

Airport Access Plans for Boston

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•LOGAN INTERNATIONAL AIRPORT in east Boston is located closer to the central business district than any other major airport in the United States. Although it is only 2 airline miles from the Airport Administration Building to Boston's City Hall, the airport is nevertheless somewhat isolated geographically from the people it serves, both air travelers and those who work there. This isolation comes about because Logan is on a peninsula surrounded on three sides by arms of Boston Harbor. Direct land access is from the northwest only.

Highway access between Logan Airport and downtown Boston is via the Mystic River Bridge or via the Sumner and Callahan Tunnels (really one tunnel in which Sumner Tunnel carries westbound traffic and Callahan Tunnel carries eastbound traffic). These routes are severely congested during rush hours. To get to and from the airport, the people who live in the communities to the west, southwest, and along the south shore must face these bottlenecks, not to mention the downtown Fitzgerald Expressway. The people on the North Shore are more fortunate. They have the McClellan Highway (Route C-1). People who live to the northwest of the city as in Everett and Chelsea face a system of secondary roads and back streets.

Until Cleveland opened its new airport transit line, Boston was the only U.S. city that could boast a direct rail transit line to its airport, but the situation is not as good as it sounds. First of all, the MBTA Blue Line, or east Boston line, only passes by the airport and does not go directly to the terminal area. It is necessary to take a shuttle bus from Airport Station for about a mile or so to the various terminals. Second, the Blue Line, when it gets downtown, terminates near Government Center and is not a through route. People destined for Back Bay or Brookline (the western and southwestern suburbs) must transfer to other rail lines serving these areas. People destined for Cambridge, Dorchester, or the South Shore must make two rapid transit station transfers.

PRESENT ACCESS MODES

Most persons traveling to and from the airport use automobiles for transportation. The largest proportion use private automobiles, but a significant number uses taxicabs or rented vehicles. The proportionate number of persons using MBTA services (i. e., Airport Station and shuttle bus) is approximately 5 percent and has remained at this percentage level for the past 6 years during which air travel volumes have increased rapidly. This constant percentage has, of course, meant a steady increase in the number of persons entering the turnstiles at Airport Station. For the 5 years from 1962 to 1967, the daily one-way turnstile count at Airport Station rose from an average of about 1,000 to 1,600 riders—an increase of 60 percent.

A 1962 survey of air travelers at Logan Airport indicated that MBTA riders formed approximately 5 percent of all traffic to and from the airport. This proportion varied little between days of the week. In 1967 the Massachusetts Port Authority surveyed airport access patterns and found that the use of the MBTA bus was relatively stable at 5 percent of total airport users. Incidentally, it does not make much difference whether we are talking about the MBTA shuttle bus or the rapid transit station, because practically everyone who arrives by rapid transit uses the bus and vice versa. Results of these two surveys are given in Table 1.

The use of the private automobile has increased noticeably, while the MBTA has about held its own. The use of taxis, rental cars, and limousines has decreased proportionately.

With rapidly increasing air passenger volumes and introduction of aircraft with 200 to 500 seats, the impact on the vehicular tunnels between downtown and Logan Airport will be severe. Even the present volumes, reaching 70,000 vehicles a day, cannot easily be accommodated during the

peak hours. The cross traffic on the streets of the downtown side of the tunnels and the lack of adequate access roads add to the congestion. The central artery (Fitzgerald Expressway) has average daily volumes of more than 100,000 vehicles, and slowdowns during adverse conditions are frequent. Traffic during rush hours also backs up on the McClellan Highway on the east Boston approach to the Sumner Tunnel. At times the airport exit road traffic has been halted as drivers slowly edged onto the McClellan Highway.

ACCOMMODATION OF FORECAST DEMAND

Proposals for alleviating this central artery overloading primarily center about a proposed third harbor tunnel. A study has been completed for the Massachusetts Turnpike Authority, which calls for a tunnel extending from the present end of the Massachusetts Turnpike (I-91) under the Fort Point Channel on the Boston side, to the McClellan Highway in East Boston. The plan also calls for a new expressway extending northeasterly to a connection with Interstate 95 in Revere. The extension of I-95 southward to the Revere Marshes is currently under construction. The proposed third harbor tunnel will provide adequate relief only if proper approaches and connections are built at each end. A suggested alternative to the tunnel would be a high-level bridge.

Logan Airport started in 1923 as the East Boston Airport. It was taken over by the Massachusetts Port Authority in 1959. During 1968, eight million total air travelers were accommodated at Logan Airport. Only 10 years ago, in 1958, the total was less than 2.5 million. This more than tripling of air travelers in 10 years indicates the magnitude of the growth factors involved. Another six million persons, who were neither air travelers nor airport employees, visited the airport during the past year. Airport employees number approximately 8,000, including 7,000 persons who are employed by the airlines.

The growth rate of total air passengers is running about 14 percent per year. Landrum and Brown (1), who did a study for the Port Authority of Boston Metropolitan Air Service Facilities, have forecast 15.6 million passengers by 1980. The Federal Aviation Administration and United Airlines have forecast closer to 26 million for the same year.

In 1968 Logan served approximately four million enplaned (one-way) passengers or eight million total passengers. This means the airport handles 16,000 enplaned passengers per day and 1,600 at peak hour. Air passengers, however, are only part of the total population drawn daily to the airport from the community. The survey of the airport population shows that each passenger generated 0.8 nonflying visitors, or almost one visitor per passenger. The other important part of the population comprises the employees of various airport facilities. Total airport population, therefore, is more than twice the passenger count. At peak hour, 2,200 cars now enter the terminals on the airport road system. At present, 5,800 parking spaces are needed and provided for passengers and visitors. Of these, 3,170 spaces are located in the new three-level parking garage.

With respect to today's total, the airport will double its passenger volume by 1980. Translating these figures into vehicular volumes and parking requirements reflects the scale of problems to come. By 1980, 13,700 parking spaces for passengers will be

TABLE 1
WEEKDAY ACCESS MODE DISTRIBUTIONS FOR
LOGAN INTERNATIONAL AIRPORT

Mode	Percentage	
	Nov. 1962	April 1967
Private automobile	60	68.6
Taxi	30	23.3
Rental car and limousine	5	2.4
MBTA	5	5.3

required with 4,000 more spaces needed for employees. The peak-hour traffic will have 5,800 vehicles entering the airport, while the present three lanes of entry road could only have a capacity of 3,600 vehicles per hour. The ultimate capacity for passenger parking on present Port Authority-owned land is 14,600 spaces, if five-level parking structures are constructed.

The airport, from an air and runway capacity point of view, is capable of handling 15 million annual enplaned passengers. The ground parking and road facilities, when expanded to the maximum possible on the land available will be congested by an annual level of 12 million enplaned passengers. Long before this point is reached, however, congestion will occur on the feeder road system leading to the airport. This problem will be compounded by the increased traffic to be generated by airport employee growth caused by expanding cargo facilities and passenger terminals, inasmuch as the use of air cargo is growing rapidly. It will become necessary for many passengers, visitors, and employees to find alternate means of getting to Logan Airport. As a first step toward determining what must be done to improve access to the airport by public transportation, the Bureau of Transportation Planning and Development of the Massachusetts Department of Public Works is applying for a federal technical study grant to assist the Port Authority and the MBTA in carrying out an origin-destination study of airport users. Before we invest in additional public transportation facilities, we must first determine where the airport users are coming from, where they want to go, and why.

SURVEY RESULTS

Before we discuss further what needs to be done to improve public transportation to the airport, consider the results of a survey of airport loop bus passengers conducted for the MBTA by Traffic Research Corporation in 1966.

More than half of the MBTA patrons are students, airport workers, and military personnel. Twenty-one percent are students, 21 percent work at the airport (24 percent if the 3 percent representing pilots and stewardesses is included), and 12 percent are members of the armed forces. More than half of the MBTA riders are in the categories of business, recreation-vacation, and family travel. This is contrary to the experience of public transit operators in many other cities who claim that the great majority of their patrons are airport employees. Twenty-four percent of transit trips to Logan are in the category of airport employee work trips.

The problem of access at any major airport has two basic elements; one is access external to the airport, and the other is internal access to the various terminals, facilities, and parking areas within the boundaries of the airport.

Logan Airport was not served by public transportation until 1945 when the first bus service to the airport was provided, with connections to the Maverick Square Station in east Boston. Maverick Square was at that time the terminus of the rapid transit line. In 1952, the east Boston rapid transit line was extended to the Orient Heights area with a stop at the airport, and shortly thereafter to its present terminus at Wonderland in Revere. The line now totals 6.13 miles of track, extending between Wonderland in Revere, and Bowdoin Station in downtown Boston. Trains are normally operated in two-car lengths except during peak hours when four-car trains are used. The length of platforms on this line will not permit trains of more than four cars. Most of the cars in use on this line seat 48 persons and are 48 ft 6 in. long by 8 ft 7 in. wide. This is quite small (capacity is approximately 135 passengers per car or 540 passengers per four-car train) for a rapid transit car, but the size of these vehicles is limited by the east Boston tunnel under Boston Harbor, which was built in 1904 for use by streetcars.

When Airport Station was constructed in 1952, the transit authority instituted a bus shuttle service to the airport terminal buildings. In 1967, Airport Station was modernized and refurbished, with escalators to provide improved pedestrian connections between rapid transit and bus services. Modernization of Airport Station is part of a general station modernization program being undertaken with federal aid. It is hoped that this modernization will attract more transit riders and, with better signing and graphics, make it easier for them to find their way through the subway system. Also in 1967, the airport shuttle bus line was equipped with new air-conditioned buses with

special luggage racks. During peak hours there are two buses on this route, and they operate on a 7-minute headway.

POSSIBLE IMPROVEMENTS TO THE PRESENT SYSTEM

Regarding external access to the airport by public transportation, the greatest single improvement would be an in-town extension of the Blue Line to provide a direct connection with the Green Line, which serves the western corridor with four branch routes and traverses the downtown central area and extends to Somerville in the northwest corridor bordering on Boston. People in the western suburbs and Boston's Back Bay area could then have direct access to Airport Station. People coming in on other transit routes would have to make no more than one transfer in downtown Boston. A study of the central area rapid transit system, being conducted by the MBTA, is exploring the traffic potential, engineering feasibility, and cost of this proposed through route. The study is also considering the feasibility of a branch or spur from the Blue Line into the airport terminal area to replace the shuttle bus between Airport Station and the air terminal area. Although it may prove feasible to build such a spur, it could hardly provide the final stage of distribution to the individual terminals that is so badly needed. The MBTA is also studying the possible extension of the Blue Line for about 1 mile from the present Wonderland terminal to a large parking area close to Interstate 95. Other planned improvements include new cars for the Blue Line and modernization of additional stations. Additional capacity could be provided by lengthening platforms for six-car trains, but there are no immediate plans for doing this because the line is still operating well below its design capacity.

The incorporation of a rapid transit line in the proposed third harbor tunnel is another possibility but one that would involve many engineering problems and enormous expense. Even then, the line would not pass close enough to the terminal areas to provide the necessary final distribution. It would also pose the question of what to do with the existing East Boston Rapid Transit Tunnel, inasmuch as two parallel transit lines under the harbor would be difficult to justify. A more reasonable scheme would probably be the incorporation of an express bus service through the new tunnel between the airport and the proposed trade and transportation center, which is planned for construction on the site of the present South Station.

CIRCULATION WITHIN LOGAN AIRPORT

It is becoming apparent that the present shuttle bus service will deteriorate with the increasing volume of automobile traffic with which the buses mix. Currently, peak-hour delays frequently occur, tending to inhibit the use of transit.

It will probably be many years before the MBTA could justify the construction of an additional rail transit line to the airport. There are many higher priority construction projects that require funding. Our current planning is aimed at making the best possible use of the existing Blue Line and extending it if feasible. A "people-mover" is needed that will be free from surface congestion and that can transfer people and their luggage quickly from Airport Station and from a central parking area to their desired terminals with a minimum of waiting time and a maximum of comfort. High speed is not necessary. A regular flow of vehicles, or modules, and adaptability to wide fluctuations in demand are more important than high speed. Such a system should be capable of integrated baggage handling so that the traveler will not have to handle his baggage as he enters the system. The system should be simple in design and be capable of a small turning radius to permit its construction in the existing, rather heavily built-up area. Logan was laid out with primarily the private automobile in mind; little thought was given to the future needs for public transportation.

To do its job properly at Logan, the people-mover would have to serve the following areas: a subterminal and parking garage, the southwest terminal, south terminal, north terminal, international terminal, hotel, employee parking area, and Airport Station. Two basic concepts are a loop system and a radial system, with the loop system serving the various terminals and parking areas from a central distribution point. The loop system appears to be more practical for Logan.

A recent study of possible intra-airport transit systems done for the Port Authority by John Carl Warnecke and Associates (3) has recommended a capsule type of system as the most practical for Logan because of its inherent flexibility and baggage handling capability. Although most of these systems are still in the development stage, some will probably become operational in the next 2 or 3 years.

CONCLUSION

I have outlined the problems and described some of the things that are being done and should be done to cope with the rapidly increasing surface congestion at Logan. The two projects that currently hold the most promise in my opinion are the MBTA Central Area Systems Study, which will recommend improvements to the Blue Line, and the joint MBTA-MPA Study of Mass Transportation for the Airport. The results of these studies will point the way to future improved facilities for convenient access to the great airport.

REFERENCES

1. A Study of the Air Transportation Potential and Facility Requirements in the Metropolitan Boston Air Service Area. Landrum and Brown, Sept. 1968.
2. Report on Joint Study by the Massachusetts Bay Transportation Authority and the Massachusetts Port Authority on Improved High-Speed Public Transportation Between Logan International Airport and Downtown Boston. Dec. 1968.
3. Intra-Airport Transit System Study for Boston-Logan International Airport. John Carl Warnecke and Assoc., Feb. 1969.