

# Olympic Park-and-Ride Advance Reservation System

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## ABSTRACT

The Games of the 23rd Olympiad were celebrated in Los Angeles July 28 to August 12, 1984. The Southern California Rapid Transit District (RTD) operated a dedicated fleet of 550 buses during the Games for spectators at the Olympics. Described in this paper is one aspect of RTD's Olympic services, the advance reservation system designed for the Olympic park-and-ride lines. The goals of this reservation system were twofold: one goal was to provide an attractive service to patrons; the other goal was to enable the level of service provided to be tailored to demand. Both goals were achieved. Patrons were pleased with the service and cost savings were realized because of efficient use of personnel and equipment. Ticketron operated the reservation system and processed nearly 190,000 reservations during the 72-day sales period. Reservations were available by mail (37 percent of total orders), over the telephone (36 percent), and in person (61 percent). Sales began slowly and peaked at more than 7,500 per day.

The Games of the 23rd Olympiad were celebrated in Los Angeles July 28 to August 12, 1984. Twenty-three sporting events were conducted at venues (competition sites) scattered across the Southern California area. The Southern California Rapid Transit District (RTD) operated a dedicated fleet of 550 buses for spectators at the Olympics; this fleet served the vast majority of the venues. Service included special park-and-ride, express, and shuttle lines, operated in addition to the regular line service. Described in this paper is one aspect of the Olympic services, the advance reservation system developed for the Olympic park-and-ride lines.

## GOALS OF THE ADVANCE RESERVATION SYSTEM

The goals of the advance reservation system were twofold.

One goal was to provide an attractive service to patrons. By offering reservations, RTD could guarantee that those with reservations would get a seat on a park-and-ride bus within a specific 20-min time period. This guarantee limited possible uncertainty on the part of potential riders about the convenience of taking the bus. Although actual travel time was subject to current traffic conditions, people with bus reservations could be sure that they would arrive at their events on time, in comfort, and with a minimum of fuss.

The second goal of the reservation system was to allow the level of service provided to be tailored to demand. Information on reservation requests was used to modify initial allocations of equipment. By tailoring the service in this way, equipment would not be sent out to stand idle, and busy locations could receive equipment not needed elsewhere. Minimizing idle equipment kept down both equipment and labor costs.

## MODEL OF TRAVEL BEHAVIOR

Initial bus capacities for each park-and-ride line were based on a model of spectator travel behavior. This model was based on venue-specific mode split targets, seating capacities of the venues, event

schedules, and spectator behavior at previous special events.

During spring 1983, the local transportation agencies, Los Angeles City Department of Transportation, Los Angeles Police Department, California Department of Transportation, California Highway Patrol, RTD, and the Los Angeles Olympic Organizing Committee (LAOOC), met to determine target mode splits for all modes for each Olympic venue. Public transit's share of travelers ranged from 0 percent for some small, remote venues not served by public transit to 40 percent at Exposition Park, site of the opening and closing ceremonies, athletics (track and field), swimming, diving, and boxing. Shares were also assigned to charter buses, although no charter representatives participated in the meetings. For Exposition Park, 25 percent of the spectators were allocated to charters, leaving only 35 percent to come in private automobiles.

Service sufficient for meeting the mode-split targets for public transit was to be provided by RTD with some assistance from local municipal bus operators. RTD then went a step further and allocated the overall mode split for transit between the different types of service it offered: park and ride, express from downtown Los Angeles, short-haul shuttles, and regular line service.

This process resulted in the derivation of a percentage of spectators to be transported by RTD to each venue by each type of service. By using these derived percentages and the stadia capacities provided by LAOOC, the number of spectators to be transported from each RTD park-and-ride lot was calculated for each venue and for each competition session. Ridership was allocated to the individual park-and-ride lots based on lot size and the geographic distribution of ticket sales.

At each lot, the ridership was spread over the expected window of travel to determine needed capacities in periods of 20 min. Capacities were designed to accommodate the entire allocated ridership within a 2-hr period, although for the convenience of the traveler reduced levels of service were offered both before and after the 2-hr window.

Bus capacities at each lot were checked and adjusted if necessary to keep total ridership within the limits that could be accommodated by parking in

the designated lot and nearby parking areas. For this calculation, an average automobile occupancy of 2.5 persons per car and a 15-percent turnover rate were assumed. Also assumed was a factor of 25 percent for walk-ins and others who came to the lot without reservations.

#### VENDOR SELECTION

RTD considered the possibility of operating a reservation system itself but quickly decided that the service should be run by a contractor with the appropriate facilities and experience. The vendor was selected through the RTD's regular competitive bid process. Bids on the contract came from firms of two types: firms in the business of selling tickets to cultural and sporting events, and firms specializing in fulfillment services, adept at filling mail and telephone orders for products.

Bids were judged on the following: (a) the firm's ability to process mail, telephone, and in-person orders; (b) the cost per order; and (c) an evaluation of the firm's ability to quickly adapt their services to a new situation. Ticketron was selected as the vendor for the advance reservation system.

The Ticketron organization is structured such that many local Ticketron outlets are independent stores. However, two chain stores also participate as a group, Sears, Roebuck and Co., and Tower Records.

Both RTD and Ticketron hoped that Sears would be willing to participate in the RTD Olympic park-and-ride program. The 22 local Sears stores would have provided outlets convenient to almost everyone in Southern California, advertising would have been simplified, and Sears was already identified with the Olympics as one of the distributors of ticket order forms for Olympic events. Sears, however, declined to participate because it believed that the unique nature of the program, and the extra work and inventory control required, would add more effort than it was capable of handling.

Tower Records readily agreed to participate in the program and their eight local stores were the only outlets listed in the RTD Olympic information brochure. Their stores were soon joined by nine independent outlets. Later, in response to tremendous demand, more independent stores were added. By the end of the program, 28 outlets were participating.

#### OPERATION OF THE RESERVATION SYSTEM

All reservations on RTD park-and-ride lines were handled by Ticketron. RTD service centers, which normally sell RTD monthly bus passes, sold the daily gold passes without reservations and directed all requests for reservations to Ticketron. Ticketron was able to process telephone, mail, and in-person orders. The usual Ticketron telephone numbers were used and additional operators were added as needed. Ticketron had several telephone numbers, allowing most people in Southern California to reach them with a local call. However, they did not have an incoming toll-free line (800 number). Callers from outside the local calling area were responsible for the applicable telephone charges. Telephone lines operated from 9:00 a.m. to 9:00 p.m. Monday through Saturday and 10:00 a.m. to 6:00 p.m. on Sunday.

A mail-order reservation form was included in a brochure developed by the RTD entitled RTD Bus Service Guide to the 1984 Olympics. Over one million copies of this brochure were distributed by RTD and supplemental reservation order forms as well as brochures were available at all local Ticketron outlets (Figure 1).

Accommodating walk-in orders was considered essential. Telephone and mail orders were to be cut off 10 days before the day of travel to ensure sufficient time for the person making the reservations to receive the passes and reservations in the mail. A strong buying surge was anticipated as the Games neared. Only in-person ordering could accommodate this last-minute demand.

Ticketron outlets were attractive for other reasons as well. People could go to a Ticketron outlet, complete their transaction, and leave with their reservations and passes. Because tickets were checked at the time of purchase, many people felt more comfortable with this manner of purchase, which obviated the use of the postal service and eliminated the possibility of orders being filled incorrectly.

However, using Ticketron outlets had two drawbacks to the customer. Cash was required for all transactions, and a trip to the local Ticketron outlet was required. As the time of the games approached, some outlets experienced lines of patrons waiting to make RTD park-and-ride reservations. At the same time, however, the outlets had queues, the telephones were also busy, and those making reservations over the telephone were subject to busy signals and waits.

Because there were three ways of ordering, patrons were able to choose the method they preferred. Also, orders were distributed between the choices, thus adding to the capacity of the entire system. Reservations were first accepted on June 1, 1984, and were sold until one day before the day of travel.

People making reservations indicated the day on which they wanted to travel, the park-and-ride lot they wanted to use, their destination, and their desired departure time. The Ticketron clerk would check the availability and, if necessary, suggest alternatives. When a match was made, the transaction was completed and recorded in the Ticketron computer. The customer then received (in person or by return mail) RTD gold passes for the desired day and Ticketron reservation tickets indicating the date, time of reservation, point of origin, and destination. The passes and tickets were packaged in a pre-printed envelope describing the park-and-ride procedures; they are shown in Figure 2.

Reservation holders received a reservation for a specific 20-min period (e.g., 8:00 a.m. to 8:19 a.m.) for travel to their venue. No reservations were offered or accepted for return trips. Patrons were required to be at the loading area of their park-and-ride lot by the start of the 20-min period and were guaranteed a seat on a bus sometime during that period. The number of buses scheduled for each 20-min period was based on event schedules and reservation demand. Reservation holders were to be boarded first, with walk-ins being carried on a space-available basis, probably as standees.

#### RESERVATIONS AND THE GOLD PASS

Gold passes were valid for unlimited travel on all RTD lines (including the special Olympic service) on the date for which they were issued. Many patrons who planned to use the longer distanced express services as a means to get to a special Olympic shuttle found the passes without reservations financially attractive.

Initially, Ticketron processed only requests for reservations that included the purchase of a gold pass. To minimize confusion, customers wanting to buy gold passes without reservations had to purchase them at one of RTD's 11 Customer Service Centers. Although the passes were accepted on the park-and-

## PARK/RIDE RESERVATIONS ORDER FORM

Reservations will be offered on all RTD Olympic Park/Ride lines, but not on the other Olympic bus service. Persons with reservations will be guaranteed a seat on a bus during a specific 20-minute period from the Park/Ride site. Reservations will not be accepted on buses returning to the Park/Ride lots to allow patrons more flexibility in departing. Bus service will continue

until two hours after the completion of an event or until all passengers are accommodated.

Reservations can be made by mail, telephone, or in person through Ticketron. To make your reservation determine which Park/Ride lot is most convenient for you to use and the time you wish to travel.

(please print)

Individual Order		FIRST NAME		INITIAL
LAST NAME		LAST NAME OF COMPANY CONTACT		INITIAL
Company Order (if applicable)		COMPANY NAME		
STREET ADDRESS		APT./SUITE NO.	CITY	STATE
DAY TIME TELEPHONE		EVENING TELEPHONE		ZIP CODE

**CIRCLE ONE SAMPLE**

LINE NO.	ORIGIN-DESTINATION	DATE	EVENT
711	VALLEY COLLEGE-EXPO PARK*	8/13/84	BOXING
712	CENTURY CITY-EXPO PARK	PREFERRED DEPARTURE TIME 8:30 AM	
713	HOLLYWOOD PARK-EXPO PARK	IF FIRST CHOICE UNAVAILABLE RESERVE EARLIER BUS LATER BUS <input checked="" type="checkbox"/>	
714	CERRITOS COLLEGE-EXPO PARK		
715	PASADENA CITY COLLEGE-EXPO PARK		
719	ALPINE VILLAGE-EXPO PARK		
721	VALLEY COLLEGE-UCLA	NUMBER OF RTD OLYMPIC GOLD PASSES REQUIRED	
723	HOLLYWOOD PARK-UCLA	4 X \$11.00 = \$44.00	
753	HOLLYWOOD PARK-LONG BEACH	\$11.00 INCLUDES AMOUNT DUE	
754	CERRITOS COLLEGE-LONG BEACH	\$1.00 SERVICE CHARGE	
764	CERRITOS COLLEGE-ANAHEIM		

OFFICE USE ONLY EC DATE PC LOC

WILL ANYONE IN YOUR PARTY REQUIRE AN ACCESSIBLE BUS? YES  NO

HOW MANY CARS WILL YOUR PARTY BE BRINGING TO THE PARK/RIDE LOT? 1

HOW MANY CARS WILL BE LEFT AT THE PARK/RIDE LOT ALL DAY? NONE

**CIRCLE ONE**

LINE NO.	ORIGIN-DESTINATION	DATE	EVENT
711	VALLEY COLLEGE-EXPO PARK*	8/13/84	BOXING
712	CENTURY CITY-EXPO PARK	PREFERRED DEPARTURE TIME AM PM	
713	HOLLYWOOD PARK-EXPO PARK	IF FIRST CHOICE UNAVAILABLE RESERVE EARLIER BUS LATER BUS <input type="checkbox"/>	
714	CERRITOS COLLEGE-EXPO PARK		
715	PASADENA CITY COLLEGE-EXPO PARK		
719	ALPINE VILLAGE-EXPO PARK		
721	VALLEY COLLEGE-UCLA	NUMBER OF RTD OLYMPIC GOLD PASSES REQUIRED	
723	HOLLYWOOD PARK-UCLA	X \$11.00 = \$ .00	
753	HOLLYWOOD PARK-LONG BEACH	\$11.00 INCLUDES AMOUNT DUE	
754	CERRITOS COLLEGE-LONG BEACH	\$1.00 SERVICE CHARGE	
764	CERRITOS COLLEGE-ANAHEIM		

OFFICE USE ONLY EC DATE PC LOC

WILL ANYONE IN YOUR PARTY REQUIRE AN ACCESSIBLE BUS? YES  NO

HOW MANY CARS WILL YOUR PARTY BE BRINGING TO THE PARK/RIDE LOT? \_\_\_\_\_

HOW MANY CARS WILL BE LEFT AT THE PARK/RIDE LOT ALL DAY? \_\_\_\_\_

\*EXPOSITION PARK VENUE FOR SWIMMING, DIVING, TRACK & FIELD, BOXING AND OPENING & CLOSING CEREMONIES.

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### BY MAIL

Send Mail Orders To: Ticketron  
Post Office Box 45002  
Los Angeles, CA 90045

Mail orders must reach Ticketron 10 days before reservation date

Certified check or money order payable to Ticketron, Mastercharge or Visa • Total Order \$ \_\_\_\_\_

MASTERCHARGE  VISA

Expiration Date \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

Attach additional forms if necessary

### BY PHONE

Ticketron Telephone Numbers  
(213) 410-1062 (619) 231-3554  
(714) 634-1300

Telephone orders must be made 10 days before reservation date

### IN PERSON

Tower Records Ticketron Outlets accepting RTD reservations in person:

8840 Sunset Blvd. Hollywood	306 N. Beach Blvd. Anaheim
14612 Ventura Blvd. Sherman Oaks	1215 W. Covina Parkway West Covina
8717 Van Nuys Blvd. Panorama City	1160-B E. Imperial Highway Brea
1028 Westwood Blvd. Westwood	23811 El Toro Rd. El Toro

Cash only—no checks, no credit cards

In person sales will be accepted until the day before the reservation date

### NO REFUNDS OR EXCHANGES


FIGURE 1 Reservation order form.

ride lines, reservations were necessary for guaranteed seating. Ticketron issued reservations only in conjunction with the purchase of passes. It was not permissible to buy a pass at RTD and then obtain a reservation ticket from Ticketron.


Customers continued to request gold passes without reservations from Ticketron. Demand was especially strong in geographic areas such as Orange County that were not served by RTD Customer Service Centers. Accordingly, on July 10, 1984, Ticketron

began selling gold passes without reservations and cautioned the buyers about the limitations on their use at park-and-ride lots. Ticketron sold over 28,000 gold passes without reservations in the 18 days before the Games.

RTD gold passes, valid for one day of unlimited travel, sold for \$10.00 each at RTD Customer Service Centers. Customers using Ticketron to make a reservation or purchase a pass without a reservation were charged an additional fee. In-person transactions

	STORE	RTD OLYMPIC PARK AND RIDE SERVICE	DATE/EVENT CODE	802
	MUST	FROM CERRITOS COLLEGE		
KEEP	TO ANAHEIM		8:40AM	
STUB	THURSDAY 02 1984		TO	
802	BOARD FROM 8:40AM TO 8:59AM		8:59AM	8:59AM
	4305858 10121563880918			
\$10.00	SIGN:		\$0.00	06/20



### RTD SPECIAL OLYMPIC SERVICE

- Check your tickets and passes. NO REFUNDS OR EXCHANGES.
  - Correct RTD Park and Ride?
  - Correct Olympic Destination for your event?
  - Correct date for your event?
  - Correct departure time for your event?
- Bring both your passes and tickets to the Park/Ride lot.
- Park/Ride reservations are made by 20-minute periods. You must be at the BUS LOADING AREA of the Park/Ride lot by the beginning of the reservation period and you will receive a seat on a bus leaving within that 20-minute period.  
ALLOW plenty of time for parking. RTD DOES NOT CONTROL PARKING AT THE OLYMPIC PARK/RIDE LOTS.
- Your passes are good ALL day on any bus in the RTD system. It will also be used on your RETURN trip. KEEP IT IN A SAFE PLACE. You do not need tickets for your return trip or any side trips.
- Return service continues until approximately 2 hours after each event.



FIGURE 2 Reservation ticket, envelope, and RTD gold pass.

cost \$0.75 per reservation (or per pass, if one was bought without a reservation), and the fee for telephone and mail orders was \$1.00 for each gold pass. These transaction charges, partially subsidized by RTD to keep the price low, were considerably lower than Ticketron's customary charges. For each pass sold, RTD paid Ticketron \$0.80, which was less than the usual 10 percent fee paid by RTD to commissioned agents of pass sales.

#### ACCESSIBILITY OF SERVICE

Accommodation for patrons requiring lift-equipped buses was included in the design of the reservation system. The reservation form included a question on the need for accessible equipment, and Ticketron set up procedures for recording this information. During the program, 556 requests for accessible equipment were recorded, a substantial number of which oc-

curred during the first week of the program. Subsequent checking indicated that as many as 90 percent of these requests were recorded in error by Ticketron operators who misunderstood their instructions. Actual ridership requiring lift-equipped buses was not recorded separately, but indications are that it was quite low.

#### RESERVATION PATTERNS

Customers selected their reservation time period from what was available at the time of purchase based on their individual travel desires. They balanced their own estimate of travel time with their desired arrival time plus the additional amount of time they wanted to have as a cushion.

In general, people chose to arrive well before their reserved departure times. This was most pronounced for opening and closing ceremonies, which

were scheduled for late afternoon on weekends. There was less urgency to arrive early for weekday morning events, some of which began at 8:00 a.m., requiring departures at 6:00 a.m.

The most popular reservation periods were those that started on the hour, particularly 7:00 a.m., 8:00 a.m., and 2:00 p.m. The adjacent time slots filled only after these were sold out.

Opening day was the strongest early seller. Later, the popular lots began to sell out on the days on which track and field events were being held. When the coliseum was not in operation, all of the lots had capacity for more cars and riders.

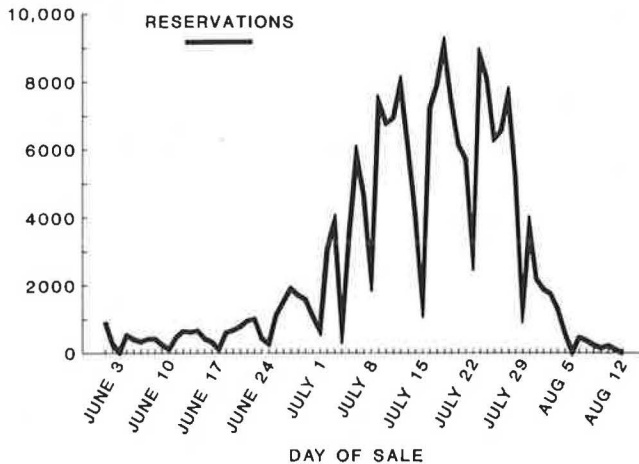
**SALES OF RESERVATIONS**

During the 72-day sales period, 189,260 reservations were sold. In addition, 63,431 RTD gold passes were sold without reservations for a total of 252,691 passes sold.

Through the middle of July, telephone reservation orders accounted for about one-half of the sales and in-person orders for about 45 percent; the remaining 5 percent of sales were by mail. When mail and telephone orders were closed out, all subsequent orders were taken in person. The final breakdown was 61 percent in person, 3 percent by mail, and 36 percent by telephone. Gold passes sold by RTD (35,269) were all over-the-counter purchases. Ticketron sold a few passes by mail or over the telephone, but 98 percent of their sales of gold passes were in person.

Sales of reservations through the initial 17 Ticketron outlets, by telephone, and by mail began on Friday, June 1, 1984. First-day sales of 913 reservations showed that many people had been waiting for the program to begin. Media coverage was good, with television interviews of the enthusiastic first customers. RTD brochures were not widely distributed until the second week of the program, so initial sales were prompted solely by news reports, word of mouth, and calls to RTD telephone information operators.

Sales increased steadily although slowly during June from a weekday average of 430 reservations per day during the first full week of the program to a weekday average of 1,580 reservations per day during the last week of June. Figure 3 shows sales of reservations by day of sale. During the following week (the first week of July) sales increased dramatically, reaching a weekday average of 4,080 per day.



**FIGURE 3** Sales of Olympic park-and-ride reservations by day of sale.

Weekend sales, although still substantially lower than weekday sales, also increased. Sales during subsequent weeks showed continued momentum, as sales averaged about 7,500 per weekday. Sales continued during the Games but at a significantly lower level.

Of the 190,000 reservations sold, nearly 95 percent were for service to Exposition Park, site of the boxing, swimming and diving, and track and field venues, as well as the opening and closing ceremonies. The other three park-and-ride destinations split the remaining 5 percent of the reservations as follows: UCLA, 3.7 percent; Long Beach, 1.6 percent; and Anaheim, 0.1 percent. Ridership on park-and-ride lines was similarly skewed, as shown in Table 1.

**TABLE 1** Reservations and Ridership of Olympic Park-and-Ride Lines by Destination

Destination	Reservations		Passengers	
	000s	Percent	000s	Percent
Exposition Park	179.0	94.6	209.1	95.5
UCLA	7.0	3.7	6.4	2.9
Long Beach	3.0	1.6	3.2	1.5
Anaheim	0.3	0.1	0.3	0.1
Total	189.3	100.0	219.0	100.0

**DISTRIBUTION OF RESERVATIONS**

Distribution of the number of reservations by line and by park-and-ride lot is given in Table 2. Seven park-and-ride lots fed 11 park-and-ride lines as shown in Figure 4. Initially, the most popular lots were at Cerritos College, Valley College (and the adjunct lot in Van Nuys), and Pasadena City College.

**TABLE 2** Number of Reservations by Park-and-Ride Lot and Line

Park-and-Ride Lot	Line	Reservations	
		Number	Percent
Valley College	Line 711—Exposition Park	30,933	
	Line 721—UCLA	4,052	
	Subtotal	34,985	18
Hollywood Park	Line 713—Exposition Park	36,930	
	Line 723—UCLA	2,912	
	Line 753—Long Beach	1,315	
	Subtotal	41,157	22
Cerritos College	Line 714—Exposition Park	37,838	
	Line 754—Long Beach	1,687	
	Line 764—Anaheim	259	
	Subtotal	39,784	21
Pasadena City College	Line 715—Exposition Park	34,358	18
	Line 719—Exposition Park	5,254	3
Alpine Village	Line 711A—Exposition Park	5,566	3
Van Nuys	Line 712—Exposition Park	28,156	15
Century City			
Total		189,260	100

Hollywood Park began to sell only after the big, popular lots and the small lot at Alpine Village reached capacity. Eventually, Hollywood Park outperformed the other lots. It was the biggest lot, but also had the most expensive parking fees. Table 3 gives the number of spaces in the Olympic park-and-ride lots and the parking fees.

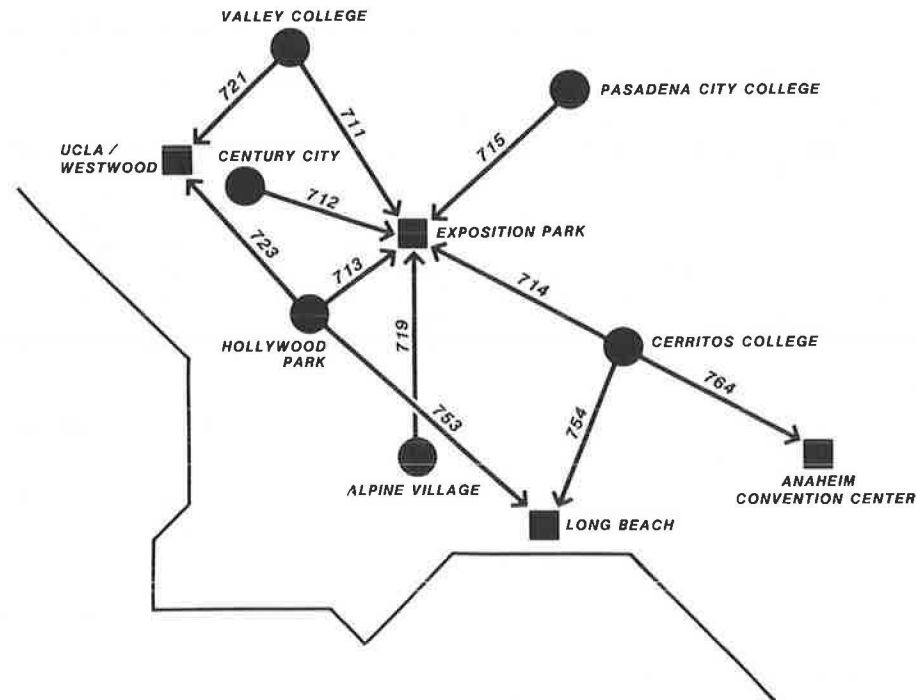


FIGURE 4 Map of park-and-ride service system.

TABLE 3 Number of Parking Spaces and Parking Fees in Olympic Park-and-Ride Lots

	No. of Parking Spaces	Parking Fee (\$)
Valley College	2,220 <sup>a</sup>	None
Van Nuys	325	None
Century City	3,500 <sup>b</sup>	6.00
Hollywood Park	5,000	10.00 <sup>c</sup>
Cerritos College	1,600	None
Pasadena City College	1,650	5.00
Alpine Village	350	None
Total	12,125	

Note: Park-and-ride lots were chosen based on the following criteria: minimum of 1,500 spaces, open 6:00 a.m. to midnight, available each day of the Olympics at little or no cost to RTD, and close to freeways. Locations were selected in each geographic sector of the area with emphasis on those sectors with the largest number of ticket holders. Some exceptions to the above criteria were made. The Van Nuys location was an old bus yard near Valley College and operated as a supplemental location on peak days. Alpine Village was limited to 350 spaces and operated only on weekdays. It was the best available lot in that sector and sold out virtually every day.

<sup>a</sup> For service to Exposition Park, 1,300 spaces (1,250 on weekdays); for service to UCLA, 900 spaces.

<sup>b</sup> Parking structure: approximately 800 monthly parking permits were issued; only 1,000 spaces were guaranteed for park-and-ride use, but many more were available.

<sup>c</sup> First week, \$7.50; second week, \$10.00.

#### ADJUSTMENTS TO PARK-AND-RIDE LOT CAPACITIES

LAOOC set the ticketing policy for the Games. For the more popular events, tickets were limited to two or four per household and no group arrangements were available. Tickets to the popular events were allocated by lottery, with 50 percent designated for Southern California residents, 30 percent to other U.S. residents, and the remainder to official sponsors and National Olympic committees. With the tickets so scattered, carpool formation was made more difficult.

Based on the ticket distribution plan, data from previous special events in Los Angeles, and the assumption that kiss and ride and carpooling would take place, an average of 2.5 persons per car was used in planning the use of the park-and-ride lots. There were also indications that local recreational vehicle parks and some hotels might provide van service to the lots.

Ridership was allocated to each lot based on the original estimates of lot size and an average of 2.5 passengers per car. Some but not all of the lots had adjacent commercial or on-street parking. Data from early mail and telephone orders indicated the average automobile occupancy would be lower than 2.5, perhaps 2.25 persons per car. This information was derived from answers to questions on the reservation form. It now appears that the Ticketron operators or the customers did not fully understand the questions. Also, as they got busier, the Ticketron operators neglected to ask the questions. The end result was sporadic, unreliable data. As a precaution, however, capacities were lowered in line with the lower automobile occupancy.

Detailed records of car volumes were not recorded at the parking lots that did not charge parking fees. Some figures are available for those lots that charged fees. Dividing ridership by occupied parking spaces yielded figures between 2.5 and 3.0 passengers per car. The higher figures were for lots with parking available nearby. Actual automobile occupancy for cars entering the park-and-ride lots was about 2.5 persons per car.

Capacities of the parking lots were adjusted midway through the sales of reservations as better sales information became available. In several cases, lot capacities were initially overestimated and estimates had to be reduced. RTD did not control the lots and could not offer reserved parking. Still, RTD believed it had an obligation not to cause the lots to overflow, particularly in areas with no adjacent parking. With conservative assumptions about automobile occupancy and turnover, no lots overflowed.

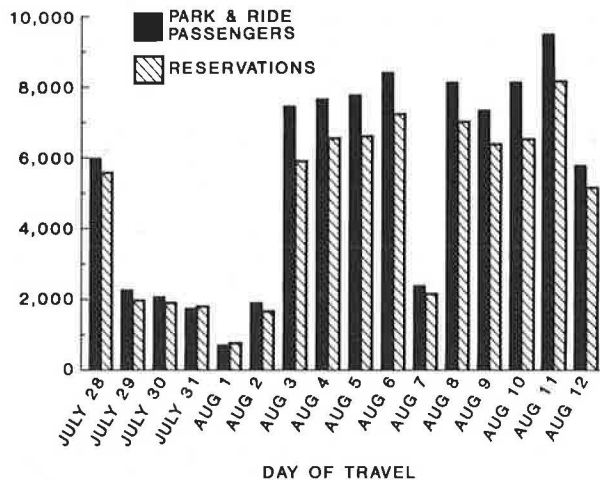


FIGURE 5 Number of RTD Olympic park-and-ride service reservations and level of ridership by day of travel.

#### DAILY VARIATION IN RIDERSHIP

Figure 5 shows the sales of reservations and level of ridership by day of travel. Ridership, expressed in number of roundtrip passengers, varied with the different daily event schedules. Because 95 percent of the reservation holders and 80 percent of the riders were destined for Exposition Park, most of the daily variation can be explained by changes in the operation of the three Exposition Park venues. On August 1, 1984, the day with the lowest level of ridership, the coliseum and swim stadium were inactive; only preliminary boxing matches were held that day at the sports arena. On August 11, 1984, the day with the highest level of ridership, all three venues held double sessions of finals in their sports.

#### RIDERS WITHOUT RESERVATIONS

Ridership on park-and-ride lines was about 20 percent higher than the number of reservations. As reservations sold out, people were encouraged to come as standbys. Reservation capacities were figured on seated loads, leaving more than 25 percent additional capacity available for standees. The number of reservations sold at any individual lot on any particular day was constrained to allow room in the parking lot for 25 percent of the riders to be people without reservations. This was part of the effort to keep bus use efficient and to prevent an overflow of cars at the parking lots, an effort that was successful.

#### BUS CAPACITIES

Initial bus capacities were based on event schedules and the model of travel behavior as adjusted for parking lot constraints. The model predicted desired travel times fairly well, and the reservation system acted to flatten and spread out the peaks. As popular times sold out, people were channeled to adjacent time periods.

#### EARLY PASSENGER ARRIVAL AT TERMINALS

On several days, particularly opening day, service did not begin early enough. This was true on both park-and-ride lines and shuttles. Shuttles, which

were scheduled to begin 4 1/2 hr before the start of opening ceremonies, were started early when hundreds of impatient people were lining up at the terminal and stops, some arriving 2 hr before the advertised start of service.

Similar situations occurred at the park-and-ride lots on opening day. Lots were scheduled to open about 3 hr before the start of the event. Many of the lots were crowded even before RTD personnel arrived 1/2 hr before the scheduled beginning of service. It is still unexplained why people, who would never expect an airplane or a train or even a regular bus to run ahead of schedule, would expect Olympic bus service to begin 1 or 2 hr early. Some of the people who arrived early at the park-and-ride lots were standbys, those who could not or chose not to get reservations. Many of the others, however, were reservation holders with later reservation times. It now appears that these people either bought times they did not want because their first choice was sold out or they did not believe that the scheduled times would be adhered to.

RTD personnel at the park-and-ride lots [the passenger assistance force (PAF)] consisted of venue captains and their assistants, who supervised the operations; fare exchange personnel, who sold tickets and tokens to those without passes; and passenger assistants, who loaded the buses and counted the passengers. Venue captains and assistant venue captains were drawn from the ranks of RTD's road supervisors and instructors. The others were volunteers from RTD's management staff.

The PAF received 1 day of training covering details of the special Olympic service and specific procedures for each of the tasks. Most of the passenger assistants and fare exchange personnel had had little or no previous experience with bus operations. Moreover, the problem of patrons arriving early and demanding transportation had not been foreseen. Consequently, crowd control measures had to be developed more or less on the spot. On most occasions, passenger loading adhered to the 20-min time periods established by the reservation system. However, on those occasions when large volumes of riders appeared and equipment levels permitted, passengers were loaded as they arrived without regard to whether they had reservations or the times of those reservations.

In most cases, there was sufficient equipment available to board everyone within 20 min of their arrival at the lots. At other times, such as opening day, waits were longer. However, the lots were always cleared early enough to deliver everyone to their venues by the start of the event.

#### PROBLEMS

Two general types of problems were encountered during the operation of the Olympic park-and-ride program: first, there were difficulties in explaining the complexities of the Olympic bus service through a third party; and second, Ticketron had trouble keeping up with the orders.

The RTD brochure described the entire Olympic service, but some people were left with unanswered questions. Neither the Ticketron telephone operators nor the ticket clerks in the outlets were prepared to explain the system to inexperienced bus riders. RTD telephone information operators were trained to perform that function, but reaching them required an additional telephone call. Also, RTD information lines were frequently busy.

Ticketron had a variety of problems in keeping pace with the orders. Sales began slowly but soared at the beginning of July. A rush at the end had been

anticipated but they were still unable to keep up. Consequently, telephone orders were cut off early and additional outlets were added to accommodate the demand for reservations.

Reservation clerks filled orders by using computer terminals. The 33 terminals in the Ticketron central office were more than had been needed for other special programs. For the Olympic program, the 33 terminals were staffed for two shifts and performed well. Problems that arose were due to the slowness of the ticket printers.

Orders were grouped and printed in batches. Tickets for each day of travel were printed, packaged, and mailed separately because the system was not designed to link them. Herein lay the source of most complaints. People ordered tickets for several days of travel at one time but received them separately. Some orders went astray or were delayed in the mail. Ticketron handled numerous complaints from people who had received partial orders. Most of these complaints were resolved when the remaining tickets subsequently arrived.

Given that printer capacity was the bottleneck, there was no reason to expand the capacity of the telephone operators beyond a certain point. All terminals were staffed all day, in contrast to the usual practice of staggering shifts to overlap only for a few hours; however, a third shift was not added.

Previously, Ticketron had conducted little mail-order business. Most of their business consisted of in-person transactions and orders that were purchased by credit card and picked up at a later date. Accordingly, they had a small staff trained to print tickets, stuff envelopes, and mail orders. The Olympic program overwhelmed their staff. Overall, the number of errors in filling orders was small; many of the errors, however, could be attributed to placing on the small staff demands to which they were not accustomed.

Long lines at the Ticketron outlets were another problem. Some customers demanded information and assistance beyond the ability of even the most well-intentioned clerks, slowing the processing of others. Over time, many clerks lost patience. Signs were posted at each outlet to inform customers about which dates and lots had sold out so that people would not wait needlessly. Additional outlets were added to relieve the pressure, and, occasionally, non-RTD Ticketron business was sent to outlets not participating in the RTD reservation program.

#### COST SAVINGS

One of the goals of the reservation system was to tailor service to demand in an attempt to keep costs at a minimum. Original estimates of equipment requirements were based on the mode-split targets, model of travel behavior, and roundtrip travel times. As reservations were placed, they were monitored and appropriate changes were made to estimates of capacity. In some cases service was added whereas in others it was reduced.

The final schedules reflected the latest information from the reservation system. However, schedules were finalized 10 days before each day of Olympic service and sales of reservations continued until one day before. Last-minute changes were effected through streamlined procedures and extra effort on the part of the RTD's planning, scheduling, transportation, and maintenance departments.

The number of buses actually put into service varied greatly from the original estimates. Service to the venues outside Exposition Park was reduced to reflect the lower-than-expected level of ridership.

Service to Exposition Park was also reduced from some lots on the days when the coliseum was not operating. When the coliseum was operating, however, service was generally added.

The largest change between original estimate and final schedule was at Hollywood Park, which never sold out. An average of 38 buses was used to go to Exposition Park from Hollywood Park on each of the days the coliseum was in session, a substantial reduction from the 84 buses originally scheduled.

Overall, service was reduced on the park-and-ride lines a total of 900 bus-days. Even without reservations, much of that service might have been eliminated by the operations staff as it became apparent that it was not needed. With reservations, demand was predictable and it was possible to better match service to demand.

Putting a dollar figure on the actual number of buses that were not deployed is difficult because some of the service may have been eliminated anyway. Some of the buses would have been used for less than a full day. Considering these and other factors, the cost savings that resulted from using a reduced number of buses was in excess of \$150,000 during the 16 days of service.

Other aspects of the savings cannot be quantified. The process of scheduling buses was smoother and more reliable with reservations than it would have been without them. Not only was service cut back ahead of time, but it was also added in advance, saving much aggravation, waiting, and operator overtime. Patrons were directed to lots with available capacity, preventing lots from overflowing. Peaks were spread, allowing better utilization of equipment and personnel.

#### SUMMARY AND CONCLUSIONS

The Olympic park-and-ride advance reservation system was a success. The problems encountered were relatively minor. Both the riding public and the RTD management benefited from having the system in place.

Given the chance to do it over again, only a few aspects of the program would be changed. RTD control of the parking lots would have improved planning, operations, and customer relations. Such control would have allowed parking and bus transportation to be combined and sold as a package. RTD could then have charged one uniform fee for its services regardless of park-and-ride location. Also, if people reserved parking spaces with their bus reservations, RTD would have better understood the number and timing of cars arriving at the lots.

Ticketron performed well under circumstances substantially different from those under which it usually operates. With hindsight, it can be seen that there is a need for more, if not all, of the local outlets to participate in the program from the beginning to spread the load and reduce confusion. Additional lead time would have allowed for the printing of special RTD ticket stock, although the RTD gold passes would still have been sold.

The limited capacity of the ticket printer can only be overcome by redesigning their system to allow batching of orders and by using faster equipment and experienced personnel.