

Public Transportation for Airport Employees: Q3 Extension into John F. Kennedy International Airport

DANIEL K. BOYLE AND PAUL R. GAWKOWSKI

Public transportation extensions to airports have often focused on the needs of air travelers; the employee market has generally received less attention in ground transportation planning at airports. An extension of a local New York City Transit Authority bus route, the Q3, into John F. Kennedy International Airport (JFK) is described, and the results of a survey of Q3 riders are presented. JFK employees form a stable ridership base, and those recently employed are especially dependent on Q3 service. The route extension has been successful in attracting new riders from alternative modes (primarily the automobile). Free transfer privileges with connecting bus routes have been instrumental in establishing a large service area for local bus service to JFK.

Provision of public transportation service to airports has received increased attention in recent years. Much of this attention has focused on the extension of rapid transit lines designed to provide fast, relatively inexpensive connections between the central business district and the airport. Rapid transit extensions support the metropolitan airport's role as a transportation hub and serve the important function of reducing congestion on ground transportation for the air traveler market segment.

The other major role of the metropolitan airport is as an employment center for jobs related to flight service or cargo handling. This role is supported by public transportation that provides convenient access to the airport for employees. The employee market segment has generally received less attention in ground transportation planning at airports than the air traveler market. This market segment is potentially larger and more lucrative, given the daily nature of employee travel. Even the most frequent flyers do not travel to airports five times a week, and the amount of baggage that they carry often precludes rapid transit usage.

To address the travel needs of the employee market at John F. Kennedy International Airport (JFK), the New York City Transit Authority extended the Q3 bus route into the airport in December 1987. This paper describes this extension and presents the results of an onboard survey conducted in October 1990. The survey's purpose was to determine travel and

work patterns and previous or alternative modes of transportation.

In the next section of the paper, the physical layout, employment patterns, and transportation access at JFK are described. The Q3 routing and its extension into JFK are then presented, and a discussion of the on-board survey design and implementation follows. Survey results are analyzed, and conclusions and implications are presented. The Q3 extension and survey results are of timely interest to other transit agencies considering route extensions to serve airports or other major employment concentrations outside the central business district.

JOHN F. KENNEDY INTERNATIONAL AIRPORT

JFK, in southern Queens along the banks of Jamaica Bay approximately 15 mi from Manhattan (Figure 1), has the highest concentration of employment in New York City outside of the Manhattan central business district. JFK is the nation's leading air cargo gateway, with a 1988 volume of 1.3 million tons. The Port Authority of New York and New Jersey operates the three major commercial airports in the New York metropolitan area: JFK, LaGuardia, and Newark.

Total employment at JFK is approximately 42,000, distributed within the airport as shown in Figure 2. The central terminal area accounts for a significant proportion of total employment at JFK, but most workers are scattered throughout the airport. This dispersion of job locations within the airport makes it somewhat more difficult to serve work trips via public transportation.

JFK is generally not well served by public transportation. The closest rapid transit service is the A-train at the Howard Beach station, outside the airport's border. This station was the terminus for the "Train to the Plane," a premium-fare service that operated from 1978 to 1990. Shuttle buses connected the station to airline terminals, making the trip the "train to the bus to the plane." This service was discontinued in 1990 because of low patronage, high operating costs, and poor equipment utilization. A free bus shuttle from the Howard Beach station to the airline terminals is now operated by the port authority.

Access to JFK by local bus (Figure 3) has been provided primarily by Green Bus Lines, one of the four privately owned local bus companies still operating in Queens County. The major Green Bus route into Kennedy is the Q10, which op-

D. K. Boyle, Brooklyn/Queens/Staten Island Bus Service Planning, New York City Transit Authority, 130 Livingston Street, Third Floor, Brooklyn, N.Y. 11201. Current affiliation: Center for Urban Transportation Research, College of Engineering, University of South Florida, 4202 East Fowler Avenue, ENG 118, Tampa, Fla. 33620. P. R. Gawkowski, Brooklyn/Queens/Staten Island Bus Service Planning, New York City Transit Authority, 130 Livingston Street, Third Floor, Brooklyn, N.Y. 11201.

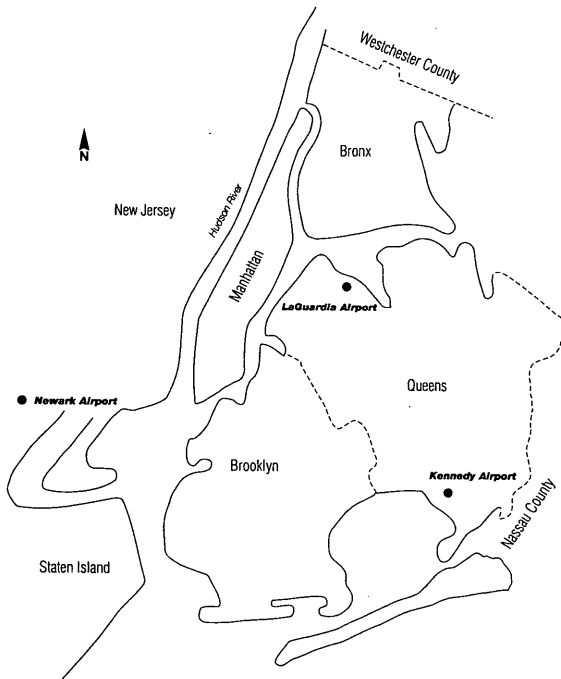


FIGURE 1 Airport locations in New York City metropolitan area.

erates from Union Turnpike in Kew Gardens (at a rapid transit station served by the E- and F-trains) to the central terminal area, Federal Circle, and the hangar area on the airport grounds. The Q10 also serves the Lefferts Boulevard station of the A-train. Green Bus's Q7 route provides service to Cargo Plaza from the Rockaway Boulevard station on the A-train, and the Q9 route operates into JFK via the Q10 route during peak periods only. One transit authority local bus route, the Q3, originated in Jamaica and terminated at the airport periphery on Farmers Boulevard at Rockaway Boulevard, where Green Bus's Q6 route also ended. The Q3 operated only during weekday morning and evening peak periods until December 1987. The Q6 route has since been extended a short distance onto airport grounds to serve the postal facility in the north cargo area.

Premium-fare coach service to JFK from midtown Manhattan and from LaGuardia Airport is provided by Carey Transportation. Carey also serves the Jamaica Long Island Railroad Station.

Q3 EXTENSION TO JFK

In December 1987 the transit authority extended the Q3 route into JFK's central terminal area via the north cargo area, previously unserved by public transportation. At the same time, the span of Q3 service was expanded to 21 hr/day, 7 days a week. This extension was not designed as a service for air travelers, since the Q3 routing was a roundabout way to travel between the E and F rapid transit lines and the airport. Instead, the authority anticipated that the extension would be used primarily by airport workers.

At the transit authority's request, the port authority provided a breakdown of home addresses of JFK employees by ZIP code. Figure 4 shows the distribution of employee residences. The concentration of workers in southeast Queens and surrounding areas can be seen readily. Despite their proximity to the airport, these employees had no direct access via public transportation. Transit riders from southeast Queens were required to ride into Jamaica, transfer to another bus or to the subway, and then transfer again to the Q10, ensuring at least a 1-hr and two-fare (often a three-fare) trip.

Figures 5 and 6 show the routing of the Q3 bus. From the 165th Street bus terminal in Jamaica, the Q3 travels along Hillside Avenue, serving the 179th Street station, the last stop on the F- and R-lines. At 187th Place, the Q3 turns south and proceeds to JFK primarily via Farmers Boulevard. The route enters the airport at Rockaway Boulevard, its former terminus, and travels through the north cargo and cargo plaza areas into the central terminal area. Minor changes in Q3 routing within the airport have been made since 1987 as a result of roadway construction.

The Q3 is essentially a north-south route, whereas most routes in Queens are oriented east to west. Thus, free transfer privileges are available between the Q3 and every major transit authority and private bus route in southeast Queens as well as many bus routes serving eastern and northern Queens. The Q3 extension provided one-fare access to JFK for most

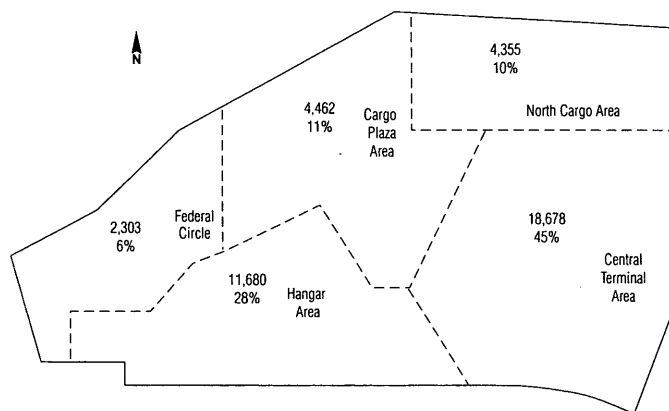


FIGURE 2 Distribution of employment by area at JFK, 1986.

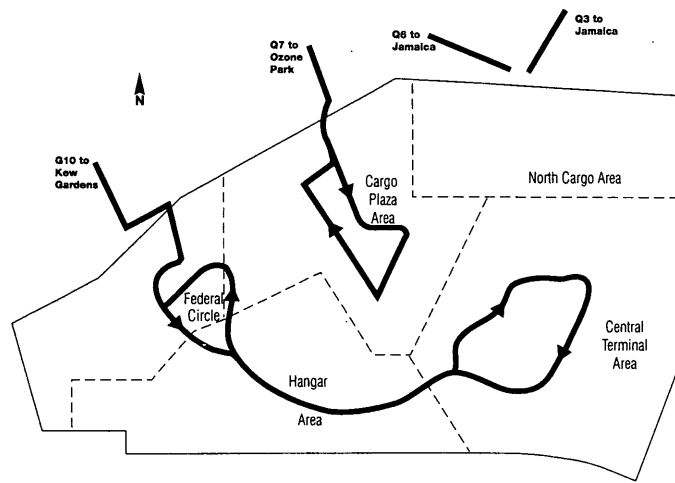


FIGURE 3 Bus routes serving JFK, 1986.

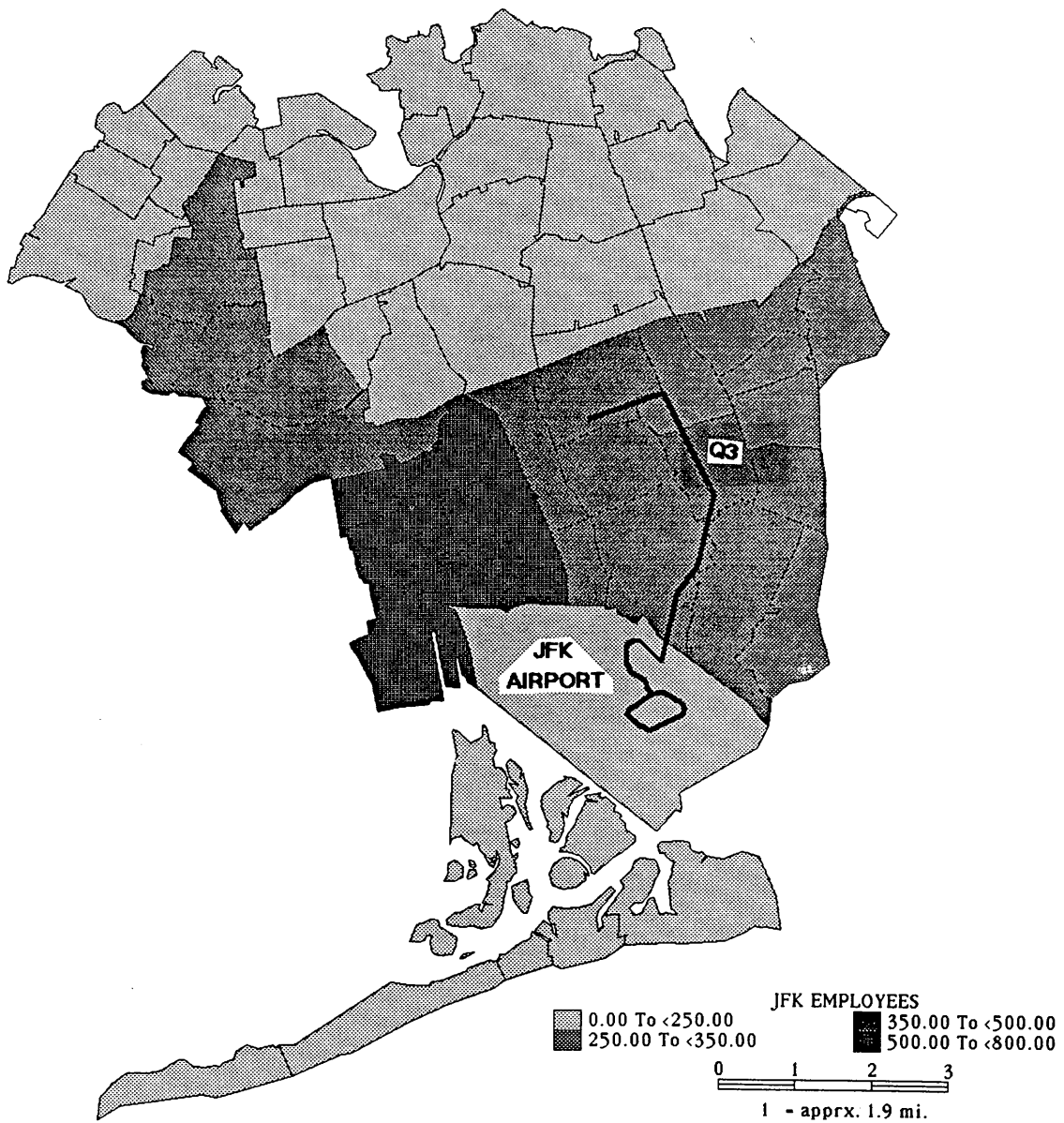


FIGURE 4 JFK employees' residences by ZIP code, 1986.

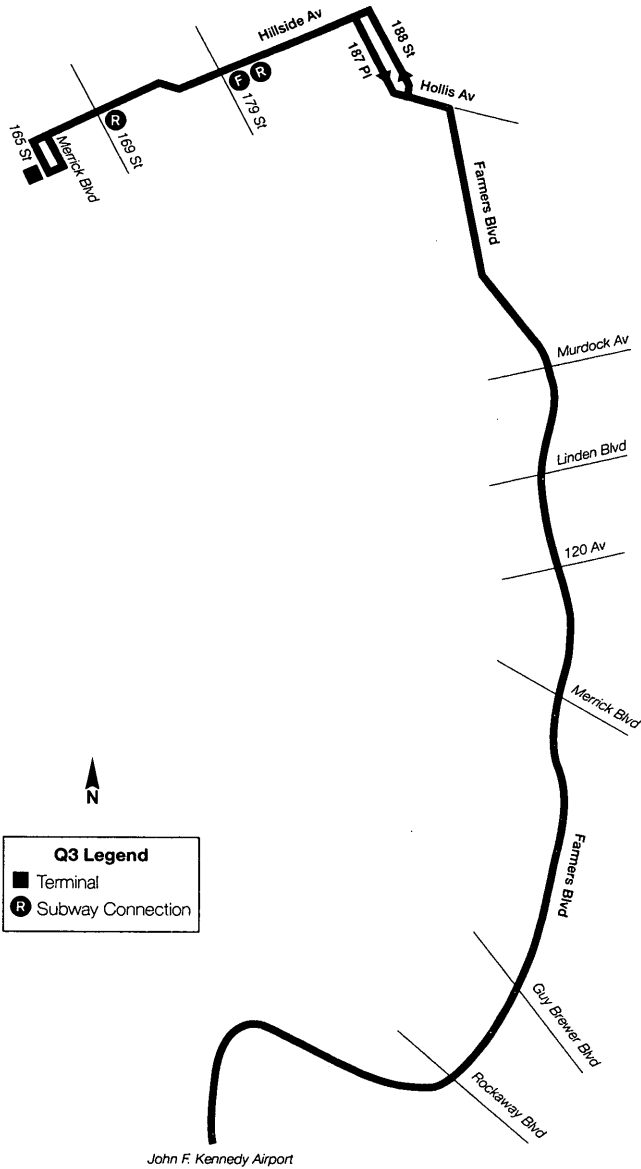


FIGURE 5 Q3 route in Queens.

of eastern Queens, including almost all of southeast Queens. Peak-period headways were shortened from 20 or 25 min to 15 min, and new midday, evening, and weekend service was provided every 30 min.

Extensive marketing activities were undertaken by the transit and port authorities. Community officials were briefed at an early stage. Brochures including Q3 timetables were printed by the transit authority, a first for local bus service in Queens. These were distributed by the port authority to all employers at JFK; the port authority also placed articles about the new service in airport newspapers and newsletters. Direct mailings went out to all households in southeast Queens. On Sunday, December 6, 1987, a special inaugural Q3 bus with local dignitaries on board traveled from the 165th Street bus terminal to JFK, where the port authority hosted an opening-day celebration (incidentally, using the same room in which the Beatles were introduced to America in 1964).

SURVEY DESIGN AND CONDUCT

The extension to JFK and the longer span of service proved to be an immediate success. Q3 patronage soon increased to the point that additional service was added to the route. Figures 7 and 8 indicate the growth of overall Q3 ridership as well as ridership into JFK; Table 1 shows changes to the Q3 schedule since 1987. This ridership trend is all the more notable when placed against the backdrop of decreasing system-wide trends in bus ridership.

Ideally, an origin-destination survey would have been conducted within 12 months of the start-up of JFK service on the Q3. However, resources for conducting origin-destination surveys within the transit authority were focused during this time on other major changes, such as the opening of the Archer Avenue line. In addition, the Q3 extension opened up employment opportunities at the airport to residents of southeast Queens, but obviously all new employment did not begin in the first 6 or 12 months. Given a reasonably high rate of job turnover at JFK, the delay in surveying riders provided a broader picture in that it included employees who began work at the airport well after the extension.

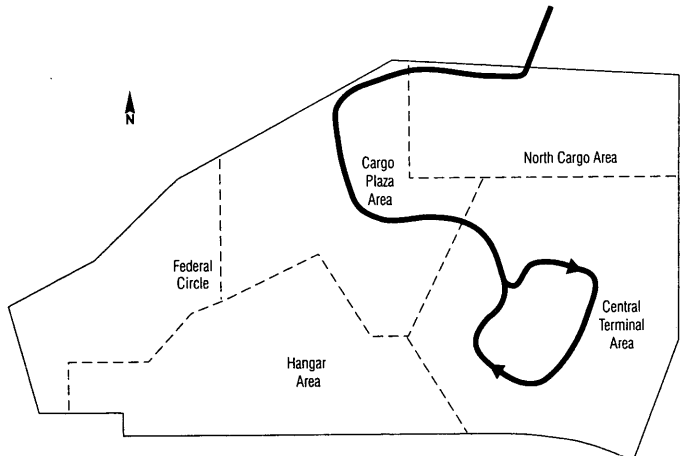


FIGURE 6 Q3 extension into JFK.

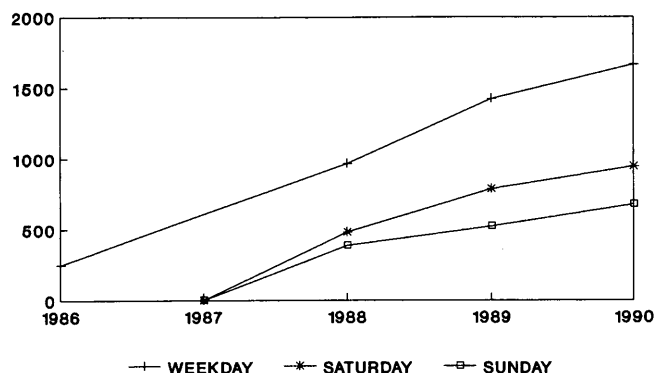


FIGURE 7 Q3 daily ridership, peak load point (6:00 a.m. to 9:00 p.m.).

One ridership count in January 1989 indicated that during the period surveyed (6:00 a.m. to 9:00 p.m.), more passengers were riding the Q3 to the airport than from the airport. The mystery of this imbalance was solved when later evening checks revealed frequent standing loads on buses leaving the airport between 9:00 p.m. and midnight. A 21-hr ride check was requested and scheduled for October 25, 1990. In conjunction with this, a brief survey was prepared to administer to Q3 riders on trips into the airport.

The purpose of the survey was threefold: to determine travel patterns on the Q3, to gain information on JFK employees, and to ascertain previous or alternative modes of travel. Riders were asked where they boarded the Q3 bus and whether they had transferred from another bus or the subway. The survey included questions on frequency of travel on the Q3, employee status at the airport, and length of employment. JFK employees were asked about their previous mode (if they had worked at the airport for at least 3 years) or alternative mode of travel.

The survey was administered on board Q3 buses by traffic checkers and planning staff. Figure 9 shows a copy of the survey form used. All trips going toward JFK were scheduled to be surveyed. The surveyor boarded a JFK-bound Q3 bus at Rockaway Boulevard, the last stop before the airport, identified himself or herself as a transit authority employee and then began to interview riders. Two persons were assigned to buses at particularly busy times. Surveyors altered the pattern

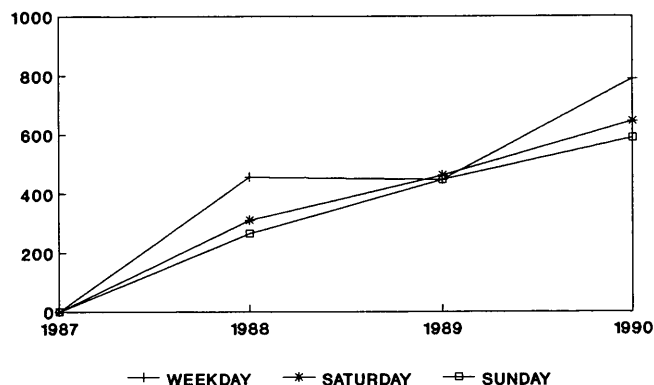


FIGURE 8 Q3 daily ridership into JFK (6:00 a.m. to 9:00 p.m.). (1988 weekend data estimated.)

TABLE 1 Q3 Schedule Changes

Day	Date	Scheduled Headway		
		AM	Midday	PM
Weekday	1987	20	--	25
	Dec 1987	15	30	15
	Dec 1988	12	30	15
	June 1989	12	20	12
	June 1991	10	15	12
Saturday	1987	--	--	--
	Dec 1987	30	30	30
	Dec 1988	30	30	20
	Sept 1989	20	20	15
	Sunday	1987	--	--
Dec 1987		30	30	30
Sept 1989		30	20	30
Sept 1991		30	20	20

of questioning riders, sometimes beginning in the front of the bus and other times in the back.

Table 2 reveals the number of successfully completed interviews, the number of riders approached for information, and total ridership into JFK. The number of riders sampled was below 100 percent because of a few missed trips. Overall, approximately 90 percent of all riders were included in the sample, and the response rate from those surveyed was approximately 70 percent.

The sample was then expanded by time period to match total ridership. Time periods were selected to reflect differing peak/off-peak ridership patterns as well as differing response rates. Four separate time periods covered the morning peak (5:00 to 8:00 a.m.); the midday period (8:00 a.m. to 1:00 p.m.); the afternoon peak, when ridership into the airport was heaviest (1:00 to 4:00 p.m.); and the rest of the day (4:00 p.m. to 1:30 a.m.). Early evening and late evening were similar in terms of ridership patterns and response rates. Table 2 contains expansion factors by time period. Numbers in the remaining tables represent expanded ridership.

SURVEY RESULTS

As expected, most Q3 riders were airport employees, the market for which the service was designed. Peak ridership into the airport in the morning and afternoon corresponded with shift changes. Most riders came not all the way from Jamaica, the northern terminus of the Q3 route, but boarded along Farmers Boulevard in southeast Queens (Table 3). The heaviest boarding locations were at major transfer points at Merrick Boulevard (Q5), Guy Brewer Boulevard (privately operated Q111 and Q113), and Linden Boulevard (Q4). These three locations accounted for more than 33 percent of JFK-bound boardings, and the seven busiest bus stops accounted for more than 60 percent (Table 4). More than 80 percent of Q3 riders use the service at least 5 days a week.

The most significant and interesting findings were those concerning length of employment at JFK, prevalence of trans-

1. Where did you get on the Q3?
2. Did you transfer from a bus or subway line? If yes, what # ?
3. How many days a week do you make this trip?
4. Do you work at JFK Airport? If yes, how long have you worked here?
 (If at least 2 1/2 years, ask question 5)
 (If less than 2 1/2 years, ask question 6)
 (If no, this is the last question)
5. How did you get to work at JFK before the Q3 was extended?
6. Do you ever come to work at JFK some other way than on the Q3?

1. _____ (Cross Street)

2. Subway # _____ Bus # _____ No _____

3. # Days per Week _____

4. Length of Time worked at JFK _____ Do not work at JFK _____

5./6. Car _____ Bus # _____ Taxi _____ Other (specify) _____

1. _____ (Cross Street)

2. Subway # _____ Bus # _____ No _____

3. # Days per Week _____

4. Length of Time worked at JFK _____ Do not work at JFK _____

5./6. Car _____ Bus # _____ Taxi _____ Other (specify) _____

1. _____ (Cross Street)

2. Subway # _____ Bus # _____ No _____

3. # Days per Week _____

4. Length of Time worked at JFK _____ Do not work at JFK _____

5./6. Car _____ Bus # _____ Taxi _____ Other (specify) _____

1. _____ (Cross Street)

2. Subway # _____ Bus # _____ No _____

3. # Days per Week _____

4. Length of Time worked at JFK _____ Do not work at JFK _____

5./6. Car _____ Bus # _____ Taxi _____ Other (specify) _____

FIGURE 9 Q3 JFK survey, September 25, 1990.

TABLE 2 Response Rates and Expansion Factors by Time of Day

Time Period	Q3 Riders into JFK	Interviews Requested	Interviews Completed	Response Rate	Expansion Factor
5 a.m. to 8 a.m.	233	178	118	66.3%	1.97
8 a.m. to 1 p.m.	216	216	195	90.3%	1.11
1 p.m. to 4 p.m.	337	316	219	69.3%	1.54
4 p.m. to 1:30 a.m.	159	134	60	44.8%	2.65
TOTAL	945	844	592	70.1%	

TABLE 3 Boarding Locations of Q3 Riders into JFK

Location	Riders	Percent
Hillside Avenue	279	29.6
187 Place and Hollis Avenue	64	6.8
Farmers Boulevard:		
North of Linden Boulevard	100	10.5
Linden Boulevard to 122 Avenue	145	15.4
Merrick Boulevard to 144 Rd	175	18.5
Guy Brewer Blvd to Rockaway Blvd	130	13.8
Unspecified Intersection	52	5.5
Total along Farmers Boulevard	601	63.6
TOTAL	945	100.0

fers from other routes to the Q3, previous modes of travel for long-time employees, and alternative modes for recent employees. Taken together, these findings highlight the most salient factors in the success of the Q3 route extension.

Table 5 reveals the means of access to the Q3 bus. Slightly more than half of the passengers entering the airport transferred from another bus, 47 percent reported no transfer, and only 2.5 percent used the subway to reach the Q3. The low figure for access by subway is not surprising, since the Q10 provides a more direct trip to JFK from the Queens Boulevard rapid transit line. Most transferring passengers used a transit authority bus to reach the Q3, but 12 percent of total riders transferred from a private bus route (generally a free transfer), and 3 percent transferred from a Metropolitan Suburban Bus Authority route and paid an additional fare.

The average duration of employment at JFK for Q3 riders was 31.4 months, or slightly more than 2.5 years. Table 6 presents a breakdown of length of employment, with the largest number of Q3 riders falling into the 12- to 35-month cat-

egory (35 percent). The next largest category was less than 1 year, with 29 percent of passengers. Twenty-six percent had worked at the airport for 3 years or more; these riders were already employed at JFK when the Q3 route was extended in December 1987. The remaining 9 percent of riders either did not work at the airport or did not respond to this question.

The previous mode used by long-time airport employees was of particular interest to the authority, since a major argument in favor of the Q3 extension was that it would attract riders who had been using other modes. Table 7 shows the response of long-time employees to this question. The predominant mode previously used was the automobile, with 54 percent reporting that they had traveled to work at the airport by private automobile or by taxi. Only 32 percent had used public transportation, in line with expectations because of the indirect routings before the Q3 extension. The remaining long-time employees reported other modes or did not respond.

The question asked of employees who worked at the airport for less than 3 years concerned alternative rather than pre-

TABLE 4 Heaviest Boarding Locations for Q3 Riders into JFK

Location	Riders Boarding	Percent of Total Boardings
Merrick Boulevard	121	12.8
Guy Brewer Boulevard	117	12.4
Linden Boulevard	107	11.3
165 Street Terminal	72	7.6
187 Place/Jamaica Avenue	64	6.8
Murdock Avenue	60	6.3
Hillside Avenue/179 Street	58	6.1
TOTAL BOARDINGS	945	100.0

TABLE 5 Means of Access to Q3 Bus for Riders into JFK

Means of Access	Riders	Percent
Subway	23	2.4
Bus	477	50.5
T.A. Bus	342	36.2
Private Bus	109	11.5
MSBA Bus	26	2.8
Walk	442	46.8
No Response	3	0.3
TOTAL	945	100.0

vious modes. The response to this question was very low, indicating the possibility that some of the interviewers misunderstood the instructions and terminated the interview if the respondent was not a long-term employee. According to several interviewers, however, many recent employees perceived no alternative and indicated that the Q3 was their sole means of access to JFK. This supports another major argument in favor of the Q3 extension, that it would expand employment opportunities and serve as a plus in recruitment for JFK-based companies. Of those recent employees who indicated an alternative, 71 percent cited private automobile or taxi and 29 percent mentioned another bus route (Table 8).

To summarize briefly, the survey results have confirmed the importance of the Q3 extension for airport employees, particularly in southeast Queens, who previously did not have convenient access via public transportation. These employees form a stable ridership base; recent employees are especially dependent on Q3 service. The only complaint voiced to the interviewers concerned the infrequent late evening service; the latest Q3 schedule provides additional trips in this time period.

TABLE 6 Length of Employment at JFK

Time	Riders	Percent
3 or More Years	249	26.3
1 - 2.9 Years	334	35.4
Less Than 1 Year	277	29.3
Not Employed at JFK	75	7.9
No Response	10	1.1
TOTAL	945	100.0
Average Length of Employment:	31.4 months	

TABLE 7 Previous Mode Used by Long-Time JFK Employees

Previous Mode	Number	Percent
Automobile	125	50.2
Taxi	10	4.0
Bus or Subway	57	22.9
Bus and Subway	24	9.6
Other	15	6.0
No Response	18	7.2
TOTAL	249	100.0

CONCLUSIONS AND FUTURE DIRECTIONS

The survey results indicate that the extension of the Q3 has been successful in terms of a number of criteria:

- Attracting new riders from previous modes.
- Attracting new riders when they are hired at the airport,
- Establishing a large service area for local bus service to JFK through transfers with connecting routes,
- Expanding employment opportunities at JFK for residents of southeast Queens, and
- Reducing automobile congestion in the airport and on surrounding roadways.

The extension of the Q3 bus to JFK has demonstrated a significant level of demand for local bus service on the part of airport employees. The success of this extension is measured primarily by its increased ridership, with concomitant increases in service frequency, ever since December 1987.

More broadly, its success can be measured from other perspectives. From a community perspective, the expanded access provided from Queens neighborhoods to a major center of employment opportunities achieves an increasingly elusive

TABLE 8 Alternative Mode Used by Recent JFK Employees

Alternate Mode	Number	Percent
Automobile	61	10.0
Taxi	10	1.6
Bus	29	4.7
No Response	511	83.6
TOTAL	611	100.0

goal in this era of job relocation to often distant and inaccessible suburbs. From the perspective of an employer, the expansion of the pool of potential employees within reasonable commuting distance ensures a healthy labor market and provides an important advantage in recruitment efforts.

The major reason for the Q3 success is that the extension supplied a service for which there was obvious demand. Beyond this, a primary factor was the extensive network of routes within a single-transfer ride of JFK via the Q3. The north-south orientation of the Q3 route was important, because this provided free transfer opportunities with all major southeast Queens bus routes (which are oriented in an east-west direction) along with the Hillside Avenue corridor routes. This importance was demonstrated in Table 5, which showed that more than half of Q3 riders into JFK had transferred from another bus.

The widening of the potential market for local bus service to an airport by choosing a route with many transfer connec-

tions has been a major consideration in transit authority planning for other route extensions of a Q3 nature. A Brooklyn bus route (B10) has been proposed for extension to JFK. The B10 was selected from a number of candidate routes in part because of the number of connections it offers to other Brooklyn bus routes. At LaGuardia Airport in northern Queens, a new route has been proposed to tap potential employee markets in Harlem and (through transfer privileges) upper Manhattan and northwestern Queens. Both of these proposed routes would vastly simplify public transportation access to the airports from the neighborhoods served.

A well-designed local bus route serving a remote employment center and offering extensive connections with other major routes can attract significant ridership. The Q3 route extension has successfully tapped the employee market segment at JFK and has demonstrated the important but less obvious role of the metropolitan airport as a major employment center.