

## **5.H.2 SECONDARY (INDUCED) IMPACTS**

Major development proposals often involve the potential for secondary or induced impacts on surrounding communities. Examples may include shifts in population movement and growth, public service demands, and changes in business and economic activity to the extent influenced by proposed airport development. Induced impacts will normally not be significant except where there are also significant impacts in other categories, especially noise, land use, or direct social impacts. Another example of induced impact could be impacts to surface transportation systems related to increased congestion on surrounding roadway systems as the result of an airport's growth and development. Included in this section are the results of a study conducted by Broward County on the economic impact FLL had on the local and regional economy in 2002. This section discusses the factors to be considered in determining the economic impacts of construction activities at the airport.

### **5.H.2.1 Surface Transportation**

FLL is bounded on the north by Interstate-595, on the west by Interstate-95, on the east by U.S. Highway 1, and on the south by Griffin Road. Interstate-595 and Interstate-95 are both classified as primary arterials-interstate. Interstate-595 runs in an east-west direction and provides four through lanes in each direction between Interstate-75 and U.S. Highway 1. Interstate-95 runs north-south through Broward County and provides four through lanes, as well as a high-occupancy vehicle lane in each direction. U.S. Highway 1 is classified as a state principal arterial and runs north south through Broward County. It is a six-lane divided arterial between Interstate-595 and Griffin Road. North and south of these points, U.S. Highway 1 is a four-lane principal arterial. Griffin Road is a six-lane divided state minor arterial that runs in an east-west direction between U.S. 27 and U.S. Highway 1. The terminal roadway system is accessed from Interstate-595, U.S. Highway 1, and Griffin Road via the airport's perimeter road. **Table 5.H.2-1, Local Traffic Volumes**, shows the average annual daily traffic (AADT) on the main roads around the airport.

**Exhibit 5.H.2-1, External Airport Roadway Network Average Daily Traffic Volume Count Locations**, graphically depicts the traffic volume count locations on the adjacent road network.

**Table 5.H.2-1  
LOCAL TRAFFIC VOLUMES  
Fort Lauderdale-Hollywood International Airport**

LOCATION	2006 AVERAGE ANNUAL DAILY TRAFFIC (TOTAL TRAFFIC)
Griffin Road east of I-95	27,000
Griffin Road west of I-95	40,500
I-595 east of I-95	111,500
I-595 east of U.S. Highway 1	35,000
US Highway 1 south of the main airport terminal	67,500
US Highway 1 south of Griffin Road	282,000

Source: Florida Department of Transportation Traffic Counts, 2006

Interstate-595 terminates just east of U.S. Highway 1 into Eller Drive, which is the main entrance to Port Everglades Midport and Southport. NE 7<sup>th</sup> Avenue is located immediately east of U.S. Highway 1. It is a two-lane road that connects Eller Drive and Griffin Road.

To the west of the airport and Interstate-95, there are a series of minor arterials and local collectors that serve an area of mixed commercial and industrial development, much of it related to the airport, as well as single-family residential neighborhoods. The major north-south street in this area is Ravenswood Road/Angler Avenue.

Existing (year 2006) volumes for the morning and the evening peak hours are graphically depicted on **Exhibit 5.H.2-2, Existing 2006 Peak Hour Traffic Volumes and Level of Service With Existing Lane Geometries**, for each of the five study intersections.

Level of service (LOS) is a quantitative measure of the quality of service on a roadway, developed from the perspective of transportation users. LOS uses a scale of user satisfaction applicable to each of the following modes of transportation: automobiles, trucks, bicycles, pedestrians, and buses. The service measures include: speed, travel time, ability to maneuver, interruptions, comfort, and convenience.

LOS is categorized by six letter grades, "A" through "F," with "A" being the best and "F" being the worst.

- LOS A – primarily free-flow operations at average travel speeds. Vehicles are completely unimpeded in their ability to maneuver and control delay at signalized intersection is minimal.
- LOS B – reasonably unimpeded operations at average travel speeds. The ability to maneuver is only slightly restricted, and control delays at signalized intersections are not significant.

- LOS C – stable operations. Mid-block maneuvers and lane changes are more restricted, longer queues, adverse signal coordination.
- LOS D – significant delays and low travel speeds. Combination of signal progression, inappropriate signal timing, and high volumes.
- LOS E – significant delays and low travel speeds. Combination of adverse progression, high signal density, high volumes, extensive delay at critical intersections, and inappropriate signal timing may be the cause.
- LOS F – urban street flows at extremely low speeds. Intersection congestion is likely at critical signalized location, with high delays, volumes, and extensive queuing.

The current lane geometries for each intersection are graphically depicted on Exhibit 5.H.2-2. Based on existing (year 2006) counts the AM and PM peak hours for traffic on the study area roadways are generally from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m., respectively.

As shown, the intersection of SE 30th Street /U.S. Highway 1 currently operates at LOS C during the AM peak hour, but diminishes to LOS F during the PM peak hour. This indicates that the intersection is operating at an unacceptable LOS (i.e. worse than LOS D), and capacity enhancements are warranted.

The remaining four study intersections are currently operating at an acceptable LOS (i.e. LOS D or better), and therefore, do not require capacity enhancements at this time. The intersection of Griffin Road/U.S. Highway 1 operates at LOS D during both peak hours. Both the northbound Interstate-95 and southbound Interstate-95 intersections with Griffin Road are operating at LOS C during both peak hours. The intersection of SE 42nd Street/Ravenswood Road is operating at LOS A and LOS B during the AM and PM peak hours, respectively.

### **5.H.2.2 Economic Impacts**

In 2001, Broward County was home to 811,860 working people, including 39,000 that are self-employed.<sup>1</sup> One in four residents commutes to a job outside Broward County; while 21,000 work from their homes. Broward County is a net exporter of labor, meaning that there are more working adults living in the County than there are jobs. Census 2000 showed 801,772 residents aged 16 and over in the labor force, which represents a 63 percent labor force participation rate. Most were paid employees (717,821); 83 percent worked in the private sector and 12 percent in Federal, state, and local government.<sup>2</sup>

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<sup>1</sup> Bureau of Economic Analysis, Bureau of Labor Statistics, National Agricultural Statistics Service, National Center for Health Statistics, U.S. Census Bureau. Internet web site: [www.fedstats.gov](http://www.fedstats.gov).

<sup>2</sup> 2000 U.S. Bureau of the Census. DP-3. *Profile of Selected Economic Characteristics: 2000 Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data Geographic Area: Broward County, Florida.*

A comparison of employment and labor force in Broward County, by industry type, shows that there are more workers than jobs in nine of the 13 industrial sectors.<sup>3</sup> Only four sectors have excess employment: Professional and Business Services, Leisure and Hospitality Services, Wholesale Trade, and Public Administration.

### **5.H.2.3 Economic Impact Assessment**

The actual amount of money spent by airport users at businesses within the local economy represents only a portion of the total economic activity resulting from this spending. For instance, airport users purchase goods and services from airport concessions, rent hotel rooms and cars, and eat at local restaurants. In turn, these travelers, local residents, and businesses and their employees purchase goods and services from other businesses, thereby creating a chain reaction. The total impact resulting from an increase in expenditures is described in terms of direct, indirect, and induced effects. These purchases of goods and services between firms occur between different economic sectors, such as manufacturing, agriculture, and transportation.

The magnitude of direct, indirect, and induced economic impacts of an airport depends on the number of enplanements, operations, and airport-related expenditures, the amount that travelers spend upon arrival and during their stay, the structure and diversity of the local economy, and the quantity of airport-related purchases made within the local community. This section discusses the economic impact the existing airport has on the local and regional economy.

A typical approach for estimating the regional economic effects of airports involves surveys to determine "direct" and "indirect" employment and spending at on- and off-airport locations. Regional economic "multipliers" are used to estimate "induced" effects that flow from direct and indirect impacts. "Direct impacts" are consequences of economic activities carried out at the airport and in the immediate vicinity by airlines, airport management, Fixed-Base Operators (FBOs), and other tenants with direct involvement in aviation. "Indirect impacts" derive primarily from off-site economic activities attributable to the airport. These activities include services provided by travel agencies, hotels, restaurants, and retail establishments. The multiplier effects of direct and indirect impacts create "induced impacts." These include businesses supplying goods and services to direct and indirect activities, and households supported by jobs created as a consequence of direct and indirect activities.

Economic impacts are usually measured in terms of output, or gross sales, and jobs. The methodology proceeds through the following steps:

- Determine Direct Airport Impacts. This task involves the enumeration of all on-airport employment and estimation of its payroll. Enumeration includes both traditional airport employment plus specialized businesses that rely on access to airports, such as aviation maintenance and aircraft manufacturing.

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<sup>3</sup> 2000 U.S. Bureau of the Census. DP-3. *Profile of Selected Economic Characteristics: 2000 Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data Geographic Area: Broward County, Florida.*

- Estimate Indirect Airport Impacts. Indirect impacts are generally estimated using several approaches. Off-airport transportation impacts, such as airline crew expenditures and travel agent commissions, are estimated from survey data. Visitor spending impacts are often estimated through surveys of departing passengers that identify trip purpose, trip duration, and spending patterns.
- Estimate Induced Impacts of Airport. Induced impacts are estimated using industry sector-specific multipliers estimated from input-output models.
- Calculate Total Economic Impacts. The total economic impacts of an airport are the sum of the direct, indirect, and induced impacts, using the output and/or employment impact measures.

In 2002, Broward County conducted an Economic Impact Assessment<sup>4</sup> for the airport using a model produced by Regional Economic Models, Inc. (REMI) to evaluate the economic impacts associated with airport's activities. Results of the study estimated that 9,200 people were employed at the airport in fiscal year (FY) 2002, making it the third largest employer in the County, after the School Board of Broward County and the Broward County Government, representing a payroll of \$353 million. The airlines accounted for 35.9 percent of airport employment, and the passenger terminal concessionaires and terminal services (food and beverage, rental car, and others) accounted for 30.4 percent. FBOs, ground transportation providers, government agencies, and other businesses accounted for the remaining 33.7 percent. Total expenditures of on-airport organizations for wages, goods, and services, and capital improvements in FY 2002 were estimated to be \$884 million, which represents the direct impact of airport-related activity.<sup>5</sup>

As part of this Economic Impact Assessment,<sup>6</sup> a model produced by REMI was used to evaluate the economic impacts associated with the airport's activities. The estimates of employment impacts were derived from surveys of on-airport businesses conducted at the airport in 2002 and passenger surveys conducted at the airport in 2000 and 2002.<sup>7</sup>

Estimation of the direct economic impact of the overall economy of the region was based on an analysis of the on-airport surveys. The direct economic impact of the airport on the region was estimated to be \$559 million in 1997.<sup>8</sup> As shown in

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<sup>4</sup> *Final Report - Economic Impact Assessment for FY 2002 and FY 2015 with and without Proposed Runway 9R/27L Expansion Fort Lauderdale-Hollywood International Airport.* Leigh Fisher Associates (now known as Jacobs Consultancy), December 2002.

<sup>5</sup> *Final Report - Economic Impact Assessment for FY 2002 and FY 2015 with and without Proposed Runway 9R/27L Expansion Fort Lauderdale-Hollywood International Airport.* Leigh Fisher Associates (now known as Jacobs Consultancy), December 2002.

<sup>6</sup> *Final Report - Economic Impact Assessment for FY 2002 and FY 2015 with and without Proposed Runway 9R/27L Expansion Fort Lauderdale-Hollywood International Airport.* Leigh Fisher Associates (now known as Jacobs Consultancy), December 2002.

<sup>7</sup> *Final Report - Economic Impact Assessment for FY 2002 and FY 2015 with and without Proposed Runway 9R/27L Expansion Fort Lauderdale-Hollywood International Airport.* Leigh Fisher Associates (now known as Jacobs Consultancy), December 2002.

<sup>8</sup> *Final Report - Economic Impact Assessment for FY 2002 and FY 2015 with and without Proposed Runway 9R/27L Expansion Fort Lauderdale-Hollywood International Airport.* Leigh Fisher Associates (now known as Jacobs Consultancy), December 2002.

**Table 5.H.2-2, Estimated Direct Economic Impact by Type of Business / FY 2002**, the direct economic impact of the airport on the primary service region was estimated to be \$884 million in 2002. The 58 percent increase in economic impact between 1997 and 2002 was attributed to the 40 percent increase in the number of enplaned passengers over that period, as well as increases resulting from inflation.<sup>9</sup>

In 2002, passenger airlines employed an estimated 2,400 people and the cargo airlines employed an estimated 900 employees, accounting for 36 percent of the total airport employment. Terminal concessionaires, including rental car companies, employed an estimated 2,800 people, representing about 30 percent of total airport employment.<sup>10</sup>

**Table 5.H.2-2  
ESTIMATED DIRECT ECONOMIC IMPACT BY TYPE OF BUSINESS / FY 2002  
Fort Lauderdale-Hollywood International Airport**

Type of Business	Number of On-Airport Employees	Millions of Dollars		
		Payroll	Expenditures	Direct Economic Impact
<b>Airlines</b>				
Passenger	2,400	\$146	\$182	\$327
Cargo	900	\$35	\$62	\$97
<b>SUB-TOTAL:</b>	3,300	\$181	\$243	\$424
<b>Terminal</b>				
Concessionaires	1,600	\$40	\$21	\$61
Rental Car Companies	1,200	\$28	\$63	\$91
<b>SUB-TOTAL:</b>	2,800	\$68	\$84	\$152
<b>Other</b>				
Ground Transportation	500	\$12	\$52	\$64
FBOs	1,100	\$28	\$82	\$109
Govt. Agencies	700	\$31	\$38	\$70
Other Industries	800	\$33	\$32	\$65
<b>SUB-TOTAL:</b>	3,100	\$104	\$204	\$308
<b>TOTAL:</b>	<b>9,200</b>	<b>\$353</b>	<b>\$531</b>	<b>\$884</b>

Source: Final Report - Economic Impact Assessment for FY 2002 and FY 2015 with and without Proposed Runway 9R/27L Expansion Fort Lauderdale-Hollywood International Airport, Leigh Fisher Associates (now known as Jacobs Consultancy), December 2002.

#### **5.H.2.4 Economic Impacts of Construction**

Airport improvements generally have a ripple effect throughout the regional economy. Spending on the construction of improvements provides economic benefits to multiple industries in the region, not just the construction industry. The same is true of spending on air transportation operations and airfreight.

<sup>9</sup> Final Report - Economic Impact Assessment for FY 2002 and FY 2015 with and without Proposed Runway 9R/27L Expansion Fort Lauderdale-Hollywood International Airport. Leigh Fisher Associates (now known as Jacobs Consultancy), December 2002.

<sup>10</sup> Final Report - Economic Impact Assessment for FY 2002 and FY 2015 with and without Proposed Runway 9R/27L Expansion Fort Lauderdale-Hollywood International Airport. Leigh Fisher Associates (now known as Jacobs Consultancy), December 2002.

Expenditures in these industrial sectors also create positive economic impacts in other sectors of the regional economy.<sup>11</sup>

A regional Input/Output (I-O) model is typically used to estimate the impact of projects on the regional economy. One such model is the RIMS II developed by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). RIMS II uses a set of region and industry specific economic multipliers and is commonly used to estimate the regional impacts of airport construction. It can also be used to quantify the economic impacts of other public and private sector projects. "RIMS II is based on an accounting framework called an I-O table. For each industry, an I-O table shows the distribution of the inputs purchased and the outputs sold. A typical I-O table in RIMS II is derived mainly from two data sources: the BEA's national I-O table, which shows the input and output structure of nearly 500 U.S. industries, and BEA's regional economic accounts, which are used to adjust the national I-O table in order to reflect a region's industrial structure and trading patterns. As noted RIMS II data incorporates the regional economic characteristics."<sup>12</sup> For the EIS analysis, the multipliers used were for a region comprised of Broward, Miami-Dade, and Palm Beach counties. The most current version of the RIMS II multipliers are based on the BEA's 1997 national benchmark I-O accounts and BEA's 2003 regional economic accounts. BEA released these RIMS multipliers in October 2005.

Using the RIMS II multipliers, for every dollar spent on construction, \$2.164 is generated across all industries in the region. For every million dollars of spending on construction, it is estimated that 12.88 jobs are created across all industries in the region. Increased investment in airport infrastructure would allow for increased transport of passengers and freight. Increasing the expenditure on air transportation also multiplies throughout the regional economy. For every dollar spent on air transportation, \$2.16 is generated throughout the regional economy, and jobs would be created at a rate of 18.38 for every million dollars of air transportation expenditure.

#### **5.H.2.5 Public Services**

The Broward County Sheriffs Department provides on-airport police and Aircraft Rescue and Fire Fighting (ARFF) services. **Table 5.H.2-3, Fire Departments Within the Vicinity of the Airport**, lists the existing fire departments in proximity to the airport. **Table 5.H.2-4, Police Departments Within the Vicinity of the Airport**, lists the existing police departments in proximity to the airport. **Table 5.H.2-5, Hospitals Within the Vicinity of the Airport**, lists the existing hospital services in proximity to the airport.

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<sup>11</sup> *Final Report - Economic Impact Assessment for FY 2002 and FY 2015 with and without Proposed Runway 9R/27L Expansion Fort Lauderdale-Hollywood International Airport.* Leigh Fisher Associates (now known as Jacobs Consultancy), December 2002.

<sup>12</sup> *Regional Multipliers, A User Handbook for the Regional Input-Output Modeling System (RIMS II)*, Third Edition, March 1997, U.S. Department of Commerce, Bureau of Economic Analysis.

**Table 5.H.2-3  
FIRE DEPARTMENTS WITHIN THE VICINITY OF THE AIRPORT  
Fort Lauderdale-Hollywood International Airport**

<b>Facility</b>	<b>Address</b>	<b>Location to FLL</b>
Broward County: District 14 - Port Everglades	1901 Eller Drive, Fort Lauderdale	Northeast
Broward County: District 3 - Airport	200 Terminal Drive, Fort Lauderdale	On airport
Broward County: District 2 - Dania Beach	100 W. Dania Beach Boulevard, Dania Beach	South
Hollywood Police Department	2207 Raleigh Street, Hollywood	South

Source: The Corradino Group, 2006.

**Table 5.H.2-4  
POLICE DEPARTMENTS WITHIN THE VICINITY OF THE AIRPORT  
Fort Lauderdale-Hollywood International Airport**

<b>Facility</b>	<b>Address</b>	<b>Location to FLL</b>
City of Dania Beach: Fire Station 1	102 W. Dania Beach Boulevard, Dania Beach	South
City of Dania Beach: Fire Station 93	2741 Stirling Road, Fort Lauderdale	Southeast
Hollywood Fire Department	3250 Hollywood Boulevard, Hollywood	Southeast

Source: The Corradino Group, 2006.

**Table 5.H.2-5  
HOSPITALS WITHIN THE VICINITY OF THE AIRPORT  
Fort Lauderdale-Hollywood International Airport**

<b>Facility</b>	<b>Address</b>	<b>Location to FLL</b>
Broward General	1600 South Andrews Avenue, Fort Lauderdale	Northeast
Imperial Point	6401 North Federal Highway, Fort Lauderdale	Northeast
Pembroke Pines General Hospital	2301 N University Drive, Pembroke Pines	Southwest
Plantation General Hospital	421 NW 42 Avenue, Plantation	Northwest
Hollywood Medical Center	3600 Washington Street, Hollywood	Southeast

Source: The Corradino Group, 2006.