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# A Special Event Parking and Transit Pass System Using Ticketron: The Rochester, New York, Tall Ships Experience

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## ABSTRACT

Ticketron is a well-known advance reservation and ticket sales system that is seldom used in the field of transportation. Although Ticketron could be used more fully in many transportation situations, one of the best applications is for special event, park-and-ride shuttle bus ticket sales. The use of Ticketron in such a situation by the transportation system in Rochester, New York, for a 4-day Tall Ships Festival in July 1984 is described. More than 29,000 parking tickets for 94,000 bus passengers were bought through Ticketron. The event and the transportation system worked well owing in part to the Ticketron sales. The costs and benefits of using Ticketron in Rochester is described along with general transportation characteristics in which Ticketron sales would be most beneficial. Although not applicable in all situations, the use of Ticketron can greatly improve the allocation of scarce transportation resources, and it is especially applicable for special-event transportation. The successful Rochester experience also demonstrates that the use of Ticketron in special-event transportation need not be limited to large cities, but its use is also justified in medium-sized cities as well.

## THE CONCEPT

Advance sales of tickets by Ticketron for concerts, camp sites, and other activities is well known in the United States. Such sales involve multiple-event scheduling using decentralized computer terminals connected to a central mainframe computer. Event information is often provided to remote terminal outlets using microfilm. The system is nationwide, thus event reservations can be made from anywhere in the United States. This nationwide sales network is important for events that draw from more than a local market.

Only a few applications of Ticketron sales can be found in the field of transportation. Several colleges such as Pennsylvania State University and the University of Wisconsin, Madison, include the pre-sales of reserved parking spaces as part of their football ticket system. Bus and airline reservations are also provided as part of tours that are scheduled through Ticketron. It has also recently been learned that the 1984 Summer Olympics issued more than 200,000 Ticketron tickets for some of its transportation services. No other Ticketron transportation applications are known by the author. In cases in which Ticketron is used, transportation is

generally included as part of the event and not as a separate transportation space reservation.

However, it is possible to use more fully the Ticketron computer technology and nationwide sales structure in transportation. Applications could include any situation in which reserved space (seats, parking spaces, road space, etc.) is needed, especially when the transportation capacity is limited, when there is a premium price for premium service, when the transportation demand is regional or nationwide, or when the service is used so infrequently so as not to justify its own computer reservation equipment. Other situations would be instances in which large sales volumes would justify the centralized computer reservation system, as well as make fare collection extremely slow or difficult for the transportation system.

One of the best transportation applications of Ticketron is prepaid transit passes and/or parking tickets to large-scale special events. The concept presented in this paper is to use the Ticketron centralized computer technology and nationwide sales structure in a special event, prepaid parking and transit pass system. The implementation of such a concept in Rochester, New York, during July 1984 is described in the remainder of this paper.

#### THE ROCHESTER EXPERIENCE

##### The Event

Rochester, New York, is a medium-sized city of 241,000 located in upstate New York along Lake Ontario. Its regional population of 971,000 ranks 39th in the United States. Last year, Rochester was 150 years old and the city celebrated with a year-long community birthday party. One of the many events of the year was a Lake Ontario-Tall Ships Festival held during July 1984.

The Lake Ontario Festival was composed of numerous activities including the arrival and display of 21 Tall Ships, a Rochester Philharmonic concert, giant firework displays, aerial plane displays, parades, a picnic for 3,000 senior citizens, and other entertainment. The festival, held July 12 through 15, 1984, was expected to attract 250,000 people with a peak demand expected on Saturday night for the Rochester Philharmonic concert and fireworks display.

Event financing was important. There was no charge for admission to the Tall Ships site. Because the general sesquicentennial budget could not absorb a potential transportation cost of \$250,000, the transportation system would require a major fare collection effort--a factor that greatly influenced the decision to use Ticketron.

##### The Site

The Tall Ships Festival was held at Ontario Beach Park along the lake and on the vacant Port of Rochester land along the Genesee River. The site of approximately 50 acres was devoted almost entirely to festival activities with little room for parking. Parking was so limited that most entertainers, concessioners, and staff had to be shuttled to the site.

Access to the site was also extremely constrained. Because of its location along a lake, river, and a set of railroad tracks, only two streets provided access to the site. One access street was a 4-lane principal arterial with numerous traffic signals, and one was a 2-lane local collector. The nearest freeway was 4 mi to the west of the site; however, a 4-lane, limited-access parkway did connect the freeway to the principal arterial approximately 1 mi south of the site.

A rock concert held at the Tall Ships site in 1982 drew an unexpected crowd of 25,000 people. Because of the limited site parking and limited access, this crowd caused complete gridlock. Emergency vehicles were completely blocked from the site. The memory of this experience was fresh in the community's mind as planning for the Tall Ships event began. As many as 100,000 people were expected at the Saturday night activities, or four times more people than at the rock concert. Based on a concern for public safety, a decision was made to restrict all automobile access to the site. A cordon line was established on local streets approximately 3 mi from the festival site. The only automobiles allowed within this special-event, automobile-free zone were those of local residents or workers who obtained access permits. More than 25,000 such permits were issued through local police departments and community associations.

##### The Access System

With the exception of the automobiles mentioned in the preceding paragraph, access to the site was limited to buses, bicycles, or pedestrians. Although an amazing number of people did bicycle or walk, the vast number of people took a bus to the event. Several types of buses were used. First, more than 230 private charter buses were driven to the site during the 4 days. This does not include the 73 charter buses that carried more than 3,000 senior citizens to the site on Friday. Second, three internal shuttle systems served the site. One shuttle bus served citizens within the automobile-free zone, a staff-press shuttle served a remote parking lot, and the police operated a separate shuttle for law enforcement personnel. Third, the regular 100 lines of the local transit authority directly served the site. This transit service was the major access for those who did not buy the park-and-ride tickets. Seventeen thousand more people rode the 100 line during the 4-day festival than during a typical Thursday through Sunday period. The last bus access provided to the site, and the subject of this paper, was the park-and-ride shuttle system.

##### Park-and-Ride Shuttle System

An elaborate park-and-ride system shown in Figure 1 was established to serve the site. Nine separate color-coded transit routes served 26 parking lots. Each lot was numbered and color coded according to the transit line it served. The lots ranged in size from 100 to 3,500 spaces and were from 4 to 19 mi from the site. The large number of parking lots was required to handle the 100,000 Saturday evening peak and also serve a potential 50,000 Thursday and Friday daytime crowd. This latter group caused some of the longest bus trips because two distant colleges had to be used for weekday, daytime parking.

The parking scheme was further complicated by the fact that some lots, mostly Eastman Kodak lots, were not available during the day on weekdays, but were available after 6:00 p.m. Thus, the parking system had a large number of lots with variable capacities (depending on both the day and time of day). Ticketron is very attractive in such a system because of the information that can be printed on the ticket for parking lot control.

The weekday-weekend event pattern also caused problems for the shuttle system. The local public transit authority could only promise 10 buses for the weekday daytime shuttle; thus, this service had to depend on the major private school bus provider in Rochester. On Saturday, up to 300 buses were com-

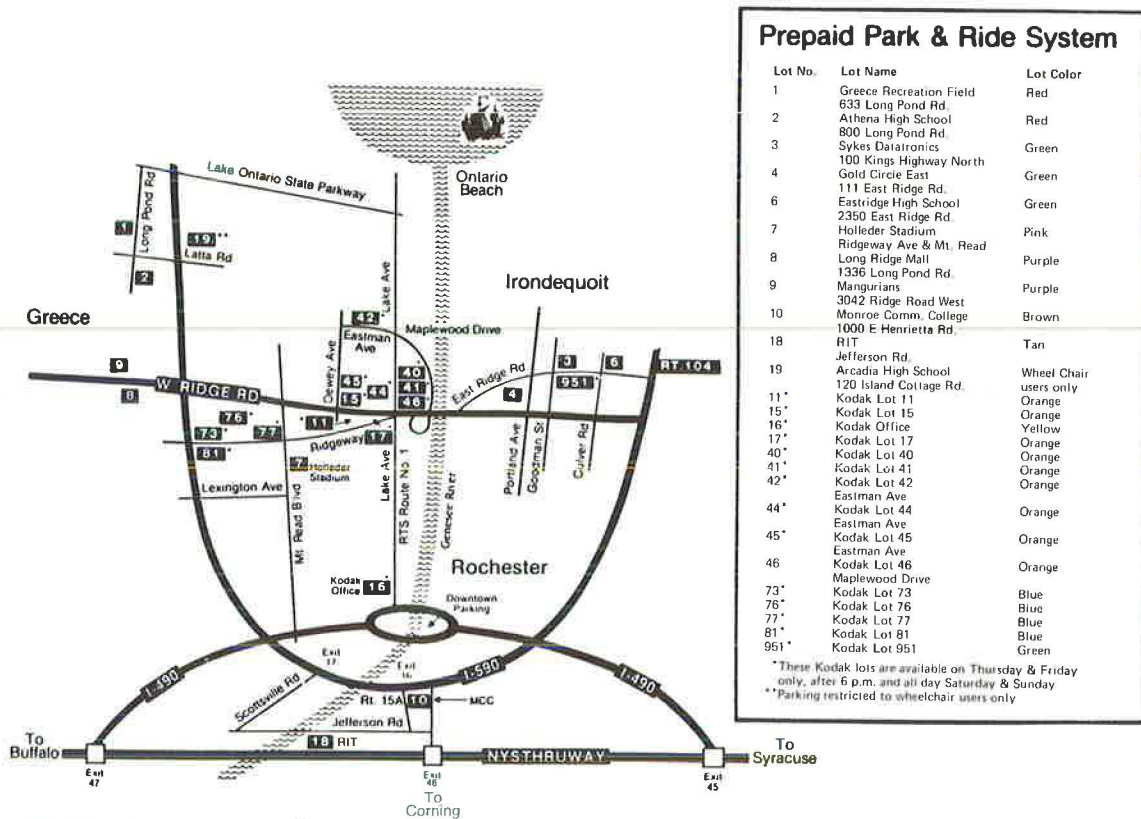


FIGURE 1 Park and ride parking.

mitted to the park-and-ride shuttle--200 from the school bus operator and 100 from the local transit authority. Actual use, of course, varied according to the demand.

Two separate shuttle load-unload areas were established on the site, each with 10 to 12 bus gates. The school bus operator was assigned the western load area and the transit authority was assigned the eastern load area on the basis of the parking lots they had to serve. This separation of the mixed fleet worked very well from a management control and physical dimension standpoint. The color-coded routes were each assigned one or more gates depending on Ticketron sales for the day.

Charter buses were given a separate loading area, but were not allowed to wait at the site because of lot capacity restrictions. The Liftline, a wheelchair-accessible transportation service provided by the transit authority, was also given a separate gate area along a street with newly installed sidewalks.

Prepaid Ticketron System

Thus far a complicated park-and-ride shuttle system to a special event has been described. It would be possible to run such a system without an advance ticket sale system or, specifically, without a Ticketron prepaid system. On-board or on-site bus fare collection could be used, or tickets could be sold at banks, retail outlets, or city-town clerks' offices. However, given the complexity of the park-and-ride system, the expected patronage volumes, and the fact that fare collection on school buses is illegal in New York State, it became apparent that Ticketron was the only rational way to handle the Tall Ships transportation fare collection system.

Because of the computer, the Ticketron system is extremely flexible. Parking lot and other transportation priorities and capacities can be established and the tickets can be issued by priority or can be printed with any combination of transportation information. If needed, the system can be used to collect information about each consumer (for example, when the consumer needs wheelchair-accessible transportation service). Summaries of ticket sales can be obtained quickly at any time to give advance estimates of the size of the crowd at the special event. Knowing the transportation demand in advance is extremely important in planning for the transportation system. The Ticketron sales network also relieves the organization of the event from the problems of cash collection, cash control, and security, which is a major problem at any special event.

In Rochester, the Ticketron tickets served two separate purposes: to reserve a parking space at one of the 26 lots and to provide access to a bus for a particular day of the event. In effect, the ticket represented a vehicle or parking space, and the number printed on the ticket represented bus passengers. This relatively simple concept created some confusion for the public, particularly because the price of the ticket was based on the number of bus passengers and the Ticketron surcharge to the consumer was based on the ticket or vehicle (\$2 per passenger and \$1 per ticket, respectively). For example, the cost of a ticket for three people in one vehicle would be \$7 (3 times \$2 plus \$1 ticket surcharge).

The Ticketron system also provided direct parking control. Ticketron allowed selected close-in parking lots to fill first. A two-tiered parking lot sales hierarchy was used to accomplish this parking priority scheme. Upper limits on vehicles' capacities were established for each lot and ticket sales could

not exceed these limits. Time-of-day limits were also established. Certain lots were not available before 6 p.m. on weekdays (a zero lot capacity), and in one lot the capacity increased from 550 to 800 spaces after 6 p.m. This represented not only an upper lot capacity by time of day, but also a crude estimate of time of arrival at the event.

Another limit was also imposed--a maximum daily bus passenger limit. Due to the limited site size, it was believed that only 50,000 to 60,000 park-and-ride bus passengers could safely be on the site in any one day (in addition to those who came by other modes). Fortunately, these upper ticket sales were never reached, although the Saturday limit of 50,000 was nearly reached at 49,814.

The two-part ticket was also used to provide consumer information about the transportation system. The color code of the parking lot-transit route was printed, as was the parking lot number. As mentioned previously, the number of bus passengers was printed up to a maximum of nine people per vehicle (to represent a van). Also printed was the day of the event. All tickets were sold as day-long passes to the event. There was no overbooking of parking lots to account for parking turnover, a conservative decision that should be evaluated by others who use the Ticketron park-and-ride system.

One of the parking lots was reserved for wheelchair-bound or other handicapped passengers. A policy was set whereby up to four family members could travel in the Liftline wheelchair bus with the handicapped person. More than 400 people in 125 vehicles used this lot. Thus, it is possible to obtain information about the traveling consumer through the Ticketron system, for example, compact versus full-sized car users, and so forth.

The park-and-ride tickets were marketed through the local media who were more than eager to provide the information to the public. Ticket information was mentioned in all press releases and in the information packets sent to media and travel agents within 400 mi of Rochester. Thousands of park-and-ride system maps were sent to all Ticketron outlets within the same region. Color-coded maps were published several times as news items by the local daily newspapers. The message was clear: "If you want to see the Tall Ships, buy a park-and-ride ticket and take the bus." The public gracefully accepted this requirement.

### Cost

The cost of the Ticketron system had two parts. Ticketron charged the ticket buyer \$0.11 to \$1 per person service charge depending on the number of bus passengers per ticket. (The charge was \$1 per ticket with up to nine bus passengers per parking ticket). Persons who used the city-owned Community War Memorial were not charged the ticket surcharge. The second cost was a charge to the event sponsor for each ticket sold. Charges generally ranged from \$0.10 to \$0.25 per ticket depending on sales volumes and other factors. Building owners that generated Ticketron sales generally received the lower rates when the sales occurred at their building box offices. In Rochester, sales occurred at both remote Ticketron outlets and the Community War Memorial. The total Ticketron bill to the city was approximately \$7,000.

Although the cost of setting up an alternative transit fare collection system was never fully analyzed in Rochester, there was no doubt that Ticketron was the least expensive and least burdensome administrative system considering the complex parking scheme. Computerized ticket control was a

necessity. The Ticketron sales also totally relieved the bus drivers from the job of fare collection, thus enabling more efficient use of the buses, particularly with large volume movement of people.

It should be noted that some lines of people waiting up to an hour did develop at Ticketron outlets during the last week of ticket sales. Although tickets went on sale a month in advance, a considerable number of Rochester skeptics did not buy tickets until the last moment, apparently believing the Tall Ships would either not arrive or Rochester's weather would not allow viewing of them. More than 28 percent of the ticket sales occurred during the last 4 days before the event. This waiting, while considered an inconvenience by the public, was inevitable under any system, whether at a central distribution site, on the buses, or at the parking lots themselves.

### Results

In two words: it worked. Despite some minor problems, the event was extremely successful. An estimated 240,000 people safely visited the site during the 4 days. Access to the site was maintained for public safety vehicles at all times. Although transportation could only be considered one factor in the success of the event, it had to be considered an important factor. The Ticketron prepaid park-and-ride shuttle ticket system was an important part of the success of the transportation.

Table 1 gives total Ticketron sales by lot with the lot location, lot color, transit provider (GA is the school bus provider and RTS is the local transit authority), and the lot capacity given on the left. Percent capacity (automobiles per lot capacity) is given for both the peak day and during the 4 days. Subtotals for each color-coded bus line and the two transit providers are also given. More than 94,000 people in 29,000 vehicles attended the Tall Ships event.

Another result of interest to planners was the actual vehicle occupancy, 3.21 persons per car was the actual rate versus the 3.20 rate used for planning the park-and-ride services. Special event automobile-occupancy estimates found in the literature ranged from 3.25 used for the Seattle World's Fair up to 4.0 for some other special events. A low automobile occupancy was used in Rochester because the event was on a smaller scale and involved less long-distance driving than the World's Fairs. This actual vehicle occupancy may be useful to others planning special-event transportation systems in medium-sized cities.

Mode split statistics are not readily available and may not be relevant to other cities given the automobile-free zone established in Rochester. However, for those interested, estimates of mode split are: 45 percent park and ride, 7 percent number 1 transit line, 7 percent private charter bus, 32 percent walk, and 9 percent bicycle. One surprise was the thousands of people who walked or bicycled many miles to the event. Planners of special-event transportation need to consider these normally overlooked transportation modes as well.

One of the most difficult tasks was to predict total attendance and shuttle bus demand during the 4-day period. Attendance at longer-term World's Fairs and Tall Ships' visits to large cities, such as Boston, New York, and Philadelphia with their 250,000 to 1 million per day attendance figures, did not apply in Rochester. In the end, high, medium, and low guesses were made. Estimates ranged from 275,000, 184,000, and 103,000 for total attendance and 220,000, 143,000, and 63,000 for park-and-ride buses. The actual total attendance of 240,000 was, thus,

TABLE 1 Tall Ships Travel Demand

PARKING LOT:	LINE #	COLOR	BUS OPER.	DAILY LOT CAP.	FOUR DAY TOTALS		AVG. VEH. OCC.	% CAP. USED	PEAK DAY % USED
					TOTAL VEHICLES	TOTAL PERSONS			
GREECE RECREATION	1	RED	GA	2,050	3,761	11,801	3.14	46%	100%
ATHENA H. S.	2	RED	GA	350	1,208	4,078	3.38	86%	100%
HOLLENDER STADIUM	7	PINK	GA	1,300	3,194	10,292	3.22	61%	100%
LONG RIDGE MALL	8	PURPLE	GA	850	2,466	7,813	3.17	73%	100%
GOLD CIRCLE EAST	4	GREEN	RTS	200	800	2,798	3.48	100%	100%
SYKES DATATRONICS	3	GREEN	RTS	800	1,826	6,019	3.30	57%	100%
MANGURIANS	9	PURPLE	GA	200	643	2,067	3.21	80%	100%
EASTRIDGE H. S.	6	GREEN	RTS	200	800	2,678	3.35	100%	100%
MONROE COMM. COLL.	10	BROWN	GA	3,500	6,631	21,158	3.19	47%	97%
ROCH. INST. TECH.	15	TAN	GA	800	1,634	5,198	3.18	51%	99%
KODAK	LOT# 42	ORANGE	RTS	2,500	1,932	5,952	3.08	19%	65%
KODAK	LOT# 41	ORANGE	RTS	300	345	1,156	3.35	29%	100%
KODAK	LOT# 44	ORANGE	RTS	300	324	1,008	3.11	27%	100%
KODAK	LOT# 45	ORANGE	RTS	300	135	422	3.13	11%	39%
KODAK	LOT# 73	BLUE	GA	300	166	541	3.26	14%	44%
KODAK	LOT# 76	BLUE	GA	100	35	94	2.69	9%	31%
KODAK	LOT# 77	BLUE	GA	200	81	245	3.02	10%	34%
KODAK	LOT# 951	GREEN	RTS	300	470	1,655	3.52	39%	100%
KODAK	LOT# 40	ORANGE	RTS	600	735	2,412	3.28	31%	100%
KODAK	LOT# 46	ORANGE	RTS	400	495	1,659	3.35	31%	100%
KODAK	LOT# 81	BLUE	GA	800	84	309	3.68	3%	9%
KODAK	LOT# 11	ORANGE	RTS	300	114	369	3.24	10%	29%
KODAK	LOT# 15	ORANGE	RTS	100	92	256	2.78	23%	76%
KODAK	LOT# 17	ORANGE	RTS	300	230	716	3.11	19%	63%
KODAK OFFICE	16	YELLOW	RTS	2,500	1,019	3,116	3.06	10%	28%
ARCADIA H. S.	HANDI- LIFT- 19	CAPPED LINE		100	125	410	3.28	31%	53%
		RED	GA	2,400	4,969	15,879	3.20	52%	100%
		PINK	GA	1,300	3,194	10,292	3.22	61%	100%
		PURPLE	GA	1,050	3,109	9,680	3.18	74%	100%
		BROWN	GA	3,500	6,631	21,158	3.19	47%	97%
		BLUE	GA	1,400	366	1,189	3.25	7%	22%
		TAN	GA	800	1,634	5,198	3.18	51%	99%
		GA-SUB TOTAL		10,450	19,903	63,596	3.20	48%	88%
		GREEN	RTS	1,500	3,896	13,140	3.37	65%	100%
		ORANGE	RTS	5,100	4,402	13,950	3.17	22%	72%
		YELLOW	RTS	2,500	1,019	3,116	3.06	10%	28%
		RTS-SUB TOTAL		9,100	9,317	30,206	3.24	26%	65%
		HANDI- LIFT- CAPPED LINE		100	125	410	3.28	31%	53%
		GRAND TOTAL		19,650	29,345	94,212	3.21	37%	77%

near the high estimate of total attendance, and the actual park-and-ride bus users of 94,000 was near the low end. These estimates are so dependent on the local event and the site that no conclusions should be drawn for other cities. However, they do provide an order of magnitude for special event attendances.

The last result that should be mentioned is the actual and perceived control that Ticketron sales allow. As stated previously, more than 94,000 people bought park-and-ride tickets and they arrived in 29,000 vehicles.

The advance knowledge of these ticket sales greatly reduced the uncertainty in planning for transportation and other event support services. With advance ticket sales, scarce transportation resources such as bus drivers and loading gates can be allocated more efficiently. Ticketron sales also provided a public image of event control and professionalism. Indeed, the advance sale system provide real control by distributing only a limited number of people to each parking lot and by giving priority to certain lots. It is this control whether real or perceived that is perhaps the most important result of the Rochester Ticketron park-and-ride system experience.

#### APPLICATION TO OTHER CITIES

Ticketron can be used more fully in transportation, especially in special-event transportation, in any location in the United States. However, the benefits and costs of its use obviously depend on the unique circumstances of the local event. Questions to be considered include:

1. Are there general admission charges or an event budget line for transportation that could avoid a separate transportation fare collection effort?
2. Are there many or only a few parking lots that serve the event (on-site fare collection would be easier at a few lots)?
3. Do all the buses have on-board fare collection equipment, generally meaning is the event held in the evening or on weekends when school buses do not have to be used?
4. Does the event have adequate on-site parking and/or access so as not to require separate transit service?
5. Is the event demand local or regional in nature?, and

6. Are the ticket sales volumes for the expected event high enough to justify the computerized Ticketron system?

In general, the use of Ticketron is more justified in situations in which ticket sales volumes are high; the demand is, at least, regional; there is a premium price for a premium transportation service; the

transportation demand occurs infrequently, as in special event transportation; and the park-and-ride system is relatively complex.

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## Experiences with Time-of-Day Transit Pricing in the United States

ROBERT CERVERO

### ABSTRACT

Evidence on time-of-day transit pricing in the United States is examined in this paper, particularly in terms of ridership, fiscal, and equity impacts, as well as with respect to various implementation issues. Thirty-two time-of-day fare programs have been initiated in the United States since the early 1970s, of which 22 currently exist. These are about evenly split between off-peak discounts, peak-period surcharges, and programs involving differential rates of fare increases between peak and off-peak periods. Most fare differentials have been fairly modest to date (i.e., around \$0.10 to \$0.15), although there have been several cases in which peak exceed off-peak surcharges by \$0.35. From interviews, it was found that the most prevalent reason for adopting time-of-day pricing was to encourage ridership shifts to the off-peak. Unfortunately, there was little empirical evidence to suggest that time-of-day fare programs to date have accomplished just that, although in most cases the proportion of total ridership during off-peak periods rose. Off-peak users were found to be more sensitive to differential fare changes than peak riders, with midday discount programs demonstrating the most prolific ridership impacts. Before-and-after analysis generally showed that time-of-day fare programs have had fairly inconsequential effects on efficiency and equity, ostensibly because of the nominal size of most differentials. Cost recovery rates did increase significantly for most peak surcharge programs, however. The most successful programs have been those that collect fares on the basis of run direction (rather than exact time) and that aggressively market their programs.

Since 1970, more than 30 areas in the United States have introduced adult transit fares that vary by time of day. Of these, 12 programs were eventually discontinued, leaving some 23 areas in the United States with time-of-day pricing as of late 1983.

These programs have ranged from additional surcharges for rush-hour services to fare discounts during the midday and bargain passes limited to off-peak periods. Time-of-day fares have been implemented on conventional bus, rapid rail, and demand-responsive (i.e., dial-a-van) modes of public transportation and in metropolitan areas as small as 25,000 and as large as 5 million persons. Fare differentials have ranged from \$0.05 to more than \$1, and have been as large as 300 percent in relative terms.

Interest in time-of-day transit pricing has been prompted largely by the U.S. transit industry's

worsening financial situation over the past several decades. Nationwide, deficits rose from under \$300 million in 1970 to more than \$4.4 billion in 1982. Despite a massive infusion of government aid to cover these deficits, nationwide ridership increased only marginally, from 5.93 billion annual trips in 1970 to only slightly more than 6 billion in 1982 (1).

With operating subsidies becoming less certain, fare structures that attempt to approximate the costs of providing different types of services are gaining increasing popularity. In contrast to the more common practice of uniform pricing, time-of-day differentials attempt to encapsulate the higher overhead and staffing costs of accommodating rush-hour loads while charging non-peak users a fare reflective of basic level services. Charging more for peak period use can increase farebox returns because rush-hour tran-