
Boeing Logistics Support Systems: Role in the San Antonio and Texas Economies

Full Report



**Center for Community and Business Research
Institute for Economic Development
University of Texas at San Antonio
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This study was conducted by the Center for Community and Business Research, a division of the Institute for Economic Development, housed at the University of Texas at San Antonio. The study was conducted at the request of Boeing Logistics Support Systems (formerly Boeing Aerospace Support Center San Antonio) to document their role in the San Antonio and Texas economies.

The report is presented in three parts. The first provides descriptive information on Boeing Logistics Support Systems' (BLSS) reach into Texas, the San Antonio metropolitan area, and redevelopment of the former Kelly Air Force Base. The second part documents the direct, indirect, and induced economic impacts of BLSS's operation in the state of Texas. The third part is a summary of critical observations in the report. An executive summary is also available as a separate document; both are available at <http://www.iedtexas.org>.

I. Boeing Logistics Support Systems' Reach

Boeing Logistics Support Systems in San Antonio, Texas, was established as Boeing Aerospace Support Center in 1998 as a maintenance and modification center for large aircraft. The facility, formerly part of the San Antonio Air Logistics Center, is an anchor tenant for the re-developed Kelly Air Force Base.

Boeing Logistics Support Systems has 1.4 million square feet of enclosed area, including 668,000 square feet of hangar space. The hub of Boeing Logistics Support Systems' San Antonio operations is Building 375, the largest free-standing, high-bay aircraft hangar in the world. It can accommodate up to 15 wide-body aircraft at a time. BLSS also has available more than 3.5 million square feet of aircraft ramps, run-up areas, and parking pads. Capabilities include facilities for paint and repaint, non-destructive inspection, and corrosion control, as well as backshops and office space. Military and selected commercial maintenance and modification programs include:

KC-135 Programmed Depot Maintenance: Depot level repairs and inspections, including major structural repairs. Employs approximately 600 BLSS workers.

KC-135 Global Air Traffic Management: Employs approximately 140 BLSS workers to upgrade older KC-135 aircraft with modern cockpits, landing systems, and communications systems.

C-17 Globemaster III Sustainment Partnering: A primary Air Force Depot for the C-17. BLSS employs approximately 500 people to provide modifications and block upgrades.

KC-10 Extender Contractor Logistics Support: Provides spares and warehousing, as well as depot-level repairs, modifications, and inspections, for the worldwide KC-10 fleet. Employs approximately 300 BLSS workers.

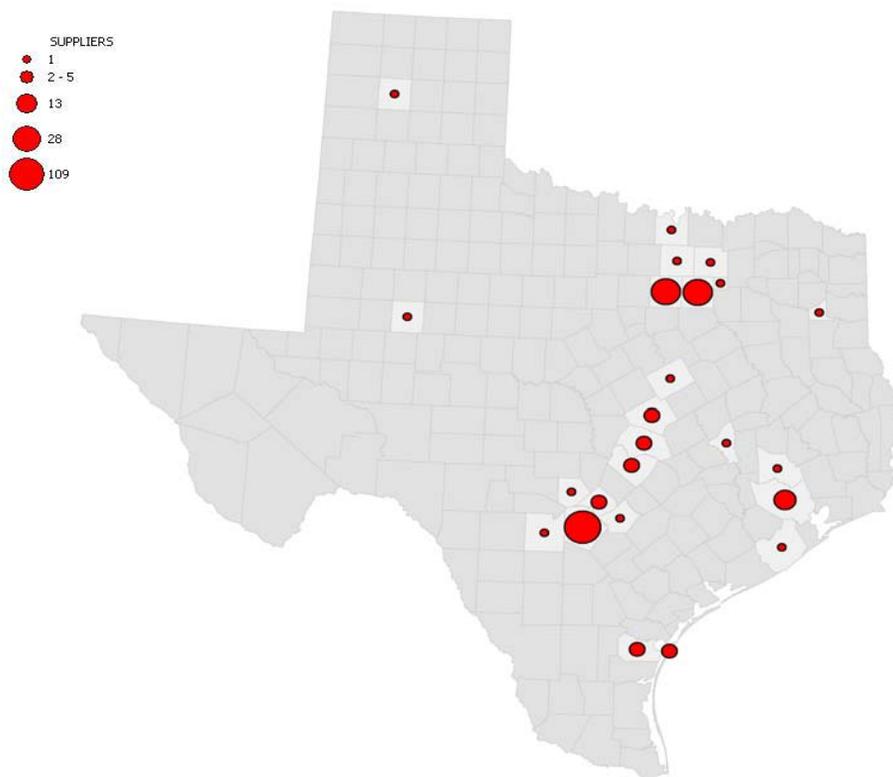
C-130 Avionics Modernization Program: Modernizes C-130 with full replacement of cockpit technologies. Employs approximately 50 BLSS workers.

Several of Boeing Logistics Support Systems' programs have a global reach, with service of aircraft that support operations and fly around the world. However, its presence in Texas, in the San Antonio metropolitan area, and in the re-developed Kelly Air Force Base has specific implications for the economic well-being of these localities. In 2004, BLSS drew on the resources of 208 suppliers in the state of Texas, 109 of which are in the San Antonio area. BLSS employed 1,436 San Antonio area workers at the end of 2004. Notably, it contributed substantially to the stabilization of employment in the transition of Kelly Air Force Base to civilian KellyUSA. The following three sections document Boeing Logistics Support Systems' reach into Texas, the San Antonio metropolitan area, and the redeveloping KellyUSA site.

Reach into Texas

The Boeing Corporation currently employs approximately 5,300 employees in nine Texas facilities. In addition to maintenance, repair, and overhaul (MRO) and air defense logistics support at KellyUSA, Randolph Air Force Base, and Universal City Training Support Center in San Antonio, Boeing provides space shuttle and space station development in Houston; defense MRO in El Paso, Abilene, and Del Rio; homeland security services in Richardson; and defense logistics support in Kingsville.

Figure 1: Number of BLSS Suppliers in Texas Counties, 2004



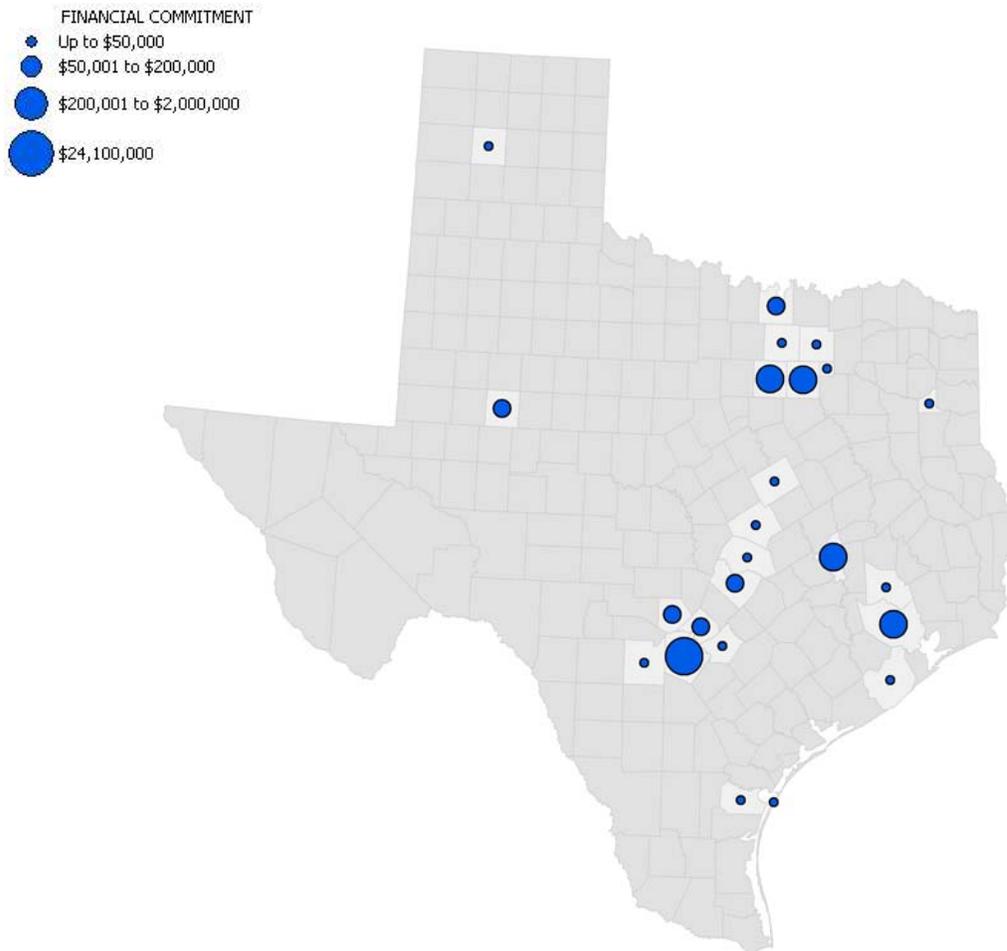
Source: BLSS

In 2004, Boeing Logistics Support Systems contracted materials, supplies, equipment, and service from 208 independent suppliers in Texas. As illustrated in Figure 1, the highest concentration of suppliers is in Bexar County, where 109 San Antonio area companies provided services to BLSS. However, BLSS drew on suppliers from 22 other Texas counties as well, with smaller concentrations in Dallas (28 suppliers), Tarrant (28 suppliers), and Harris (13) counties.

Financial commitments to these suppliers in 2004 totaled \$29.2 million, an average of just over \$140,000 per supplier in fixed price contracts. Figure 2 shows how BLSS resources are spread among suppliers across the state.

Almost 83 percent of Texas supplier financial commitments (\$24.1 million) went to Bexar county suppliers, an average of \$221,000 per supplier. Notable commitments outside of the San Antonio MSA include a \$1.7 million contract with a Brazos county (Bryan) supplier and a total of \$1.2 million in contracts with Harris county (Houston) suppliers.

Figure 2: BLSS Financial Commitments to BLSS Suppliers in Texas Counties, 2004

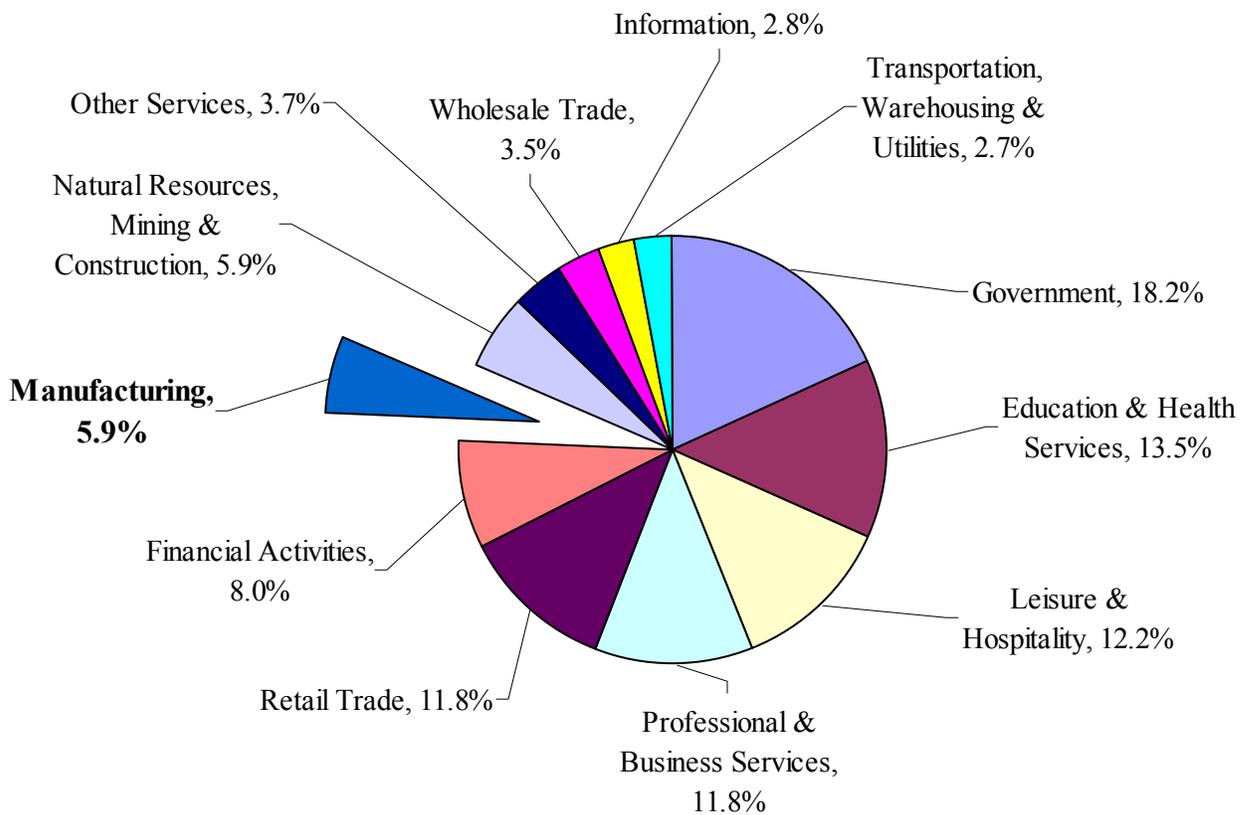


Source: BLSS

Reach into the San Antonio MSA

The Texas Workforce Commission reports total nonfarm employment in the San Antonio metropolitan statistical area (MSA) at 776,900 workers in June 2005. Figure 3 illustrates the distribution of nonfarm employment across nonfarm industries in the San Antonio MSA. The biggest employer is government (18.2 percent), including 96,900 local government workers and 44,800 state and federal government workers. In comparison, the manufacturing industry accounts for 45,800 workers, or 5.9 percent of the nonfarm labor force. It is equal in size to the natural resources, mining, and construction industry, and slightly smaller than the financial services industry.

Figure 3: Non-farm Employment in San Antonio MSA, June 2005



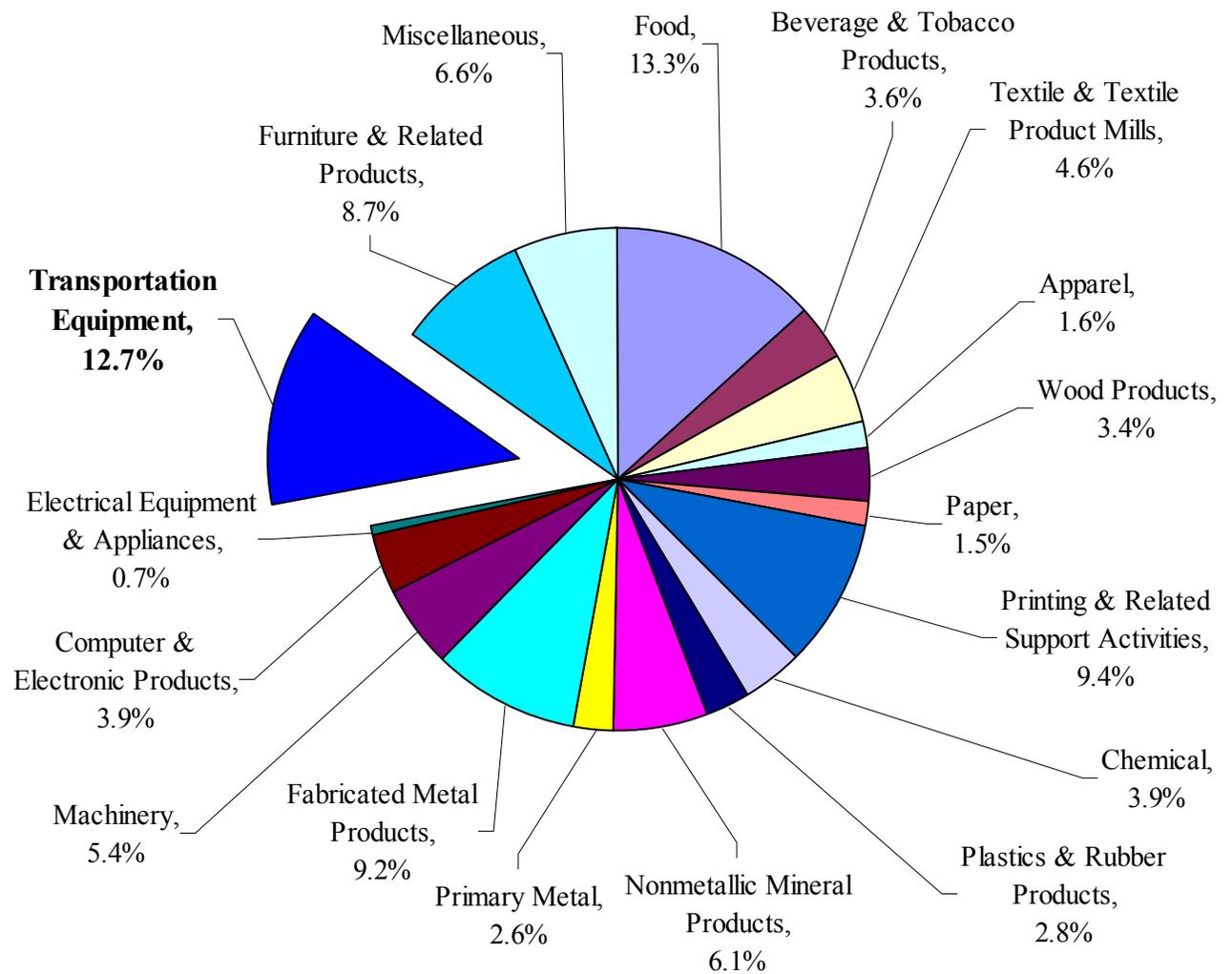
Source: Texas Workforce Commission

However, not all jobs are alike. Despite the relatively small share of the manufacturing industry, manufacturing jobs are vital to any region's economic structure. Manufactured products are more likely to be exported, bringing in new dollars to fuel the economy. Manufacturing activities generally add more value to the product than other types of activities, therefore supporting higher paying jobs than in more labor intensive industries such as retail trade, business services, and leisure.

The manufacturing base also generates other business activities for the economic area. For example, manufacturing firms hire professional services of outside firms, build large facilities, purchase parts and supplies from local and regional suppliers, purchase health services for their employees, and upgrade the skill level of the local workforce. Consequently, manufacturing has a disproportionate positive impact on the economy than most other industries. We return to this point later in the report.

San Antonio boasts a diversified manufacturing sector, with no overwhelmingly dominant industries (see Figure 4). However, Boeing Logistics Support Systems operates in one of the largest. The Texas Workforce Commission reports June 2005 employment in the San Antonio

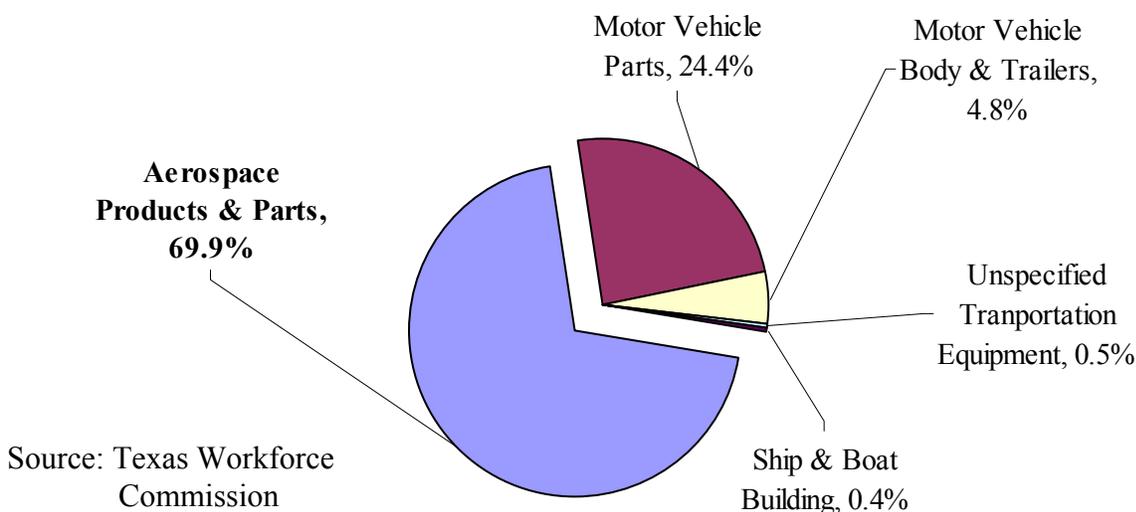
Figure 4: Manufacturing Employment in San Antonio MSA, June 2005



Source: Texas Workforce Commission

MSA food manufacturing subsector at 5,899 workers, which represents a 13.3 percent share of manufacturing employment.¹ However, transportation equipment manufacturing follows quickly behind, with 5,635 workers and a 12.7 percent share of area manufacturing jobs.

Figure 5: Transportation Equipment Manufacturing Employment in San Antonio MSA, June 2005



Of 5,635 jobs in the transportation equipment manufacturing subsector, 3,940 are for aerospace products and parts manufacturing. Because Boeing Logistics Support Systems performs such a wide variety of manufacturing-like activities we analyze their economic activities in relation to the aggregate of an industry cluster comprising three manufacturing subsectors: aircraft manufacturing (NAICS 336411), aircraft engine and engine parts manufacturing (NAICS 336412), and other aircraft parts and equipment (NAICS 336413), which comprise the aerospace products and parts manufacturing subsector. As illustrated in Figure 5, transportation equipment manufacturing employment in the San Antonio metropolitan area is dominated by aerospace products and parts manufacturing, which represents seven out of ten jobs in the subsector.

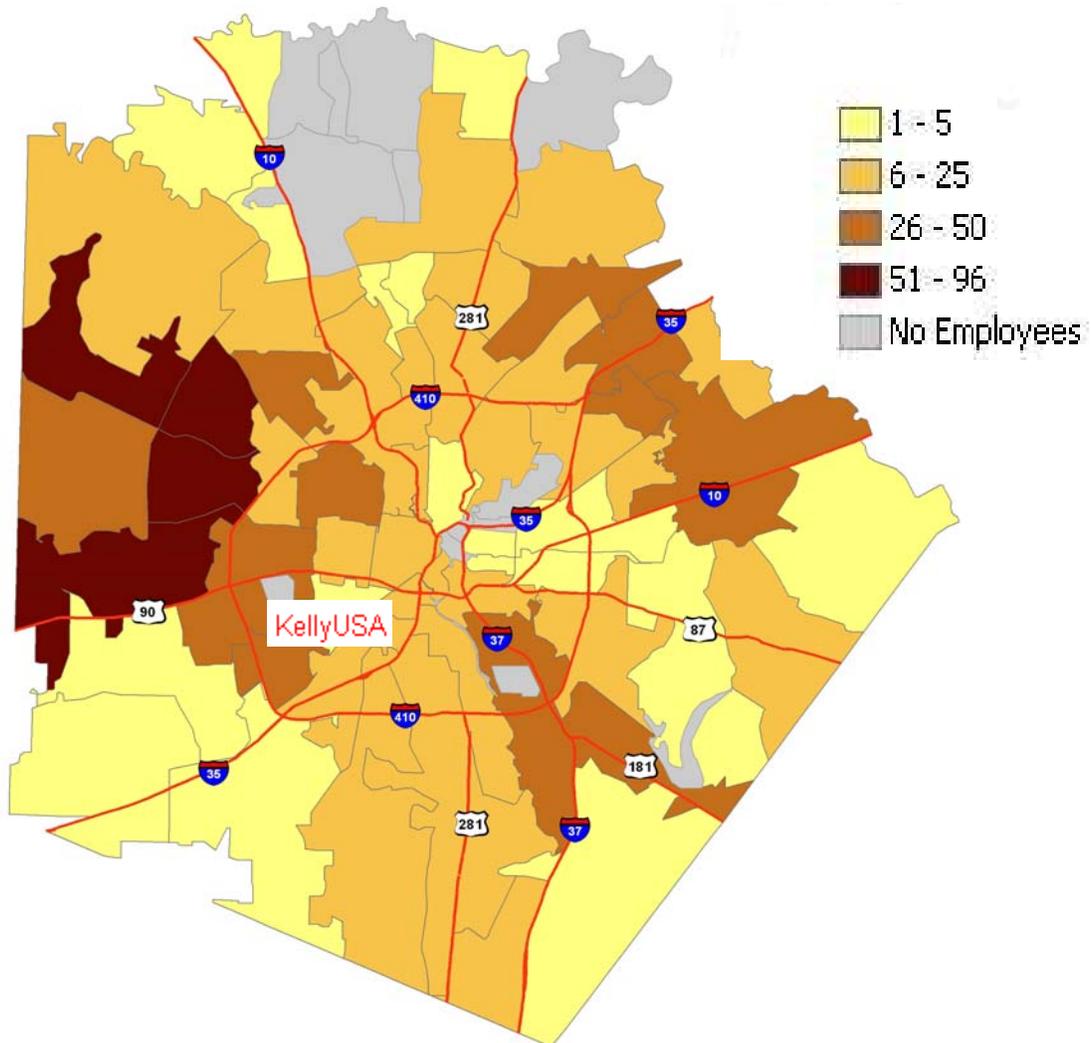
County Business Patterns (2002) reports 21 establishments in the aerospace products and parts manufacturing subsector in the San Antonio MSA and 137 in Texas. BLSS's primary San Antonio colleagues include Standard Aero and Raytheon in aircraft maintenance and repair; and General Electric, Lockheed, and Pratt & Whitney in aircraft engine maintenance and repair. Other notable manufacturers in this subsector are Cessna, Fairchild, and Sino Swearingen, all of whom engage in aircraft design and manufacturing in the San Antonio MSA.

¹ The Texas Workforce Commission reports 45,800 manufacturing jobs in the San Antonio MSA in June 2005. However, subsector wages is specified for only 44,301 of these jobs. Consequently, share of manufacturing jobs is calculated as a percentage of 44,301.

With 1,436 employees at year-end, BLSS accounted for over one-third of the area aerospace product and parts manufacturing jobs. In short, BLSS is a substantial part of a subsector that accounts for a large share of manufacturing jobs in the San Antonio metropolitan statistical area.

BLSS employees are drawn from all parts of Bexar county. As Figure 6 indicates, the greatest concentration of employees commutes from the western side of the county. However, employees come from nearly all the zip codes in Bexar county, with concentrations including the northeast, southeast, and near west portions of the county. Some employees commute from outside the county.

Figure 6: BLSS Employment in Bexar County, Texas, by Zip Code



Reach into Kelly Air Force Base Redevelopment

Kelly Air Force Base in San Antonio was one of sixteen military installations that experienced reduction in 1995. U.S. military operations were completely curtailed, resulting in loss of an estimated 10,912 civilian jobs. Figure 7 summarizes civilian job loss and creation in the ten years since the 1995 round of Base Realignment and Closure (BRAC).

Figure 7: Civilian Job Loss and Recovery for 1995 BRAC thru September, 2004 ²

	Estimated Civilian Jobs Lost	Estimated Civilian Jobs Created	Recovery Percentage
Kelly Air Force Base, TX	10,912	5,296	49%
McClellan Air Force Base, CA	8,828	3,469	39%
Letterkenny Army Depot, PA	2,512	916	36%
Indianapolis Naval Air Warfare Center, IN	2,196	1,776	81%
Bayonne Military Ocean Terminal, NJ	2,015	995	49%
Fitzsimmon Army Medical Center, CO	1,612	1,116	69%
Louisville Naval Ordnance Station, KY	1,435	822	57%
Stratford Army Engineering Plant, CT	1,400	0	0%
Fort Ritchie, MD	1,373	42	3%
Memphis Defense Distribution Depot, TN	1,289	1,045	81%
Reese Air Force Base, TX	1,238	468	38%
Ogden Defense Distribution Depot, UT	1,105	2,468	223%
Savanna Army Depot, IL	436	103	24%
Sierra Army Depot, CA	374	7	2%
Seneca Army Depot, NY	273	1,205	441%
Fort, Pickett, VA	245	272	111%

Of the sixteen military bases in the 1995 BRAC, Kelly Air Force Base was hardest hit in terms of civilian job loss. However, the reconstituted KellyUSA has been able to attract and retain military contracts to continue some of the work that was originally conducted under the auspices of the federal government. Continuation of maintenance and modification for large aircraft by Boeing Logistics Support Systems is an example of the reclamation of civilian jobs. Of those military installations that faced reduction and closure in 1995, the former Kelly Air Force Base currently has the highest number of civilian jobs created (5,296, as of September 2004). A recovery of 49 percent of civilian jobs lost due to BRAC compares favorably with other 1995

² Holman, Barry W. 2005. Military Base Closures: Observations on Prior and Current BRAC Rounds. Washington, DC: United States Government Accountability Office, GAO-05-614.

base reduction recoveries to date. The most direct comparison is McClellan Air Force Base, another air logistics center downsized in 1995. McClellan's cuts were not as steep, and their recovery has not been as pronounced. Kelly's recovery success is due largely to its ability to attract productive tenants who can hire large numbers of San Antonio area laborers.

Boeing Logistics Support Systems is an important component of the Kelly Air Force Base redevelopment. According to the Greater Kelly Development Authority, BLSS accounts for 29.4 percent of private sector jobs and 17.2 percent of the marketable space. Their rent of 1.5 million square feet of KellyUSA space makes BLSS a principal anchor tenant.

II. Boeing Logistics Support Systems' Economic Impact

Boeing Logistics Support Systems' role in the San Antonio region and the Texas economy may also be quantified in dollar terms. This data is important to the community, Department of Defense customers, and area elected officials as well as for Boeing itself, to aid in decision-making regarding the optimal future of BLSS considering all its stakeholders' interests.

In addition to standard economic benefits of private business spending, businesses generate economic impact in the form of recirculated spending derived from a large employment and expenditure pattern. Traditional methods to assess economic impacts of industry were used in this report, beginning with collection of all the direct expenditure and employment data for a representative year of BLSS operations. Data from the most recent financial reporting period of April 2004 through March 2005 was compiled from BLSS financial statements, contracts, and operating reports to determine the direct impacts. With these as a basis, the overall ripple-effect on indirect and induced spending are derived.

Direct impacts include the following categories:

- 1) Operations: Expenditure data by class for statewide expenditures mapped from BLSS financial statements to applicable industry sectors for a representative year of operations (2004). Operations spending primarily includes supplies, tools, repair and support equipment, aircraft parts, logistical and transportation services, business and professional services, vehicles, leases, fuel, utilities, insurance, and consultants.
- 2) Personnel and benefits: wages, salaries and benefits of direct labor and support staff employed directly by BLSS at year-end 2004.
- 3) Capital expenditures: Uses and sources of capital expenditures, which totaled approximately \$6.8 million in 2004, were mapped into applicable industry sectors for fiscal year 2004. Over the past eight years BLSS capital expenditures have totaled \$82.7 million, so the 2004 increment is less than the annual pro-rata amount. Capital expenditures have included a chemical strip gear facility, infrastructure upgrades, a hangar door, blast fences, and a parts cleaning facility. BLSS makes capital improvements through a combination of corporate allocations and grants or contracts with public and private investors.

- 4) Tuition reimbursement: For employee skill upgrades and development, and for career advancement. These expenditures totaled \$2 million in 2004.
- 5) Charitable contributions: Along with its employees, BLSS contributed \$400,000 to local charities in 2004. The Boeing Employees Community Fund donated \$255,775, while BLSS corporate added \$144,225. Beneficiaries are 30 organizations, including: Boys & Girls Club of San Antonio, Girl Scouts of the San Antonio Area, local ISDs K-12 educational partnering, Elf Louise, Fisher House, San Antonio Zoo and the American Diabetes Association.

Figure 8: Boeing Logistics Support Systems' Direct Economic Impacts, 2004

Operations	\$ 43,000,000
Personnel and Benefits	\$ 111,500,000
Capital Expenditures	\$ 6,800,000
Tuition Reimbursement	\$ 2,000,000
Charitable Contributions	\$ 400,000
Total	\$ 163,700,000

As is typical in economic impact studies of this type, these direct quantifiable impacts are used to measure indirect and induced effects of the presence of Boeing's San Antonio operations within the context of the state economy.

What are Economic Impacts, and How are They Calculated?

An economic input-output software called IMPLAN (MIG, Inc.) is used to estimate the economic impacts of spending that occur through backward linkages in the Texas economy. Such linkages capture the steps taken backwards in Boeing Logistics Support Systems' business processes to add value and produce its final products: repaired, overhauled and updated aircraft along with logistics and support services. This takes a specialized set of business processes:

- contract marketing and management to meet Department of Defense and worldwide fleet user requirements;
- extensive specialized direct labor of a highly skilled workforce for MRO services;
- support labor and administration per Department of Defense customer requirements;
- parts for all fleets serviced and their changing generations of technological advancement;
- 208 Texas (and over 700 non-Texas) subcontractors and suppliers for a variety of goods and services;
- including subcontractor management and coordination with strategic partners also located at KellyUSA (World Wide Technologies, North American Aviation Services, Triumph);
- leasehold interest, development and maintenance of unique facilities, featuring the world's largest aircraft hangar, plus a 3.5 million square foot ramp area and joint-use runway shared with adjacent Lackland Air Force Base;

- technological assets from Boeing fleet production experience;
- innovation, design and application of new avionics solutions;
- installation of new aircraft mission and task packages;
- environmental, worker safety, and security compliance;
- civil and defense authorities support for Boeing;
- anchor KellyUSA base redevelopment efforts; and
- being a good corporate citizen for BLSS's hometown of San Antonio through charitable and civic engagement activities.

All these business processes are assembled at KellyUSA to enable this value-added activity of major aircraft program MRO to occur in San Antonio, Texas, through BLSS instead of occurring in another region or with another company. All these steps in the value-added process must be efficient for BLSS to sustain competitive viability in performance of its current contracts and in future bidding cycles for extension and expansion of these major aircraft system workloads commencing in 2009.

These core business processes also have large price tags, paid by the Department of Defense and other customers, representing new "outside" resources flowing into the San Antonio and Texas economies. This is an important point in any economic impact analysis: virtually all payments to BLSS represent a net gain to the local and state economies, since none of BLSS's direct customers (principally the federal government) are based in Texas. Texas contributes an overall share of 7.3 percent of Federal taxes, a portion of which supports the Department of Defense, a smaller portion of which supports the Air Force, and yet a smaller portion of which supports these specific MRO contracts. Therefore, a substantial net gain of new resources versus the low Texas share of its costs flows into BLSS's Texas operations. These resources appear as forward linkages recycling throughout the region and state where they are spent and re-spent several times, which can be quantified using "multipliers."

The forward steps taken by all these actors are estimated to describe how the direct impact benefits of BLSS related expenditures and employment are re-circulated throughout the economy, in further business and consumer expenditure patterns for this industry. These are manifested in further business and personal spending and investments, such as:

- hiring by BLSS subcontractors and suppliers;
- plant, equipment, and inventory expansions;
- payments to second and lower tier suppliers and subcontractors;
- business, financial, and professional services;
- consumer housing and other major purchases, such as cars, appliances, and furnishings;
- consumer food and beverage, apparel, travel, and entertainment;
- family health, education, and quality of life improvements; and
- greater tax and public service benefits for state and local governments.

To calculate the monetary effects of the BLSS industry pattern for these linkages, the IMPLAN model uses benchmark tables provided by the Bureau of Economic Analysis (National Income and Product Accounts) as well as other statistical data. Minnesota Implan Group (MIG, Inc.,

IMPLAN's developer) provides the most current economic and demographic data available for use with IMPLAN so that it is customized for the economic region being studied. IMPLAN is, in a sense, a general accounting system of the economic transactions taking place between industries, businesses, and consumers in an economy. The result is an estimate of the impacts of direct spending on total output (sales), personal income, taxes, and employment. By expanding the analysis beyond the direct impacts, IMPLAN provides a more complete picture of the total economic effects of business activity.

Direct effects are the changes in local business activity (increased sales) as a direct consequence of business activity (spending).

Indirect effects are the changes in activity (retail, wholesale, and producer levels) for suppliers to the directly-affected businesses.

Induced effects are further impacts on spending for food, clothing, shelter, and other consumer goods and services as a consequence of the change in workers and payroll of the directly and indirectly affected businesses.

More detail on IMPLAN and its estimation procedures is included in a methodological appendix at the end of this report.

Findings: Economic Impacts of Boeing Logistics Support Systems in 2004

At the end of 2004, Boeing Logistics Support Systems employed 1,436 employees on-site at KellyUSA. Most of these workers (1,036) were hourly production staff who earned an average salary of around \$62,000, which is above the area prevailing wage for all workers. This is also well above the area's prevailing wage for aircraft workers and service technicians, a category that includes some salaried workers, which the Texas Workforce Commission puts at \$36,216 in 2004.

In 2004, BLSS paid \$111.5 million in salaries and benefits³, \$29.2 million to Texas suppliers and over \$22 million in various other items for a direct expenditures total of \$163.7 million. As illustrated in Figure 9, this direct spending translates into an additional \$39.5 million of indirect economic activity, plus \$153.9 million of induced economic activity in the state of Texas. Economic output of direct, indirect and induced spending totaled \$357.1 million in 2004.

One component of total output is proprietor income and employee compensation, which reflects increased employment, pay levels, and proprietorship income in the state due to BLSS spending. Direct, indirect and induced proprietor income and employee compensation result in spending totals of \$167.4 million. Another component is increase in business taxes derived from the presence of BLSS operations. Business taxes as a result of direct, indirect and induced spending total \$13.2 million.

³ Direct spending on salaries and wages is conservative because it includes only salaries and benefits paid to those workers employed at 2004 year-end. It excludes those workers who left during 2004.

Figure 9: IMPLAN Estimates of Boeing Logistics Support Systems 2004 Texas Impacts

Economic Impacts:	Direct	Indirect	Induced	Total
Output (\$ Mil)	\$ 163.7	\$ 39.5	\$ 153.9	\$ 357.1
Proprietor Income and Employee Compensation Component (\$ Mil)	\$ 53.8	\$ 20.3	\$ 93.3	\$ 167.4
Business Taxes Component (\$ Mil)	\$ 6.3	\$ 1.9	\$ 5.0	\$ 13.2
BLSS San Antonio employees	1,436			
BLSS contract and partial year employees; and Texas suppliers employees	+ 1,336			
Employment	2,772	335	1,067	4,174

Finally, with BLSS and its 208 Texas suppliers and subcontractors directly employing an estimated 2,772 Texans to perform its work, related economic activity calculations show indirect employment totals of 335 and the induced employment totals of 1,067. Total Texas employment as a result of direct, indirect and induced employment is 4,174.

Analysis of Findings

- *Contributing toward manufacturing job growth, and dominating its industry cluster*

The San Antonio metro economy is underrepresented in the manufacturing sector, at 5.9 percent of total employment compared with 9 percent manufacturing jobs in Texas and 11 to 12 percent in the nation. Manufacturing provides higher value-added activity and generally involves high-skilled and higher-paid jobs. The predominance of its products is sold to non-local customers, which brings substantial new resources into the local and state economies.

This is certainly the case with Boeing Logistics Support Systems, which contributes to the diversification and strengthening of the regional economy. San Antonio's manufacturing industry is varied in its activity, and has historically lacked large, dominant employers in any one subsector. In aggregate, only the manufacturing sectors of transportation equipment and food processing can be considered dominant, representing 13 percent each of the metropolitan area's total manufacturing employment. Within the transportation equipment subsector, BLSS clearly dominates its industry cluster at this time. As indicated in Figure 10, BLSS represents 36.4 percent of the cluster employment share locally.

Figure 10: Industry Cluster Employment Share, year-end 2004

	Total industry cluster employment	BLSS employment	Percent of employment
Texas	38,306	1,436	3.7%
San Antonio MSA	3,940	1,436	36.4%

- *Providing higher than average earnings*

Besides representing a dominant actor within this industry cluster, the earnings differentials of BLSS jobs in comparison with other manufacturing sector jobs, and in comparison with all sectors of employment in San Antonio are substantial. As indicated in Figure 11, hourly technical workers at BLSS earned an average annual wage of approximately \$62,000 in 2004, and all workers earned an average of around \$66,000. In contrast, the prevailing average wage for aircraft service technicians in the San Antonio MSA is just over \$36,000. The difference points to the large proportion of skilled workers in the BLSS workforce and the willingness of BLSS to pay a competitive wage.

For many decades the San Antonio economy has been productive in growing its tourism and visitor industry as one sector of competitive advantage, and has also relied heavily on government and military installations for jobs. In the case of tourism, with 11 percent of the workforce, many jobs have been created but offer generally average-to-lower wages. Additionally, from a previous highpoint of 29 percent in the 1970s, government employment has shrunk to now represent 18 percent of the local non-farm workforce. So as the region strives to recalibrate its economy with a better mix of higher-skilled and higher-paying jobs, maximizing the contributions of jobs such as those offered by BLSS is critical.

Figure 11: San Antonio MSA Salary Comparison, 2004

	Average Annual Wage	Number of Workers
All Industries	\$ 32,535	606,007
Manufacturing	\$ 36,969	45,800
Transportation Equipment Manufacturing	\$ 50,005	5,635
Aerospace Product & Parts Manufacturing	\$ 48,857	3,940
- Aircraft Manufacturing	\$ 51,565	2,088
- Aircraft Engine and Engine Parts Manufacturing	\$ 48,264	1,438
- Other Aircraft Parts & Equipment Manufacturing	\$ 37,262	414
Aircraft Workers & Service Technicians (includes salaried workers)	\$ 36,216	nr
BLSS San Antonio, Entire Workforce	\$ 66,000	1,436
BLSS San Antonio, aircraft Workers & Service technicians (hourly)	\$ 62,000	1,036

Sources: Texas Workforce Commission 2004 data (private, non-farm) for San Antonio Metropolitan Statistical Area figures and BLSS; nr = not reported by the Texas Workforce Commission.

- *Higher value-added activity*

The total magnitude of these business activities, along with the new money brought into the community by “export” sales to its customer base outside of Texas, creates a multiplier effect that magnifies the value of direct spending. Multipliers are factors indicating the degrees of spending and re-spending (indirect and induced effects) in particular industries and economies being studied. When employees and suppliers receive compensation from BLSS, they spend portions of these resources with local and in-state businesses and their employees. Further rounds of such spending continue until leakages through spending outside the jurisdiction ultimately balance with the new resources brought into the economy in the first place. As summarized in Figure 12, the economic activities of BLSS are estimated to multiply throughout the Texas economy at a rate of 3.1 times for personal income, 1.5 times for employment, and 2.2 times for total spending.

Figure 12: BLSS Texas Multipliers

Economic Impacts:	Direct	Multiplier	Total
Personal Income (\$ Mil)	\$ 53.8	3.1	\$ 167.4
Employment (BLSS and Suppliers)	2,772	1.5	4,174
All Output (\$ Mil)	\$ 163.7	2.2	\$ 357.1

As a high value-added activity, requiring a generally higher-skilled and higher-paid workforce, with extensive upstream supplier and subcontractor relationships, these multipliers are higher than would typically be found in most other area industry clusters.

Workers:

With a legacy carried-over from the former history of Kelly Air Force Base Air Logistics Center, San Antonio workers have developed strong competencies in aviation MRO skills and trades. Many observers credit generations of Kelly civil service employment and skills development opportunities as the primary factor in establishing a strong Hispanic middle class and opportunities for upward mobility in San Antonio. BLSS San Antonio recognized this factor as a strong asset in terms of workforce availability in deciding to establish themselves here in 1998. Since then this legacy has continued with a new generation of MRO specialized workers now employed at KellyUSA.

Businesses:

BLSS did business with 208 Texas suppliers and subcontractors in 2004. This includes 109 in Bexar County (San Antonio) alone. Collectively, these companies received \$29.2 million in compensation for their goods and services in 2004, and added employment staff directly linked to their BLSS support activity.

Where business goals and social goals intersect to place an emphasis on development of Texas small and minority-owned businesses, BLSS has made it a priority to do its part as well. Given Texas and San Antonio demographic trends where Latinos and other minority groups are increasingly dominating the workforce ranks (56 percent Hispanic at BLSS), it is important that they participate successfully in business ownership. Outreach efforts to identify small

disadvantaged supplier companies, and mentoring efforts to involve them in helping BLSS provide ultimate customer value, are part of their corporate policies. Examples include:

Aerospace Products Company

- Small, disadvantaged, women owned, Native American business
- Five year contract worth over \$3 million per year
- Employs 20 people
- Opened facility at KellyUSA
- FY2003 BLSS Small Business Subcontractor of the Year

AVCHEM

- Supplier of all chemicals and chemical management services
- Contract for past three years
- Contract renewable on a month to month basis worth \$7 million
- Total of seven employees at KellyUSA site

Aviation Technologies

- Small minority women owned business
- Thrust reversal modifications supplier
- Estimated Boeing investment for the 2006 fiscal year is \$1.7 million
- Open facility at KellyUSA

Future Potential for Sustained Economic Impacts of Boeing Logistics Support Systems

The nature of the defense business is for set terms to provide specific workloads. Impacts of economic output and job creation for this industry segment are typically measured in increments of five-year contracts and their potential extension periods. Department of Defense contracting is becoming increasingly competitive, so no guarantees for sustaining these impacts can be made beyond the competitive positioning efforts of Boeing Logistics Support Systems and its partners. An emphasis on continuous production improvements through lean manufacturing processes, and further overhead cost reductions, are the current focus of their management entering an upcoming round of major workload re-competitions, most notably for the 2009 thru 2013 time frame.

BLSS workloads for the KC-135 PDM and KC-135 GATM are in contract negotiation for short-term extensions for a competitive bidding round in 2007. The KC-10 CLS workload is due for re-bidding in 2006. The KC-135 programs represent approximately 43 percent (600 workers), and the KC-10 program represents another 21 percent (300 workers) of BLSS employment. Consequently, almost two-thirds of BLSS workers and BLSS's continued viability as a business unit operating at KellyUSA depend on being competitively positioned to win the KC-10 and KC-135 contracts for the 2009 thru 2013 contract term.

To give a general approximation of what is at stake for the Texas and San Antonio area economies based upon the outcomes of the Department of Defense MRO workload re-competition cycles, and the viability of continued BLSS operations at KellyUSA or not, Figure 13 presents a forecast of future economic impacts for BLSS. The forecast begins with the total output and multiplied total impact reported for 2004 in Figure 9.

Even if a business stays at steady-state, its future outputs are subject to the value of inflation. To derive an estimate of increases in value per year, we consulted the producer price index (PPI) program at the U.S. Bureau of Labor Statistics. The PPI measures the average change over time in the selling prices received by domestic producers for their output. The PPI program maintains change in price data for a variety of industries, including aircraft engine and engine parts manufacturing. To estimate the average change in aircraft engine and engine parts manufacturing over the past decade, we consulted the PPI data and calculated annual industry inflation between 1994-1995 and 2003-2004. During this time frame, the smallest price change was 0.7 percent between 1997 and 1998, and again between 1998 and 1999. The largest price change was 4.9 percent between 2002 and 2003, and again between 2003 and 2004. However, over the decade, the average annual change in selling prices for aircraft and engine parts manufacturing was 2.21 percent.

Figure 13: Forecast of BLSS San Antonio Economic Impacts in Texas (\$ Mil.)

	Direct Output	Total Output
2004	163.7	357.1
2005	167.3	365.0
2006	171.0	373.1
2007	174.8	381.3
2008	178.7	389.8
2009	182.6	398.4
2010	186.7	407.2
2011	190.8	416.2
2012	195.0	425.5
2013	199.4	434.9

Figure 13, then, forecasts BLSS output and total impact by increasing 2.21 percent annually through 2013. This projection is based on several assumptions that will change the 2013 total impact as BLSS outputs deviate from industry averages. One assumption is that the industry average inflation of 2.21 percent for the past decade will hold for the coming decade. Second, we assume that 2004 is a representative base year for estimation. Third, we assume that BLSS will maintain levels of business comparable with 2004 over the coming decade. Changes in prevailing economic prices and BLSS business activity will impact the 2013 estimate. Nonetheless, absent changes in the level of business, these industry assumptions suggest that BLSS economic impacts will grow from current total impacts of \$357.1 million in 2004 to

\$434.9 million in 2013. The next five-year contract period, 2009 thru 2013, totals an estimated \$2.1 billion in total economic impact for the Texas economy.

III. Summary Conclusions

Boeing Logistics Support Systems is a unique and significant contributor to the United States' defense preparedness, by providing critical aircraft systems maintenance, repair, overhaul and support services to optimize fleet utilization for the KC-135, C-17, KC-10 and C-130 programs under contract at this time.

BLSS supplier relationships reach across Texas with 208 active suppliers providing \$29.2 million in goods and services, averaging \$140,000 each. Bexar County (San Antonio) enjoys the greatest supplier concentration with 52 percent of the companies and 83 percent of the financial commitments overall in 2004.

BLSS is a dominant actor within the local manufacturing arena and provided nearly half of the aerospace products and parts subsector jobs in 2004 for the metropolitan area. Considering that the San Antonio economy has only 5.9 percent manufacturing jobs, sustaining the BLSS contribution toward such higher-skilled and higher-wage jobs is important for a healthy and diverse economy.

Manufacturing jobs typically have a higher positive economic impact, are better paid, add greater value, and bring more new dollars into the local and state economies. The BLSS production workforce earns an annual average of \$62,000 versus the metro area average of nearly \$33,000 for all workers and just over \$36,000 for comparable aircraft industry workers.

BLSS is the principal anchor tenant at KellyUSA, the redeveloped Kelly Air Force Base, contributing 29.4 percent of the jobs and leasing 17.2 percent of the marketable space. KellyUSA has been the most successfully redeveloped large military facility from the 1995 BRAC round, due in large part to Boeing's decision to locate BLSS operations there in 1998.

BLSS direct economic impacts in 2004 totaled \$163.7 million in expenditures, including \$111.5 million in salaries and wages, \$29.2 million to Texas suppliers and \$22 million in other categories. Multiplier effects of BLSS rippling through the Texas economy provided an additional \$39.5 million indirect effect through all levels of supplier activity, plus another \$153.9 million induced effect through re-spending of added worker and business income. This resulted in a total output increase for the Texas economy of \$357.1 million for 2004 due to the presence of BLSS San Antonio.

BLSS's 2004 direct employment of 2,772 workers (including partial-year and supplier employees) leveraged creation of another 1,402 indirect and induced jobs, for a total employment impact in 2004 of 4,174 Texas jobs.

BLSS is in a 20-year lease at KellyUSA and facilities investments exceeding \$82 million have been made since 1998 to position BLSS for long term competitiveness. However, Department of

Defense MRO contracts are open to potential bidders that could relocate major workloads to other parts of the country.

Approximately two-thirds of the BLSS workload contracts are entering re-competition rounds for new 5-year terms, generally running from 2009 to 2013. These include the KC-135 and KC-10 workloads currently employing around 900 BLSS workers in the San Antonio area.

A forecast of the BLSS future impacts on the Texas economy from 2009 to 2013, based on this study's assessment of 2004 as a representative year, indicates that over \$2 billion in total state economic output is dependent on their continued viable operations and competitive contractual success.

Methodological Note: Economic Impact Analysis

The purpose of this study was to provide an estimate of the short run economic impacts on the regional economies of the San Antonio Metropolitan Statistical Area (MSA) and for the state of Texas as a whole. For our analysis, we used the eight-county MSA as defined in December 2003 (Atascosa, Bandera, Bexar, Comal, Guadalupe, Kendall, Medina and Wilson Counties).

The first part of our analysis required us to estimate the direct expenditures within the regions. These direct impacts were measured for the 2004 fiscal year. The data for estimating the economic impacts of Boeing Logistics Support Systems were derived from financial statements, budget data and other information provided by BLSS personnel. A multiplier effect was then measured for each one of these direct economic impacts through the IMPLAN Input/Output model. IMPLAN is a widely used input/output modeling software first developed by the United States Forest Service in 1979, and now marketed by Minnesota IMPLAN Group (MiG, Inc).

The latest regional and state economic data (2002) were used for this report. The model utilizes benchmark tables provided by the Bureau of Economic Analysis as well as other statistical data to model transactions occurring within a region, state or the nation. IMPLAN is, in a sense, a general accounting system of the economic transactions taking place between industries, businesses, and consumers in an economy and estimates the impacts on total output (sales), personal income, indirect business taxes, and employment. By expanding their analysis beyond the direct impacts, IMPLAN provides a more complete picture of the economic effects of transactions. The latest available economic data from IMPLAN (2002) were used to estimate the indirect and induced impacts of BLSS.

Operational Expenditures

Operational expenditures were provided by BLSS. These included gross payroll by hourly workers, managers, other exempt and non-exempt workers, and engineers; group insurance; leases; utilities; compensation insurance; savings plan; tuition reimbursement; state sales & property tax; payments made to suppliers; and capital expenditures. All categories were allocated to single or aggregated IMPLAN sectors except for salaries and related costs. Salary and wage related costs were analyzed separately.

Related IMPLAN sectors include professional fees and services (aggregate of sectors 423-424 and 437-460 – various professional services); materials and supplies (aggregate of sectors 403-406, 408-412 – various retailers); utilities (sector 498-State and local government utilities); telecom (sector 422-telecommunications); repairs and maintenance (aggregate of sectors 453, 458, 460, 484-486 – various repair services); and rentals and leases (aggregate of sectors 432, 434, and 435 - various rental services).

Capital Expenditures

Capital expenditure data were provided by BLSS. These expenditures were allocated to IMPLAN sector 38 (commercial and institutional buildings). The IMPLAN model estimates local and non-local expenditures based on the underlying industry makeup of each region and the propensity to buy across industries (local purchase coefficients). The model local purchase

coefficients were applied to each sector in the analysis. The direct expenditures for capital were then modeled in IMPLAN to estimate the additional impacts to the regional economy.

Salaries and Wages

In order to estimate the economic impacts of BLSS payroll, the direct salary and wage expenditures were discounted by 15 percent to account for average tax burden, with the remainder representing disposable income. The remaining amount was then applied to the median household range for the selected MSA and the state. IMPLAN models households as institutions based upon benchmarks of consumer expenditures provided by the Bureau of Labor Statistics. Indirect and induced expenditures were derived from the model results.

Methodological Note: Contextual Data

Contextual data in this report comes from unemployment insurance reports by Texas businesses to the Texas Workforce Commission. The timeliness and detail of this data make it attractive for many reports. However, the data have several limitations that result in likely undercounting of economic activity within subsectors. In 2002, Richard Butler and Mary Stefl compiled their most recent iteration of Aerospace Industry in San Antonio. They list two reasons why Texas Workforce Commission data likely results in undercounting. First, contract laborers are likely counted in the industry of their employer firm rather than the firm in which they are providing contract labor. Second, some companies may be incorrectly coded according to industry. However, since industry coding at the establishment level is not provided by the state, researchers are unable to assess the scope and impacts of this problem.

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