areas: tourism, the military, and agriculture, for example, by exploring opportunities to supply Asia with crops like strawberries and blueberries flown in overnight shipments. However, there are currently no cold storage warehouses or the funds to build them at this time. The official also said that disposable medical equipment and military equipment are other areas of potential opportunity. As of February 2013, the GTP attracted 13 tenants.

Source: GAO.



**Table 17: Washington Dulles International Airport (IAD), Washington, DC Regional Profile****Airport Characteristics**

Washington Dulles International Airport (IAD) occupies a 12,000-acre site with four runways ranging in length from 9,400 feet to 11,500 feet. Located approximately 20 miles west Washington DC, IAD is owned and operated by the Metropolitan Washington Airports Authority and offers direct air services to more than 40 destinations in the U.S., Canada, Mexico, the Caribbean, South America, Europe, Asia, Africa, and the Middle East. The Airport Manager at Dulles views the airport's international connections as its strength when compared against other airports in the region. In 2011, the airport was the 23rd busiest passenger airport in the U.S. with 11,044,383 passengers enplaned, representing a 2.06 percent decrease in passenger enplanements from 2010. Also in 2011, the airport was the 45th busiest air cargo airport in the U.S. with 446,608,904 pounds of cargo landed, representing a 0.82 percent decrease in pounds of cargo landed from 2010.

According to the airport manager, officials at the airport are considering new airport land uses to generate non-aeronautical revenue sources to help pay for the airport's capital improvement projects. The Airport Manager serves on the neighboring counties' Chambers of Commerce and is careful not to compete with local businesses when deciding what projects to develop inside the fence.

**Regional Characteristics**

In 2010, the Washington-Arlington-Alexandria-DC-VA-MD-WV metropolitan statistical area contained approximately 5.6 million residents. A representative from the Fairfax County Economic Development Authority said that the proximity to Washington DC and the Pentagon, and the area's top-ranking schools are among the regional assets. The representative also said that Virginia has consistently been pro-businesses with supportive tax policies, zoning and permitting. According to the representative, there are about 390 foreign-owned businesses in Fairfax County, and the Pentagon and Department of Defense employ many consultants in the area. Also, the representative said that primary market for the region between the airport and Washington, D.C., is office-type jobs, given its 115 million square feet of office space and the region's skilled and educated workforce. A representative of the Dulles Advisory Committee said that the Committee's recent efforts have been focused on connecting to commercial areas along the planned transit corridor from Washington, DC, to the airport.

The Metropolitan Washington Airports Authority (MWAA) is managing the construction of the Silver Line to connect the airport to Washington DC's metro-rail system. The Airport Manager at Dulles views ground access to and from the airport as critical to provide fluid movement of people to and from the airport, and to increase area serviceable by the airport. This official said the metro-rail connection is expected to make it easier for passengers and airport employees to access the airport.

According to officials from the Fairfax County Department of Planning and Zoning, the Virginia Department of Transportation (VDOT) and the Federal Highway Administration (FHWA) are studying two potential projects that would add surface connections to the airport in the future: (1) The Tri-County Parkway Location Study will evaluate a north/south transportation link through Fairfax, Loudoun, and Prince William Counties, in Northern Virginia, to connect Manassas with I-66 and the Loudoun County Parkway near IAD; and, (2) a proposal to construct a limited access roadway to the west of IAD in Loudoun County.

**Unique Opportunities and Challenges**

A representative from the Fairfax County Economic Development Authority said that regional coordination among the many stakeholders from Maryland, the District of Columbia and Virginia can be a challenge because the multiple jurisdictions involved tend to prioritize their geographic portion of the region without coordinating with other jurisdictions. However an official from the Fairfax County Department of Planning and Zoning said that informal working groups have formed with representation that includes neighboring communities to address issues of mutual concern, such as how to address roadway capacity concerns.

According to Fairfax County officials, the county is engaged in planning studies in the vicinity of IAD and the Access Road Corridor, to create transit-oriented development close to the future Silver Line Metrorail stations. They believe that new mixed use development, including residential and employment areas, may increase demand for passenger and cargo service at IAD.

The Airport Manager said that a mismatch between the low volume of cargo and the high passenger volumes can be challenging. There is not lot of manufacturing in the region around the airport, and thus, cargo operations are limited for Dulles, but the airport is within an hour drive for most of the region's passengers in a region with many professional-consulting or other office jobs, making it a viable passenger airport.

Source: GAO.

# Appendix III: Objective, Scope, and Methodology

This report describes the factors that our research and airport operators, government officials, developers, and other stakeholders identified as key considerations for airport-centric development. Specifically, this study describes the activities of stakeholders who are engaged airport-centric development and the motivations and beliefs of those stakeholders with respect to their efforts.

To determine the key characteristics of airport centric development, in the United States and internationally, we first conducted a bibliographic search of relevant articles and books cited in the following data-bases. (See table 18.)

**Table 18: Bibliographic Databases for Airport-Centric Development**

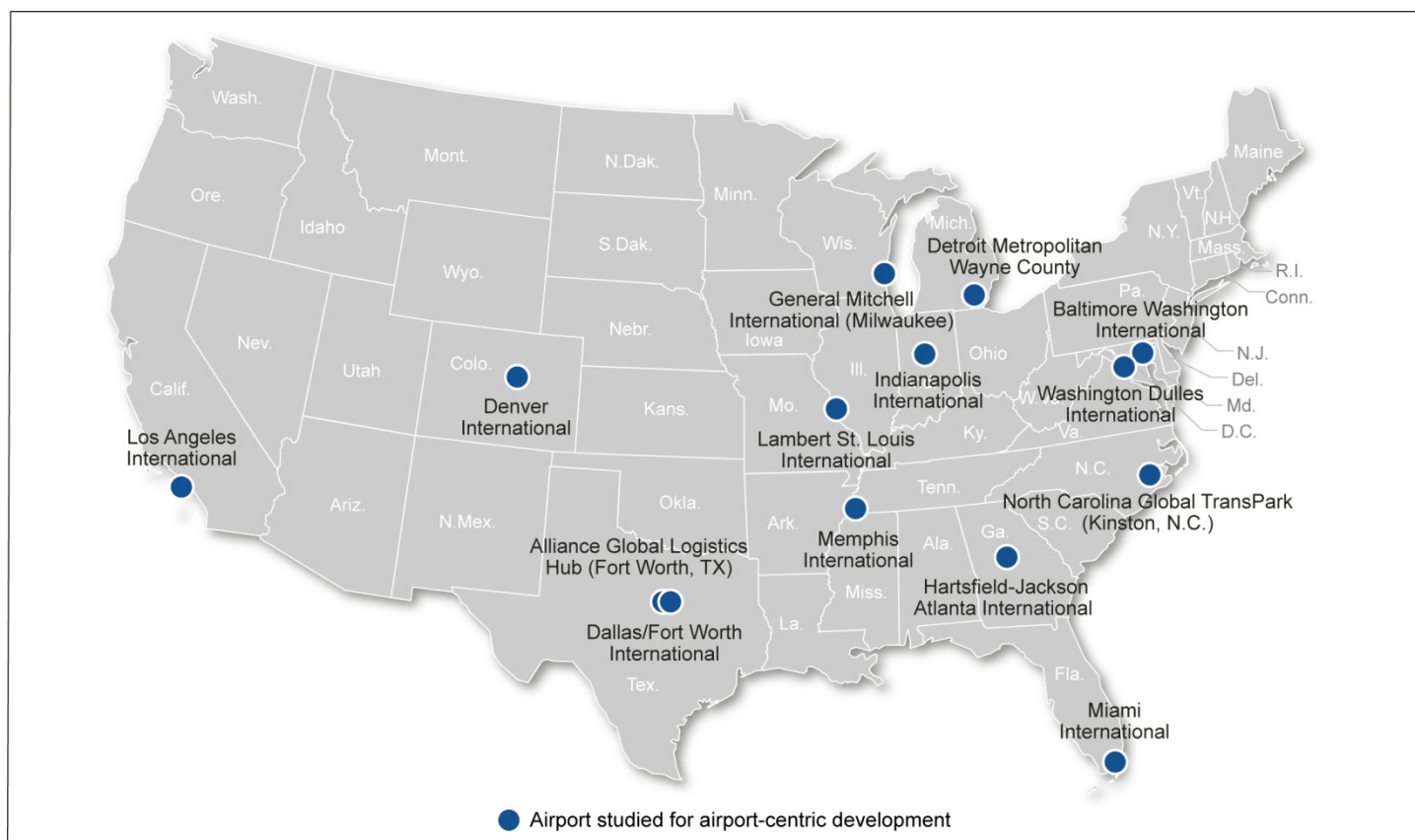
| Database  | Description   |
|---|---|
| Transport Research International Documentation (TRID) | Combines records from the Transportation Research Board’s (TRIS) database and the Organisation for Economic Cooperation and Development’s International Transport Research Database (ITRD) database |
| ProQuest  | Scholarly and trade publications covering topics such as economics, transportation, politics and government, and engineering  |
| NTIS  | Technical and other research reports produced by or with funds from the federal government  |
| Social SciSearch                                      | International index of social, behavioral, and related sciences   |
| EconLit   | Scholarly material about economics and related disciplines  |
| Academic OneFile                                      | Variety of scholarly and trade material on economics, transportation, education, politics and government, engineering, and other topics   |
| Economic Development (ECO 4334/INB 4334)              | Scholarly articles on management, economics, finance, accounting, marketing, international business, and technology   |
| PapersFirst   | Papers presented at academic, professional conferences, symposiums, and workshops   |

Source: GAO.

We supplemented the citations we obtained from this search with those from the bibliographies of other studies we had obtained, and recommendations from experts we interviewed. After screening the abstracts of these studies for relevance, we collected information from these studies for further analysis. To supplement the information obtained from our literature review, we spoke with federal officials at the Department of Transportation and its Federal Aviation Administration; the Economic Development and International Trade Administrations within the Department of Commerce; and the Environmental Protection Agency. We also spoke with experts in transportation, trade, logistics, and community development about airport-centric development issues.

To obtain information about airport-centric activities, we selected a purposeful sample of airports based on the number of passengers and amount of cargo served; expert recommendations; and geographical representation. This selection procedure yielded of the following 12 scheduled airline and 2 industrial airports for closer study (see fig. 7).

Figure 7: Purposeful Sample of Airports



Source: FAA.

From this purposeful sample of 14 airports, we selected 7 sites to visit to understand the activities and perceptions of stakeholders; we conducted telephone interviews with representative of and stakeholders involved with the other 7 airports. See table 19.

**Table 19: Data Collection Method for Airport Purposive Sample**

| <b>Airport</b>  | <b>Data Collection</b> |
|---|------------------------|
| Alliance Global Logistics Hub, TX <sup>a</sup>              | Site visit             |
| Hartsfield-Jackson International Airport, GA                | Telephone              |
| Baltimore/Washington International Airport, MD              | Site visit             |
| Dallas/Fort Worth International Airport, TX                 | Site visit             |
| Denver International Airport, CO                            | Telephone              |
| Detroit Metropolitan Wayne County, MI                       | Site visit             |
| Dulles International Airport, VA                            | Telephone              |
| Indianapolis International Airport, IN                      | Telephone              |
| North Carolina Global TransPark in Kinston, NC <sup>a</sup> | Telephone              |
| Los Angeles International Airport, CA                       | Site visit             |
| Memphis International Airport, TN                           | Site visit             |
| Miami International Airport, FL                             | Site visit             |
| General Mitchell International Airport in Milwaukee, WI     | Telephone              |
| Lambert-St. Louis International Airport, MO                 | Telephone              |

Source: GAO.

<sup>a</sup>Industrial airport.

To obtain a full range of relevant stakeholder perspectives on the airport-centric development efforts, we interviewed airport officials; executives from businesses located adjacent or near to airports; representatives of real estate development organizations; local and regional economic development specialists, and federal, state, and local government officials. We attempted to identify critics of airport-centric development in each airport region, but we were generally unable to identify critics.

We conducted our interviews using a semi-structured approach that allowed our interviewees to respond to provide the information that was most relevant for their airport and region in each of several broad areas. These areas included: challenges interviewees had experienced in their development efforts; ways they had or might address those challenges; the likely success of their development efforts; factors that might facilitate or hinder development; any lessons learned or advice the interviewees identified for others interested in such development efforts; their assessment of the impact of the considerations for their initiative; and illustrative examples of how their development efforts had proceeded.

This approach permitted stakeholders at each site to tailor information based on their own experiences, but does not allow for generalizations about how the considerations may impact on the progress of all airport-centric developments or whether such development should be considered at any given locality. To understand the level of development planned and efforts underway, we also reviewed available plans related to the airport-centric development efforts including project plans and airport master plans.

Based on our literature review and the interviews we conducted with experts, agency officials, and stakeholders, we identified the following factors considered by stakeholders at selected U.S. airports and regions when pursuing airport-centric development: 1) development at the airport, 2) air and surface connectivity, 3) funding sources for development, (4) development in the region, and (5) collaboration among stakeholders. In this report, we use these 5 factors to discuss how these considerations generally relate to airport-centric developments and provide our observations about how particular localities applied these considerations.

Throughout the report we use the indefinite quantifiers, “some”, “many”, and “most” to inform the reader of the approximate quantity of stakeholder or interviewee type within the regions where we interviewed that agreed with the particular statement or idea, without actually stating the specific number of those in agreement in each case. To determine when to use each indefinite quantifier, we split the total of each type of stakeholder group into thirds, so that “some” would refer to more than one but fewer than or equal to one-third of the group; “many” would refer to more than one-third but fewer than or equal to two-thirds of the group; and, “most” would refer to more than two-thirds of the group but not the full group. The corresponding numeric range of values for each stakeholder group can be found in the table below. For example, most of the airport representatives would refer to between 10 and 13 (of the total 14).

**Table 20: Numeric Range of Values for Indefinite Quantifiers**

|                        | <b>Airport<br/>stakeholders</b> | <b>Business/<br/>private sector<br/>stakeholders</b> | <b>Regional/<br/>local<br/>government<br/>stakeholders</b> | <b>Regional<br/>stakeholders<br/>(airport + business<br/>+ regional)</b> | <b>Federal<br/>Government<br/>Agency<br/>representatives</b> | <b>Experts</b> |
|------------------------|---------------------------------|--|--|--|--|----------------|
| One                    | 1                               | 1  | 1  | 1  | 1  | 1              |
| Some                   | 2-4                             | 2-4  | 2  | 2-11   | 2-3  | 2-6            |
| Many                   | 5-9                             | 5-8  | 3-4  | 12-22  | 4-6  | 7-12           |
| Most                   | 10-13                           | 9-12   | 5  | 23-32  | 7-9  | 13-17          |
| All (total group size) | 14                              | 13   | 6  | 33   | 10   | 18             |

Source: GAO.

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# Appendix IV: GAO Contact and Staff Acknowledgments

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## GAO Contact

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