

# GO Rail 1989 Survey Results

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The Government of Ontario (GO) commuter rail system provides an attractive alternative to automotive journey-to-work travel in the greater Toronto area. Operating with conventional rail technology, the 7-line, 47-station system carries more than 80,000 passengers each weekday, or some 20 million passengers per year, over its 356-km network. The system is in a continuous state of expansion and upgrade to meet the demands of Toronto-bound commuters. Systemwide surveys of riders have been conducted as a cooperative effort between GO Transit and the Ontario Ministry of Transportation since 1981. The biennial surveys collect both origin-to-destination and rider-characteristic data, which provide a base for operational and policy-planning purposes. Some results of the 1989 survey are described.

Government of Ontario (GO) Rail is the first interregional transit system in Canada created and funded by a provincial government. The original GO Rail began as a demonstration project in 1967 with the premise that, by attracting motorists off the highways, such a service would reduce the need for new multimillion-dollar expressways. The system has since been expanded to seven lines that serve an area of more than 8000 km<sup>2</sup> (3,000 mi<sup>2</sup>) with a population of more than 4 million. Figure 1 shows the lines and stations in 1989.

In addition to rail service, GO Transit operates bus services in support of and independent of the rail system. Of the 10 million passengers who use the GO Bus service annually, approximately 10 percent use routes connecting with rail services.

The original Lakeshore lines operate on all-day, two-way schedules over most of their routes. The Lakeshore West route operates at full service (10 min peak, 60 min off-peak) for only about two-thirds of its length, with a limited three-train extension in the peak direction for the remainder. The newer routes operate between one and five trains daily in the peak direction over a 2-hr period.

Free parking is provided for more than 20,000 vehicles on the system, but despite the large number of spaces, demand at many of the lots often exceeds supply. To dissuade riders from parking at the stations, kiss-and-ride lanes for passenger pickup and drop-off are provided at most stations. In addition, special access loops for buses and integrated fare arrangements with most local transit operators are now in place. Despite these efforts, parking lot capacities continue to be a major problem for GO Transit.

GO fares, charged by distance over a zone system, are much less than the cost of commuting by car but do not undercut the prices set by local transit operators. The goal set for GO Transit is to recover 65 percent of operating costs through fare box revenue with the provincial government making up the balance and paying all capital costs.

Union Station in downtown Toronto is the hub of the GO Rail system and is directly linked to the Toronto Transit Commission's (TTC's) extensive subway and surface transit network. Of the 80,000 daily rail passengers, 98 percent exit or board GO Rail at Union Station, and nearly one-third of these passengers transfer to TTC services. To promote the use of both transit systems and to make this transfer more economical, a combined GO/TTC monthly pass package known as Twin Pass was introduced in January 1988. An average GO monthly pass costs about \$115, and a TTC monthly pass is \$53. The Twin Pass offers this combination at a \$20 discount. Acceptance of this fare package has been high; more than 10 percent of GO riders purchase it on a regular basis.

Future demand on the GO Rail system will come from all areas of the greater Toronto area (GTA). Downtown Toronto is expected to continue to dominate employment activity in the GTA. To date, GO Rail service has expanded incrementally in response to emerging trends in population and employment growth. The period from 1987 to 1989 was characterized by sustained economic expansion, which has, however, slowed in recent months. The Ontario Ministry of Transportation (MTO) predicts that current ridership levels will more than double during the next 30 years, and it is anticipated that all seven lines will be upgraded to full-service status during this time period. Extensions of the existing rail lines and upgrades of some limited services had been completed by early 1990, and plans have been made for additions to the system.

## SURVEY METHOD

Given the high growth experienced by GO Rail, an ongoing survey program has proved useful in measuring the various changes on the system. GO Transit is responsible for distribution and collection of the survey forms, and the Transportation Demand Research Office of MTO administers the data collection, processing, and report generation. In 1989 the consulting firm of Cole, Sherman and Associates was contracted by MTO to assemble the data base and prepare a report. GO Transit and MTO share the responsibility for design and development of the survey content.

Table 1 gives data collected by each of the GO Rail surveys undertaken since 1981. Changes between the 1989 and previous surveys include the addition of questions concerning duration of residence, previous trip method, fare type following the introduction of the new Twin Pass program, and parking at GO Rail stations. Because of space limitations, questions pertaining to trip purpose and family income group, which had not changed significantly in other years, were dropped from the latest version. They may be reinstated in future surveys to maintain a time series data bank.

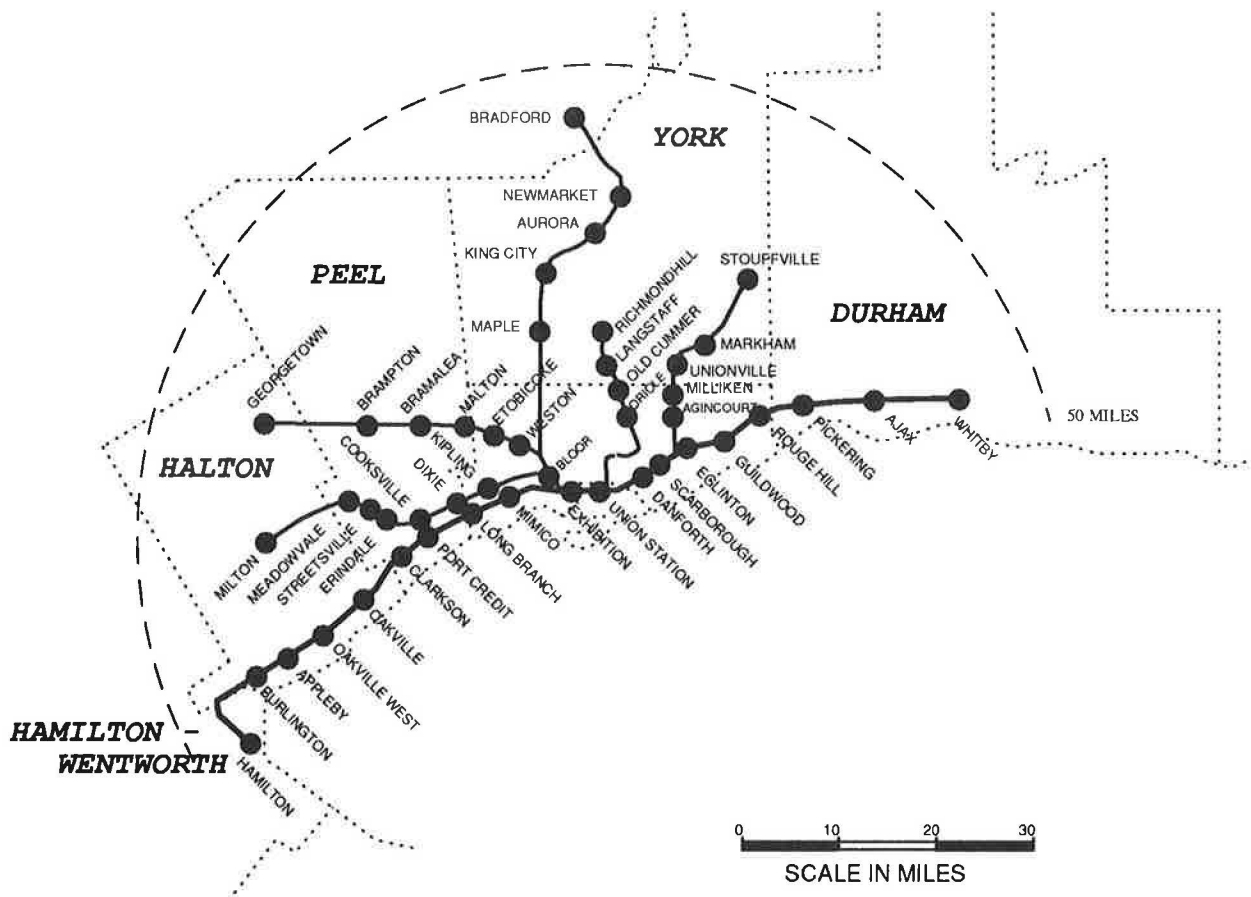


FIGURE 1 GO Rail system lines and stations, 1989.

TABLE 1 DATA COLLECTED IN GO RAIL SURVEYS

		81	83	85	87	89
<b>Origin End:</b>	Trip Origin	*	*	*	*	*
	Origin Purpose	*	*	*	*	*
	Boarding Station	*	*	*	*	*
	Boarding Time	*	*	*	*	*
	Mode Station	*	*	*	*	*
<b>Destination End:</b>	Trip Destination	*	*	*	*	*
	Destination Purpose	*	*	*	*	*
	Destination Station	*	*	*	*	*
	Mode from Destination	*	*	*	*	*
<b>GO Fare:</b>	Fare Medium	*	*	*	*	*
	Reason for Single Fare Use	*	*	*	*	*
	Fare Category (e.g. student)	*	*	*	*	*
<b>Twin Pass Users:</b>	Previous Fare Medium					*
	Uses Twin Pass for GO Bus					*
<b>New User:</b>	Previous Trip Mode					*
<b>GO Frequency:</b>	Trips/Week	*	*	*	*	*
	TTC Fare Medium				*	*
<b>Reverse Trip:</b>	On Same Day	*	*	*	*	*
	Mode Used	*	*	*	*	*
<b>Socio/Economic:</b>	Male/Female			*	*	*
	Age			*	*	*
	Family Income	*	*	*	*	*
	Car Availability for Trip	*	*	*	*	*
	Why GO Used Over Auto	*	*	*	*	*
<b>GO Use History:</b>	Years of Use	*	*	*	*	*
<b>Residence History:</b>	Years at Present Residence	*	*	*	*	*
	Location of Previous Residence	*	*	*	*	*
	Importance of GO Transit					*
<b>Employment History:</b>	Years at Employment Location	*	*	*	*	*
	Location of Previous Employment	*	*	*	*	*
<b>Drive &amp; Park Users:</b>	If Parking Lot Closed, How Would Make This Trip					*

GO Rail surveys are conducted on a single midweek day in November to minimize the effects of special events, vacations, and compressed workweeks. The day of the survey is chosen to correspond to GO Transit's own count program, which provides calibration data. Survey cards are distributed as riders board at Union and other Toronto stations for all afternoon outbound trains. This has proved to be a better approach than distributing forms at all 47 GO stations to collect inbound trip information. More than 80 percent of the daily outbound trips on the rail system are surveyed with this method. Boxes were provided at each station to collect completed responses. A small number of surveys were mailed back, although no postage was provided.

In the 1989 survey, 17,600 valid responses were collected, a response rate of 42 percent. Although more responses were collected for the 1989 survey than in previous years, the response rate was slightly lower.

Trip records on survey cards were geocoded using the Universal Transverse Mercator 6-degree coordinate system. Four points on each survey card were assigned a geocode: origin, access station, egress station, and final destination. Each point was assigned an x-y coordinate, which allows better analysis of characteristics such as distance between points of an individual's trip. Geocoding also provides more flexibility for geographic analysis, because each set of coordinates can be aggregated to any zone system.

Survey records were expanded to daily totals by using GO Transit's count data, which record boardings and alightings

for each station by train number. Expansion factors were then calculated for each egress station, which, when summed, equal the daily outbound ridership.

## ISSUES

Current GO Rail survey data are necessary to understand the forces affecting the system in recent years. As indicated in Figure 2, ridership on GO Rail has increased by 20 percent per year during the study period. Traditional forecast methods were unable to explain this accelerated growth. Several questions on the survey were designed to give planners insight into the characteristics of new GO riders.

A portion of the growth can be attributed to increases in service levels on some of the rail lines. During the study period, two of the limited-service lines were upgraded by the addition of one or two trains in the peak period. An analysis of the geocoded trip segments for the 1987 and 1989 surveys enables planners to identify changing trip patterns resulting from service improvements.

The combination of rapid growth in demand and new services raises a number of operational concerns for GO Transit. By analyzing trip patterns and new demand characteristics, the operator is able to rationalize parallel and complementary bus services, plan station size and parking requirements, and add extra cars to existing consists to meet the higher demand.

A fourth major issue that can be addressed through analysis of survey data concerns travel demand research. Insight into trip generation, transit mode split, fare elasticities, and sensitivity to increased service levels can be gained from the survey data.

## SURVEY RESULTS

Though rail ridership has increased rapidly during the study period, GO Bus ridership has increased only moderately, actually dropping during the past year (see Figure 2). Much of the decline in bus ridership can be attributed to a two-station extension of the Lakeshore East GO Rail line, which replaced a bus service. Congestion on the approaches to Toronto has increased travel times by road and inhibits the use of the GO Bus system. There appears to be little shift from GO Bus to GO Rail in most other corridors; only 1.6 percent of new riders indicate GO Bus as their previous travel mode. The largest segment of new riders on the rail system indicated that they did not make the trip at all before their use of GO Rail. Nearly 50 percent of new riders indicated that they did not previously make the surveyed trip.

Figure 3 shows growth and current ridership levels for each GO Rail line between 1981 and 1989. The full-service Lakeshore lines, which together account for 70 percent of total ridership, dominate the picture. GO Transit initiated limited service on the Milton, Bradford, and Stouffville corridors after 1981.

Growth was evident on all lines between 1981 and 1987. The largest increases in ridership were on the new Milton and both Lakeshore lines. The sustained Lakeshore West growth during a time of increased competition from the new Milton service is of particular interest. More than 80 percent of ridership growth was concentrated on these same three lines during the survey period. Most of the growth on Lakeshore East and Milton can be attributed to either extensions of the line or added service. The rate of growth on the Lakeshore West line, however, continued to exceed forecasts. Analysis of data

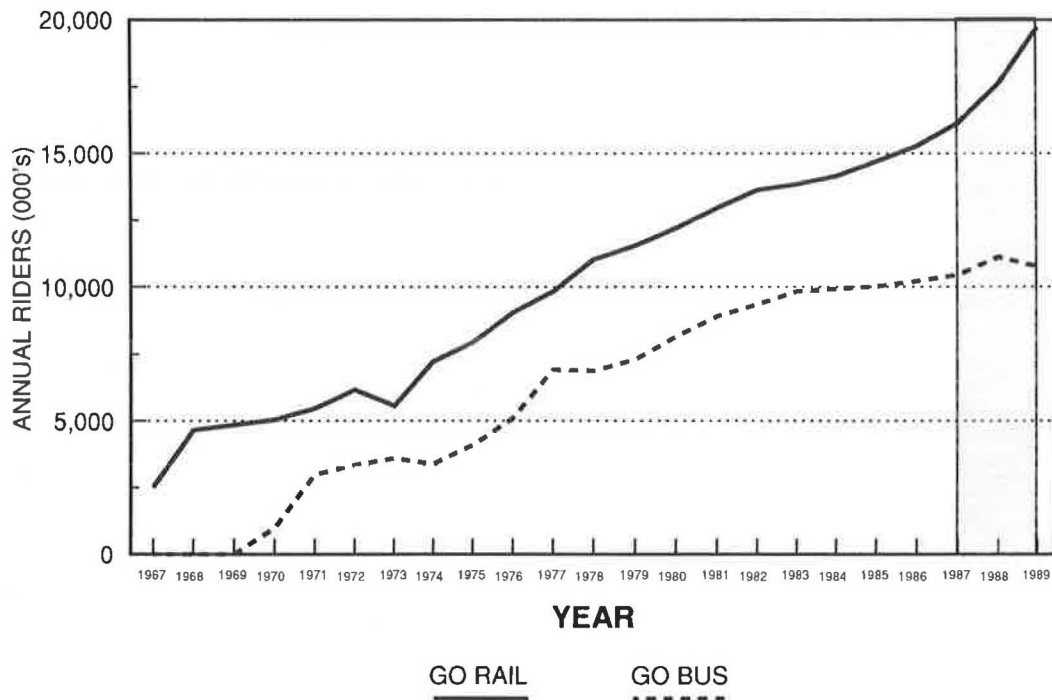


FIGURE 2 GO system annual ridership.

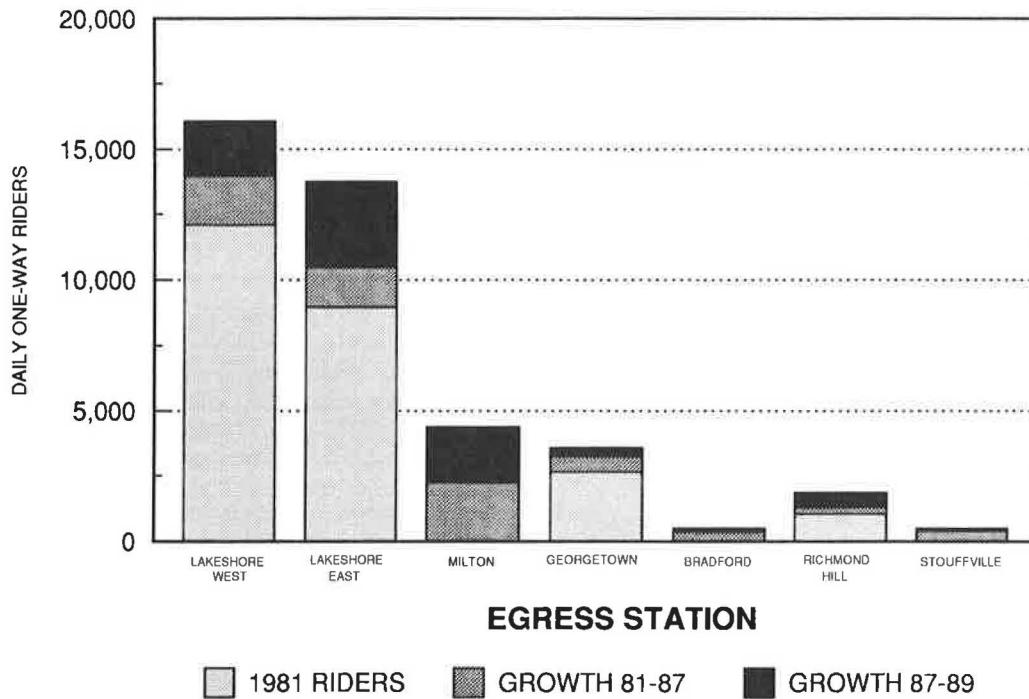


FIGURE 3 Ridership growth by line, 1981-1989.

collected by the 1989 GO Rail Survey permits a more detailed study of the forces influencing ridership growth in this corridor.

Figure 4 shows growth in patronage at individual stations along the Lakeshore West GO line. The chart shows the effect of the full-service portion of the line. Oakville is the current terminus for all-day service and has both the highest passenger

volumes and egress trip lengths, because GO patrons from areas further to the west travel there to take advantage of greater flexibility in travel times. Between 1987 and 1989, however, Oakville experienced little ridership growth compared with the two stations immediately to its east.

This trend is interesting because these areas of GO growth are fully developed residentially, and GO Rail market pen-

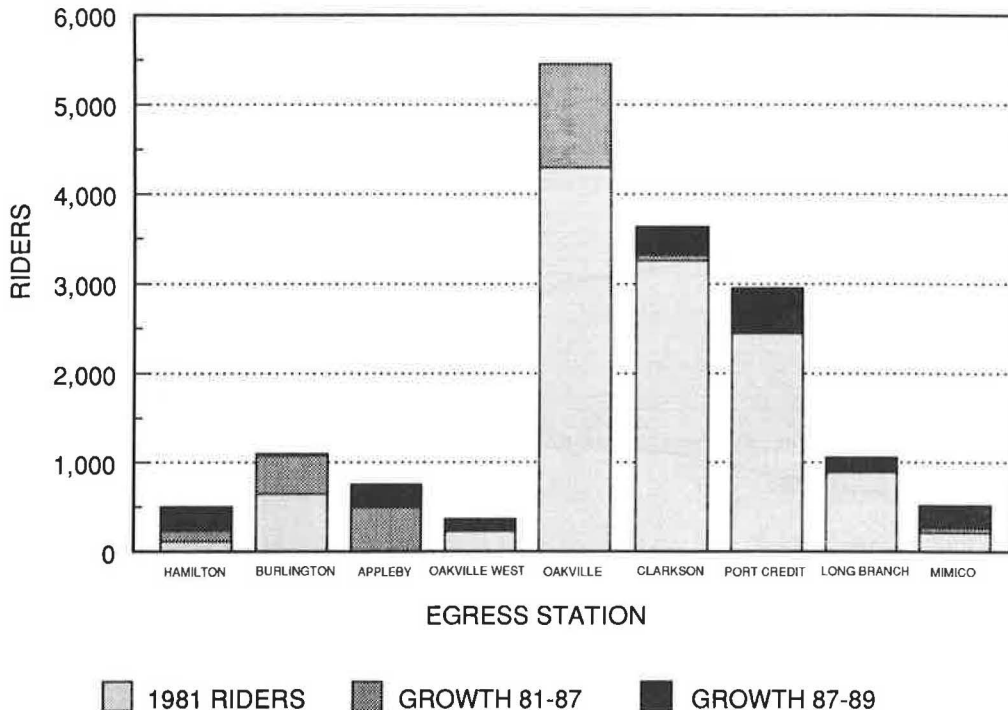


FIGURE 4 Growth in patronage at stations on Lakeshore West line, 1981-1989.

etration was assumed to have matured. Figure 5, which shows previous trip method by years at residence for all riders at the Clarkson station who indicated that they had been riding the GO service for less than 1 year, was extracted from the survey data to examine this question. The central feature is the large number of new residents—new riders who did not previously make this type of trip, which indicates both a higher rate of residential turnover and greater attractiveness of GO service than is suggested by the forecasting model. More than 90 percent of riders indicated that the availability of GO Transit service was very or somewhat important to their choice of residential location (see Figure 6). Mode shift, particularly from automobile, suggests another factor that probably influences ridership. The number of respondents indicating automobile as a previous trip mode rises as length of time at current residence increases. This may indicate dissatisfaction with growing congestion.

Congestion on the road system feeding Toronto has become increasingly significant in recent years. Total trips across the

metropolitan border in the peak period (3 hr) have increased by 12 percent since 1987. GO Rail carried 9 percent of all trips and 20 percent of the increase in trips over the border in the peak period. Current cordon counts indicate that GO Rail has carried more than 100 percent of the increase in trips to the primary GO Rail market in downtown Toronto since 1987.

Besides investigating growth of ridership on the GO system, the 1989 survey collected information that can be used to evaluate other aspects of GO service. Table 2 compares fare media choices by riders in 1989 with those in 1987. The two dominant fare types continue to be Monthly Pass and Ten Ride tickets, which offer discounts of 10 to 20 percent from the cost of a single fare. The small percentages counted in the Single and Other fare categories reflect the low proportion of occasional riders in the average weekday total. As hoped, introduction of the Twin Pass resulted in a shift to monthly pass use. Purchases of the Twin Pass have been consistent with forecasts provided by transportation planners. A series

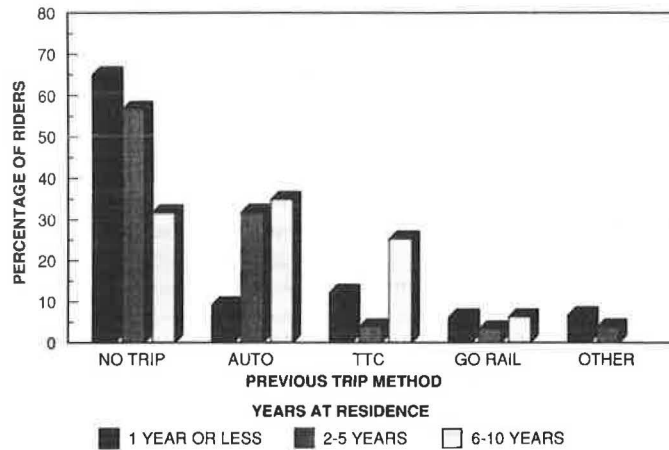


FIGURE 5 Previous trip method by years at residence, new Clarkson riders.

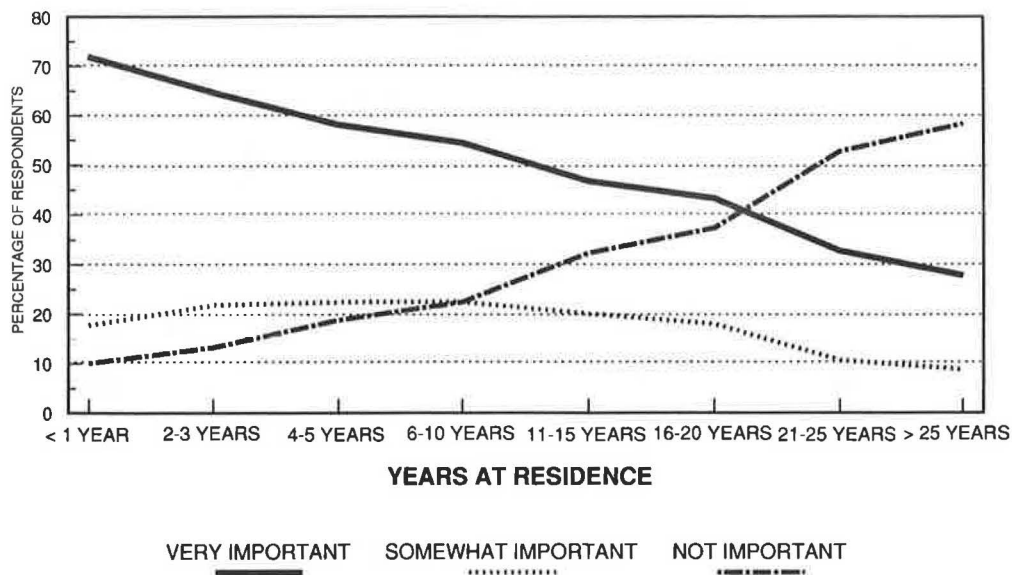


FIGURE 6 Importance of GO to choice of residence.

TABLE 2 FARE MEDIA CHOICES BY RIDERS, 1987 AND 1989

	% 1987	% 1989
MONTHLY PASS	43.2	36.8
TWIN PASS	-	10.3
(TOTAL GO PASS)	(43.2)	(47.1)
TEN RIDE TICKETS	46.6	43.2
SINGLE FARE	9.7	8.1
OTHER	.4	1.2

TABLE 3 GO AND TTC TRIPS TAKEN DURING LAST 7 DAYS

NUMBER OF TRIPS	% ON GO		% ON TTC	
	1987	1989	1987	1989
0	0	0	47.7	47.7
1-5	10.3	9.6	23.1	20.3
6-10	77.8	77.7	22.2	21.5
11-15	11.5	12.1	5.0	6.0
16 PLUS	.4	.4	1.9	1.2

of fare elasticities, which relied heavily on previous GO system surveys, was developed as necessary input to cost-benefit negotiations between GO and TTC.

Figure 7 shows access mode by distance to Union Station for 1987 and 1989 for the two major modes. Walk and transit combined account for 97 percent of all trips to Union Station, although fewer than one-third of GO riders transfer to the subway on any given day. The chart clearly shows the 1.5-km (approximately 1-mi) break point between walk and transit. The introduction of the Twin Pass was expected to influence this relationship, but only a slight shift in mode by distance has occurred.

In addition to affecting access mode and distance, the Twin Pass program was expected to influence the number of trips made on transit. Table 3 gives the number of GO and TTC trips made by riders during a 7-day period using various fare media. The table indicates little difference from 1987 for all GO riders, but it is necessary to consider that segment of the market purchasing the Twin Pass. Twin Pass users have increased their trip making on the TTC portion of the system. Nearly 35 percent reported that they made more than 10 TTC trips over a 7-day period, compared with 8.4 percent for all other fare types.

At the destination, which is in most cases the home end of the GO Rail trip, automobile is by far the preferred egress mode. Table 4 gives percentages by egress mode for 1987 and 1989. Because average egress trip length on the system is approximately 4 km and integrated local transit connections are available at nearly all stations, it is somewhat surprising

TABLE 4 EGRESS MODE, 1987 AND 1989

EGRESS MODE	% 1987	% 1989
WALK	12.1	11.6
LOCAL BUS	16.4	15.2
GO BUS	4.2	1.7
DRIVE AND PARK	51.7	56.2
RIDE IN CAR	2.1	3.6
KISS 'N RIDE	12.6	8.5
OTHER	.9	3.2

that use of the automobile continues to grow. Free parking at all stations has no doubt contributed to this trend but, on the other hand, has been a major selling point in attracting commuters from their cars to GO for the major portion of their trip. As discussed earlier, riders have come to expect the availability of free parking, to the point where overall ridership on the system appears to be affected. The decline in Go Bus as an egress mode is attributable to replacement of some services by train extensions, but the deterioration in the share of GO riders using local transit is of more concern.

To explore the relationship between parking and GO ridership, respondents who parked their cars at the station were asked how they would access the GO system if their usual parking lot was closed temporarily for resurfacing. Clearly, the provision of parking is a significant factor; more than 30

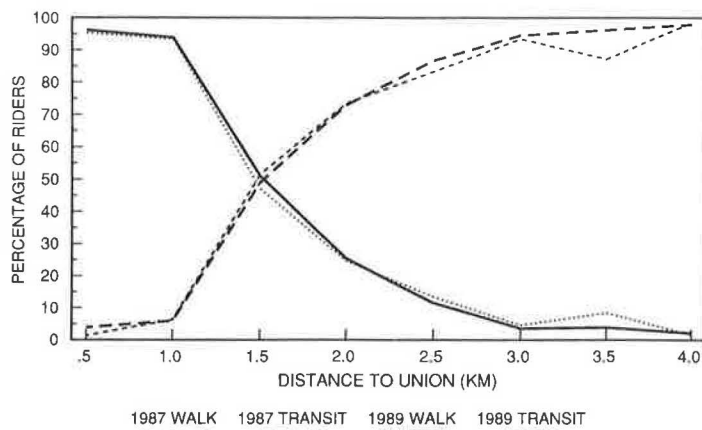


FIGURE 7 Access mode by distance to Union Station.

percent of respondents indicated that they would not use the GO system at all for their trip without it (see Table 5). Interestingly, use of carpools and local transit are poorly perceived as trip-making options, though they are probably valued by transportation planners as the best solutions to parking and congestion problems at and around the stations.

Survey respondents were provided a list and asked to rank their top three reasons for using GO Rail. Table 6 gives only the top-ranked reasons for using GO.

Riders recognize the increasingly prohibitive travel time and cost of driving to and parking in the core area. The low captive market for GO reflects the suburban nature of the service; car ownership is more necessary. Previous GO surveys have also indicated a higher-than-average family income for the typical GO rider compared with other transit users.

Although a comments area was provided on all previous GO surveys, 1989 was the first time that rider comments were grouped, coded, and analyzed. Overall, 55 percent of riders provided a codable comment. The split into positive, negative, and suggestion categories was approximately one-third for each. Table 7 gives the specific comment groupings available for analysis in the 1989 survey. On the positive side, the service-related and general complimentary comment types dominated, with 90 percent of the total. Individual preferences and personal schedule requirements are evidenced by the high negative ranking for the service category. Perhaps

TABLE 5 TRAVEL OPTIONS TO GO STATION IF PARKING LOT CLOSED

TRAVEL OPTIONS TO STATION	%
DRIVE TO ANOTHER STATION	27.5
WOULD USE KISS'N RIDE	22.5
DRIVE TO FINAL DESTINATION	7.5
TRANSIT TO FINAL DESTINATION	21.0
GO BUS TO DESTINATION	4.5
CARPPOOL TO FINAL DESTINATION	2.5
USE LOCAL TRANSIT TO STATION	5.0
OTHER	9.5

TABLE 6 TOP-RANKED REASON FOR USING GO

REASON FOR USING GO	%
COST	23.4
RELAXING	20.7
FAST	16.9
CONVENIENT	13.8
NO OTHER MODE	10.5
DIRECT SERVICE	9.2
SAFE	2.9
RELIABLE	2.6

TABLE 7 COMMENTS BY RIDERS

COMMENT GROUP	% POSITIVE	% NEGATIVE
SERVICE	50.1	61.3
PARKING LOTS	2.9	15.0
SERVICE ENVIRONMENT	4.5	9.8
FARES	2.1	7.8
PAY PARKING	0	1.2
GENERAL	40.0	4.9

the most interesting feature of Table 7 is the negative comments directed toward fares and pay parking. The low negative ranking for GO fares indicates that cost may not be a major issue for most riders. The number of GO parking lot complaints reinforces the concerns riders have about this aspect of the system.

The number of riders expressing concern about the possible introduction of some form of pay parking, even though no pay parking program exists, is of particular significance. Stratified analysis of the coded comments indicated no significant differences between geographic areas, new and old riders, or regular versus irregular riders.

## SUMMARY

The GO Rail system is an integral component of the GTA transportation system. During the past decade, and in particular during the past 2 years, GO Rail has experienced strong sustained growth in ridership, which has enhanced its role in facilitating both cross-boundary and GTA travel. Current and time series data are required to ensure that future priorities are well placed. Systemwide snapshots of rider and trip-making characteristics on the GO Rail system, such as the 1989 GO Rail Survey, have proved to be a valuable source of operational and policy planning data. Analysis of the 1989 survey reflects the type of study that has been completed to date and demonstrates the flexibility of the data base to respond in a timely manner to topical issues.

## ACKNOWLEDGMENTS

The authors wish to acknowledge the efforts of the following persons, whose participation in either the 1989 GO Rail Survey or the preparation of this report were invaluable: R. Boyle, G. Johnston, and D. K. St. Clair, GO Transit; J. Terry, Cole, Sherman and Associates, Ltd.; J. Tao, MultiSystem Consultants; D. S. Thompson, MTO; and the staff of the Transportation Demand Research Office of MTO.

*Publication of this paper sponsored by Committee on Commuter Rail Transportation.*