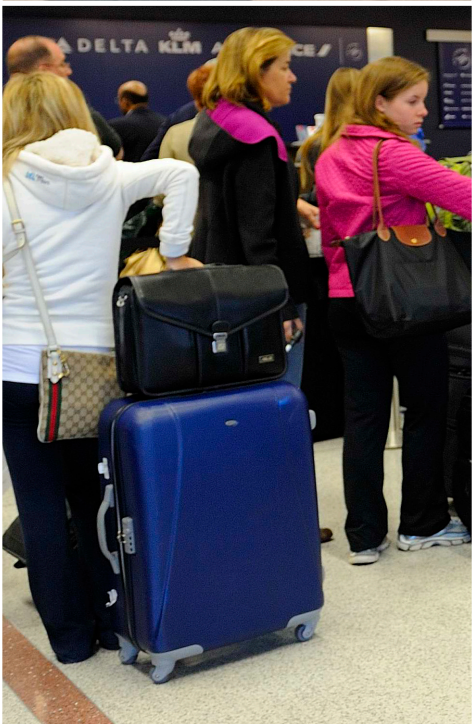


THE ECONOMIC IMPACT OF



Blue Grass Airport



Prepared for:
**Lexington-Fayette
Urban County Airport Board**

Prepared by:

WilburSmith
ASSOCIATES

The Economic Impact of Blue Grass Airport

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Prepared for:

Lexington-Fayette Urban County Airport Board
4000 Terminal Drive, Suite 206
Lexington, Kentucky 40510-9607

Prepared by:

Wilbur Smith Associates
6600 Clough Pike
Cincinnati, Ohio 45244

WilburSmith
A S S O C I A T E S



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Executive Summary

Blue Grass Airport serves the greater Lexington region and major parts of Kentucky, providing airline service and general aviation facilities to residents and businesses in the area. This report summarizes the major economic contributions, as well as numerous qualitative benefits, that the Lexington region and Kentucky realize from Blue Grass Airport. The economic contributions are quantified in terms of employment, payroll, and economic output, as measured in 2010. The analysis considers the impacts associated with airport operations, on-airport capital improvement projects, visitors who arrive via commercial airlines, and visitors who arrive on general aviation aircraft.

The economic impacts of Blue Grass Airport were estimated using an FAA-approved methodology that has been successfully applied at airports throughout the United States. Direct impacts of on-airport businesses and government organizations, along with spending by airport visitors, were measured through extensive survey efforts. These direct impacts circulate in Kentucky's economy when money is re-spent, creating additional economic impacts. For example, when airport employees buy groceries using money from their airport paychecks, this re-spending helps support additional economic output and employment. This re-circulation of economic activity continues to multiply the impacts until they leak beyond the boundaries of Kentucky. These multiplier impacts were calculated using the Impact Analysis for Planning economic model, using parameters specific to Kentucky. The total economic impact of the airport was determined by adding together the direct and multiplier impacts. The total economic impact of the airport was substantial. In brief, in 2010, Blue Grass Airport:

- Supported 3,478 jobs
- Generated more than \$104 million in annual payroll
- Produced more than \$370 million in annual economic output

Realizing that not all economic benefits can be traced directly to the aviation activity that takes place on the airport, this study surveyed 300 companies in Lexington and the surrounding area to determine how they used Blue Grass Airport and valued its services. Responding businesses reported averaging 40 airline trips per year out of the airport, resulting in approximately \$15,000 in ticket expenditures per business. Nearly 25 percent of the companies made use of general aviation aircraft, either through ownership, leasing, or chartering. Approximately half reported that their vendors or clients used general aviation to travel to Lexington to conduct business. The survey demonstrated that much of the business conducted in Lexington would not exist, or would be much more costly, without the services and amenities provided by the airport.

Finally, Blue Grass Airport and its staff contribute to Lexington in many ways that defy conventional economic definitions. For example, no financial value can be placed on lives saved by air ambulances that use the airport. Another example is how the airport works closely with area chambers of commerce and tourism associations to promote the region to businesses and tourists. One last example is that airport staff volunteer their time to assist non-profit and community organizations such as the Kentucky Blood Center. Efforts like these, even though they don't directly contribute to the bottom line, enhance the quality of life of Lexington residents, making the region a better place to live.



Blue Grass Airport - Enhancing Lexington's Economy

Blue Grass Airport got its start in 1940 when local officials purchased farmland for construction of the airport, which began in 1941. The airport went into operation in 1942 and served initially as a secondary training facility and supply gateway for the U.S. Army. Following the end of World War II, the city of Lexington took control of the airport and began work that would turn the airport into a commercial airline service facility. To oversee operations of the airport, a 10-member board of directors, the Lexington-Fayette Urban County Airport Board, was formed. This public, non-profit board is appointed by the mayor of Lexington and confirmed by the Urban County Council, the legislative body governing the city.

The airport is an important component of Lexington's economy, contributing to both the Lexington region and major parts of Kentucky. For starters, Blue Grass Airport is the primary scheduled airline service provider for central and eastern Kentucky, serving 54 counties, as shown in **Figure 1**. Seven major airlines fly non-stop to 15 hub cities throughout the U.S. More than 1.1 million passengers flew in and out of the airport in 2010.

Figure 1
Blue Grass Airport Service Area



Source: Blue Grass Airport and Wilbur Smith Associates, March 2011.

Because of the airport, residents of Lexington and Kentucky can more conveniently access the national air transportation system, allowing them to conduct business in all parts of the U.S. and internationally, to visit family and friends and to enjoy vacation destinations. The airport also makes it easy for hundreds of thousands of visitors to come to Lexington for business and for the amenities that the region offers. The airport assists the Lexington Convention and Visitors Bureau with bringing conventions to the region by providing in-airport signage, and making the airport welcome center and executive lounge available to conventioners. The airport takes an active role in attracting aviation conferences to Lexington, landing events such as the American Association of Airport Executives Media Relations Conference in 2007 and



the Boyd Group Conference in 2009. The American Association of Airport Executives Southeast Chapter plans to hold its 2013 conference in Lexington.

Known as the "Horse Capital of the World," Lexington has an extensive equine industry that is supported by the airport. Two Thoroughbred auction companies are based in Lexington. Fasig-Tipton Company is the oldest Thoroughbred auction firm in North America. The other, Keeneland Association, Inc., is located across the street from the airport and is famed for both its horse auctions and Thoroughbred racing events. The two largest equine veterinary practices in the world are also located in Lexington. Hagyard Equine Medical Institute was founded in 1876, and moved to Lexington in 1891. The facility offers a multitude of equine health services, supported by more than 60 vets and a staff of support personnel. Rood & Riddle Equine Hospital opened in Lexington in 1986 and quickly grew to a staff of more than 50 vets and in excess of 200 support personnel. The airport is such an integral part of the regional equine industry that it has an air cargo operation – H.E. “Tex” Sutton Forwarding Company, LLC – dedicated solely to transporting horses to and from Lexington. Using a Boeing 727 specifically outfitted for horses, the company can ship up to 21 horses at a time. In a typical year, the company moves as many as 700 horses in and out of Blue Grass Airport.

Lexington further enhanced its equine reputation in late 2010 when it hosted the Alltech FEI World Equestrian Games. Held every four years, Lexington was the first location outside of Europe to stage the competition. The 2010 World Equestrian Games drew 632 athletes and 752 horses from 58 countries to Lexington. Attendance exceeded half a million fans, many of whom arrived through Blue Grass Airport.

As home to the University of Kentucky, Lexington is a center for higher learning and research. Blue Grass Airport supports this university, and others, by providing airline flights and charter service for the schools' students, faculty, and sports teams. The University of Kentucky estimates that it purchased nearly 10,000 airline tickets in its most recent fiscal year for business travel by university employees. On top of this, the school's football and basketball teams charter aircraft for traveling to away games.

The high-tech field and healthcare industry also have a significant presence in Lexington. Companies like printer manufacturer Lexmark International, headquartered in Lexington, capitalize on the access to the national air transportation system that the airport provides. Lexington is home to numerous large hospitals, such as Central Baptist Hospital, University of Kentucky Healthcare, and St. Joseph Health System, which employ thousands. Healthcare facilities benefit from being able to use Blue Grass Airport to transfer patients and ship organs for transplant.

The next section examines a number of the socioeconomic trends that have helped drive the economy of Lexington and the surrounding region. Additionally, it looks at future trends expected to take place in the Lexington region that will carry the economy into the future.

Lexington and Fayette County Socioeconomic Overview

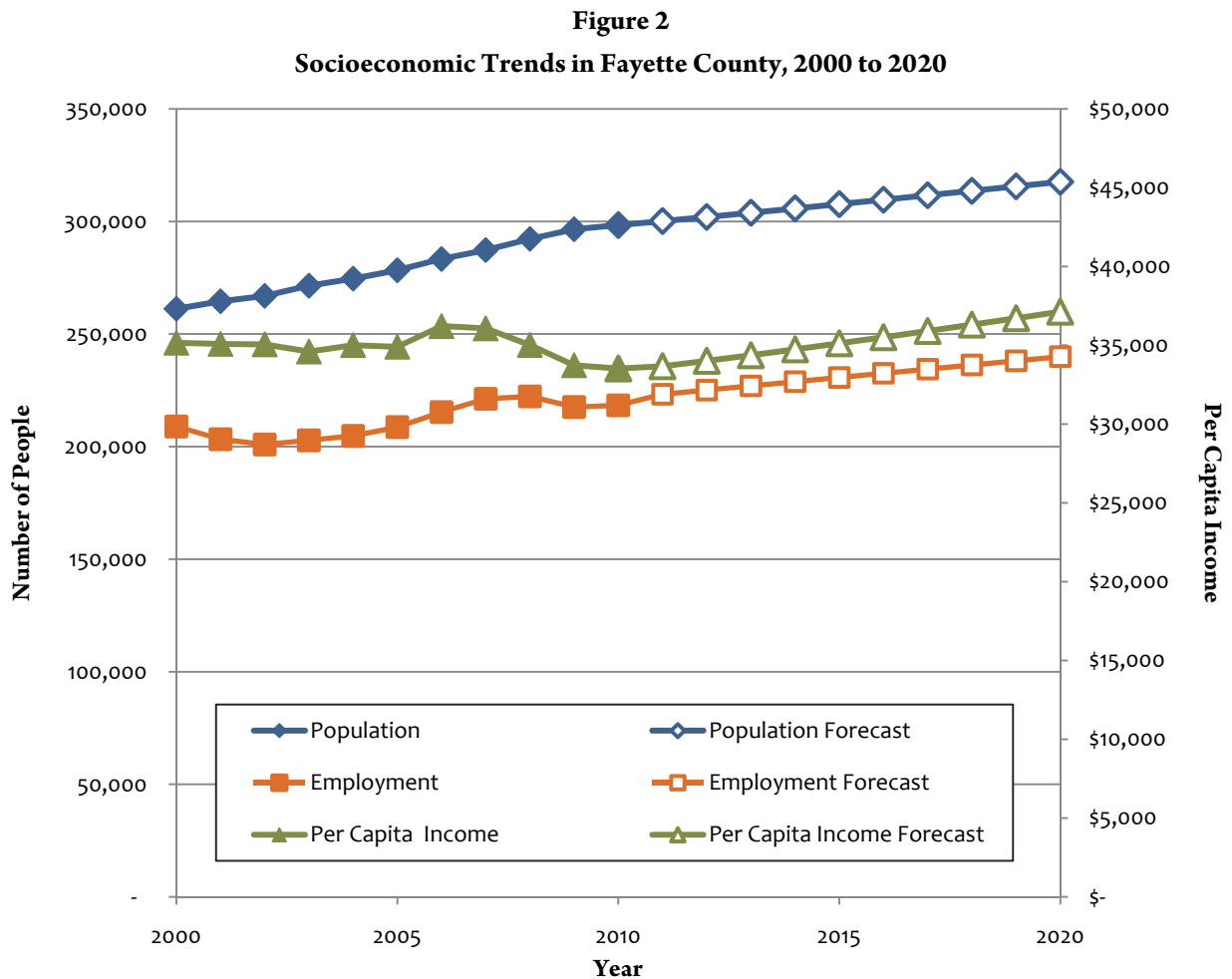
Blue Grass Airport is located in Lexington, Kentucky, the second largest city in Kentucky and the county seat of Fayette County. The city has a diversified economy that has helped the region weather the recession of 2007 - 2009. To better understand how the region's economy has functioned in the past and is expected to perform in the near future, this section examines Fayette County's socioeconomic trends from 2000 through forecasts of 2020. Typically, as population, employment, and income change in a particular market area, there is a corresponding change in demand for air carrier, air cargo and general aviation services. The following section provides details on the socioeconomic trends that have occurred in recent years in Fayette County.



Population

In 2000, the population of Fayette County stood at more than 261,000. By 2010, the county's population had grown in size to 298,000 people, a 1.3 percent compound average annual growth rate. During that 10-year period, the county's population increased by no less than 1,800 in any individual year, and averaged an increase of more than 3,700 people per year. The largest growth came in 2006, when population jumped by more than 5,000 people.

The average growth rate of Fayette County's population of 1.3 percent per year exceeded the U.S. national average of 0.9 percent for the same period. Looking to the future, Fayette County's population is forecast to grow to nearly 318,000 by 2020, yielding an average annual growth rate of 1.0 percent, which would match the rate of national population growth. **Figure 2** shows the trend of Fayette County population growth from 2000 to 2020.



Source: Woods and Poole Economics, Inc., March 2011.



Employment

In 2010, there were more than 218,000 people employed in Fayette County. This total employment was down less than 2 percent from the county's peak employment of 222,000 in 2008. In fact, the county has experienced growth in employment every year since 2002 with the exception of 2009, during the economic recession. Employment projections for 2011 indicate that Fayette County employment levels are expected to exceed their peak in 2008, and continue to grow at an annual average compound rate of 1.1 percent to 2020, as shown in Figure 2. This is part of the reason that Forbes.com ranked Lexington ninth out of 200 metro areas for best places for business and careers.¹

When looking at the top employers in Fayette County, it becomes clear how significant educational institutions are to the economy. Nearly half of those employed by the top 10 employers work for the University of Kentucky or Fayette County Public Schools.

Technology companies are also major employers in the region. Lexmark International, ACS, and Lockheed Martin support 20 percent of the total workforce of the top 10 county employers.

The importance of healthcare is also evident, as hospitals employ nearly 20 percent of those employed by the top 10 employers. **Table 1** shows the number of jobs at the 10 largest companies in Fayette County.

Table 1
Top 10 Employers in Fayette County

Company	Type of Business	Employees	Percent
University of Kentucky	Public Research University	12,096	34%
Fayette County Public Schools	Public School	5,300	15%
Lexmark International, Inc.	Printer and Document Services	3,130	9%
Lexington-Fayette Urban County Government	Local Government	2,973	8%
Central Baptist Hospital	Healthcare	2,500	7%
St. Joseph Hospital	Healthcare	2,300	7%
ACS, a Xerox Company	Data Procession and Outsourcing	2,050	6%
Lockheed Martin	Defense Contractor	1,750	5%
Veterans Medical Center	Healthcare	1,565	4%
Walmart	Retail	1,497	4%
Total Employees		35,161	100%

Source: Commerce Lexington, March 2011.

Per Capita Personal Income

The trends of per capita personal income in Fayette County, reflecting the relative standard of living in the area, roughly mirror that of employment. A noticeable difference, as seen in Figure 2, is that per capita

¹ Retrieved from www.forbes.com/lists/2010/1/business-places-10_Best-Places-For-Business-And-Careers_Rank.html on 4 April 2011.



income for Fayette County peaked in 2006, as compared to the employment peak in 2008. Since 2006, per capita income has declined year-to-year, settling at approximately \$33,000 per person in 2010.

The near-term forecast expects per capita income growth to remain flat, but to pick up in later years, with an overall average annual growth rate of 1 percent out to 2020.

In summary, Fayette County has an economy that focuses on diversified areas, namely education, technology, healthcare, and the equine industry, that has helped cushion the negative impacts of the recent recession. Unlike other areas of the U.S. that have seen people and businesses continuing to flee poor economic conditions, Lexington and Fayette County have a growing population and increasing employment base. Per capita income has yet to show signs of recovering from the recent national economic downturn, but forecasts predict that it will start showing positive growth in future years, as employment, along with the regional economy, begin to exhibit signs of recovery and growth.

Study Approach

Aviation is an important factor influencing the continued economic growth and development of Lexington and the surrounding region. To quantify how influential the airport is, this study expresses its economic impact in terms of employment, annual payroll, and annual output. These impacts were generated by three aviation-dependent groups that were analyzed as part of this study. These aviation-dependent groups are:

- On-airport tenants, including both businesses and government organizations
- Visitors traveling to the Lexington region via commercial airline service
- Visitors traveling to the Lexington region via general aviation aircraft

In addition to the quantifiable economic impacts, the study surveyed 300 companies in the Lexington region to gain a better understanding of the ways businesses value the airport. The study also examined some of the qualitative benefits that Blue Grass Airport provides the community.

The following three sections describe the study approach.

The Economic Modeling Process

This study indicates that many people, beyond the immediate environs of the airport, derive significant economic benefits from the operation of the airport and its associated businesses. A detailed, quantitative modeling effort was undertaken to quantify the economic impacts that occur as a result of on-airport activities (airlines, fixed base operators, flight schools, corporate flight departments, government, and various other business). In addition, businesses and jobs that are supported by the expenditures of visitors who arrive via scheduled commercial airline service and general aviation aircraft are also quantified. These on-airport activities and visitor expenditures result in additional economic activity throughout the Lexington region and the state of Kentucky. As initial waves of spending associated with the airport system are released into Kentucky's economy, successive waves of employment, payroll, and economic output occur. These additional benefits are measured using sector-specific employment, payroll, and economic output multipliers derived from an economic model specific to Kentucky.



This study expresses the economic benefits of Blue Grass Airport in three distinct categories. Those three categories are direct impacts, multiplier impacts, and total impacts.

Direct impacts include the impacts related to activities by on-airport businesses and government agencies, and the off-airport impacts attributable to visitor spending at locations found away from the airport, such as hotels and restaurants. Direct impacts account for the initial point where money first starts circulating in the economy.

Multiplier impacts result from the re-circulation and re-spending of direct impacts within the economy. This re-spending of money can occur multiple times and takes two forms - indirect and induced. Indirect impacts occur when businesses spend their revenue on business expenses. Induced impacts occur when employees spend their earnings on goods and services.

Because multiplier impacts are not as easy to measure as direct impacts, it is important to employ a reliable method of estimating multiplier impacts. A leading method used to estimate multiplier impacts is the input-output model.

The Impact Analysis for Planning (IMPLAN) input/output model was used to quantify multiplier impacts in this study. IMPLAN is a linear model that estimates purchases and sales between hundreds of sectors of the economy. The U.S. Forest Service, in cooperation with several other government agencies, initially developed the IMPLAN system to generate regional non-survey input-output models for regions as small as a single county. This modeling process is considered one of the leading methods currently available for estimating the total economic impact of an industry and has been used to estimate economic impacts for individual airports and systems of airports throughout the country.

The IMPLAN model contains a large economic database used to generate input-output tables. It includes data from sources such as Dun and Bradstreet, the U.S. Department of Commerce, and the U.S. Census Bureau. IMPLAN multipliers and data tables specific to Kentucky's industrial sectors were obtained and used in this analysis. The IMPLAN input-output model used for this analysis requires direct impact estimates for three separate components of the economy. These categories are:

- Employment – Employment is the number of jobs based on full-time equivalent (FTE) positions. For example, two part-time workers are assumed to equal one full-time position.
- Payroll – Payroll is the annual total of wages, salary, and benefits paid to all employees.
- Output – Output for on-airport activity is typically assumed to be the sum of annual gross sales and average annual capital expenditures. While this assumption works well for profit-oriented businesses, it must be modified for organizations that do not generate revenue, such as air traffic control towers or corporate flight departments. Airlines also fall into this category since it is difficult to allocate airline revenue to specific airports. The output associated with these types of activities is estimated as the sum of annual payroll, annual operating expenditures, and average annual capital improvement outlays. For visitors using the airports, output is assumed to equal annual visitor spending.

It is important to note that payroll and output should not be combined because elements of economic benefit related to payroll are also contained, to some extent, in the output estimate. Each of the three impact components (employment, payroll, and output) stand alone as a measure of an airport's total economic impact.

Total impacts are the combination of all direct and multiplier impacts.



Data Collection Methods

Various data collection efforts were undertaken to gather the information needed to estimate the economic activity occurring at Blue Grass Airport. Data collected were used as inputs in the modeling process that identified the total economic impact of the airport.

Three distinct efforts were made to collect data through surveys from three segments of airport users. Those segments were the on-airport tenants, commercial airline service visitors, and general aviation visitors. On-airport tenants were defined as any organization with employees operating from airport property and include FBOs, airlines, concessionaires, corporate flight departments, government agencies, and airport management. Commercial airline service visitors were those passengers arriving on commercial airlines that were visitors, as opposed to residents, to the area. General aviation visitors were those non-resident users of general aviation aircraft arriving at the airport.

All direct impacts presented in this analysis were identified through survey efforts. IMPLAN multipliers were then applied to the direct impacts to estimate all subsequent multiplier impacts.

Direct impacts estimates are important to ensure that final economic impact estimates are valid, since estimates of multiplier impacts are driven by estimates of direct impacts. The methods used to collect information related to each group sampled in this analysis are discussed in the following sections.

On-Airport Tenants

All on-airport tenants were contacted by airport staff to collect information regarding their economic activity. Surveys were then delivered to each, and follow-up calls, emails, and visits were made where necessary to obtain responses and verify information.

Surveys sent to each airport tenant requested the following data:

- Type of activity conducted by the tenant
- Number of full-time and part-time on-airport employees
- Total operating expenses (excluding capital improvements)
- Total annual salary, wages, and benefits paid to on-airport employees
- Total capital improvement expenditures on the airport for 2008 through 2010
- Total gross sales (where applicable)

Airport tenants were classified into one of 15 categories based on the type of activity they conducted at the airport. This was done to aid in applying Kentucky-specific industry multipliers, as well as estimating per capita payroll and output for those tenants that did not provide survey data. Those 15 categories were:

- Air cargo
- Aircraft maintenance
- Airline
- Airport management
- Air traffic control
- Charter
- Concessionaire
- Corporate flight department



- Federal government
- Fixed base operator
- Flight instruction
- Parking
- Rental car
- State/local government
- Transportation Security Administration (TSA)

This data was used to estimate the impacts of on-airport activity as explained in the Model Assumptions and Impact Estimates Methodologies section.

Commercial Airline Service Visitors

Blue Grass Airport is served by seven major airlines that bring visitors to the Lexington region from all over the country and the world. Spending by these visitors supports local businesses such as hotels, restaurants, and retail establishments. To estimate these expenditures, airport staff undertook a survey effort of commercial airline service passengers in January and February of 2011. More than 500 passengers responded to the survey.

Each passenger was asked to identify themselves as either a resident of, or a visitor to, Lexington. Those that identified themselves as visitors were asked to provide the following information:

- Trip purpose
- Airline used
- Number of nights stayed
- Number of people traveling in their group
- Expenditures by their group for lodging, food, rental car, other ground transportation, retail, and other expenses

This data was used to estimate the impacts of commercial airline service visitor spending as explained in the Model Assumptions and Impact Estimates Methodologies section.

General Aviation Visitors

The majority of aviation operations at Blue Grass Airport are conducted by general aviation aircraft - aircraft that are not military nor used for scheduled airline service. General aviation aircraft bring visitors to the Lexington region for leisure and business purposes. Those visitors spend money on hotels, restaurants, and retail establishments, just as commercial airline service visitors do. To estimate these expenditures, surveys for general aviation visitors were made available at TAC Air, the airport fixed base operator (FBO) frequented most often by general aviation visitors.

General aviation visitors that responded to the survey were asked to provide the following information:

- Number of travelers on their aircraft
- Where their aircraft is based
- Trip purpose
- Length of stay
- Expenditures for lodging, food, rental car, other ground transportation, retail, and other expenses



- Number of people responsible for these expenditures (this was asked because aircraft flight crew may not know how much their passengers spent and vice versa)
- Any other comments

In addition to the data gathered at TAC Air, a national database of general aviation visitor expenditures was consulted. Data from airports similar to Blue Grass Airport were used to supplement the survey data. This combined data was used to estimate the impacts of general aviation visitor spending as explained in the Model Assumptions and Impact Estimates Methodologies section.

Model Assumptions and Impact Estimate Methodologies

The economic impact model for Blue Grass Airport takes the collected data, and through the use of various assumptions and FAA-approved methodologies, estimates the total impacts attributed to the airport. This section explains those assumptions and methodologies.

On-Airport Direct Impacts

The easiest estimates to explain are those related to the on-airport activities of businesses and government organizations located on the airport. These direct impacts, expressed as employment, payroll, and output, are based on responses to the surveys distributed to on-airport entities. For those tenants that responded to the survey, employment is based on the number of full-time and part-time employees they reported, and expressed as full-time equivalents (FTE), where each part-time employee counts as half a full-time employee. Payroll reflects the wages, salaries, and benefits paid by tenants in 2010 for the workers they employed during the year. Output generally equals the gross sales of the tenant plus average annual capital expenditures. For organizations that do not generate sales (i.e., corporate flight departments, government agencies, etc.), output was estimated as annual payroll plus annual operating expenses plus average annual capital expenditures.

More than 70 percent of all on-airport tenants provided a survey response. For those tenants that did not respond to the survey, airport staff provided estimates of employment. Using the data from survey responses, per employee ratios of payroll, expenses, and gross sales were calculated for each of the 15 categories identified on the tenant survey. For categories that had insufficient survey responses, per employee ratios of payroll, expenses, and employment were developed from a national database of on-airport tenants. These ratios were then applied to the employment estimates to obtain estimates of economic impact. These results were further modified for certain businesses. Airport rental car companies pay the airport an annual concession fee of 10 percent of their gross revenues, so each company's gross revenues were verified against airport financial reports. Likewise, airline expenses were verified against airport accounting records.

Nearly all fuel sales at Blue Grass Airport are handled by TAC Air. As a result, some of the economic output of TAC Air is the result of fuel purchased by airlines and corporate flight departments based at the airport. If one were to include all of the fuel purchased by airlines and corporate flight departments as part of their output, and all of the fuel sold by TAC Air as part of its output, Blue Grass Airport would be credited twice for the same economic transaction. To correct for this, airline and corporate flight departments had their expenses (and corresponding economic output) reduced to account for fuel purchased from TAC Air. One corporate flight department did not have this correction applied since it possesses its own fuel farm and does not purchase fuel from TAC Air.



Capital Improvement Project Direct Impacts

In addition to the typical day-to-day costs of operating a business, there are expenditures associated with capital projects and other improvements to the business that do not occur on an annual basis. To account for the economic impact of these capital improvement projects (CIP), on-airport tenants were asked to provide a three-year history of CIP expenditures. This three-year history was averaged to smooth out the irregular nature of capital projects and to obtain an estimate of annual output. Since it is difficult to gather employment and payroll data associated with CIP, these impacts were estimated using Kentucky-specific ratios and data. The IMPLAN model provided a ratio of 6.5 jobs in Kentucky for every \$1 million spent on CIP. Data from the U.S. Bureau of Labor Statistics was used to estimate that the average payroll for Kentucky construction workers in 2010 was \$33,100. This average payroll was then applied to the estimated number of CIP employees.

Commercial Airline Service Visitors Direct Impacts

Economic impacts of commercial airline service visitors stem from their spending while in the Lexington region. To estimate this level of spending, a variety of sources were used.

The estimate started with the airport's number of annual enplaned passengers. FAA origin and destination data was used to estimate the number of enplaning passengers, approximately 41.5 percent, that were visitors to the region.

Passenger survey data found that business travelers to Lexington spent approximately \$440 during their stay, while leisure travelers spent approximately \$380 on their trip. The two averages are fairly close mainly because leisure travelers tended to stay for longer periods of time - 6.2 days versus an average of 2.7 days for business travelers. These spending averages did not include airfare, since that economic impact is captured by the airline impacts under the On-Airport Direct Impacts. Likewise, money spent on rental cars was not part of these spending averages since the impact of the rental car companies captured those expenditures. A weighted average of these two spending groups of \$417 per trip was used to estimate the total direct expenditures by commercial airline service visitors to Lexington.

The IMPLAN model produced a ratio of 12.9 Kentucky jobs supported by \$1 million in commercial airline service visitor spending. These jobs are predominately in the hospitality, retail and service industries. Data from the Bureau of Labor Statistics was used to estimate that each job supported by commercial airline service visitor spending earned an annual payroll of \$20,700 in 2010.

General Aviation Visitors Direct Impacts

Visitors to Lexington also arrive on corporate and general aviation aircraft. Estimating their expenditures involved using survey data from visiting pilots and passengers along with estimates of transient traffic and airport operations data.

Starting with the number of general aviation itinerant operations (those operations that operate outside the airport's local traffic area), it was estimated by the airport FBO that two-thirds of that activity involved true transient traffic, or aircraft carrying visitors to the region (as opposed to general aviation traffic that is based at Blue Grass Airport and returning from a trip). Survey data provided the number of visitors per arriving true transient aircraft, yielding the total number of general aviation visitors. Survey data also indicated that general aviation visitors spent \$165 per visit, so total general aviation visitor expenditures could be estimated.



Employment related to general aviation visitor spending was estimated using the Kentucky-specific ratio of 20.1 jobs per \$1 million of general aviation visitor spending, developed from the IMPLAN model. As with the commercial airline service visitor spending, these jobs are generally found in the hospitality, retail, and service sectors. The payroll associated with these jobs was estimated at \$20,700 per job, based on Kentucky data from the Bureau of Labor Statistics.

Multiplier Impacts

As the direct impacts discussed above are generated, money re-circulates in the economy, which creates indirect and induced impacts. Indirect impacts are those impacts that result from the re-spending by on-airport businesses when they purchase goods and services within Kentucky. Induced impacts come from aviation-related employees spending their earnings on goods and services in Kentucky. When this money re-circulates in the economy, it supports additional employment, payroll, and output. The impacts from this re-circulation of money are commonly referred to as multiplier impacts.

Multiplier impacts result from various interdependencies within an economic system. For example, the operation of an airport requires inputs in the form of supplies, equipment, and maintenance. These inputs generate a boost in sales for those businesses providing these products. Moreover, these goods and services require inputs for their production. The process continues as a large number of impacts re-circulate through the economy. The total requirement for goods and services is a multiple of the direct needs of the airports in the study; hence they are referred to using the term “multiplier.”

The multipliers that were used in this analysis were developed specifically to measure the economic impacts of Blue Grass Airport in Kentucky. The IMPLAN model was used to create multipliers that were applied to the various categories of economic activity taking place at the airport. **Table 2** summarizes these multipliers.

The multipliers presented in Table 2 were used to estimate the indirect and induced impacts in this analysis. For example, \$100 in direct expenditures (output) in the Aviation sector supports a total output impact equivalent to \$149 (\$100 times the multiplier of 1.49). Multiplier impacts would therefore be \$49 (total impacts of \$149 minus direct impacts of \$100).



Table 2
Kentucky IMPLAN Multipliers by Economy Sector

	Employment	Payroll	Output
Aviation (Note 1)	2.01	1.56	1.49
Concessions (Note 2)	1.26	1.46	1.64
Government (Note 3)	2.19	2.01	2.08
Capital Improvement Projects (Note 4)	2.06	1.72	1.67
Commercial Airline Service Visitors (Note 5)	1.51	1.71	1.62
General Aviation Visitors (Note 5)	1.33	1.54	1.61

Source: Wilbur Smith Associates and IMPLAN, March 2011.

Notes:

1. Aviation multipliers are the weighted average of the Aircraft Manufacturing, Aircraft Engine and Engine Parts Manufacturing, Other Aircraft Parts and Auxiliary Equipment Manufacturing, and Transport by Air multipliers.
2. Concessions multipliers are the weighted average of the Retail Stores - Miscellaneous, Business Support Services, Hotels and Motels, Including Casino Hotels, and Food Services and Drinking Places multipliers.
3. Government multipliers are the weighted average of the Other Federal Government Enterprises, and Other State and Local Government Enterprises multipliers.
4. Construction multipliers are the weighted average of the Construct Other New Nonresidential Structures, Asphalt Paving Mixture and Block Manufacturing, Cement Manufacturing, Ready-mix Concrete Manufacturing, Maintenance and Repair of Nonresidential Structures, and Architectural, Engineering, and Related Services multipliers.
5. Visitor expenditures multipliers are the weighted average of the Retail Stores - Miscellaneous, Automotive Equipment Rental and Leasing, Hotels and Motels, Including Casino Hotels, and Food Services and Drinking Places multipliers. Weightings were different for commercial airline service and general aviation visitor multipliers to reflect the difference in their spending habits.

Total Impacts

Total impacts consist of the combination of direct and multiplier impacts. When referring to Blue Grass Airport's economic impacts, this generally means the total employment, total payroll, and total output of the airport.

Economic Impact of Blue Grass Airport

Blue Grass Airport is a major contributor to the economic vitality of the Lexington region. This section of the report breaks the airport's economic impacts into direct impacts and multiplier impacts, and discusses the driving factors behind each. The section concludes with the overall economic impact of the airport—the total impacts.

Direct Impacts

The direct impacts of Blue Grass Airport are shown in **Table 3**, allocated among the four categories of On-Airport, Capital Improvement Projects, Commercial Airline Service Visitors, and General Aviation Visitors.



Table 3
Blue Grass Airport Direct Economic Impacts

Category	Employment	Payroll	Output
On-Airport	481	\$23,628,000	\$83,486,000
Capital Improvement Projects	239	\$7,897,000	\$36,706,000
Commercial Airline Service Visitors	1,236	\$25,585,000	\$95,922,000
General Aviation Visitors	162	\$3,353,000	\$8,066,000
Total Direct Impacts	2,118	\$60,463,000	\$224,180,000

Source: Wilbur Smith and IMPLAN, March 2011

On-Airport Direct Impacts

The on-airport impacts of Blue Grass Airport accounted for 481 employees with a payroll of more than \$23 million, producing more than \$83 million in economic output. Not surprisingly, the largest contributors to these impacts were those businesses and organizations with the largest work forces. This included airport management and its support staff, the air traffic controllers working in the airport tower, TAC Air (the airport FBO), TSA, and SSP America (the airport food and beverage concessionaire). However, a number of businesses contributed millions of dollars in economic output without having a huge work force, including H.E. "Tex" Sutton Forwarding LLC, the rental car companies at the airport, American Airlines, Delta Air Lines, and Republic Parking.

Capital Improvement Projects Direct Impacts

Another major contributor to the direct economic impacts of Blue Grass Airport was capital improvement projects (CIP) undertaken by the airport and businesses. CIP contributed 239 jobs, a payroll of more than \$7 million, and more than \$36 million in economic output to direct economic impacts.

Because these projects tend to occur irregularly and may take less than a year, or many years, to complete, the average impact over the past three years was used to smooth out the economic benefits. These projects contribute to the economy through the employment and expenditures needed to complete these improvements. By far, the airport was the main driver in this category, with improvements to the airfield, including the relocation of the general aviation crosswind runway. The airport also undertook significant renovations of the terminal and enhanced the main entrance along Man O' War Boulevard.

TAC Air also contributed significantly to this category. The FBO opened a new executive terminal that included two conference rooms, a gift store and art gallery, an exercise room, pilot's lounge, and flight planning space. TAC Air also expanded its hangar space to accommodate travelers arriving for Lexington's many popular events, such as University of Kentucky athletic games, and Keeneland's races and auctions.

Other companies also invested considerable capital in their operations in the past few years. Both SSP America and The Paradies Shops put hundreds of thousands of dollars into improving their airport concessions.



Commercial Airline Service Visitors Direct Impacts

Out of all the direct impact categories, commercial airline service visitor impacts supported the largest number of jobs and the greatest amount of economic output. This is to be expected since Lexington is a destination airport, drawing both business and leisure travelers. Commercial airline service visitors are estimated to have spent more than \$95 million in 2010 (not including airline fares or rental car expenditures, as explained previously). Spending by commercial airline service visitors supported 1,236 jobs with a payroll in excess of \$25 million.

The estimate of commercial airline service spending was determined as shown in **Table 4**.

Table 4
Blue Grass Airport Commercial Airline Service Visitor Expenditure Estimate

2010 Enplaned Passengers	Percent Visitors	Visitors	Spending per Visitor	Visitor Expenditures
554,285	41.5%	230,028	\$417	\$95,922,000

Source: Wilbur Smith and IMPLAN, March 2011

General Aviation Visitors Direct Impacts

While the majority of visitors using Blue Grass Airport arrive by commercial airline, a substantial number arrive by general aviation aircraft. These visitors also spend a good deal of money in the local economy. **Table 5** shows how these expenditures were estimated. As stated previously, the estimate of general aviation visitor expenditures relied on survey results from pilots and general aviation visitors passing through TAC Air, as well as survey results from other airports similar in size, and number and type of operations. The results of these surveys found that, on average, each visiting general aviation arrival brought 3.9 visitors, each of whom spent an average of \$165 during their stay.

Table 5
Blue Grass Airport General Aviation Visitor Expenditure Estimate

Itinerant Operations	Percent True Transient	General Aviation Arrivals	Visitors per Arrival	General Aviation Visitors	Spending per Visitor	General Aviation Visitor Expenditures
37,587	67%	12,535	3.9	48,888	\$165	\$8,066,000

Source: Wilbur Smith and IMPLAN, March 2011

This resulted in an estimated \$8 million of general aviation visitor expenditures, which supported 162 jobs with a payroll of more than \$3 million.

All Direct Impacts

The combined impact of all direct impacts accounts for 2,118 employees, and more than \$60 million in payroll. All of this aviation activity creates more than \$224 million in direct economic output. These impacts are predominately felt in the Lexington region.



Multiplier Impacts

When expenditures related to the direct economic impacts discussed above occur, this is only the initial point of entry of this economic activity. These impacts are re-spent over and over again, creating indirect and induced impacts, collectively termed multiplier impacts. The airport FBO's fuel purchases support the jobs and economic activity associated with the fuel distributor. Construction workers that build hangars spend part of their paychecks on groceries, keeping local stores in business and their clerks employed. The restaurants frequented by airport visitors pay local utilities for services, providing employment for utility workers, and so on. Without the direct economic impacts provided by the airport, these multiplier impacts would not exist and many companies would have to scale back business, or even cease operations.

Table 6 shows the multiplier impacts for each category.

Table 6
Blue Grass Airport Multiplier Economic Impacts

Category	Employment	Payroll	Output
On-Airport	428	\$18,252,000	\$56,919,000
Capital Improvement Projects	252	\$5,687,000	\$24,720,000
Commercial Airline Service Visitors	627	\$18,060,000	\$59,553,000
General Aviation Visitors	53	\$1,817,000	\$4,927,000
Total Multiplier Impacts	1,360	\$43,816,000	\$146,119,000

Source: Wilbur Smith and IMPLAN, March 2011

Multiplier impacts account for 1,360 employees with more than \$43 million in payroll and more than \$146 million in economic output. These impacts are felt in the Lexington region as well as other parts of Kentucky due to the re-circulation of the initial direct impacts.

Total Impacts

The total economic impact of Blue Grass Airport is determined by adding together the direct impacts and the multiplier impacts. Table 7 shows the total economic impact of Blue Grass Airport.

Table 7
Blue Grass Airport Total Economic Impacts

Category	Employment	Payroll	Output
On-Airport	909	\$41,880,000	\$140,405,000
Capital Improvement Projects	491	\$13,584,000	\$61,426,000
Commercial Airline Service Visitors	1,863	\$43,645,000	\$155,475,000
General Aviation Visitors	215	\$5,170,000	\$12,993,000
Total Impacts	3,478	\$104,279,000	\$370,299,000

Source: Wilbur Smith and IMPLAN, March 2011



As can be seen from the table, Commercial Airline Service Visitors impacts still comprise the largest segments of employment, payroll and output. However, On-Airport payroll almost matches the payroll of Commercial Airline Service Visitors impacts, despite supporting less than half the employees. This is because many on-airport jobs, such as those related to construction projects, the airline industry, and corporate flight departments, are highly skilled. Additionally, these industries are supported by other businesses that have quality jobs.

Other Impacts of Blue Grass Airport

The value of Blue Grass Airport extends beyond the jobs, payroll, and economic output that can be tied to the airport's aviation activity. Many businesses have no connection to aviation, yet they benefit from the transportation links for both passengers and cargo that the airport provides. Additionally, the airport provides certain services that go well beyond the dollar value assigned to them. These benefits are discussed in the following two sections.

Business Use of Blue Grass Airport

To assess how companies in the Lexington region use and value Blue Grass Airport, a survey was sent to 300 Lexington and surrounding area businesses. This survey asked for basic business information and how the company used the airport in terms of commercial travel, general aviation use, and air cargo services. The survey solicited the company's response to a hypothetical situation where Blue Grass Airport was not available. The survey concluded by asking the business to rate the importance of a variety of community attributes and services to their decision to expand or relocate the business.

More than 40 businesses responded to the mailed out survey, yielding a response rate of 14 percent. Most of these businesses are based in Lexington, but a small number from outside of Lexington also responded. In general, the responding businesses made extensive use of commercial air travel, averaging approximately 40 airline trips per year out of Blue Grass Airport. These companies estimated that they spent an average of \$15,000 per year on airline travel.

Companies in the Lexington area also used general aviation for business. Nearly one out of four respondents indicated that they either owned, leased, or used general aviation charters to conduct business.

More than half of the respondents indicated that their clients or vendors used general aviation aircraft to travel to and from Lexington. These businesses indicated that the use of general aviation aircraft ranged from as low as twice per year, to as high as 60 times per year, with an average of approximately once per month.

When asked how its business would be affected if Blue Grass Airport were not available, more than 23 percent of responding companies indicated that operations would be negatively affected. Most of these companies indicated that it would be more costly for them, as they would have to use airports that are farther away than Blue Grass Airport is. However, several companies indicated that they would scale back operations without the services of the airport. As one business put it, without Blue Grass Airport, it "... would put in a lot more time and effort and expense to realize the same results."

Finally, companies were asked to rate the importance of numerous criteria that could affect business relocation or expansion decisions. The number one criterion for businesses in the Lexington region was quality of life, which explains in part why Lexington was ranked so highly among best places for business



and career by Forbes.com. The availability of commercial air service was also highly valued, with 44 percent of respondents regarding air service as highly or somewhat important.

Qualitative Benefits of Blue Grass Airport

While the employment, payroll, and output supported by Blue Grass Airport are very important to the economy of the Lexington region, there are other airport benefits that go beyond these simple measures. These qualitative benefits add to the safety, welfare, health, and overall quality of life of Lexington area residents. The most obvious example of these qualitative benefits are the air ambulance flights that operate out of Blue Grass Airport on a regular basis. These operations range from life-saving emergency flights to healthcare enhancing patient transfer flights. Doctors, nurses and other medical specialists use the airport for travel so that their medical skills are available even to people located far from major medical service facilities.

The airport has close ties to both law enforcement agencies and military units. The Lexington Police Department bases its aircraft at Blue Grass Airport. Their flights support efforts to lower crime and to keep the community safe. The airport is also used for prisoner transport flights. Blue Grass Airport is home to the headquarters of the 138th Field Artillery of the Kentucky National Guard. It has operated its armory and operational maintenance shop on the southeast part of the airport since 1972. The Guard unit employs 97 full-time Guardsmen and 488 part-timers. Its annual economic output exceeds \$31.8 million.

The airport is used frequently for recreational flying, enhancing the quality of life of those that find joy in aviation. The non-profit Lexington Flying Club is based at the airport and makes flight lessons and flying more affordable for its members.

Blue Grass Airport supports operations by aerial applicators. The pesticides sprayed by these aerial applicators reduce crop losses from disease, insects, and weeds, thereby increasing the economic impact of Kentucky's agriculture industry.

Blue Grass Airport is a very active supporter of Lexington. The airport is a member of five area chambers of commerce, as well as local tourism associations. Lexington has four sister cities that the airport promotes within the terminal. The airport has also surpassed its disadvantaged business enterprise (DBE) goal every year for the past 15 years. This performance was recognized in 2009 when the airport was awarded the national DBE Advocate Partner Award from the FAA. In addition, for 10 years, the airport has been a sponsor of the minor league baseball team Lexington Legends.

The airport's management team is involved in numerous non-profit and community organizations, serving on the boards of the Kentucky Blood Center, Bluegrass Hospitality Association, Hospice of the Bluegrass, LexArts, and the Lexington Dream Factory.

Promotion of aviation in the local community is important to Blue Grass Airport as well. Airport tours are given year round to local school children and troops of Boy Scouts and Girls Scouts. The airport also provides two children with scholarships to aviation camp, held annually at the Aviation Museum of Kentucky.

All of this outreach effort by the airport has not detracted from its core mission of running a safe and efficient airport. In 2011, Blue Grass Airport was recognized by the FAA with its Airport Safety Mark of Distinction Award. The airport's executive director, Eric J. Frankl, A.A.E., was selected by the FAA Southern Region as the 2010 Air Carrier Airport Manager of the Year.



Summary

The contributions of Blue Grass Airport to the well being of Lexington and the surrounding region are substantial. This report has shown that the airport is a major catalyst for the economy, supporting 3,478 jobs, a payroll in excess of \$104 million, and economic output of more than \$370 million, as seen in **Table 8**.

Table 8
Economic Impacts of Blue Grass Airport

	Employment	Payroll	Output
Direct Impacts	2,118	\$60,463,000	\$224,180,000
Multiplier Impacts	1,360	\$43,816,000	\$146,119,000
Total Impacts	3,478	\$104,279,000	\$370,299,000

Source: Wilbur Smith Associates and IMPLAN, March 2011

In addition to these aviation-related economic impacts, a survey of Lexington-area companies found that a good number of businesses rely on the commercial airlines and the general aviation services that occur at Blue Grass Airport.

Beyond the economic impacts of the airport, there are significant qualitative benefits that the airport provides. These range from air ambulance flights that support the health of area residents, to the many ways that the airport and its staff promote and educate the local community on the importance of aviation. Blue Grass Airport is a valuable asset to Lexington and Kentucky, and will continue to help the region grow and prosper in the future.



4000 Terminal Drive, Suite 206
Lexington, KY 40510-9607
859-425-3100
bluegrassairport.com

Prepared by:

WilburSmith
ASSOCIATES

Wilbur Smith Associates, Inc.
www.wilbursmith.com