

# LOGAN INTERNATIONAL AIRPORT'S EVOLVING ROLE IN THE NEW ENGLAND ECONOMY

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# Logan Airport's Evolving Role in the New England Economy

## Major Findings

Prepared for: The New England Council  
Prepared by: Economic Development Research Group  
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**Changing Times.** Logan Airport and the entire New England economy have gone through a series of ups and downs over time. The tragic events of September 11 unfortunately served to further illustrate the interrelationship of the New England economy and its air service, as the drop in air travel affected a broad range of industries – from the hotel and convention industry to global high tech industries. While we cannot foretell how fast recovery will occur in the future, we do know that the relationship of the airport and the regional economy will continue as long as Logan Airport remains the dominant international and long-distance gateway to New England.

**The New England Economy Relies On Aviation.** The New England economy is more dependent upon air travel than most. More than half of the passengers who use the airport are traveling for business, which is far higher than the proportion of business travel nationally. The leading sectors of the regional economy – business and management services, high-tech manufacturing and financial services – are reliant on air travel, spending 25 to 50 percent more on air services than the average U.S. industry. New England's reliance on air travel is due to:

- delicate and time-sensitive products that need to be shipped by air
- global trade partners including Europe and Asia
- business and professional services with clients worldwide
- New England business with international satellite and corporate offices

Logan Airport also stands out from most other airports in its high percentage of final destination passengers. Logan ranks third among all major U.S. airports in the terms of final destination passengers, who represent over 90% of all scheduled passengers. With increasing emphasis on international travel, Logan is the only means of nonstop access to 90 percent of international destinations that can be reached from the region and ranks eighth among U.S. airports as a gateway for international destinations. In terms of economic impact, direct "origin-destination" air travel from visitors to the area brings an inflow of new money spent by outsiders when they leave the airport for personal visits and/or business in the region. By contrast, transfer passengers, who merely change planes at the airport, contribute little to the regional economy.

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**Regionalization.** Region-wide aviation planning has helped spur growth at airports across central and southern New England and improved available consumer choices. As a result, Logan Airport has become increasingly focused on serving passengers in its core service area within the belt of I-495. In measuring changes in passenger volume since 1990, the largest increase has been by business travelers coming from within the Route 128 beltway, followed by the number of business travelers coming from between Rt. 128 and I-495. The greatest decline has been in personal travelers coming from beyond the I-495 belt.

**Total Economic Contribution of Logan International Airport.** Logan Airport's contribution to the region's economic output has totaled \$6.5 billion annually (based on year 2000 passenger levels). Activities related to the operation of Logan Airport have supported more than 25,000 jobs and generated \$2.2 billion of economic output. Activities associated with spending by Logan air travelers visiting the region have supported an additional 75,000 jobs and \$4.3 billion of economic output.

**Overall Economic Impacts of Logan Airport (based on year 2000 passenger levels)**

Category of Economic Impact	Generated by Activities at Logan Airport	Generated by Visitors Using Logan Airport	Total
<b>Jobs</b>	25,625	75,016	100,641
<b>Annual Income (payroll)</b>	\$0.940 billion	\$1.768 billion	\$2.708 billion
<b>Annual Economic Output (business sales volume)</b>	\$2.191 billion	\$4.279 billion	\$6.470 billion

**Logan Airport's Future Impact.** There are many uncertainties concerning the future bounce-back of air passenger activity. A conservative scenario would be for Logan Airport's domestic passenger volumes to remain 25% below year 2000 levels, while cargo and international activities remain 20% lower and basic facility operation remains fully in place. If sustained, the reduced airport activity and reduced visitor spending in the region would represent a loss of roughly \$1.4 billion of annual economic output, including losses of 22,000 jobs and \$600 million of annual income for New England residents.

A more optimistic scenario would be for activity at Logan Airport to return to prior levels of activity within a year and then continue to grow as previously forecast. The positive consequences of that scenario are clear. However, in that case Logan Airport could once again be put on a path towards increasing air delay, with growing costs also incurred by the region's air-dependent businesses. That optimistic scenario, while good for New England's economy in the short run, will also increase the need for strategies to address the problem in the longer run.

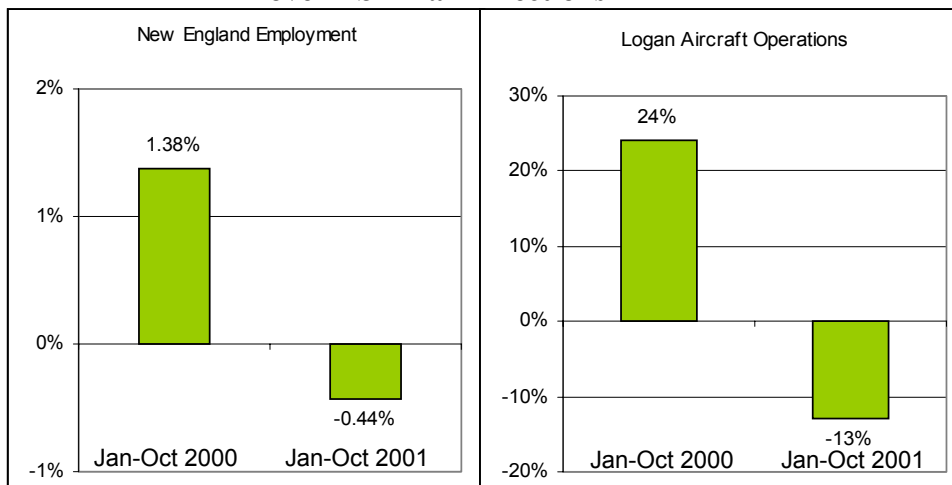
In the long run, Logan's market demand is based on strong fundamentals and there is no reason to suspect that the airport will not eventually recover. Logan's market area has one of the highest levels of reliance on local origin and destination traffic among airports in the US (88%), Logan is one of the nation's busiest airports, no single airline dominates the market (3 carriers handle 52% of the passengers), Logan is one of the nation's major international gateways, and finally, this region's large and diversified economy supports a high propensity to travel.

## Perspective: Logan Airport's Role in Changing Times

Logan International Airport plays a critical role in meeting the transportation needs of Boston, New England and indeed, the nation. Logan Airport is this region's major gateway for international air travel, and is one of the top destination airports in the United States. Logan Airport also serves as the dominant transfer point for connections from outlying areas of New England to the West Coast and international air routes.

The tragic events of September 11 led to the closing of Logan Airport for four days followed by a drop in airline activity and passenger levels. This unfortunately served to further illustrate the interrelationship of the New England economy and its air service, as the drop in air travel directly affected a broad range of industries in New England – from the hotel and convention industry to global high tech industries. While the future course of recovery in Logan Airport's activity levels is not currently known, it remains clear that the airport will continue to have a major impact on the regional economy. This report is intended to explain the continuing, and in fact growing, nature of that relationship.

### The New England Economy and Logan Airport Activity Levels Move in Similar Directions



*Source: Federal Reserve Bank of Boston and Massport.*

Logan Airport's role within the local, regional and national transportation and economic systems is evolving over time. It has been affected by a combination of higher fares (compared to those offered by discount air carriers serving some smaller regional airports), regional aviation planning (encouraging more use of regional airports by residents of outlying areas), and very real constraints on Logan Airport's capacity. As a consequence, the largest share of recent air travel growth in New England, especially price-sensitive leisure travel, has shifted to other airports within the region. At the same time, however, Logan Airport has assumed greater importance in

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servicing the needs of business travelers and passengers requiring international and other long-haul air travel services to and from New England.

Today, Logan Airport is at a critical juncture. In 2000 Logan accommodated 27.4 million passengers. It is currently ranked as the 18<sup>th</sup> busiest US airport based on passenger volume and the 12<sup>th</sup> busiest based on aircraft arrivals and departures (Airports Council International, Worldwide Airport Traffic Report, July 2000). This level of activity also caused delays. According to the Federal Aviation Administration (FAA), Logan Airport has been one of the most delayed airports in the nation. FAA statistics show that Logan was the 6<sup>th</sup> worst US airport in terms of total delays and the 2<sup>nd</sup> worst in terms of arrival delays during the year 2000 and first half of 2001. Today we face uncertainty, with possibilities for continued losses to New England's economy if air service and travel volumes do not return to previous levels, but also prospects for further delays if air travel does return to previous levels and growth rates. In the latter case, it will again be important for decisions to be made concerning options affecting Logan Airport's capacity and ability to handle future growth.

As the public discussion and debate about Logan Airport continues, it is important that this discussion take place with accurate and useful information concerning the role of Logan Airport and the air services it provides for the economy of the Boston area and all of New England. This report is intended to address that need by examining four issues:

- The air travel services that Logan Airport provides, and how its role has been changing.
- The elements of Boston's and New England's economic base that depend on air services provided at Logan Airport.
- The contribution of Logan Airport to the regional economy.
- The impact that decreased levels or efficiency of air service at Logan Airport might have on other elements of the regional economy.

By examining these four issues, this report will aid public discussion by providing a better understanding of the potential impact of proposed policies and alternative future plans for the airport. Ultimately, an examination of the economic stakes in question underscores the importance of achieving effective solutions that maintain active and efficient air service for the region.

## 1. Key Air Services Provided by Logan Airport

Logan Airport is increasingly specialized in its air service function, which has four main aspects:

- Logan Airport serves as the international gateway to and from New England.
- Logan Airport serves as a final destination, rather than a transfer facility.
- The majority of the passenger base at Logan Airport is composed of business travelers.
- The passenger base at Logan Airport is increasingly focused on service within I-495.

### *Logan is New England's international gateway for people and goods*

As one of the most internationally oriented of all U.S. airports, Logan serves as a gateway between New England and the world. Of all international destinations accessible via nonstop service from within the region, 90% are accessible only from Logan Airport. Of the 155 nonstop markets, both domestic and foreign, accessible from Logan, Hanscom, Manchester, Providence, and Worcester Airports, Logan Airport serves 97 of these markets - approximately 63% of all nonstop destinations.

Flights to international destinations comprise 24% of Logan Airport's total nonstop flights, making Logan one of the most internationally focused airports in the nation. (See Exhibit 1-1.)

**Exhibit 1-1. Importance of International Travel at Major U.S. Airports (June 2001)**  
*(Ranked by % of accessible markets that are international markets.)*

International Focus (50% +)	High International Importance (20-49%)	Low International Importance (less than 20%)	
New York JFK Miami	New York Newark Los Angeles San Francisco Houston Intercontinental Atlanta Chicago O'Hare <b>Boston Logan</b> Philadelphia	Dallas/Fort Worth Seattle/Tacoma Orlando Detroit Phoenix	Minneapolis Las Vegas Denver St. Louis NY LaGuardia

*Source: OAG Schedule Tapes, June 2001*

This international focus also is reflected in the passenger mix served by the airport: of all seats on all flights at Logan, approximately 14.3% of them are on international flights. In this respect, Logan ranks eighth among major U.S. airports for its international focus.

Part of Logan Airport's emphasis on long-distance travel services is due to the attractiveness of New England for foreign travelers. In 1999, international visitors to Boston and New England grew to 1.6 million, an increase of 3% from the previous year. Although international visitor

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activity increased the most for museums, galleries and other cultural attractions, shopping remains the number one activity of international visitors in the region. Participation in Boston conventions and meetings by international exhibitors and delegates also increased significantly. It is estimated that international visitors to New England totaled 1.7 million in the year 2000.

Besides serving as New England's gateway for air travelers, Logan International Airport is also the largest freight export gateway located within New England. Among goods that originate in New England and are shipped from New England to international destinations, Logan is the point of departure for 48% of the total value of goods, and 92% of cargo shipped by air. (See Exhibit 1-2.) The role of air cargo in the New England economy is further discussed in Chapter 2 of this report.

**BAE Systems, Information & Electronic Warfare Systems Division (IEWs)  
Interview with Gloria Ebbs, Travel Director**

BAE provides an example of how New England's knowledge based industries rely on air travel for client contact, and depend on Logan Airport for its international business travel. Headquartered in Nashua, N.H, IEWS designs electronics products for military use. This division of BAE has five regional operations and 4,500 employees in New Hampshire and Massachusetts.

Employees make approximately \$9.6 million worth of business trips each year to visit clients, all of which rely on air transportation. Top domestic destinations include airports in the Washington, D.C. area and on the West Coast. Employees traveling domestically use either Manchester or Logan Airport, depending on where the best price can be found.

International trips are also important for IEWS business but since Manchester does not offer international flights Logan is used for them.

**Exhibit 1.2. Value of Shipments from New England Ports, All Modes of Transport and Air Cargo, by Major Ports (year 2000)**

Port	Value of Shipments By All Modes in \$ Millions	Percent of Total
Logan Airport-Boston, Mass.	\$ 5,215	48.0%
Highgate Springs-Alburg, Vt	\$ 3,168	29.2%
Boston, Mass.	\$ 485	4.5%
Hartford, Conn.	\$ 273	2.5%
Derby Line, Vermont	\$ 289	2.7%
Burlington, Vermont	\$ 208	1.9%
Other 41 Sites	\$ 1,222	11.3%
Total	\$ 10,860	100.0%

Port	Value of Air Shipments in \$ Millions	Percent of Total
Logan Airport-Boston, Mass.	\$ 5,120	91.8%
Hartford, Conn.	\$ 226	4.0%
Burlington, Vermont	\$ 207	3.7%
Other 35 Airports	\$ 29	0.5%
Total	\$ 5,661	100.0%

*Note: Both tables account for goods which originated in New England.*

*Source: Massachusetts Institute for Social and Economic Research, based on US Dept. of Commerce data.*

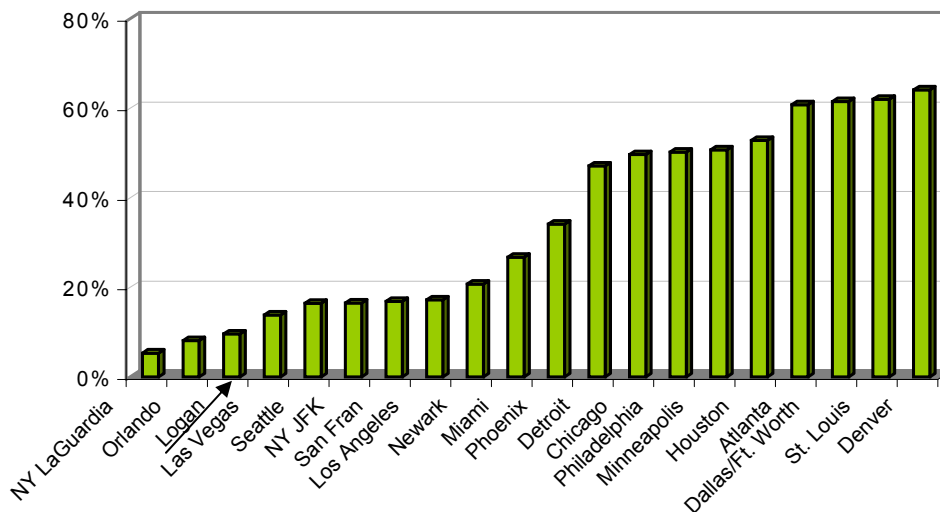


### **Logan Airport is a final destination for most travelers**

Logan Airport stands out from most other airports in its high percentage of final destination passengers. In terms of economic impact, direct “origin-destination” air travel from visitors to the area is by far the most important because it represents an inflow of new money spent by outsiders who actually leave the airport and visit or do business in the region. Transfer passengers, who merely change planes at the airport, contribute little to the regional economy.

Despite its important role as a connecting point for New England passengers, Logan is not a “transfer hub,” but is considered a “non-connecting hub” airport. Even among non-connecting hub airports, however, Logan stands out. According to the 2001 Smith Barney Hub Factbook and a Gate Demand Study by SH&E Consulting, Logan ranks third among all major U.S. airports in terms of final destination passengers, who represent over 90% of all scheduled passengers. (See Exhibit 1-3.)

**Exhibit 1-3. Transfer Flights as Percent of Total Flights at Major US Airports**



Source: SH&E Consulting, Gate Study, 2001

### **Business travel is the largest segment of Logan's passenger base**

Although the frequent flights that link Logan to multiple domestic and international destinations serve leisure travelers, use of Logan is highly oriented toward business travelers. This tendency reflects New England's attraction as a business location and the availability of lower cost options for leisure air travel at other airports in the region.

As the 1995 American Travel Survey results indicate, a high percentage of trips to and from the Boston Metro area are for business purposes. While only 23% of overall long-distance travel in

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the U.S. is business travel, 30% of Boston Metro residents traveling to the outside area are traveling on business, and 43% of outsiders who come to the Boston Metro area are traveling on business. (See Exhibit 1-4.)

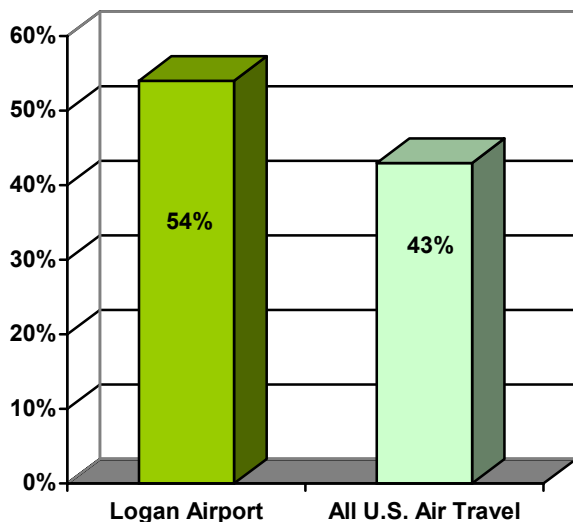
Logan Airport hosts a significantly higher percentage of business travelers than the national average. Of total Logan passengers in 1999, more than half, 54%, were business travelers, as compared to 43% of air travel in the United States overall. (See Exhibit 1-5.) Not surprisingly, data on length of trips made from Logan Airport show that over 30% of trips are for durations of three days or less, a finding consistent with the heavy orientation of Logan Airport towards serving business travelers.

**Exhibit 1-4. Long Distance Travel in U.S. and Boston Metro**

<b>Economic Sector</b>	<b>All Long-Distance Travel in U.S.</b>	<b>Trips by Boston Metro Residents to Outside Area</b>	<b>Trips by Outsiders to Boston Metro Area</b>
Business	23%	30%	43%
Pleasure	62%	63%	42%
Personal Business	15%	7%	15%
Total	100%	100%	100%

*Source: American Travel Survey, 1995*

**Exhibit 1-5. Business Portion of Logan Airport Travel and All US Air Travel**



*Source: Logan Airport Air Passenger Survey, Bruce Campbell & Associates, 1999; American Travel Survey, 1995*

**Brooks Automation**

**Interview with Jim Pelusi, Senior Vice President**

Brooks Automation is located in Chelmsford, MA, with operations in several U.S. cities and internationally in countries including England, Scotland, Germany, France, Malaysia and Japan. Support, managerial and sales staff travel at least every other week, for worldwide sales and support of Brooks product. Logan is used for approximately 90% of business trips.

The frequency of air travel, and in turn the use of Logan Airport, has increased dramatically in the past ten years, following growth of the company. Employment worldwide has grown from 100 to approximately 1,850, with sales increasing from roughly \$20 million to \$400 million.

Sales and training operations make receiving visitors an important part of Brooks operations, with virtually all visitors arriving at Logan Airport. Without the availability of the long-distance and international travel services that Logan provides, the company would seriously consider moving their Boston operation.

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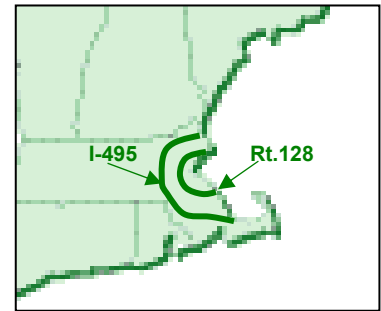
Additionally, Logan Airport ranked first among large U.S. airports (tied with Minneapolis) in terms of the percent of its total revenue that comes from the sale of premium fare tickets. These include first class, business class and full fare coach tickets, and indicate the high number of business travelers who use Logan Airport.

Among U.S. airports, Logan Airport has the 18<sup>th</sup> largest passenger base, serving 27.4 million passengers in 2000<sup>1</sup>. However, Logan Airport generates the fourth largest sum (\$3.7 billion) of airline fare revenues of any U.S. airport<sup>2</sup>.

### **Passenger base is increasingly focused within I-495**

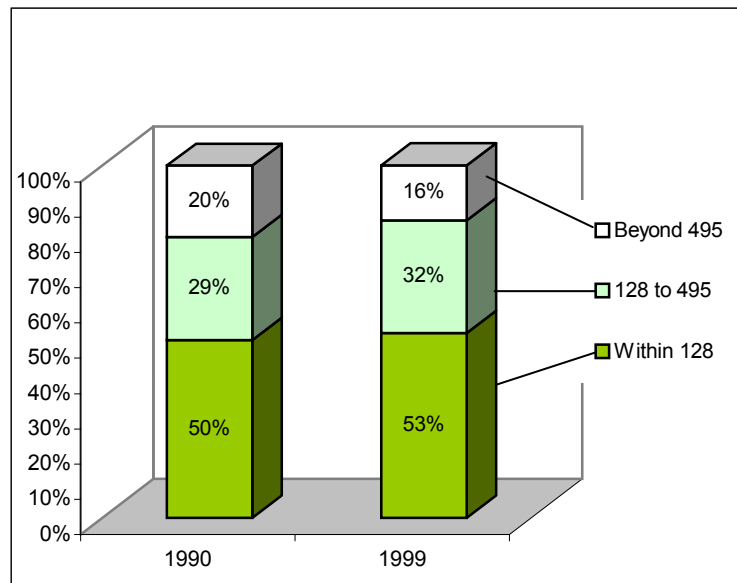
Logan Airport is increasingly focused on serving passengers in its core service area within the belt of I-495, an area that includes most or all of Essex, Middlesex, Norfolk, Plymouth and Suffolk counties in Massachusetts. (See Exhibit 1-6.) The majority of travelers utilizing Logan, whether they are residents or visitors, are coming from or going to locations within that corridor.

**Exhibit 1-6. Location of I-495 and Rt. 128 Corridors**



Passenger trends at Logan show that while passengers outside of the I-495 corridor increasingly rely on the use of other regional airports for their travel needs, Logan Airport is increasing in importance for travelers within its core service area. (See Exhibit 1-7.) According to passenger surveys at Logan, the percentage of passengers who originate within I-495 increased from 79.6% to 84.4% between 1990 and 1999. During this same period, the percentage of travelers originating from outside of the I-495 beltway decreased from 20.3% to 15.6%.

**Exhibit 1-7. Change in Origin of Logan Passengers, 1990-1999**



Source: *Massport Logan Air Passenger Surveys, 1990 and 1999*

Data illustrate Logan Airport's increasingly specialized role in serving travelers, often on business-related trips to or from its core service area within I-495. The number of business travelers coming from within 128 has increased the most since 1990, followed by the number of business travelers coming from between 128 and 495. The greatest

<sup>1</sup> FAA (ACI NA, 2000 prelim)

<sup>2</sup> US DOT DBIA; 12 months ending 3<sup>rd</sup> quarter 2000

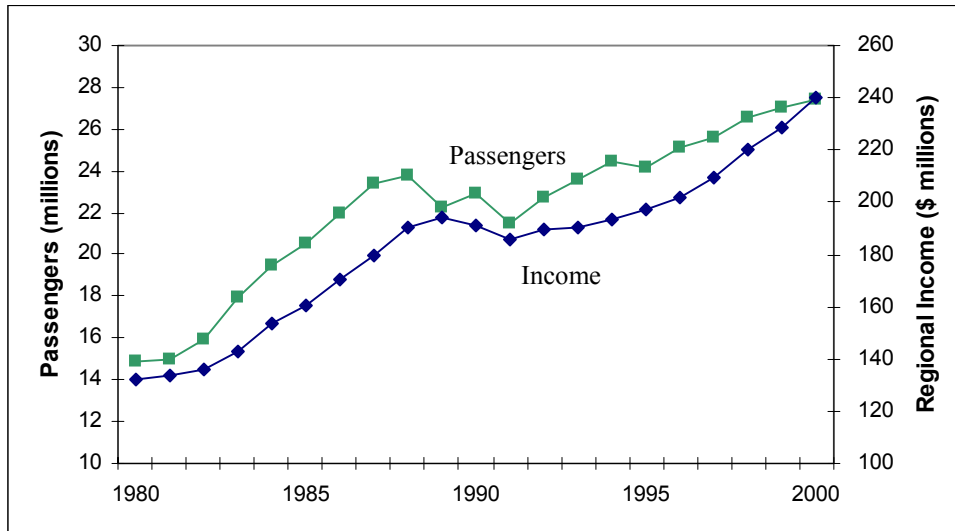
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decline is in personal travelers coming from beyond I-495. This trend is consistent with the policy of the New England Governors' Conference to increase utilization of the region's other airports (Conference Resolution 154).

### **Growth in passenger volume at Logan is correlated with growth of the New England economy**

Exhibit 1-8 below illustrates that changes in passenger volume at Logan Airport has tracked the economic health of New England from 1980 to 2000. Logan Airport experienced an 85% increase in passenger volume from 1980 to 2000, with the number of users rising from nearly 15 million to more than 27 million. Significant upswings were seen during the boom era in the mid-1980s and again during the recent growth spurt in the latter half of the 1990s. Passenger volume remained stagnant during the recession and immediate aftermath in the late 1980s through the early '90s.

**Exhibit 1-8. Passengers at Logan Airport and New England Regional Income, 1980-2000**



Sources: Massport and Bureau of Economic Analysis, income adjusted to constant 2000 dollars based on Consumer Price Index

### **Conclusions: Key Air Services**

This section has discussed the evolving role of Logan Airport in meeting regional air service needs. We have seen that Logan Airport serves four primary and increasingly specialized functions: (1) international and direct long distance air travel, (2) business travel, (3) travel for passengers originating within Logan's core service area inside I-495, and (4) the international movement of goods that critically links the region to the world economy. (See Exhibit 1-9.) While some travel continues to shift to other airports within the region, Logan Airport continues to play an increasingly important function in serving the business needs of the Boston metropolitan area and making international travel available to and from New England.

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**Exhibit 1-9. International and Long-Haul Domestic Routes from Logan Airport**



*\*In addition, Logan Airport offers direct service with an intermediate stop to Hawaii, Athens, Rio De Janeiro, Sao Paulo, Seoul, Tokyo, Singapore, and other major destinations.*

*Source: Official Airline Guide*

## 2. Regional Economy's Dependence on Logan Airport

The leading sectors of New England's economy have specialized air service needs that are served by Logan Airport. In recent years, the sectors with the highest employment and the most promising growth have been concentrated in high-tech manufacturing and services, including sectors such as business and professional services, manufacture of electronic equipment, and instruments. These industries rely on air services much more than other sectors, for both passenger and cargo travel needs, for the following reasons:

- The products produced by New England companies tend to be delicate and time-sensitive, so that they need to be shipped by air.
- New England's trading partners are heavily concentrated in areas that tend to be linked to North America by air.
- Leading industries such as business and professional services depend on sales of professional expertise, which often require travel to meet with clients and make presentations.
- Many New England businesses in high-growth industries are part of global business networks, requiring frequent and often international travel between the various offices.

Therefore, the international and business-oriented air services provided at Logan Airport, as discussed in the previous section, are important resources for the continued economic growth of New England.

**Smith-Nephew, Endoscopy Division (SNED)  
Interview with Hooks Johnston,  
Senior Vice President**

Headquartered in London, England, Smith-Nephew is a producer of medical devices. Five hundred of the company's 10,000 employees operate out of facilities in Andover and Mansfield, MA, with the rest of the company's employees spread at operations in 35 countries worldwide. Aviation is critical to SNED for business travel, hosting visitors, and cargo shipments. Approximately 8,000 business trips are made per year from the Massachusetts operations, with headquarters in London being a leading destination. All international flights use Logan Airport.

The eightfold growth in SNED's sales in the past 10 years and a company mandate to spend more time with customers have increased SNED's reliance on air travel, both for outgoing business trips and incoming visitors to the Massachusetts facilities.

Deliveries of SNED's products, which are sterile and exceptionally time-sensitive, rely on air transportation. Forty percent of products are shipped internationally, with major markets in Western Europe, Australia, Japan and South Africa. Future growth would be capped if Logan were not available, as the regional airports do not offer the long-distance and international flights required by SNED.

### **High-tech manufacturing and professional services lead economy**

The high-tech, high-wage sectors that give New England its reputation as a center for new economy activities include business and management services; high-tech manufacturing, (including electronics, instruments and computer equipment); and finance and insurance. The service, finance / insurance and high tech manufacturing sectors account for approximately 51%

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of employment across New England and 59% in the Boston area, compared with just 45% nationally. Relative to the rest of the nation, the finance/insurance sector generates unusually high wages in the region, with average pay in these sectors running 6 - 16% higher in New England and 17 - 31% higher in the Boston area than the average for the rest of the nation. (See Exhibit 2-1.)

**Exhibit 2-1.**

**Economic Structure of the United States, New England and the Boston Metro Area by Key Sectors**

<b>Indicator</b>	<b>Manufacturing: Electronics, Instruments &amp; Computers</b>	<b>Finance, Insurance &amp; Real Estate</b>	<b>Services</b>
<b>Percent of Total Employment</b>			
within USA	2.5%	7%	35%
within New England	3.8%	8%	39%
within Boston Metro Area	4.9%	10%	44%
<b>Avg. Annual Wage</b>			
within USA	\$41,465	\$42,520	\$27,130
within New England	\$44,022	\$49,370	\$29,570
within Boston Metro Area	\$48,493	\$55,750	\$33,840

*Source: US Dept. of Commerce: County Business Patterns for 1997*

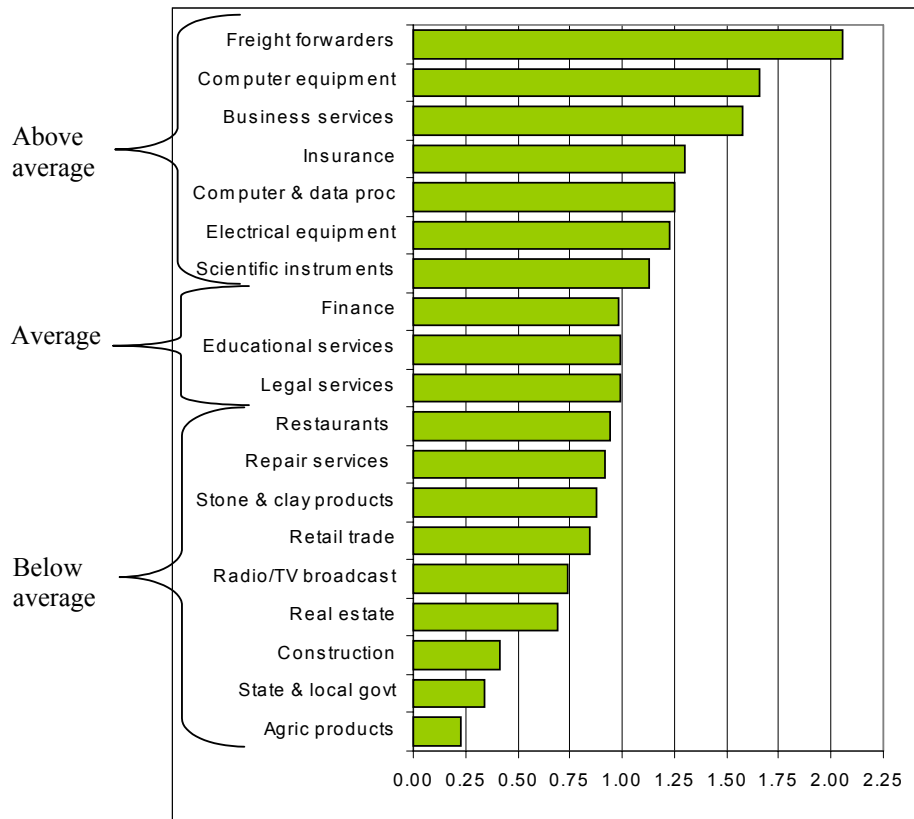
The results of a more in-depth analysis comparing the concentration of employment in different industries in Boston and the rest of the United States shows that the following industries are particularly concentrated in the Boston area:

- security and commodity brokers
- educational services
- instruments and related products
- holding companies and other investment offices
- electronic and other electric equipment
- engineering and management services
- business services

**Leading industries rely on air services**

The leading manufacturing sectors mentioned above tend to manufacture products that have an especially strong reliance on air service. Producers of high-tech products, business services and computer-oriented firms are among the industries that spend the most money on air services. Most of these industries spend at least 25% more on air services than the average industry in the United States, and a few spend 50% or more than the average of all industries in the United States. This is shown in national statistics on industry reliance on air travel. (See Exhibit 2-2.)

**Exhibit 2-2. Industry Reliance on Air Travel\***



\* Values reflect the relative reliance on air travel among individual industries, represented as a proportion of the national average (which is air travel costs representing 3.6% of total industry revenue)

Source: US Dept. of Commerce and Bureau of Transportation Statistics, 2000: *Transportation Satellite Accounts, 1996.*

### ***New England products shipped by air***

More than 440,000 tons and \$6 billion of products are *exported* annually via air from Logan Airport, comprising 15% of total New England exports. (Other exports from New England are shipped by air from New York's John F. Kennedy airport, as well as by rail, truck and water modes of transportation.) Over 80% of Logan air exports by value are technology-driven products, including electronics, instruments and computer equipment. (See Exhibit 2-3.) These industries depend more upon air transport and less on surface and water modes than other industries. This reliance on air transport is due to the unique characteristics of these products:

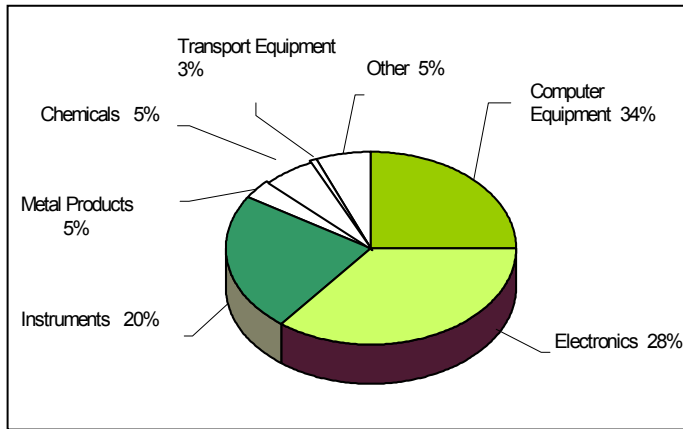
- long average shipping distances of cargo in these industries
- high average value per ton of the goods produced within these sectors
- high export ratios and long export distances demanded by these sectors
- nature of the demands of product delivery



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The predominance of high-tech products among manufacturing exports from New England necessitates the availability of air transport modes. High-tech exports make up over 50% of total exports and 56% of manufacturing exports in New England. In Boston, high-tech exports make up over 67% of total exports and over 70% of manufacturing exports. (See Exhibit 2-4.)

**Exhibit 2-3.  
Logan Airport Air Exports (Percent by Value)**



Source: Massport and the Massachusetts Institute for Economic Research, based on US Dept. of Commerce, International Trade Administration, 1999.

**EMC Corporation  
Interview with Wayne Pacheco,  
Financial Controller**

EMC Corporation is a producer of intelligent enterprise storage systems, software, and services. Because of the firm's worldwide presence, air transportation is very important and has been growing over the past ten years with the overall growth in business. Numerous business trips involving air flights are made daily by employees of EMC operations worldwide, and the destination of most of them is Boston. Logan Airport accounts for approximately 90% of its incoming employee travel from domestic US locations (TF Green accounts for the other 10%), and Logan Airport accounts for 100% of the international travel.

Most of EMC's product is shipped via air cargo to customers worldwide. Even domestic deliveries tend to rely on air transport, as shipments are often time-critical. Logan is the primary airport used for air cargo shipments, though the higher cost alternative of JFK/NY is used for about 35% of shipments (primarily international shipments to cities not well served from Boston and domestic cargo that exceeds Logan's capacity).

**Exhibit 2-4. Boston and New England's High-Tech Exports in Dollars, 1993 and 1999**

Category	Boston		New England	
	1993	1999	1993	1999
Total trade	\$6,472,471	\$10,426,980	\$27,209,480	\$36,316,637
Total manufacturing trade	\$6,179,205	\$9,995,953	\$24,155,010	\$33,462,097
(1) Industrial machinery and computers	\$1,743,140	\$2,302,184	\$5,235,656	\$6,114,501
(2) Electric and electronic equipment	\$1,140,870	\$2,472,809	\$4,980,258	\$8,172,288
(3) Scientific and measuring instruments	\$1,420,738	\$2,278,683	\$2,789,578	\$4,524,620
Total, three high-tech sectors (1)+(2)+(3)	\$4,304,748	\$7,053,676	\$13,005,492	\$18,811,409
High-tech portion of manufacturing exports	69.7%	70.6%	53.8%	56.2%
High-tech portion of total exports	66.5%	67.6%	47.8%	51.8%

Source: Calculated from US Department of Commerce, International Trade Administration data.  
<http://ese.export.gov/>

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Besides exporting products from New England, over \$6 billion of additional products are *imported* via air through Logan Airport. The major categories of imports are machinery (29.8%), electronics (16.6%), and pharmaceutical and medical products (20.1%). As such, the availability of air transport is extremely important for local and regional industries.

### ***New England's trading partners linked to North America by air***

Another factor that makes New England increasingly reliant on the availability of air transport modes is its global trade relationships. New England is unusually dependent on trade with regions of the world, such as Asia and Europe, which are often linked to North America through air rather than surface or shipping modes. The strength of these trade relationships is likely due, in part, to strong investment relationships and firm alliances in Asian economies, especially in the electronics sector.

During the 1990s, New England's trade with Asian economies grew at more than twice the national average rate, while trade growth with Mexico and Canada lagged behind the national average. By 2000, trade with Asian economies accounted for 26% of all New England exports (by value of shipments), while trade with NAFTA countries accounted for 29%, and European nations received 36% of the value of New England's exports.

This growing focus on trade with Asia, along with sustaining New England's traditional relationship with Europe, places increasing importance on the availability of air transport. Overall, less than 17% of all exports to Canada and Mexico are shipped by air, compared to 80% of exports sent to Asian and European countries. (See Exhibit 2.5.)

#### **Flying Fish: Logan Airport and the Seafood Industry**

High-tech industries are not the only export industries that rely on air cargo services at Logan Airport. A 1997 study of the seafood industry showed that firms throughout eastern Massachusetts are increasing their use of airfreight with increases in demand for fresh seafood both domestically and internationally. Representatives of seafood processing and distribution companies located in Boston said that despite the fact that more fresh fish is docked and sold in places like Portland, ME, and New Bedford, they do not want to leave the city because they are unwilling to lose their easy access to Logan Airport.

*Strengthening the Seafood Industry in Massachusetts: Shoreline Processing and Distribution Sectors; Metropolitan Area Planning Council, 1997.*

#### **Sippican Inc.**

##### **Interview with Jim Hannon, Marketing Manager**

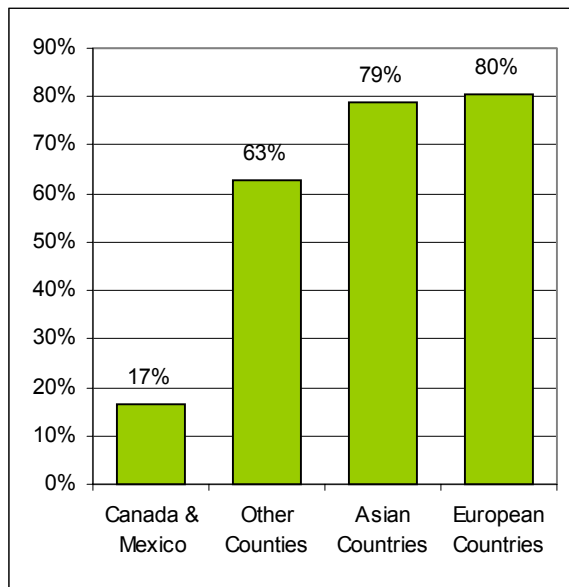
Air travel is critical for both business travel and cargo at Sippican Inc., a Marion, MA, establishment specializing in manufacture and sales of naval and oil exploration equipment. Employees at Sippican make approximately 2,000 trips a year, including international flights to the UK, France, Australia, Japan, Korea, Indonesia, Malaysia and Taiwan. Logan is used for all international flights.

Sippican's market has become more global and diversified over the past 10 years, resulting in increases in air travel. Logan is used for all air cargo shipments, which are particularly important for sales to the oil industry. The time factor for these sales is much more important than the actual shipping costs, and the mode of shipment depends upon the customer's needs.

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In 2000, the leading nation for receiving New England exports was Canada, which received goods valued at \$10.2 billion; Japan and the United Kingdom ranked second and third, with exports valued at \$3.3 billion and 3.1 billion, respectively. Japan received the largest value of goods shipped by air (\$2.9 billion), followed closely by the United Kingdom (\$2.5 billion) and France (\$2.3 billion). NAFTA, Asian and European countries accounted for almost 91% of the value of all goods exported from New England. Of the \$25 billion of products exported from New England by air, \$6 billion go from Boston's Logan International Airport and \$12 billion go from New York's John F. Kennedy International Airport.

**Exhibit 2-5**  
**Percentage of New England Exports Shipped by Air**



*Source: Massachusetts Institute for Social and Economic Research, based on US Dept. of Commerce data..*

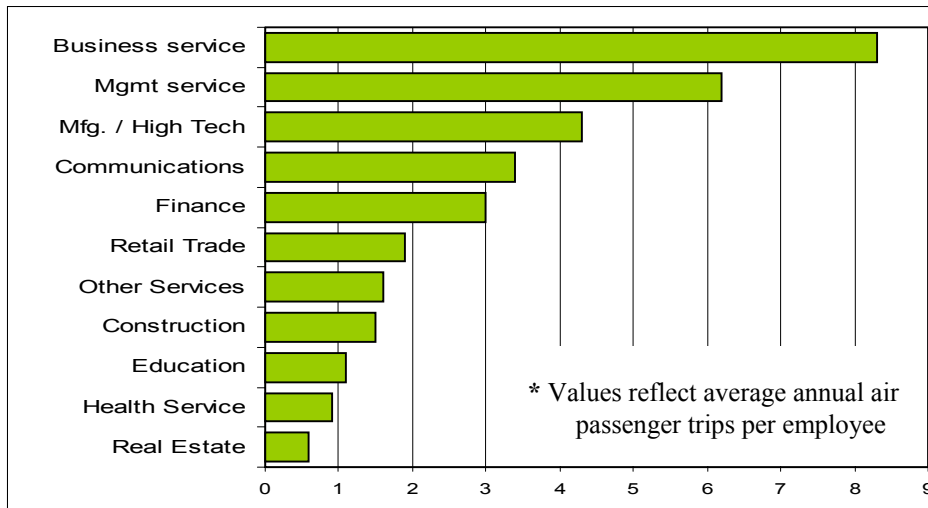
### **Business and convention travelers rely on air.**

Surveys show that rates of airline passenger travel vary widely among businesses, with the greatest amount of employee air travel occurring in the business and management services, local manufacturing sectors and finance. (See Exhibit 2-6.) Many New England businesses in high-growth industries are part of global business networks, requiring frequent and often international travel between the various offices, as illustrated in the text boxes on the following page.

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Boston annually hosts 2.8 million delegates to business conventions, representing 21% of all visitors to the City. Over 70% of delegates to business conventions in the City arrive by air, compared to 31% for other (private business, leisure and personal) visits. (Sources: Greater Boston Convention and Visitors Bureau and Massachusetts Office of Travel and Tourism.) Major investments in hotels, convention facilities, and new or expanded businesses are likely to further increase demand for passenger and cargo services at Logan.

**Exhibit 2-6. Rates of Employee Air Travel \***



Source: Massport, Business Survey, 1998.

**Fidelity Investments, Interview with David Hamilton, Director of Travel Services**

Fidelity Investments is headquartered in Boston, and fund managers visit companies all over the world in order to make intelligent investment decisions. Any given day, Fidelity employees travel 500,000 miles, covering all major U.S. cities as well as overseas destinations such as Toronto, London, Hong Kong and Tokyo.

In addition, employees of other Fidelity offices participate in meetings and training sessions in Boston; potential customers meet with senior company officials when considering where to invest their funds; and businesspeople visit to request that Fidelity invest in their companies.

Fidelity's significant growth in the past 10 years has resulted in an increase in the absolute level of use of Logan Airport, although regional airports are increasingly being used as well. Roughly 94% of Fidelity's business related air travel is through Logan Airport, compared to approximately 99% ten years ago.

**IBM Global Education Division Interview with Sean Rush, General Manager**

The Global Education Division of IBM is a consulting operation based in Waltham, MA. Four to five thousand local employees make from 6,500 to 8,500 business trips per year, with destinations including San Francisco and various points in Europe and Asia.

Regional airports are increasingly used for flights to metro New York, Washington, D.C., and other short-haul destinations. However, only Logan Airport offers the non-stop domestic and international flights needed by IBM employees, and it is still used for over 90% of IBM Global Education Division's business travel. The opening of a substantial operation in Dublin is among the factors contributing to the rising levels of international travel from the Massachusetts operation. Receiving visitors, all of whom fly into Logan Airport, is also very important to IBM.

### **3. Economic Contribution of Logan Airport**

The operation of Logan Airport, providing terminal and related service for air travelers and cargo, represents a significant piece of the total regional economy. A variety of off-airport businesses, also serving airline travelers visiting the area, represent an even larger piece of the economy within the three-state region of Massachusetts, New Hampshire and Rhode Island. These on and off-site activities fall into four categories:

- airport terminal and related activities
- off-airport businesses serving airport travelers
- suppliers of goods and services
- re-spending of worker income

#### ***\$6.5 Billion Overall Contribution to the Regional Economy***

The total economic contribution of Logan Airport is the sum of the business activity directly associated with operation of the airport and the spending of its users, plus the additional business activity associated with orders to suppliers and re-spending of worker income.

Exhibit 3-1 summarizes the overall economic impacts, by adding the separate components which are discussed below. Overall, it shows that just the activities occurring at Logan Airport and their spin-off activities (from suppliers and worker re-spending) account for \$2.2 billion of business sales, supporting over 25,000 jobs. Adding the activities associated with spending by Logan air travelers who visit the Boston area, the total effect is raised to nearly \$6.5 billion of business sales, supporting over 100,000 jobs. This figure is up from the \$5 billion impact found in a 1998 study due to three effects: (1) growth of jobs and business activity occurring at Logan Airport, (2) growth in total passengers and particularly visitors coming into the region via Logan Airport, and (3) even higher growth in international visitors, whose per capita spending in the region is triple that of domestic visitors.

**Exhibit 3-1 Summary of Overall Economic Impacts of Logan Airport**  
*(Based on Yr. 2000 passenger volumes)*

<b>Category of Economic Impact</b>	<b>Generated by Activities at Logan Airport</b>	<b>Generated by Visitors Using Logan Airport</b>	<b>Total</b>
<b>Jobs</b>	25,625	75,016	100,641
<b>Income (payroll) in \$ billions</b>	\$0.940	\$1.768	\$2.708
<b>Business Sales (output) in \$ billions</b>	\$2.191	\$4.279	\$6.470

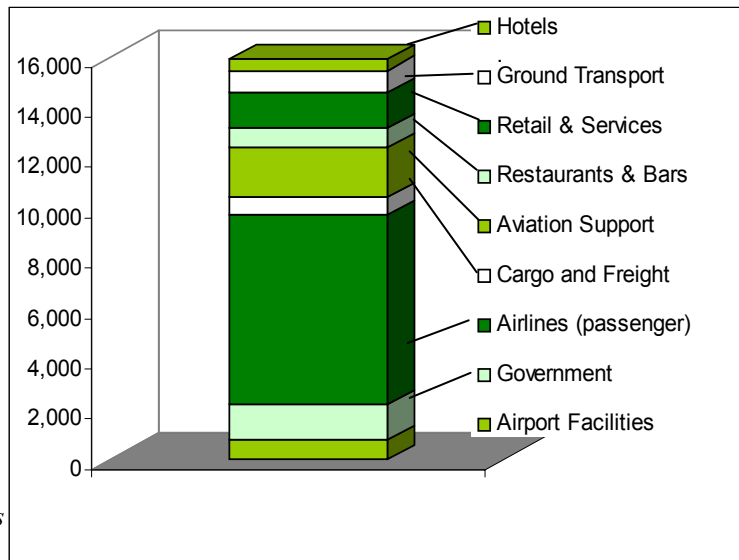
### **Airport Terminal Related Jobs**

Approximately 16,000 persons are employed in the land area comprising Logan Airport as of 2001, up 10% from 14,591 in 1998. (See Exhibit 3-2.) The growth is largely due to an increase in the number of air passengers, with openings of new retail and hotel activities. These jobs involve:

- the airlines, both passenger and cargo activities
- air terminal operation, including security, building maintenance and facility management
- public agencies: the FAA, US Departments of Immigration and Naturalization, Customs, Agriculture, Fish and Wildlife, and Drug Enforcement Agency, as well as Massport
- airline support services, including catering, in-flight entertainment, aircraft handling, fueling and maintenance
- freight services, including courier, delivery, customs broker and trucking
- passenger services, including restaurants, retail stores, hotels, banking, and shoe shine
- ground transportation services including rental car, valet parking and bus companies

**Exhibit 3-2 Employment at Logan Airport**

<b>Category</b>	<b>Emp.</b>	<b>1999 Wages \$mill</b>
Airport Bldg & Facilities	743	20.7
Government	1,394	60.4
Airlines (passenger)	7,574	283.3
Cargo & Freight Service	676	25.7
Aviation Support Service	1,977	68.3
Restaurants & Bars	792	11.0
Retail & Pass Services	1,379	31.4
Car Rent. & Grnd Transp.	889	21.0
Hotels	477	11.0
<b>Total</b>	<b>16,001</b>	<b>532.7</b>

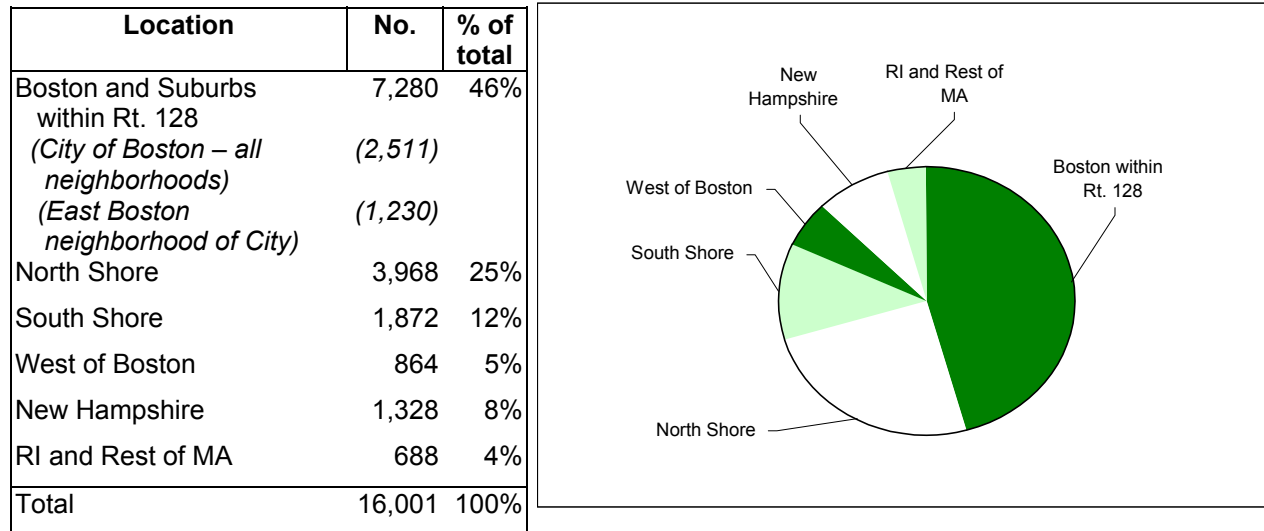


*Sources: Mass. Div. of Employment and Training, and Massport Tenant Survey, 2001; classifications by Economic Development Research Group*

The jobs at Logan Airport include a wide variety of employment that span the economic ladder, embracing the gamut of airline pilots, skilled mechanics, sales clerks, janitors and bus drivers. It is also notable that the workers at these jobs live in a widely dispersed area. Nearly half of them live in the City of Boston and its suburbs. Roughly 16% of all workers live in the City itself, and half of these City residents live in the adjacent East Boston community. The rest live elsewhere in Massachusetts, New Hampshire and Rhode Island (See Exhibit 3-3.). Their income from these jobs at Logan Airport, totaling an estimated \$533 million a year, is spent predominantly in their home areas.

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**Exhibit 3-3 Home Location of Workers at Logan International Airport**



Source: Massport Tenant Survey, 2001

**Off-Airport Jobs Serving Airport Travelers**

Logan Airport serves 27.4 million passengers annually, representing 13.7 million people arriving to Boston and 13.7 million people departing from the airport. These arrivals include persons transferring planes to other destinations, residents of the region traveling home and outsiders coming in to visit the Boston area. From the perspective of regional economic impact, the transferring passengers spend relatively little money during their short stay at the airport. Spending within the region by residents returning home also does not count as an economic impact, since residents spend most of their money in the region anyway. So only the outside visitors bring significant amounts of new money into the region.

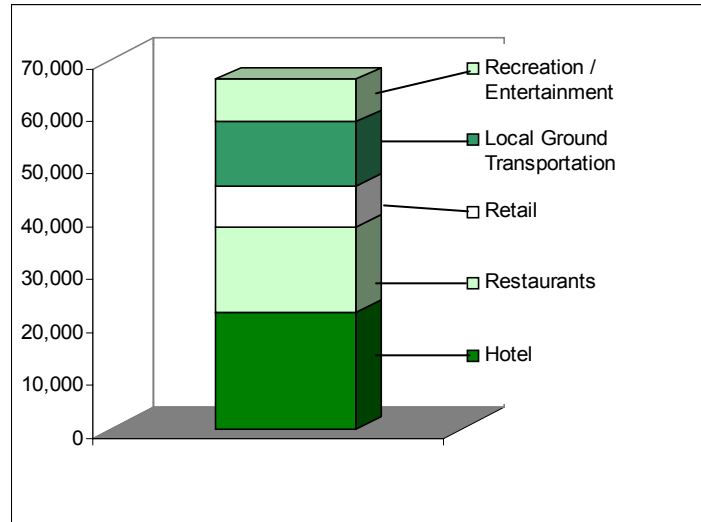
Overall, approximately 1.6 million international visitors come to Boston via Logan Airport each year, plus another 3.7 million American visitors (living outside of New England) also come into Logan Airport. These visitors spend approximately \$3.1 billion a year in the region, on hotels, restaurants, retail purchases, recreation and local travel (taxis, car rental and public transportation). These purchases support approximately 66,000 jobs within the three-state region of Massachusetts, New Hampshire and Rhode Island, with a payroll of \$1.1 billion. (See Exhibit 3-4.)



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**Exhibit 3-4 Spending by Visitors Using Logan International Airport**

Category	Business Sales (millions)	Employment Supported
Hotel	\$1,283	22,116
Restaurants	\$622	16,182
Retail	\$382	7,713
Ground Transport	\$652	12,146
Recreation	\$201	8,084
<b>Total</b>	<b>\$3,140</b>	<b>66,242</b>



Source: Calculated based on spending per visitor data from Greater Boston Convention and Visitors Bureau, and Mass. Employee/sales ratios from US Economic Census, 1997.

## Suppliers Of Goods And Services

### Orders from Airport Businesses

Activities occurring at the airport (as shown in Exhibit 3.2) generate additional orders for goods and services from suppliers. These include orders for:

- printing and publishing for the airport operator and the airlines
- banking, insurance, legal, accounting and technical services for the airport businesses
- off-site bus and parking services for airport employees
- food products for airport restaurants
- wholesale merchandise to be sold by airport stores
- furniture and equipment for offices, hotels, restaurants and stores located at the airport

Within the states of Massachusetts, New Hampshire and Rhode Island, approximately 3,500 jobs are supported by orders for goods and services from businesses located at Logan Airport. (See Exhibit 3-5.)

### Orders from Off-Airport Businesses Serving Air Travelers

Activities serving air travelers outside of the airport also generate additional orders for goods and services from suppliers. These include orders for:

- fueling and maintenance services for use of off-airport taxis, rental cars, tour buses and public transportation
- construction and operations of convention and hospitality facilities for convention visitors
- food products for off-airport restaurants
- wholesale merchandise to be sold by off-airport stores
- furniture and equipment for off-airport hotels, restaurants and stores

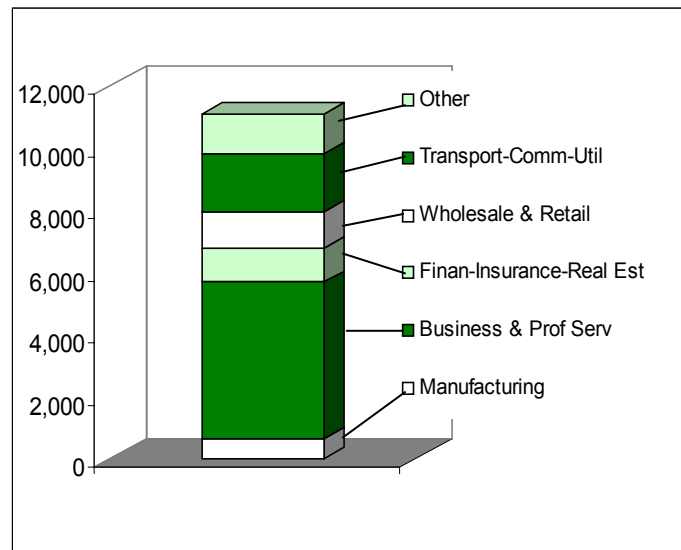


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These various suppliers of goods and services also are dispersed away from the airport. Within Massachusetts, New Hampshire and Rhode Island, there are approximately 7,600 jobs supported by supply orders generated by Logan Airport visitors spending within the region. (See Exhibit 3-5.)

**Exhibit 3-5. Jobs at Regional Suppliers (Businesses Serving Logan Airport and Visitors)**

Category	Generated by:		Total
	Oper. of Logan Airport	Visitors Using Logan Airport	
Printing & Publish	74	215	289
Food Products Mfg	23	130	153
Equip & Other Mfg	66	147	203
Transportation	1,129	375	1,504
Commun. & Util.	87	258	345
Wholesale & Retail	464	709	1,173
Fin-Ins-Real Est.	269	838	1,107
Services	1,253	3,781	5,034
Hotels & Lodging	0	203	203
Agricultural Prod.	9	102	111
Construction	86	542	628
Other	38	307	355
<b>Total</b>	<b>3,498</b>	<b>7,607</b>	<b>11,105</b>



Source: Calculated using IMPLAN economic model for Massachusetts, Connecticut and New Hampshire, based on business activity (employment and business sales) values from Exhibits 3-1 and 3-3.

**East Boston Holiday Inn  
Interview with Barry Asolone, General Manager**

East Boston's Holiday Inn is located about a mile from Logan Airport, and approximately 80% - 90% of its guests check-in because they are flying into or out from Logan. Moreover, the bar at the Inn attracts mid-management employees of various companies based at the Airport, as well as guests and other customers.

The Inn also hosts and caters many functions, of which nearly one-fourth is for businesses located at Logan Airport. These functions range from Christmas parties to training seminars.

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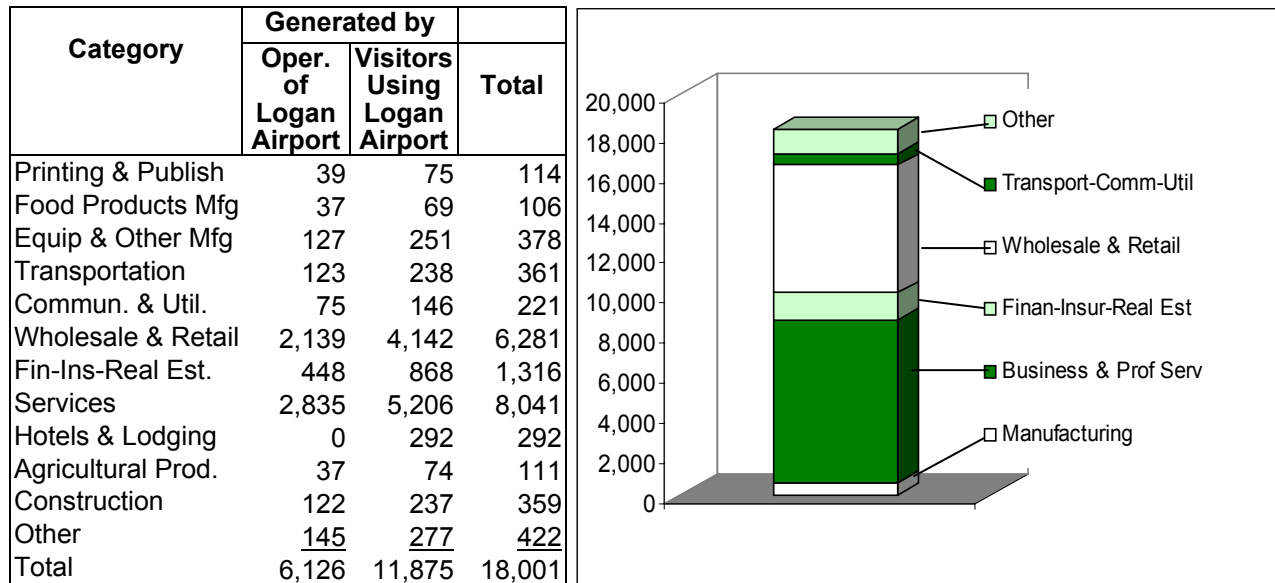
**Re-Spending Of Worker Income**

The workers at Logan Airport, at off-airport businesses serving air visitors and at supplier businesses, make a total of \$2.6 million of income. Most of that income is re-spent on consumer purchases, including:

- retail purchases of food, clothing, home furnishings, cars, CDs and other products
- purchases of services spanning haircuts, cleaning, car repair and insurance

This re-spending of income supports approximately 18,000 jobs within Massachusetts, New Hampshire and Rhode Island, with a payroll of approximately \$580 million. (See Exhibit 3-6.)

**Exhibit 3-6 Jobs Generated by Re-spending of Worker Income**



Source: Calculated using IMPLAN economic model for Massachusetts, Connecticut and New Hampshire, based on employment figures from Exhibits 3-1 and 3-3.

**East Boston Savings Bank**  
**Interview with Robert F. Verdonck, President and CEO**

The East Boston Savings Bank has four full-service branches in East Boston, two in Saugus, and one each in Winthrop and Revere, with off-site ATMs in East Boston's Day Square, Logan Airport Terminal C, and Winthrop.

The Bank tends to have customer relationships with Logan employees who live closest to the Airport. The Bank also serves many of the "mom and pop" small businesses in the community that in turn serve larger companies at the Airport or that provide auxiliary services such as "park and fly" lots. The viability of commercial real estate mortgages for these local businesses depends on the continuation of their airport-related activity.

## 4. Sensitivity to Future Changes in Air Service

The preceding analysis makes a strong case that key industries driving New England's economy depend on access to international gateway and national scale (coast-to-coast) airline services which are concentrated at Logan Airport. The economic health of the region is dependent on maintaining business access to those air services in an efficient and reliable manner. However, there are substantial uncertainties concerning the level of air service and activity likely to be occurring at Loan Airport in the future, and the level of associated delay if activity at the airport once again starts to grow.

### **MITRE**

#### **Interview with Vic DeMarines, Board Member**

MITRE is a federally funded research and development center that performs engineering, systems research, and strategic management for the Departments of Defense, Aviation, Treasury, and others. MITRE has 60 sites globally, with seven in Europe, five in Asia, and 2,500 employees at its Bedford, MA site. Employees make frequent business trips between sites and rely on Logan for approximately 95% of their air travel. Air travel has increased in the past 10 years as the company has grown and its customer base has expanded and diversified. Air travel is so integrated into MITRE's business that the company would have to relocate its Bedford office to be near another major airport if Logan could not be used. The local regional airports cannot support MITRE's travel needs.

### ***Downturn in Activity After Sept. 11, 2001***

Logan Airport was closed for four days following the tragic events of September 11 and levels of activity have remained down since then. That month, Logan Airport had flight operations down 31% and passenger levels down 43% compared to the same month in the prior year. Certain market segments were less affected: cargo was down 24% and international flights were down 24% (with international passengers down 33%) compared to Sept. 2000. Subsequent levels of activity have increased but still remain significantly below prior year figures.

A conservative scenario for the fourth quarter of 2001 and all of 2002 would be for Logan Airport's domestic passenger volumes to remain 25% below year 2000 levels, while cargo and international activities remain 20% lower and basic facility operation remains fully in place. If sustained, the reduced airport activity and reduced visitor spending in the region would represent a loss of roughly \$1.4 billion of annual economic output for New England, including losses of 22,000 jobs and \$600 million of annual income for New England residents. These losses represent reductions in the overall impact of Logan Airport, as compared to the year 2000 levels that were previously shown in Exhibit 3-1. These potential losses would be even larger if not for the fact that the shortfalls are somewhat less for international travel, which is responsible for a larger average amount of local spending, and for air cargo, which is most critical to New England's technology and service oriented businesses.

In the long run, Logan's market demand is based on strong fundamentals and there is no reason to suspect that the airport will not eventually recover. Logan's market area has one of the highest

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levels of reliance on local origin and destination traffic among airports in the US (88%), Logan is one of the nation's busiest airports, no single airline dominates the market (3 carriers handle 52% of the passengers), Logan is one of the nation's major international gateways, and finally, this region's large and diversified economy supports a high propensity to travel.

**Costs of Future Delays if Activity Once Again Grows in the Future**

A more optimistic scenario would be for activity at Logan Airport to return to prior levels of activity within a year and then continue to grow over the subsequent decade as had previously been forecast. The positive economic consequence of that scenario are clear, since it could eliminate the losses identified in the previous page, and in the future provide additional business sales, jobs and income beyond the levels previously shown in Exhibit 3-1. However, in that case Logan Airport could once again be put on a path towards increasing congestion-related delays, with growing costs also incurred by the region's air-dependent businesses. The optimistic scenario, then, while good for New England's economy in the short run, will also increase the need to implement strategies to address the congestion problem in the longer run.

The potential for future delays to affect Logan Airport's effective operation has been a very real concern in the past and is likely to eventually become a concern again in the future. Earlier in 2001, the Federal Aviation Administration (FAA) had ranked Logan Airport as fifth worst in the nation in terms of the percentage of operations (takeoffs and landings) that are delayed 15 minutes or more (Exhibit 4-1). Logan was cited as one of eight airports where at least 3% of operations experience delays greater than 15 minutes, a level classified as "significant passenger delays" by the FAA. For most business trips, delays less than 15 minutes are inconsequential, but significant delays stretching longer than 15 minutes are more likely to be problematic.

**Exhibit 4-1. Delays of 15 Minutes or Longer in 2000, By Airport**

Facility	Delays of 15+ minutes per 1000 Operations	Annual Operations (Takeoffs & Landings)	Operations Delayed 15+ minutes
New York LaGuardia	155.89	392,047	61,120
Chicago O'Hare	63.30	908,977	57,545
Newark	81.21	457,182	37,132
San Francisco	56.84	430,612	24,478
<b>Boston Logan</b>	<b>47.45</b>	<b>508,283</b>	<b>24,120</b>
Philadelphia	44.50	483,567	21,521
Atlanta	30.90	913,449	28,229
Dallas Ft. Worth	23.83	865,777	20,638
Phoenix	21.95	638,725	14,024
Los Angeles	21.87	783,684	17,141

*Source: FAA OPSNET Preliminary Data, 2001; FAA, Airport Capacity Benchmarks Report 2001*

In the long run, Logan Airport and the New England economy are likely to eventually return to prior levels of activity and growth. In that case, Logan Airport is forecast in the year 2015 to have a level of operations 14% above the year 2000 level. With larger size aircraft, total

## *Logan International Airport's Evolving Role in the New England Economy, 2001*

passenger volumes are forecast to increase by 42%. With no changes made in capacity or operating policies at Logan Airport, Massport had projected that the average delay per aircraft would increase from 14 to 38 minutes. The compounding effects of the growth in operations, larger aircraft and delays, could lead to over 23.8 million passenger-hours of delay per year.<sup>3</sup>

As Logan Airport activity recovers, we will have to confront the fact that delays can also have a substantial economic impact. Given that 54% of the passengers are business travelers, and their time is valued at over \$25/hour (reflecting prevailing wages in the finance, insurance and high tech product industries), then the business costs of the increased delays could reach over \$238 million per year. These estimates do not include the costs associated with missed or delayed meetings, missed or delayed cargo, or the value of time “lost” by non-business travelers. The economic costs of delays could be even greater if such delays adversely affect the economic health of any of the region’s airline-dependent industries. Even if we assume that only half of the business costs are borne by firms in terms of additional wages or lost productivity, with individual business travelers foregoing leisure time to absorb the other half, the economic impact could still be staggering.

## Conclusion

In the face of uncertainty over the future recovery and growth of air travel, it is important to consider both upside and downside scenarios for activity at Logan Airport, and to recognize that both can have substantial economic consequences for the region. Beyond being the Boston area’s central airport, there can be no doubt that Logan International Airport has and will continue to provide critical support to New England’s high-tech and knowledge-based economy, and serve as a gateway for business travel and for shipping highly valued and time sensitive cargo. As we enter the 21<sup>st</sup> century, these products and services will continue grow in importance to the region, meaning that air transportation in general and Logan Airport in specific, is likely to be called upon to assume an even more important role to the economic vitality of the region.

Activity at Logan Airport is likely to rebound at some time in the future, and then the issues of straining its capacity may arise again. In the past, a wide variety of proposals involving runways, air traffic control, pricing, schedule slot controls, demand management and marketing have been put forward to address those issues. This report does not take a position on any policy alternatives affecting Logan Airport’s future, but is intended to make it clear that the stakes for New England’s economy can be significant.

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<sup>3</sup> Source: Massport and FAA, *Logan Airside Improvements Planning Project, Supplemental Draft Environmental Impact Statement / Final Environmental Impact Report*, March 2001. (All figures based on the high projection for reliance on regional jets in 2015.)