

Challenges in Developing an Airport Employee Commute Program: Case Study of Boston Logan International Airport

DIANE M. RICARD

Boston Logan International Airport, a major trip generator, contributes to and is impacted upon by traffic congestion in the Greater Boston area. Located about 3 km from downtown Boston, Logan is the fifth largest airport in the United States in terms of origin-destination air passengers. Logan origin-destination passengers begin or end their air travel in the Boston region and affect the Boston regional transportation system. Because air passenger growth must be accommodated within the existing airport boundaries and regional roadways, restrictions imposed by the Logan Airport Parking Freeze, and by a responsibility to help reduce regional environmental impacts, it has become increasingly important to find feasible ways to reduce the vehicle trip generation rates of the various Logan Airport user groups. The commuting patterns of the 16,000 Logan employees, who account for about 20 percent of average annual weekday traffic, are characterized in this paper. Data presented in the paper are based on the results of an airport employee survey conducted in 1990. Commute profiles of both flight crews (who exhibit travel characteristics similar to those of air passengers) and non-flight crew employees are highlighted. Since the airport is staffed 24 hours a day with various types of workers, feasible solutions to reduce airport employee trips will be different from measures tailored to influence commute habits of the traditional office workers. In this paper available alternatives to the single-occupant private automobile are discussed, and their effectiveness relative to employee demand is assessed. There is a small employee market for most alternatives currently available, as each service was developed primarily for air passengers or downtown commuters. Finally, a summary is presented of the initiatives that the Massachusetts Port Authority (owner and operator of Logan International Airport) has taken in the past and is considering in the future to encourage employees to use higher-occupancy commute modes.

Boston Logan International Airport, owned and operated by the Massachusetts Port Authority (Massport) is a major trip generator. Logan contributes to and is affected by traffic congestion in the greater Boston area. Located about 3 km from downtown Boston, Logan is the fifth largest airport in the United States in terms of origin-destination air passengers. Logan origin-destination passengers begin or end their air travel in the Boston region, and affect the Boston regional transportation system.

Reducing air passenger and employee vehicle trips is important to Massport from an air quality perspective and from an airport management perspective. On an average weekday in 1992, about 85,000 vehicle trips were generated by Logan Airport. By comparison, Boston proper generated about 756,000 vehicle trips on an average weekday in 1992 (source: Central Transportation Planning Staff, 1992 Interim Regional Model Set). About 60 percent of vehicle trips to and from Logan are made by air passengers, and another 25 percent are made by Logan employees. For a number of years, Mass-

port has been successfully promoting, maintaining, and improving an aggressive air passenger ground-access program aimed at reducing the number of vehicle trips per air passenger trip. The nature of the Logan working environment has made it much more difficult to provide a comparable access program for employees.

Within the existing menu of transportation services available to air passengers and downtown commuters, Massport offers some incentives to employees who are seeking alternatives to the drive-alone commute. However, many Logan employees cannot commute using these services, because they were developed for customers with different travel requirements.

In this paper the challenges Massport faces in developing a successful, cost-effective employee access program are presented through a description of the access characteristics of Logan and the Logan work environment. The commuting patterns of Logan employees are characterized, available commute options are described, and initiatives that Massport currently offers or is considering in the future to encourage commuting in higher-occupancy modes are discussed.

ACCESS CHARACTERISTICS OF LOGAN AIRPORT (1)

A number of characteristics of the Boston regional transportation system, the placement and size of the airport, and the airport's proximity to neighborhoods all make access to Logan difficult during certain times of the day and week, and present significant operations management challenges for Massport. The characteristics may be categorized as follows:

1. The greater Boston area and the New England region are principal destinations for both business and pleasure travelers, and are located on one of the most heavily-traveled air corridors in the U.S. (Boston, New York, and Washington, D.C.). Ninety percent of these passengers are using the Boston local transportation infrastructure to access Logan (rather than flying into and out of Logan on their way to another destination).
2. The airport is served by a limited number of access routes (two cross-harbor tunnels and one bridge), which do not have the capacity to handle easily the volume of traffic using the system during periods of high demand.
3. Because of Logan's proximity to downtown Boston, the regional highway and public transportation system is focused on Boston in a series of radial routes converging on the central business district. Airport traffic mixes with regional vehicular traffic,

and use of the subway, commuter rail, and bus system requires transfers in downtown Boston to reach the airport. The length of time required to reach the airport and the inconvenience of the transfers makes public transportation a difficult choice for frequent airport users, such as employees.

4. Due to the restricted availability of land for airport development and Massport's commitments to the neighborhoods around the airport, the size of Logan Airport is fixed at its present area. Massport is committed to accommodating airport growth within the existing airport boundaries.

5. Responding to environmental and community responsibilities, Massport has committed to a moratorium on the number of airport parking spaces and to limiting traffic accessing the airport by way of local neighborhood streets. As part of this moratorium, Massport has committed to relocating about 30 percent of on-airport employee parking spaces to off-airport locations.

THE LOGAN WORK ENVIRONMENT

The Logan work environment presents a challenge for developing a responsive and cost-effective employee commute program. Standard transportation demand management options, such as flextime, vanpooling, or carpooling on a regular basis, are an option for only a small proportion of the population due to nontraditional work schedules.

Logan Airport operates 365 days a year, 24 hours a day. Holidays and popular vacation periods, when many businesses slow down, are some of the busiest times at an airport. Because the almost 16,000 people are employed at Logan to maintain its continuous operation, the concentration of employees commuting during standard business hours is sparser than in other industries. On an average weekday, only 60 percent of all employees commute to Logan, and only 25 percent of all employees arrive between 6:00 a.m. and 10:00 a.m. Between 30 percent and 40 percent of employees staff the airport on Saturdays and Sundays.

There are 140 employers at Logan. Seven major airlines are responsible for about 55 percent of employees, and Massport employs about 4 percent. Many employee work schedules are related to air passenger demand and flight operations. These employees may be subject to either scheduled or nonscheduled overtime, and do not have flexibility in their work schedule. Nonscheduled overtime is tied to flight delays and cancellations, events that are very difficult to predict and plan for. The numerous airport-wide shifts, which vary by company, make it difficult to develop commute options around particular shifts.

Many Logan employees have benefits packages that are based on contractual agreements or national company policies. Groups of workers at Logan belong to various unions. A collective bargaining agreement may limit the incentives to high-occupancy commuting or disincentives to the drive-alone commute that can be offered to a group of employees. Similarly, airline-wide employee policies may limit what a local airline station manager may provide employees as alternative commute incentives, especially now, when airlines are trying to cut costs to remain competitive.

LOGAN EMPLOYEES

The following is a brief profile of Logan Airport employees, presented to show the uniqueness and complexity of an employee population at a major airport. Most of the information is based on an

employee commute survey administered in the spring of 1990, which was answered by 15 percent of employees. Since the Logan work environment and available commute options have not changed much since 1990, Massport believes that the survey continues to explain overall commuting behavior. A copy of the survey instrument is included as Figure 1a. Table 1 is a summary of pertinent commute characteristics of Logan Airport employees.

A separate survey form was administered to Boston-based flight crews. All of the survey questions were the same as in the non-flight crew survey, with the exception of the following replacements (Figure 1b). Question 22 on the non-flight crew survey was not asked of flight crews.

Commute Modes

Currently there are time and cost incentives for most Logan employees to commute by automobile compared to alternative modes. As at most U.S. airports, the majority of Logan employees enjoy parking privileges on or near the airport, fully subsidized by their respective employers. All of the major airlines subsidize employee parking at airports throughout the United States. It would be difficult for an airline to discontinue this benefit at some airports and provide it at others. In terms of competitive hiring, it would also be difficult for an airline to discontinue the employee parking subsidy unless other airlines were doing the same thing.

Almost all of the surveyed employees reported that their employer does not subsidize public transportation. On an average weekday about 90 percent of Logan employees commute to Logan by automobile, and most of them are commuting alone. Another 10 percent of employees commute by subway, and the remainder walk, take a bus, or use other means to get to Logan. By comparison, the transit share of employees commuting to Boston proper is 44 percent (source: Central Transportation Planning staff, based on the 1990 Census).

Of employees commuting by subway, less than half have access to employer-subsidized parking. Twice the proportion of automobile commuters have access to employer-subsidized parking as do subway commuters. Subway commuters have fewer automobiles per adult available in the household compared to automobile commuters. The data indicate that the majority of employees commuting by subway are doing so because an automobile or airport parking is not available to them.

From most towns, depending on the time of day, the commute time by automobile offers the employee a noticeable time savings over scheduled high-occupancy vehicle services. This will be discussed further under the section Employee Alternatives to the Automobile.

Geographic Concentrations

The 10 towns with the largest concentrations of Logan employees are all in the immediate vicinity of the airport. For the 40 percent of Logan employees residing in these towns, Logan is a quick trip by automobile. For many, the extra time involved in carpooling or using public transportation is viewed as an unnecessary inconvenience.

Job Categories

Twenty-five percent of Logan employees are traditional office workers, 25 percent hold sales or service related positions, and 25

Logan Airport Employee Survey

Why you have been given or sent this questionnaire

This survey is being carried out to give Massport an up-to-date picture of the travel needs of people who work at the airport. To plan for the Third Harbor Tunnel and other developments, we need to find out how airport employees are currently getting to and from work. Please take a minute or two to answer these questions.

If you received this questionnaire at home...

please fill it out today, fold it so that the return address shows on the outside, then put it in the mail.

If you received this questionnaire at work...

please fill it out today and drop it in one of the marked boxes at your workplace; or fold it so that the return address shows on the outside and put it in the mail. Don't return a questionnaire at your workplace if you've already returned one that you got in the mail.

Thank you for your help; it is important to us. All replies are confidential.

Sincerely,

Patrick B. Moscaritolo
Director, Logan Airport

About your journey to work:

1. Today's date is... (Check one day and fill in date)
- | | |
|--------------------------------------|-------------------------------------|
| 1 <input type="checkbox"/> Monday | 5 <input type="checkbox"/> Friday |
| 2 <input type="checkbox"/> Tuesday | 6 <input type="checkbox"/> Saturday |
| 3 <input type="checkbox"/> Wednesday | 7 <input type="checkbox"/> Sunday |
| 4 <input type="checkbox"/> Thursday | |
- _____ / _____ / 90
month date
2. Think back over the last seven days. On which of those days did you go to work at Logan?
(Check every day on which you traveled to work at the airport)
- | | |
|--------------------------------------|-------------------------------------|
| 1 <input type="checkbox"/> Monday | 5 <input type="checkbox"/> Friday |
| 2 <input type="checkbox"/> Tuesday | 6 <input type="checkbox"/> Saturday |
| 3 <input type="checkbox"/> Wednesday | 7 <input type="checkbox"/> Sunday |
| 4 <input type="checkbox"/> Thursday | |

Think about the *most recent* time when you went to work at Logan and then returned home again. You should answer questions 3 through 14 about your trips to and from work on that occasion.

3. **The day on which you arrived at Logan on that occasion was...** (*check one day only*)
- | | |
|--------------------------------------|-------------------------------------|
| 1 <input type="checkbox"/> Monday | 5 <input type="checkbox"/> Friday |
| 2 <input type="checkbox"/> Tuesday | 6 <input type="checkbox"/> Saturday |
| 3 <input type="checkbox"/> Wednesday | 7 <input type="checkbox"/> Sunday |
| 4 <input type="checkbox"/> Thursday | |
4. **On that day, from where did you start your trip to go to work at the airport?**
Please specify:

town or city	state	zip code
street address or nearest intersection		
office use only:		

5. Is this place... (check one only)
- 1 ☐ your own home?
- 2 ☐ some other place?
6. At what time did you get to the airport on that day?
- hr. min.
- Enter time: :
- 1 ☐ A.M.
- 2 ☐ P.M.

7. How did you arrive at the airport on that day?
(Check one only)
- 1 ☐ driving a private vehicle (car, van, or light truck)
 - 2 ☐ passenger in a private vehicle
 - 3 ☐ MBTA Airport station and Massport shuttle bus
 - 4 ☐ MBTA Airport station and employer pickup
 - 5 ☐ MBTA Airport station and walk
 - 6 ☐ MBTA Wood Island station
 - 7 ☐ MBTA, any other station
 - 8 ☐ airport shuttle bus, without taking the MBTA
 - 9 ☐ Logan Express bus
 - 10 ☐ other bus
 - 11 ☐ other means (specify)

If you checked an answer in this box (that is, you did not travel by private vehicle), skip to question 13

FIGURE 1a Logan Airport employee survey.

8. If you went to work by private vehicle on the day in question, how many people were in the vehicle in total, including yourself?
Enter number:
9. Was the private vehicle parked... (check one only)
- ☐ in your employer's parking area immediately beside your place of work?
 - ☐ in Massport's Bird Island Flats employee lot?
 - ☐ in a passenger parking garage or lot (Terminal A, B, D, or E, or Central Parking)?
 - ☐ near the airport, off airport property?
 - ☐ or was it driven away from the airport, and not parked nearby?
 - ☐ other (specify) _____
10. If the private vehicle was parked at or near the airport, what was the cost to you for parking? If some of the costs are paid by your employer or by other passengers, count only your own share of the costs.
- ☐ parking didn't cost me anything
 - ☐ parking cost me \$ dollars cents ☐ per day ☐ per month
11. On your private vehicle trip to work, did you make any stops to pick up or drop off other people, or to do errands?
- ☐ yes, I made stops on the way
 - ☐ no, I came straight to the airport
12. On your private vehicle trip to work, did you travel... (check all that apply)
- ☐ through the Callahan Tunnel?
 - ☐ on the Central Artery, from the south ("South Station tunnel")?
 - ☐ on the Central Artery, from the north?
 - ☐ on Route 1, from the north?
 - ☐ by none of these routes?
13. On the day in question, did you leave the airport again before you finished work? (Check all answers that apply to you)
- ☐ no, I stayed at the airport until I finished work
 - ☐ yes, my job requires me to spend most of my working time away from the airport
 - ☐ yes, I left by private vehicle (car, van, or truck)
 - ☐ yes, I left by other means (MBTA, ferry, taxi, walk, etc.)
- If you did leave the airport during your working period, how many times did you leave the airport for...
- ... job-related purposes?
- ... personal reasons?
14. After work on that occasion, at what time did you leave the airport?
- Enter time: hr. min. ☐ A.M. ☐ P.M.
15. You've now told us how you traveled to and from your work at the airport on one particular occasion. How do you usually get to and from work? Is that in the same way as on the occasion you've told us about? (Check one only)
- ☐ yes, I usually go to work in the way I've already described
 - ☐ no, I usually go by car or van that is parked at the airport
 - ☐ no, I'm usually dropped off (and picked up) at the airport by a car or van
 - ☐ no, I usually go by public transportation (or walk)
 - ☐ other (specify) _____
16. If for some reason the transportation you usually use to get to the airport wasn't possible for a long period of time, how would you get to work? (Check one only)
- ☐ by private vehicle (car, van, light truck) parked at the airport
 - ☐ dropped off (or picked up) by private vehicle (car, van, light truck)
 - ☐ MBTA Blue Line
 - ☐ Logan Express bus
 - ☐ other bus service
 - ☐ other means (specify) _____
- About your job at the airport:**
17. Which of the following statements best applies to you? (Check one only)
- ☐ I have only one job at the airport
 - ☐ I have two or more different jobs at the airport
- How many different jobs do you currently have? Enter number:
18. For which company do you work at the airport? (If you have more than one job, give the one you spent most time at on the occasion you described earlier)
- Enter company name: _____
- office use only:

FIGURE 1b Logan Airport flight crew survey questions.

percent are flight crew members. The remainder hold a variety of positions, including maintenance and ramp service. Only about 15 percent of employees have more than 15 min of flexibility in their work schedules. This suggests that of the employees holding positions that are not firmly fixed to a schedule, most are already eligible for flextime. Flextime increases the number of carpool and high-

occupancy vehicle alternatives potentially available to an individual employee.

Massport, through survey analysis, has found no significant differences in commute patterns of employees by job classification, with the exception of flight crew members compared to non-flight crew members.

19. Where at the airport do you report to that job?

(Check one only)

- ☐ 1 Terminals, old or new towers, or parking garages
☐ 2 north cargo area (Marriott kitchen, Delta hangar, NW/TWA hangar, Pan Am freight, etc.)
☐ 3 south cargo area (Bird Island Flats, Mass Tech Center, general aviation, post office, etc.)
☐ 4 rental car facilities
☐ 5 Hilton hotel, MPA heating plant, or American air freight
☐ 6 other (specify) _____

20. How much flexibility do you usually have in choosing the time you report for work?

(Check one only)

- ☐ 1 none at all
☐ 2 up to 15 minutes
☐ 3 16 to 30 minutes
☐ 4 31 to 60 minutes
☐ 5 up to 2 hours
☐ 6 more than 2 hours

21. Sometimes employers share some of their employees' costs of getting to and from work, or of parking at work. In the following list, please check any form of help that you personally qualify for (even if you don't use it).

(Check all that apply)

- ☐ 1 employer provides free parking spaces
☐ 2 employer pays part (or all) of the cost of parking
☐ 3 employer pays part (or all) of the cost for public transportation
☐ 4 employer provides car (or helps with car purchase or loan)
☐ 5 employer reimburses gasoline or mileage costs
☐ 6 employer reimburses tunnel or highway tolls
☐ 7 none of the above

22. Which one of the following categories best describes your job at Logan? (Check one only)

- ☐ 1 executive/managerial
☐ 2 professional/technical
☐ 3 administrative support/clerical
☐ 4 sales/service
☐ 5 production/crafts
☐ 6 maintenance/trade
☐ 7 other (specify) _____

About yourself:

23. Unless you already did so at question 4, please tell us where your home is:

city or town

state

zip code

street address or nearest intersection

office use only:

24. How many of the people living in your household (including you) are...

...aged 17 or over

Enter number:

...aged 16 or less

Enter number:

...employed for 10 or more hours per week?

Enter number:

25. How many private motor vehicles (cars, vans, or light trucks) are available for use by members of your household?

Number of vehicles available:

FIGURE 1 (continued)

Flight Crew Members

As mentioned above, about 55 percent of employees work for seven major airlines at Logan. But the group of all airline employees is not necessarily an easy target for trip reduction, since 45 percent of this group are flight crew members, and a good deal of them do not travel during peak commute periods. Flight crews, accounting for 25 percent of Logan employees, are only responsible for about 10 percent of average weekday commute trips.

Flight crews are the pilots and flight attendants who are based in Boston and commute to Logan to begin their flight assignment

(called a tour of duty). A tour of duty will begin and end at Logan Airport, but often it lasts for several days. The average tour of duty for Boston-based flight crew members is 3 days, meaning the egress trip from Logan is taken 2 days after the access trip.

Due to employee flying time restrictions imposed by the Federal Aviation Administration and individual airlines, a flight crew member does not generate many commute trips per month. For instance, Federal Aviation Regulations prohibit flight crew members from flying more than 1,000 hours per year, or 100 hours per month, or from flying for more than 30 hours in any seven-day period (2). For most flight crew members, a private automobile is used to commute

26. Employee parking spaces are likely to be less conveniently located during the construction of the Third Harbor Tunnel. In your opinion, how can Massport help make your commuting more convenient?

office use only:

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Completely optional:

If you would like to enter our drawing for five free dining-out certificates, we need your name and telephone number. Otherwise, you may leave this blank.

Your name: _____
please print

Telephone: (_____) _____
area code

This number is 1 ☐ work 2 ☐ home

Now please drop this form in any mailbox. If you received it at work, drop it in the marked box at your workplace. Thank you for your help. It is very important to us.

FIGURE 1 (continued)

to Logan, and is parked at Logan for the duration of the tour of duty. The irregularity of commute hours and days make it difficult for a flight crew member to participate in a carpool or vanpool. It is particularly difficult for a flight crew member to plan on using an alternative to the single-occupant automobile for the trip from Logan to home, since the timing depends on the arrival time of a scheduled flight, which may experience delays. Furthermore, flex-time is not a consideration for a flight crew member, as work assignments are scheduled around specific flights.

Pilots tend to live farther away from Logan compared to other Logan employees as a result of higher-than-average incomes and the need for fewer average commute trips per month. Their sparser geographic concentrations further accentuate the difficulty

in developing reasonable commute options for this employee group.

Non-Flight Crew Members

Non-flight crew employees are responsible for the continuous operation of Logan Airport. On an average weekday, 90 percent of commute trips are made by this catch-all group of employees. A non-flight crew member generally has a work day that is between eight and ten hours. Individual work schedules take on a range of forms including standard business hours, fixed shifts, and varying hours by day, by quarter, or other time increments. Some

TABLE 1 Select Logan Airport Employee Commute Characteristics

	Non Flight Crew	Boston-Based Flight Crew	Total
Total Logan Airport Employees:	11,764	3,841	15,605
Average Weekday Employees	8,588	982	9,570
Proportion, Average Weekday Over Total Employees	73%	26%	61%
Work at Least One Weekend Day	51%	36%	47%
Average Length of Work Day (Time at Logan)	9 Hours		
Average Tour of Duty		2.7 Days	
Occupation = Flight Crew			25%
= Executive/Managerial			10%
= Professional/Technical			9%
= Administrative Support/Clerical			7%
= Sales/Service			25%
= Production/Crafts			5%
= Maintenance/Trade			13%
= Cargo, baggage, drivers, ramp/ramp service			5%
Average Weekday Employees:	8,588	982	9,570
Have more than 15 minutes of flexibility in schedule	21%		16%
Parking Subsidized by Employer			85%
Subway Commute Subsidized by Employer			3%
Commute Mode = Auto:			88%
" " " and parking subsidized by employer			92%
" " " and available autos ge number of adults in household			69%
Commute Mode = Subway:			10%
" " " and parking subsidized by employer			46%
" " " and available autos ge number of adults in household			19%

available to Logan employees do not compete very well with the automobile, and collectively attract only about 12 percent of Logan employees.

Geography

The concentration of employee origins is very different from the concentration of air passenger origins; more than 50 percent of employees originate from the corridor immediately north of Logan Airport, compared to 10 percent of air passengers. About 45 percent of air passengers begin their trip to the airport either from Boston or the corridor west of Boston, compared to 10 percent of employees. To further accentuate the differences in passenger and employee origin densities, the ratio of passengers to employees traveling to Logan on an average weekday is about three to one. Scheduled bus and limousine routes serving Logan were developed based on air passenger origins, and do not serve a large employee market. Table 2 is a comparison of air passenger and employee concentrations by geographic zones, and Figure 2 is a map denoting the zones.

Hours of Operation

For Logan employees with at least one trip end outside normal business hours, schedules developed around air passenger or commuter peaks often do not offer the frequency of service or hours of operation necessary to provide a reasonable commute. Figure 3 is a comparison of Logan employee arrival and departure times on an average weekday.

Travel Time

The door-to-door commute time to Logan on some scheduled services is not competitive with the automobile, due to the transfers required to complete the trip or to multiple stops and layovers built into a trip.

Multiple Stops and Layovers

The primary market for most of the privately operated bus routes is the downtown commuter. Offering the additional 2-mi trip to Logan is a low-cost method of filling otherwise empty seats. As such, travel times are minimized for commuters, and airport passengers experience longer travel times. On the way to Logan, commuters are first discharged at one or two locations in downtown Boston. Depending on traffic levels, travel from Logan to downtown Boston can take from 10 min to an hour. Because of the uncertainty of the travel time between Logan and downtown and the necessity to meet the evening schedule for commuters, the layover in Boston may be as long as an hour for an airport user departing Logan. On the way into Boston, a private bus route may stop in several towns to pick up passengers. Multiple stops and potentially long layovers in downtown Boston may be acceptable to the occasional air traveler, but are not acceptable service characteristics for Logan employees.

Transfers

The subway system Massachusetts Bay Transportation Authority (MBTA) in the greater Boston area offers low-cost, frequent, con-

TABLE 2 Comparison of Logan Airport Employee and Air Passenger Origins by Zone

Zone	Location	Employees	Air Passengers
1	Boston	4%	21%
2	Inner Ring, North	47%	5%
3	Inner Ring, Northwest	5%	4%
4	Inner Ring, West Northwest	1%	8%
5	Inner Ring, West	3%	7%
6	Inner Ring, South	8%	3%
7	Outer Ring, North	8%	4%
8	Outer Ring, Northwest	5%	6%
9	Outer Ring, West Northwest	1%	4%
10	Outer Ring, West	1%	8%
11	Outer Ring, Southwest	1%	3%
12	Outer Ring, South	6%	6%
13	Other Massachusetts	4%	8%
14	Connecticut, Rhode Island	1%	2%
15	Maine, New Hampshire, Vermont	5%	9%
16	Rest of the World	0%	2%

Source: 1990 Employee Survey, Spring 1993 Air Passenger Survey.

Notes:

1. Represents employee and air passenger origins on the average weekday.
2. On an average weekday, there are about 27,000 air passengers traveling to Logan and about 9,600 employees traveling to Logan; ie, 3% employees is equivalent to 1% air passengers.

venient service to downtown travelers. It is connected to a network of bus routes and commuter rail lines. The routes are primarily geared to radial travel into downtown Boston, and travel becomes less convenient between points outside of downtown Boston, including Logan. There is only one direct subway line to Logan.

The airport MBTA station is located on the edge of Logan Airport, about 1 mi from the air passenger terminals. Massport offers free bus service between the station and the air passenger terminals. Although the bus headways are consistent with the subway schedule, this presents an additional transfer for subway users. The number of transfers varies between one and three for the airport

subway user. Commuter rail users must make three transfers. The more transfers people are faced with, the less likely they are to use a service.

Fares

The fares of many of the privately operated high-occupancy vehicle services are too high for airport employees who commute on a regular basis. Generally the monthly commuting expense for the privately operated bus and limousine routes to Logan is consider-

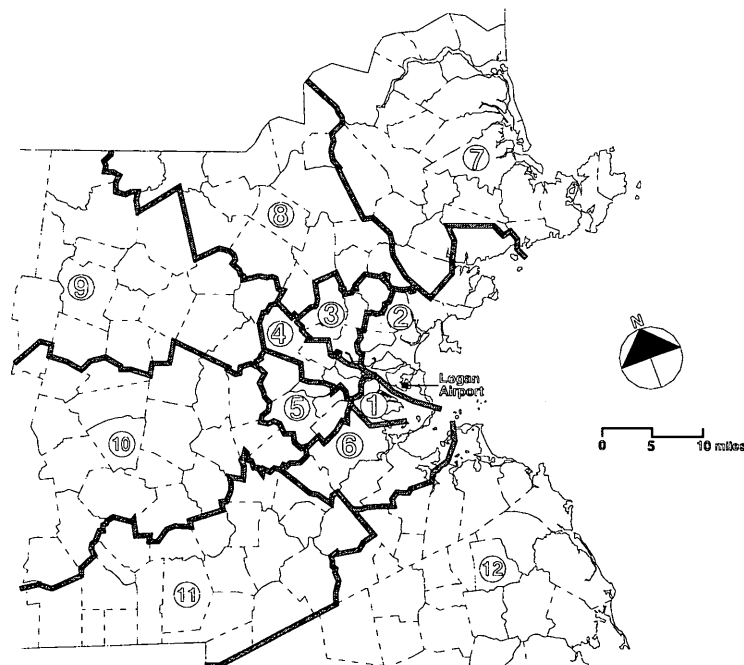


FIGURE 2 Geographic zones, eastern Massachusetts.

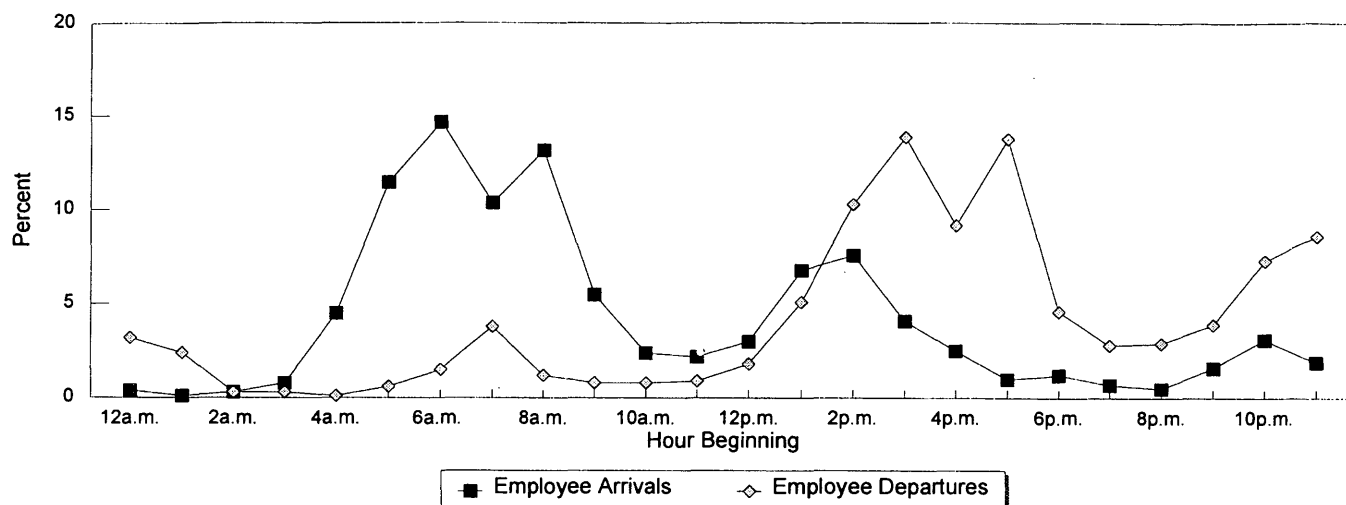


FIGURE 3 Logan Airport employee arrivals and departures by hour.

ably higher than the equivalent cost of services operated by the regional transit authority.

EMPLOYEE HIGH-OCCUPANCY VEHICLE INCENTIVES

Massport has been responsible for successful initiatives which have resulted in employees choosing alternatives to the private automobile. The following are the initial elements of our employee commute options program.

Incentives for All Airport Employees

Logan Express is a direct, non-stop bus service operated by Massport. The three routes serve remote locations, one about 32 kilometers west of the airport, one about 19 kilometers south of the airport, and one about 24 kilometers north of the airport. The services are operated daily, with weekday service at 30-min intervals from 5:00 a.m. until midnight.

Massport offers a discounted monthly Logan Express pass for all Logan Airport employees. The pass is priced slightly lower than the monthly rate for employee parking and is equivalent to between seven and nine one-way trips on the Logan Express. Ten-ride discount booklets are available for Logan Airport employees who don't find the pass to be economical. Employees using the service may park free of charge in the Logan Express parking lots. Taking advantage of the price incentive, employees of one airline convinced their employer to subsidize their Logan Express passes in exchange for their parking privileges. Several other airlines are now preparing to offer employees the option of a Logan Express pass or a subway pass in exchange for parking.

The number of employees using the Logan Express compares favorably to the concentration of employees in each of the market areas. In all, about 10 percent of employees reside in towns served by the three Logan Express routes. The most mature of the three routes captures about 25 percent of its employee market on an average weekday. On each of the routes, employees account for between 5 and 11 percent of ridership.

To further encourage employee ridership on Logan Express, beginning in January 1995, a 4:30 a.m. bus will be added on all routes to accommodate employees with early morning shift start times. Massport estimates that additional employee pass sales will cover about 40 percent of the incremental cost of the trip, and that additional air passengers using the service will cover another 50 percent of the cost.

The Airport Water Shuttle, a ferry service between Boston and Logan, offers a 60 percent discount for all Logan employees when tickets are purchased in 10-ride booklets. Some of the private high-occupancy vehicle services offer slight discounts to regular users or Logan employees. With the exception of those offered by a couple of private operators, the discounts are not deep enough to influence employee travel behavior.

As part of an effort to reduce employee vehicle trips through local neighborhoods, to comply with a federal and state regulation to reduce on-airport employee parking, and to increase air passenger parking, in August 1994 Massport relocated about 1500 employee parking spaces to a new parking garage one town west of the airport. A bus service transports employees between the airport and the garage. Massport estimates that some employees will switch to alternative modes of access rather than experience the inconvenience of driving to the remote garage to be bused to the airport. In fact, the airlines that are preparing to subsidize Logan Express passes or subway passes as an alternative to parking are doing so in recognition that alternative modes may offer an equivalent or shorter commute time compared to parking at the remote garage.

The remote garage is located in a town that has a high concentration of Logan employees. Since it is within walking distance of some residential areas, some employees may also use the bus as primary transportation to Logan.

Incentives for Massport Employees

Massport employees are subsidized for 50 percent of the monthly cost of commuting by subway, bus, commuter rail, and vanpools. The employee share of transit passes may be paid for through payroll deduction. For Massport employees commuting by Logan

Express or water shuttle, the 50-percent subsidy is applied to the cost of the already discounted monthly pass or 10-ride ticket booklet.

PREVIEW OF FUTURE PROGRAM DEVELOPMENT

In the upcoming months the following ideas will be further developed and evaluated, and some will be incorporated into a formal Logan employee commute options program. Because development of the formal program is in its early stages and is subject to discussion and collaboration with Logan Airport employers and within Massport, it is too early to provide great detail about the individual elements or cost of the program.

Ridematching Assistance

Current employee work hours and geographic considerations limit the potential for capturing large concentrations of employees in existing scheduled services. For the same reasons, the outlook for cost-effective new services is not good. In 1992 Massport conducted a survey of employees residing in a town with one of the highest concentrations of employees. Because the town does not have convenient access to public transportation, Massport considered initiating a shuttle bus network similar to a school bus network. Survey results indicated that, due to dispersed employee hours and residences, such a service would not be financially feasible.

Given the above conditions, along with current employment levels, carpooling may be a more realistic alternative for many airport employees. Massport is considering acquisition of a computerized ridematching program that enables employees to enter personal commute information directly into a data base by telephone, for temporary or part-time matching, or to become a permanent member of a carpool or vanpool. The program does not require personnel to assist in the matching. This would allow an employee to call a dedicated telephone number and communicate personal commute information using the telephone key pad. The information would be instantly processed, and the employee would be provided with ridesharing and high-occupancy vehicle alternatives. This would enable an employee with a varying schedule to participate in flexible carpooling, that is, as a part-time or temporary member of several carpools. Massport will also explore the potential for on-airport priority parking for those who choose ridesharing over single-occupant automobile access.

Logan Airport Transportation Management Association

Massport will probably provide some start-up funds for the formation of a transportation management association (TMA) among Logan employers. The TMA can then study and recommend additional elements for the employee commute options program. Massport believes that a program developed under a TMA will be more successful than a program developed by Massport, as participation in a TMA would demonstrate the employers' support of the commute options program. It would also allow an exchange of ideas among employers, including the insights of national companies who are dealing with employee commute issues in a variety of cities across the country. The TMA would facilitate the communication

of common and different employee needs. Employers would be encouraged to determine individual employee needs through surveys or focus groups, and to share the results with the TMA. Initiatives and funding mechanisms could be developed collectively, through the TMA, or by individual employers.

A TMA would be an appropriate forum for encouraging employer subsidization of alternatives to single-occupant driving, and for encouraging flextime for employees when possible. Through a TMA, a guaranteed-ride-home program could be considered back-up transportation for commuters using alternatives to the single-occupant automobile. The guaranteed ride home would probably be available for employees in the case of an emergency or unscheduled overtime.

Additional potential elements that are likely to be studied by the TMA include the following: if potential passenger and employee demand is sufficient, working with some of the private bus operators to offer a limited amount of nonstop trips to Logan; encouraging private carriers to offer deeper discounts; and adding links to existing services. The level of ridership needed to support direct trips will vary by carrier due to different operating costs and revenues. Work with the private carriers on direct trips and fare reductions is more likely to be successful through a TMA, since operators have been skeptical of employee demand when approached by Massport about potential fare reductions.

Air Passenger Services

Massport is continuously exploring the potential for additional air passenger services. Any new service would capture some employees. Studies are currently under way for another Logan Express service and for alternative transportation options for passengers whose trips originate in high-density, close-in communities. The needs of these passengers would not be met by a traditional scheduled bus service. Massport may also provide a nonstop bus link between the airport and a downtown intermodal facility upon opening of the new cross-harbor tunnel in early 1996. The intermodal facility, called South Station, is located about three kilometers from Logan Airport, near the financial district. South Station serves as a collection point for all commuter rail lines south of Boston, intercity rail, and some public and private bus routes. A high-frequency bus link between Logan and South Station will eliminate two transfers for both subway and commuter rail passengers, providing a better level of service for all Logan users.

CONCLUSION

Major airports like Logan are large traffic generators, and are viewed by many as an easy target for trip reduction. But the trip-reduction strategies that may influence airport employees are different from what is thought of for typical commuters.

Airport employees are not as influenced by trip-reduction strategies as typical commuters because of their special scheduling needs, the availability of fully subsidized on-airport or near-airport parking, and other considerations specific to an individual airport.

Because the highest employee-origin densities in the greater Boston area are not in towns with a high density of air passengers, travel mode choices available to air passengers are not viable options for many Logan employees. Because employee work hours are dispersed over all hours of the day and week, it is currently not

cost-effective for Massport to develop dedicated employee services, even for towns with a high density of employees.

A successful airport employee commute program will offer a variety of options to meet employee commuting needs. Flexible carpools may be a realistic alternative for many employees. Lower-cost initiatives that may accommodate some employees, such as flextime, where applicable, and a guaranteed ride home program, will make carpooling or vanpooling more attractive to employees.

Where feasible, existing high-occupancy modes may be made more accessible to employees by adding trips, offering reduced fares, or adding a limited amount of direct service on select routes.

Alternatives to the single-occupant automobile will become more attractive for employees if the supply of on-airport parking is reduced, particularly if on-airport priority parking is made available for carpools and vanpools. Alternatives to the single-occupant automobile will also become more attractive if employees become responsible for parking costs; however, this is unlikely at this time, due to collective bargaining agreements, nationwide airline employee benefits packages, and competitive employee benefits among airlines. Offering employees the cash equivalent of parking fees to be used for parking or for a less expensive alternative mode may also influence employees away from the single-occupant commute.

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