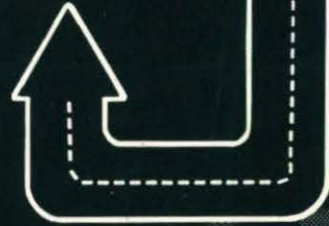


OLYMPIC IMPACT REPORT



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OLYMPICS IMPACT REPORT:

EFFECTIVENESS OF TRANSPORTATION STRATEGIES
IMPLEMENTED DURING THE 1984 SUMMER GAMES
IN LOS ANGELES

MAY, 1985

Prepared by

The Southern California Association of Governments in conjunction with the City of Los Angeles Department of Transportation, the Southern California Rapid Transit District, and Commuter Transportation Services, and in cooperation with California Department of Transportation, the Los Angeles Police Department, the California Highway Patrol, and the Los Angeles County Transportation Commission.

The preparation of this report was financed in part through a grant from the U.S. Department of Transportation, Urban Mass Transportation Administration under the Urban Mass Transportation Act of 1964, as amended.

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CHAPTER I

INTRODUCTION

I.1 Purpose of this Report

This report is prepared by the Southern California Association of Governments (SCAG), the City of Los Angeles Department of Transportation (LA DOT), and the Southern California Rapid Transit District (SCRTD) under a grant from the Urban Mass Transportation Administration. The purpose of this report is to discuss and evaluate the transportation and traffic planning efforts related to the Twenty-Third Olympiad of 1984 in Los Angeles. This report will also evaluate the extent of the effectiveness of each of the transportation planning strategies and will explore their potential usefulness for mitigation both long- and short-term traffic problems.

I.2 The Philosophy of Transportation Planning

The transportation planning process, which spanned a period of approximately four years prior to the Olympic Games, was constrained as a result of a referendum passed by the voters of the City of Los Angeles in 1978. This referendum specified that no tax money could be spent on transportation improvement measures for the Olympic games. Therefore, the planning efforts were restricted to low-cost capital traffic improvement strategies that could be funded through an agreement with the LAOOC, and implemented using existing facilities. Major construction and high capital cost traffic capacity and improvement projects were not considered. The transportation planning process focused on two major areas:

- (1) The control and management of the demand component of the traffic.
- (2) The improvement and management of the transportation supply component.

In both categories the planning and management strategies were aimed at spectator traffic, other Olympic related travel, and non-Olympic traffic. Management strategies that were developed as the result of this planning effort will be discussed in detail throughout this report. The major traffic and transportation planning measures in each category are summarized in the following table:

DEMAND MANAGEMENT

SYSTEMS MANAGEMENT

For Olympic Related Traffic

- o Transit service for spectators
- o Planned distribution of tickets to minimize travel
- o Public information
- o Parking enforcement
- o One way street system near Olympic venues
- o Bus-only priority lanes
- o Bus-only freeway ramps
- o Freeway and street message and guide signs.
- o Street restriping
- o Traffic signal synchronization
- o Curbside loading control
- o Freeway ramps and street closures
- o Daily operation of T.M. Plans

For Non-Olympic Traffic

- o Promotion of ridesharing and transit
- o Truck traffic diversion
- o Promotion of staggered work hours and modified work days
- o Promotion of vacation leaves
- o Public information
- o Expanded operating for ramp metering hours
- o Restriction of Construction and maintenance work on freeways and streets
- o Multiagency Traffic Coordination Center (TCC)

1.2.1 Coordination of the Transportation Planning Process

The magnitude of the planning effort and the numerous agencies and jurisdictions involved, required that the planning process be highly coordinated. The efficient planning, operation and dissemination of information required a major interagency planning and coordinating effort. Each implementing agency, such as the Los Angeles Olympic Organizing Committee (LAOOC), California Department of Transportation (Caltrans), Southern California Rapid Transit District (SCRTD), California Highway Patrol (CHP), the City of Los Angeles Department of Transportation (DOT), Los Angeles Police Department (LAPD), plus numerous other cities and counties would plan and implement the strategies in their jurisdiction. Other private, and public agencies, such as SCAG, Commuter Computer, and the Los Angeles County Transportation Commission (LACTC) would coordinate, review and integrate these planning efforts and aid in the dissemination of this information.

This coordination process was accomplished through individual agency efforts and various committee structures (16 committees were formed) during which representatives of participating agencies presented individual plans, exchanged comments and ideas toward the development of a coordinated multi-agency transportation effort. Caltrans, CHP and the LAOOC were the only agencies whose responsibilities for planning involved all of the Olympic sites.

The Traffic Control Subcommittee, (of the Olympic Security Planning Committee) which was the major transportation planning committee, began meeting in 1979. Its members consisted of:

California Highway Patrol, Chair
Los Angeles Department of Transportation
Los Angeles Police Department
California Department of Transportation
Los Angeles County Sheriff Department
Los Angeles County Road Department
Representatives from other cities
LAOOC, Ex-Officio member

To assemble and utilize the transportation expertise of the regional agencies, an executive counterpart to the technical staff the Traffic Control Subcommittee was created with representatives from the following agencies:

The Los Angeles Olympic Advisory Group:

- o Los Angeles County Transportation Commission (Chair)
- o Los Angeles Department of Transportation
- o Los Angeles Police Department
- o Southern California Association of Governments
- o California Highway Patrol
- o California Department of Transportation
- o Los Angeles County Road Department
- o LAOOC, Ex-Officio Member
- o Commuter Transportation Services Inc. (CTS--Commuter Computer)
- o Southern California Rapid Transit District

This group held regular monthly meetings beginning in January 1983. A total of 20 meetings were held prior to the beginning of the Games. A consensus process was used throughout the meetings to assess the magnitude of the problem anticipated on the freeway system, their interrelationship with surface street facilities, and to develop an overall traffic management plan. This group has continued meeting (with the exception of the disbanded LAOOC) in the form of a task force to analyze the traffic impacts during the Games, and to be a future forum for similar regional and multiagency planning purposes. The committee has been renamed to the Interagency Transportation Task Force.

From November 1983 through July 16, 1984, another major ad hoc committee was formed called the Olympics Public Communications Committee. Organizations and agencies attending included, LA DOT, LACTC, SCRTRD, Commuter Computer, SCAG, Ventura County Association of Governments (VCAG), Orange County Transit District (OCTD), Orange County Transportation Commission (OCTC), Atlantic Richfield Company (ARCO), CHP, LAOOC, Orange County Traffic Engineering Division, Los Angeles County Road Department, Caltrans, LAPD, and the City of Long Beach. The objective of forming an Olympics Public Communications Committee was to create a forum to provide coordination between agencies which would be involved in the supply and publication of information on Olympic transportation. From the outset each agency specified the role it was going to have in communication, public information supply, and agency coordination. Several steering (sub) committees were organized from the members of this group to deal with specific issues related to venue sites, transportation services and media and public contacts.

I.3 Methodology of the Transportation Planning Process

The overall transportation and traffic planning process for the Olympic Games could be summarized in the following general steps:

- (1) Developing transportation and traffic management strategies.
- (2) Informing the public and spectators of the strategies prior to the Games.
- (3) Implementing strategies before and/or during the Games.
- (4) Keeping the public and spectators informed during the Games.

Each agency responsible for planning a specific segment of the transportation system developed preliminary reports and/or technical memoranda regarding their anticipated projections, operation techniques and expected results. Numerous pieces of data were developed and analyzed at this stage, and included such information as:

- o Stadium and venue capacities
- o Game schedules and timing of the events
- o Event attendance figures based on ticket sales
- o Inventory of available parking supply at various venue sites
- o Background traffic conditions on the freeway system and at the venue locations (normal summer levels)
- o Traffic levels generated by Olympic spectators and the Olympic Family

Based on the above information, factors constraining and affecting the traffic operations were determined, and target goals were set for mitigation and management of potential problems. For example, the number of projected additional Olympic-related trips were superimposed over normal August traffic around a venue site. From this information, the increased traffic volumes were evaluated against freeway and surface street capacity and the available parking supply. Shortfall in traffic capacity and operation were thus identified. Freeway traffic condition and capacity summaries were developed locating potentially critical problem sites and time periods. Finally, traffic management tactics were devised to address those capacity shortfalls, and target mode splits for auto and transit were developed to overcome parking supply and roadway capacity deficiencies.

Following extensive cycles of evaluation and revision by the responsible agencies and through the committee processes, the final results of the analyses were developed as follows: First a plan of operation ("Traffic Management Plan") was developed for each venue site. These plans included such measures as methods for gathering traffic information, identification of key routes to venue parking and transit facilities, and public communication techniques using changeable message signs and other site specific control measures.

Second, an overall strategy and plan of operation was developed with the objectives of maximizing the person trip capacity, minimizing congestion and traffic incidents and facilitating operations. These strategies included:

- o Promotion of ridesharing and transit ridership through the institution of preferential treatment, additional transit services, park-and-ride facilities etc.
- o Release of public information through traffic congestion maps, commuter and spectator information packages, personal presentations, traffic reports, news releases and media centers.
- o Sponsorship of employer sponsored programs to encourage shifts in commuter and truck traffic patterns throughout Southern California.
- o Development of comprehensive real-time monitoring programs using such techniques as helicopters, electronic surveillance systems and closed circuit televisions to enable immediate system modifications by the TCC via changeable message signs, radio, and traffic signal operation modifications, etc.
- o Improvement of incident response capabilities.

I.4 Expectations

"... By far the greatest challenge facing Los Angeles as the host city to the Olympic Games will be managing the traffic. The 1984 Olympic Games will pose an enormous traffic problem that could bring the entire Los Angeles community to a halt, forcing businesses to shut down and creating continuous traffic jams that won't quit...."

The above comment was typical of the dire predictions made by transportation professionals and the general public about the nature of traffic in the Los Angeles area during the 16 days of the Summer Olympics. At first these predictions seemed to be quite reasonable considering that Los Angeles was attempting to accomplish a task that no other city had done since the 1960 Summer Olympics in Rome, which was to move great masses of people quickly and efficiently without the benefit and support of a high capacity subway or a comparable single centralized rapid transit system.

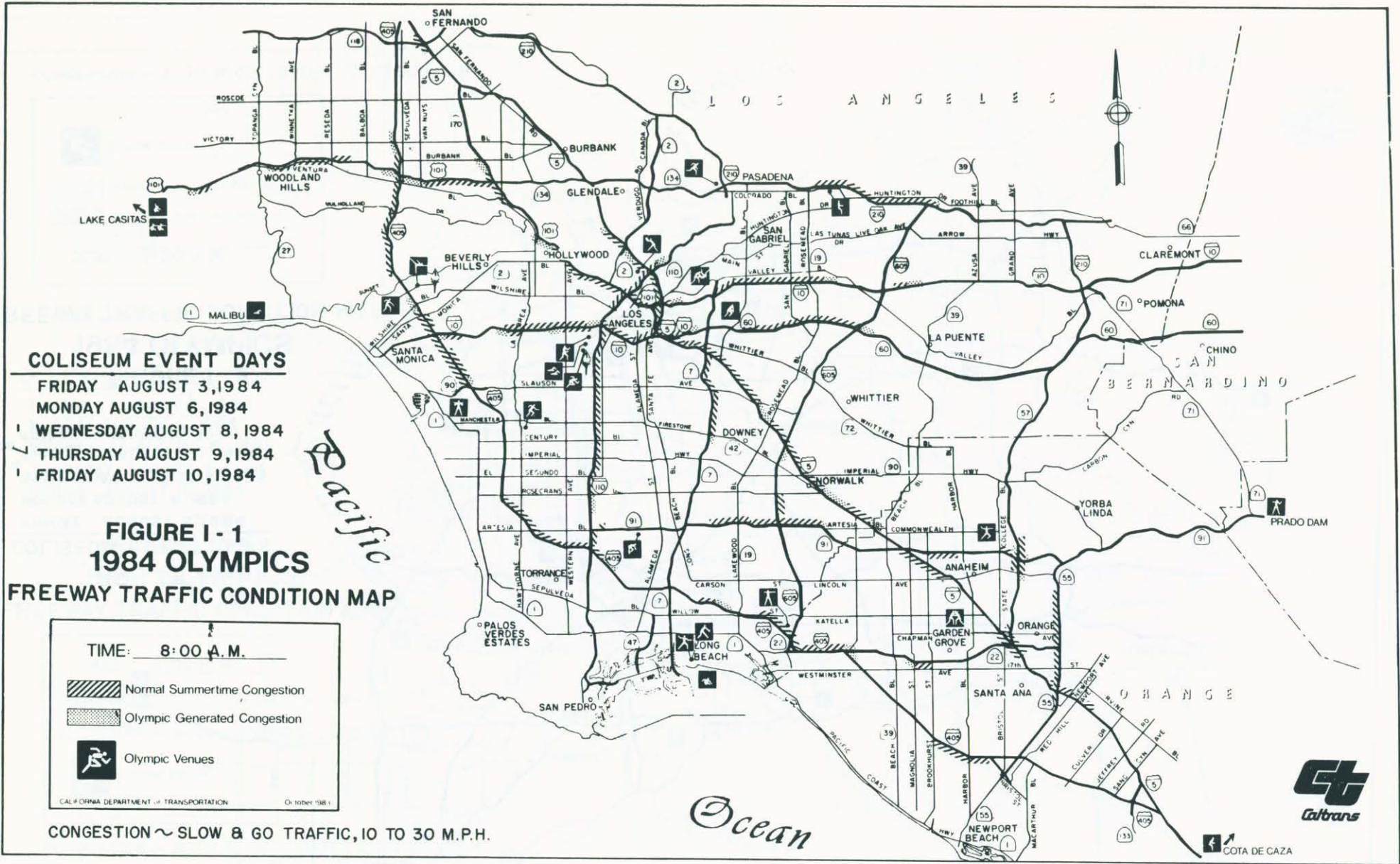
Planning agencies and transportation professionals initially predicted that approximately 1.5 million visitors would come into the area, including both ticket holding spectators and nonspectators wishing to participate in the festivities. These visitors were expected to generate as many as 5.5 million additional person trips per day on the streets and freeways of the region.

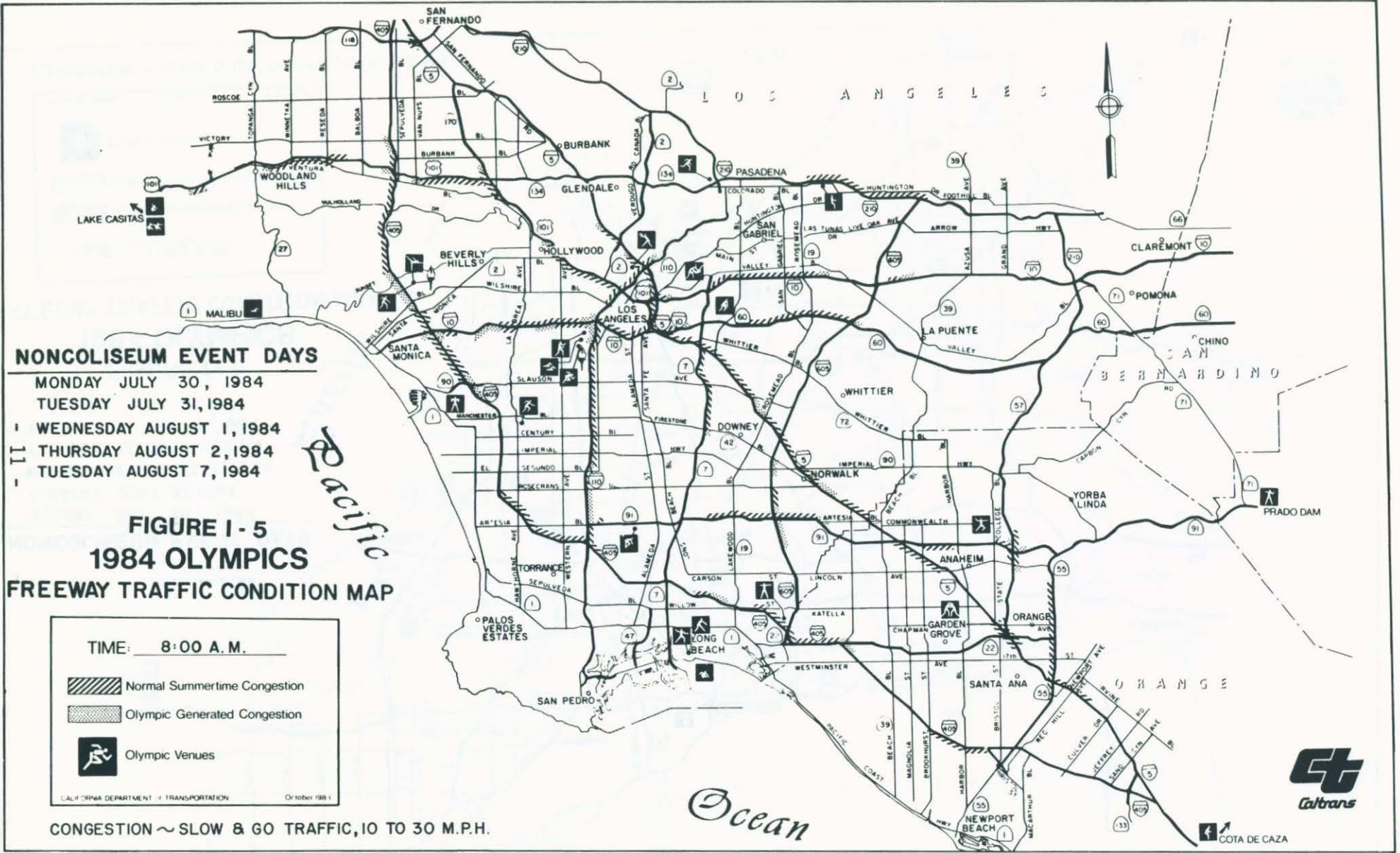
Based on the analysis of the available traffic data and parking supply capacity, it was generally agreed among the planning agencies that substantial transit patronage was required for the system to successfully operate. Estimates of transit mode splits for the various venue sites ranged from 5 to 20 percent for the less congested remote venues to as high as 40 percent - for the UCLA venues and 65 percent for the events at the Exposition Park area. Planners for SCRTD estimated that between 84,000 and 330,000 daily spectators would need to ride the bus service to achieve these agreed-upon mode splits. As a whole SCRTD expected to carry close to 40 percent of all spectators attending the events at the Exposition Park area

and UCLA, in addition to a significant share of the spectators at other venues. SCRTD designed its operation to carry an estimated total patronage of 3.5 million passengers.

During the later stages of the transportation planning process, when more data was available, planning agencies were able to refine their traffic predictions and place greater emphasis on individual venue conditions. Caltrans freeway condition maps and descriptions (see Figures 1-12) presented a reasonable estimate of traffic situations that would occur on the freeway system. These estimates considered the combinations of various venue operations, as well as the time of day, and predicted conditions assuming no mitigation measures were taken.

Caltrans predicted that when the Coliseum was in operation on weekdays, commuters would find congestion patterns to be similar to regular rush hour conditions, but that the peak periods would start earlier and would last longer. When the Coliseum was not in operation, the traffic would still be heavy for longer time periods but less congested than peak hour traffic. It was estimated that on weekends traffic would flow smoothly except for some specific areas. Traditional tourist spots and businesses would still be accessible. It was generally predicted that localized traffic congestion both on freeways and surface streets would be significant, however, the system as a whole would not experience a major breakdown.





NONCOLISEUM EVENT DAYS

- MONDAY JULY 30, 1984
- TUESDAY JULY 31, 1984
- WEDNESDAY AUGUST 1, 1984
- THURSDAY AUGUST 2, 1984
- TUESDAY AUGUST 7, 1984

Pacific

**FIGURE I - 5
1984 OLYMPICS
FREEWAY TRAFFIC CONDITION MAP**

TIME: 8:00 A.M.

-  Normal Summertime Congestion
-  Olympic Generated Congestion
-  Olympic Venues

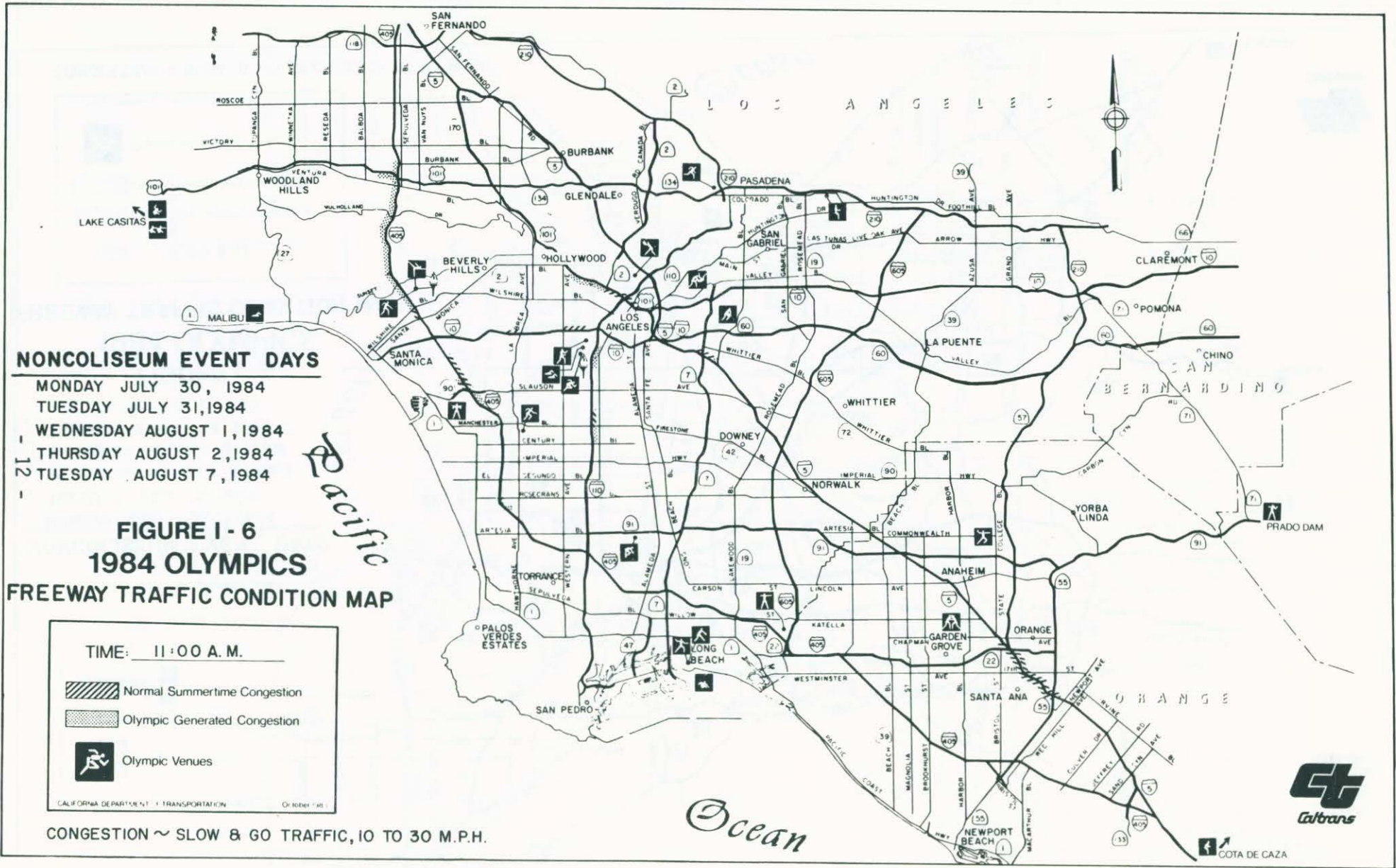
CALIFORNIA DEPARTMENT OF TRANSPORTATION October 1983

CONGESTION ~ SLOW & GO TRAFFIC, 10 TO 30 M.P.H.

Ocean



 COTA DE CAZA



NONCOLISEUM EVENT DAYS

- MONDAY JULY 30, 1984
- TUESDAY JULY 31, 1984
- WEDNESDAY AUGUST 1, 1984
- THURSDAY AUGUST 2, 1984
- TUESDAY AUGUST 7, 1984

FIGURE I - 6
1984 OLYMPICS
FREEWAY TRAFFIC CONDITION MAP

TIME: 11:00 A.M.

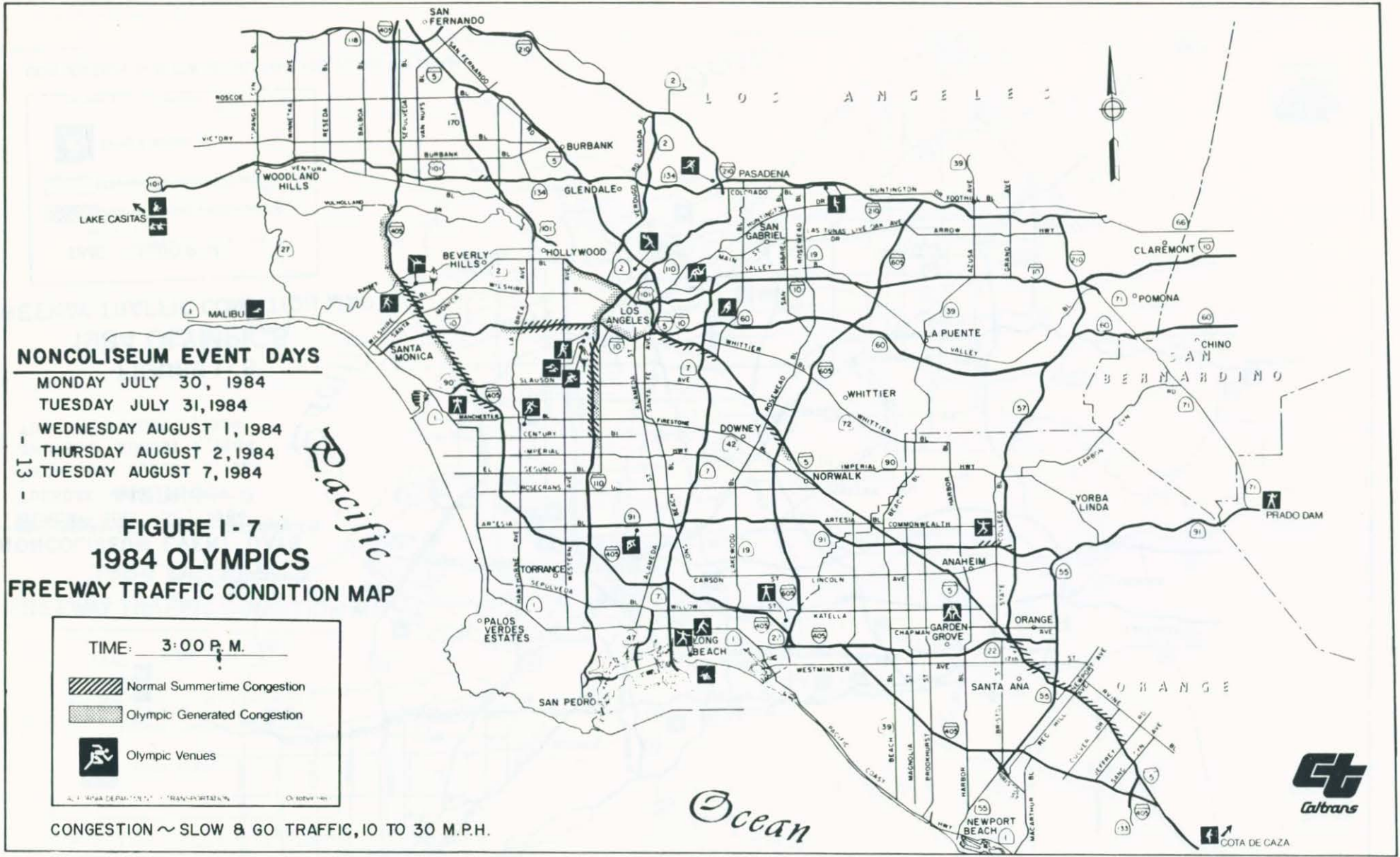
- Normal Summertime Congestion
- Olympic Generated Congestion
- Olympic Venues

CALIFORNIA DEPARTMENT OF TRANSPORTATION October 1983

CONGESTION ~ SLOW & GO TRAFFIC, 10 TO 30 M.P.H.



COTA DE CAZA



NONCOLISEUM EVENT DAYS

- MONDAY JULY 30, 1984
- TUESDAY JULY 31, 1984
- WEDNESDAY AUGUST 1, 1984
- THURSDAY AUGUST 2, 1984
- TUESDAY AUGUST 7, 1984

Pacific

**FIGURE I - 7
1984 OLYMPICS**

FREEWAY TRAFFIC CONDITION MAP

TIME: 3:00 P.M.

- Normal Summertime Congestion
- Olympic Generated Congestion
- Olympic Venues

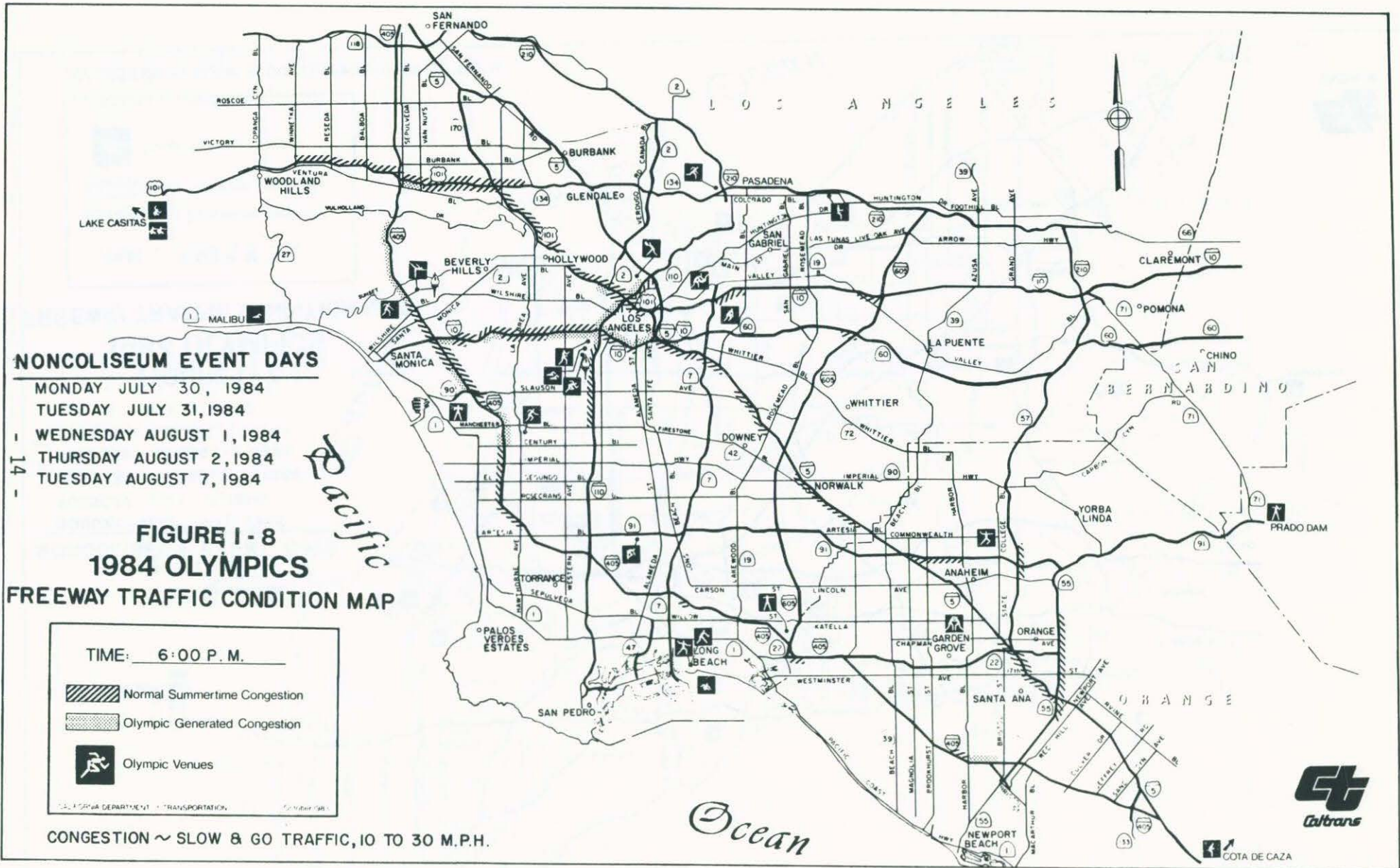
ALL MAPS DEPARTMENT OF TRANSPORTATION © 1984

CONGESTION ~ SLOW & GO TRAFFIC, 10 TO 30 M.P.H.

Ocean



COTA DE CAZA






NONCOLISEUM EVENT DAYS

- MONDAY JULY 30, 1984
- TUESDAY JULY 31, 1984
- WEDNESDAY AUGUST 1, 1984
- THURSDAY AUGUST 2, 1984
- TUESDAY AUGUST 7, 1984

Pacific

**FIGURE I - 8
1984 OLYMPICS
FREEWAY TRAFFIC CONDITION MAP**


TIME: 6:00 P.M.

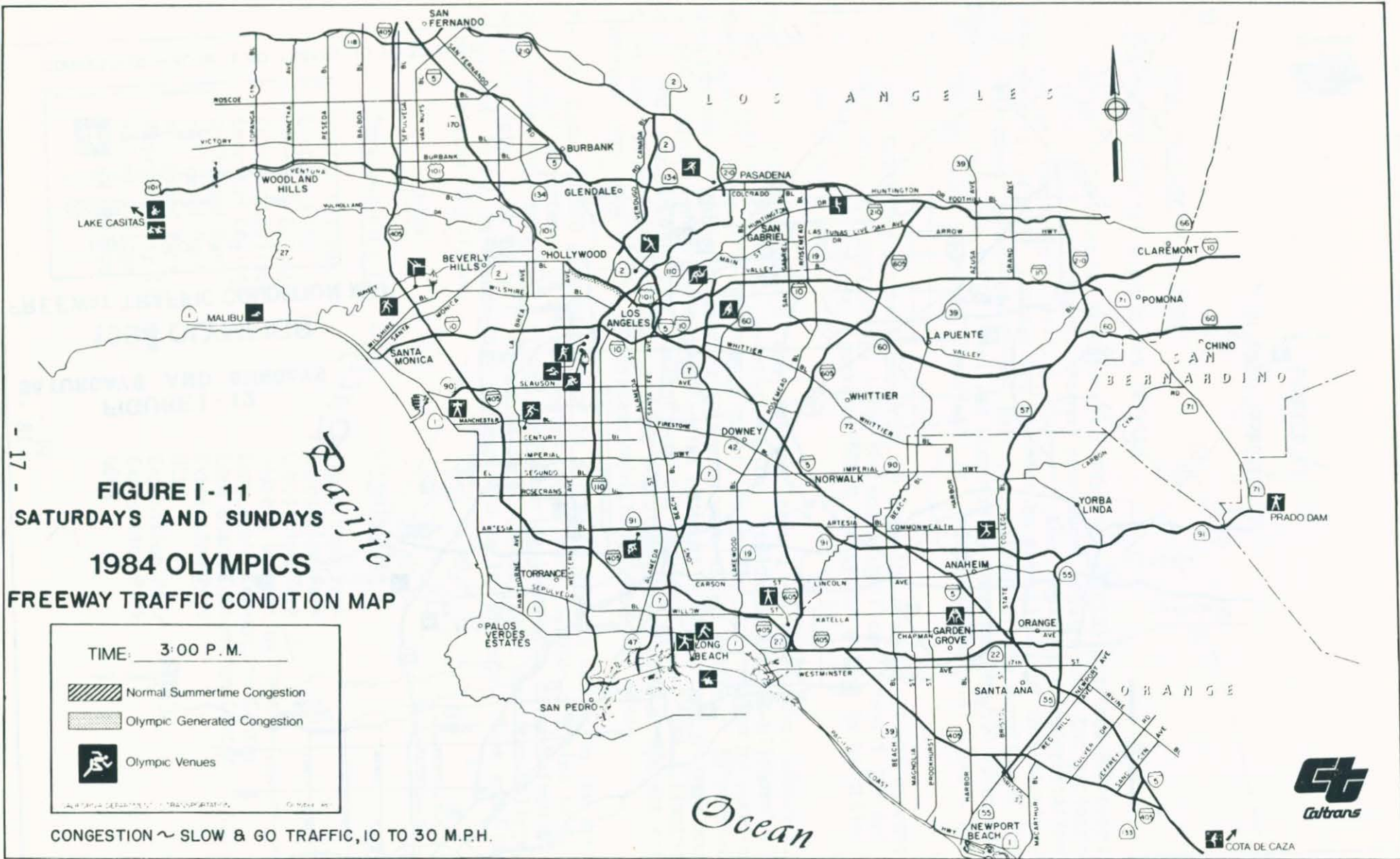
-  Normal Summertime Congestion
-  Olympic Generated Congestion
-  Olympic Venues

CALIFORNIA DEPARTMENT OF TRANSPORTATION October 1983

CONGESTION ~ SLOW & GO TRAFFIC, 10 TO 30 M.P.H.



 COTA DE CAZA



17

FIGURE I-11
SATURDAYS AND SUNDAYS
1984 OLYMPICS
FREEWAY TRAFFIC CONDITION MAP

TIME: 3:00 P.M.

Normal Summertime Congestion
 Olympic Generated Congestion
 Olympic Venues

CALIFORNIA DEPARTMENT OF TRANSPORTATION

CONGESTION ~ SLOW & GO TRAFFIC, 10 TO 30 M.P.H.



COTA DE CAZA

CHAPTER II

PLANNED IMPROVEMENTS

II.1 Mass Transportation Plans

II.1.1 SCRTD Special Olympic Bus Service

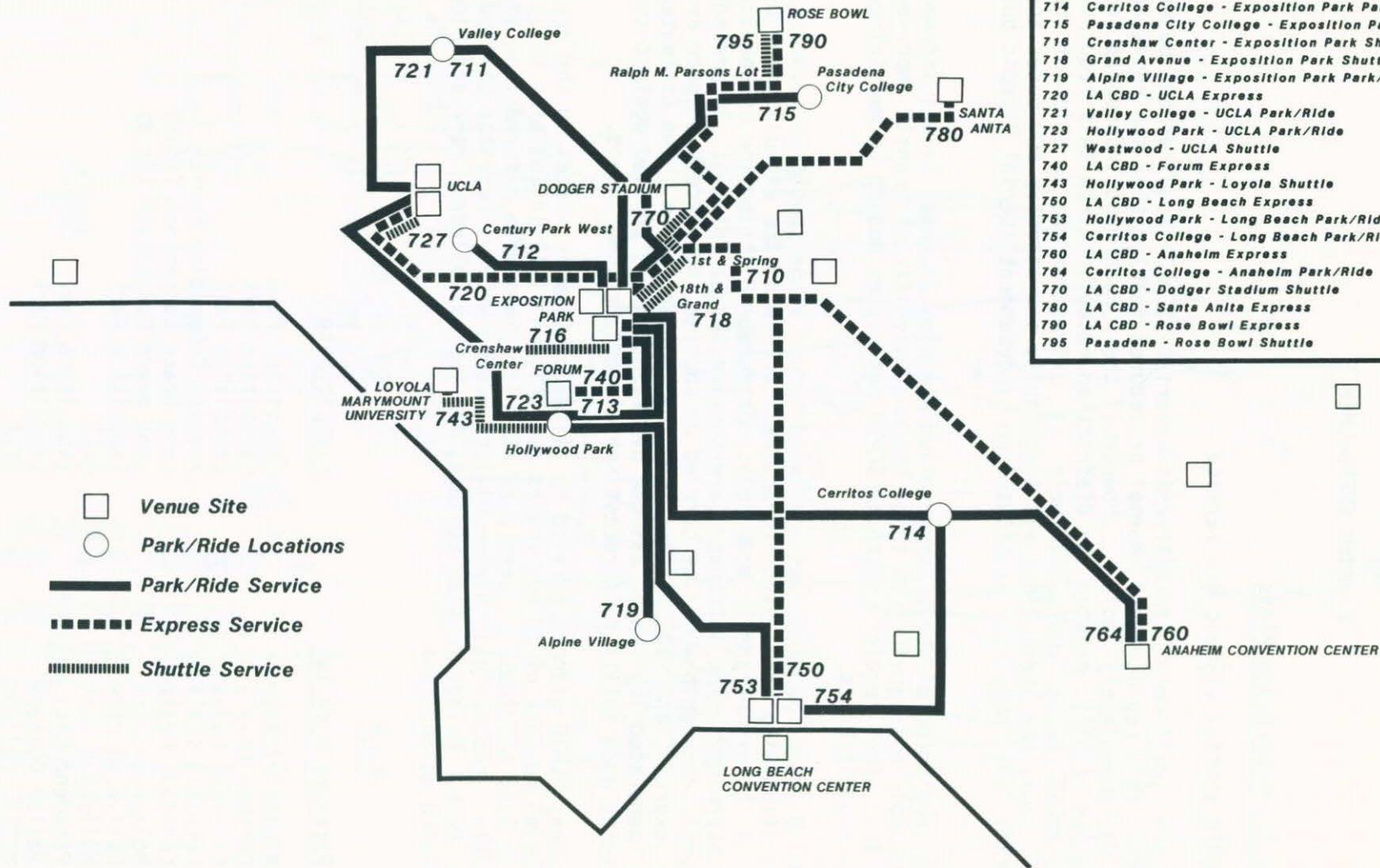
The Southern California Rapid Transit District (SCRTD) acquired 500 buses during 1984 for replacement. Normal procedures require that the replaced vehicles be immediately sold. However, the Urban Mass Transportation Administration (UMTA) granted the District an exception from this requirement, so these buses could be held as extras for the duration of the Olympics. Thus, the SCRTD fleet was temporarily increased by 500 buses and the District was able to institute an independent special Olympic bus service.

Since the beginning of the transportation planning process, it was assumed that the Olympic bus service was to be the most significant transit improvement. Also, the regular backbone SCRTD bus system was to be maintained during the Olympic Games.

The SCRTD Olympic Service was designed around venue spectator capacity, parking availability and event schedules. Following the establishment of the overall target transit mode split, patronage distribution by service type was determined. The patronage targets were set as follows: 50 percent of the Olympic ridership would be carried on shuttle, 40 percent on park and ride and express and 10 percent on the regular system. The estimated patronage generated by this assumed distribution was applied against the targeted venue mode splits to forecast vehicle and manpower needs.

For the Games, SCRTD planned service to all major Olympic venues in the area via a special network of 24 bus routes (see Figure II-1) in addition to its 253 regular line services. Eleven park and ride lines were offered from six parking lots located at: Alpine Village, Century City, Cerritos College, Hollywood Park, Pasadena City College, and Valley College. Park-and-Ride lines operated as follows:

<u>FROM</u>	<u>TO</u>
<u>Park-and-Ride Lot</u>	<u>Olympic Site</u>
Alpine Village	Exposition Park
Century City	Exposition Park
Cerritos College	Exposition Park
Cerritos College	Anaheim Convention Center
Cerritos College	Long Beach Convention Center
Hollywood Park	Long Beach Convention Center
Hollywood Park	Exposition Park
Hollywood Park	UCLA
Pasadena City College	Exposition Park
Valley College	Exposition Park
Valley College	UCLA



- 710 LA CBD - Exposition Park Shuttle
- 711 Valley College - Exposition Park Park/Ride
- 712 Century City - Exposition Park Park/Ride
- 713 Hollywood Park - Exposition Park Park/Ride
- 714 Cerritos College - Exposition Park Park/Ride
- 715 Pasadena City College - Exposition Park Park/Ride
- 716 Crenshaw Center - Exposition Park Shuttle
- 718 Grand Avenue - Exposition Park Shuttle
- 719 Alpine Village - Exposition Park Park/Ride
- 720 LA CBD - UCLA Express
- 721 Valley College - UCLA Park/Ride
- 723 Hollywood Park - UCLA Park/Ride
- 727 Westwood - UCLA Shuttle
- 740 LA CBD - Forum Express
- 743 Hollywood Park - Loyola Shuttle
- 750 LA CBD - Long Beach Express
- 753 Hollywood Park - Long Beach Park/Ride
- 754 Cerritos College - Long Beach Park/Ride
- 760 LA CBD - Anaheim Express
- 764 Cerritos College - Anaheim Park/Ride
- 770 LA CBD - Dodger Stadium Shuttle
- 780 LA CBD - Santa Anita Express
- 790 LA CBD - Rose Bowl Express
- 795 Pasadena - Rose Bowl Shuttle



FIGURE II - 1 RTD SERVICE FOR THE XXIIIrd OLYMPIAD



Six express bus lines were operated from a special Olympic bus terminal in downtown Los Angeles located at First and Spring Streets. This service was designed to transport passengers from downtown Los Angeles to:

- o UCLA
- o The Forum
- o Long Beach Sports Arena
- o Anaheim Convention Center
- o Santa Anita Racetrack
- o Rose Bowl

Seven shuttle routes were operated to Exposition Park from:

- o The intersection of First and Spring streets
- o The intersection of 18th Street and Grand Avenue
- o Crenshaw Shopping Center

Shuttle service also operated between:

- o Downtown Los Angeles and Dodger Stadium
- o Hollywood Park and Loyola Marymount University
- o Ralph M. Parsons Co. (Pasadena) and the Rose Bowl

Service in Westwood between the Federal Building and UCLA was provided by Santa Monica Municipal Bus Lines under contract to SCRTD. The policy adopted by the Board of Directors of SCRTD required that fares for the Olympic service be set such that it would fully pay for both the start-up and actual operating costs of the Olympic service. It was also determined that reduced fares for the elderly or the handicapped would not apply; all passengers would pay the full fare. The fare structure used for this operation was based on the type of the service, and was essentially distance-priced.

Shuttle Service	-- \$2.00 one-way
Express Service	-- \$4.00 one-way on lines under 20 miles
	-- \$6.00 one-way on lines over 20 miles
Park/Ride Service	-- \$6.00 one-way
Olympics Gold Day Pass	-- \$10.00 all day

II.1.2 Other Public Transit Service

The Southern California Rapid Transit District (SCRTD) and the Torrance Transit System were the only two public operators to provide special Olympic service. Torrance Transit provided special Olympic service from the South Bay area to Exposition Park and two trips to the soccer semi-finals and finals. They also provided regular service to the Long Beach Convention Center.

- o Long Beach Public Transportation Company provided regular service to the Long Beach Convention Center, Sports Arena, and El Doroardo Park.
- o Santa Monica Municipal Bus Lines, as stated earlier, operated a special shuttle service to UCLA under contract to SCRTD.

- o Santa Monica Municipal Bus Lines and Culver City Bus Lines offered regular service to UCLA.
- o Orange County Transit District provided access via regular service to three of the four venues in Orange County.
- o Montebello Municipal Bus Lines provided regular service on two routes to East Los Angeles College.
- o SCRTD regular bus service provided access to almost every venue site in Los Angeles County and to some in Orange County.

II.1.3 Transportation Efforts of Los Angeles Olympic Organizing Committee (LAOOC)

The LAOOC was responsible for developing and operating a transportation program which would successfully carry its "Family," i.e., all athletes, coaches, team officials, media, scorers, time keepers, sports officials, and international dignitaries and finally its own employees. Utilizing local charter bus companies and automobile leasing agencies the LAOOC leased the following vehicles:

- o 840 school buses
- o 150 transit buses
- o 1,500 station wagons and vans, and
- o 800 miscellaneous vehicles

Group transportation was available to all the "family" for any Olympic transportation purpose, e.g., LAX to Villages and hotel, venues, press center and practice sites. The LAOOC was not responsible for non-Olympic travel, but made charter arrangements for any group to attend any organized social event. Additionally, arrangements were made for credentialed Olympic individuals to ride all regular SCRTD service free of charge.

Five hundred and thirty school buses were leased strictly for athlete transportation. Bus service was available to the 12,000 athletes on a 24-hour basis. This effort required 1,550 personnel just to handle athlete transportation. In order to transport the 8,800 press members the LAOOC hired 1,134 drivers for the 250 40-passenger school buses. This service was also available on a 24-hour basis. Additionally, 80 special purpose buses were available on an "as needed" basis to groups within the Olympic family. Thirty buses were assigned as backups and were on call 24 hours a day at 26 different locations throughout the region to replace any breakdowns. The placement of these backup buses was designed such that no bus was more than 12 minutes from any potential breakdown location on any line.

The remaining 100 buses were used to operate shuttles from remote parking to various venues. Employees used specially built parking lots near UCLA and Exposition Park and were shuttled into the site. Buses were also operated for spectators between remote parking lots and the actual events at Lake Casitas, Coto de Caza, Prado Dam, and East Los Angeles College.

In addition to the above efforts, the LAOOC constructed a bus-only loop and terminal for 20 buses at Exposition Park on the east side of the Coliseum to

be used by the SCRTD, and created a 30 bus-bay terminal on the west side of the Coliseum to be used by SCRTD and Torrance Transit. They also utilized a bus loading zone, developed by LA DOT, in Westwood along Gayley Avenue between Strathmore and Landfair to expedite passenger loading onto SCRTD and Santa Monica buses. Finally, the LAOOC communicated these transportation plans to spectators and the general public. The June 10, 1984, Home Section of the Los Angeles Times carried a full insert which contained all of the agencies' Olympic transportation plans, with detailed information about the spectator transit services planned for each venue. Ticketholders were also mailed a special transportation guide containing detailed transit information for all venues.

II.1.4 Private and Charter Bus Operations

The traffic plan developed for the Exposition Park area by LADOT called for 25 percent of the spectators to arrive by charter bus operations. The majority of the Olympic sponsors, who were sold 10 percent of all event tickets, relied on charter operators almost exclusively for their transportation to the Games. The charter operators estimated that they would need 750 full-sized coaches to transport their share of the spectators. In addition to sponsors, the charter companies carried members of the Olympic Family to all unofficial functions. The LAOOC also contracted with various operators to transport youth groups to any Olympic event that was not sold out.

Early in the development of transportation programs for the Games, charter operators had problems with organizing and coordinating their activities. The lottery style ticketing system for the Games prevented tour groups from obtaining blocks of tickets, which would have simplified the job of the charter operators. However, hotels were able to work with several operators to put together last minutes charters to major venues.

II.2 Surface Street Improvements

The Los Angeles Department of Transportation (LADOT) had responsibility for preparing and implementing transportation plans for spectator access to venues and ceremonies within the City. They were also responsible for the continued operation of the transportation system in order to maintain a high level of mobility and circulation for the general public.

The LADOT transportation plan for the Olympics was actually a collection of five separate plans. They were:

- o Exposition Park area
 - Opening and Closing Ceremonies
 - Track and Field
 - Boxing
 - Swimming, Diving and Synchronized Swimming

- o UCLA-Westwood area
 - Gymnastics
 - Tennis

- o Loyola Marymount University area
 - Weightlifting

- o California State University at

- Los Angeles -- Judo
- o Dodger Stadium -- Baseball

These plans ranged from the complex preparations for the Exposition Park area to the minor changes required for the California State Los Angeles (judo venue). While these plans included a number of strategies aimed primarily at increasing traffic capacity and reducing demand, the following discussion is limited to the major implementation efforts undertaken by LADOT to ensure expeditious movement of general traffic and improved local access for Olympic spectators.

II.2.1 Street Closures

A number of public roadways, ranging from major highways to local streets and alleys were closed by LADOT during the Olympic Games. The majority of these roads were closed to ensure the safety of the athletes. Traffic studies also indicated that closure of certain streets would reduce the potential for traffic congestion and improve traffic safety. In all cases, local access by residents to private property was maintained, and appropriate traffic control plans were developed and implemented to reroute diverted traffic.

The following roads were closed in the Coliseum-USC area: (See Figure II-2.)

- o Streets closed to all traffic for the duration of the Games
 - o Jefferson Boulevard between Vermont Avenue and Figueroa Street
 - o McClintock Avenue between the International Shopping Center driveway and Jefferson Boulevard
 - o Hoover Street between 32nd Street and Jefferson Boulevard
 - o Menlo Avenue from north of King Boulevard to Exposition Boulevard
 - o Minor street closures around the Shrine Auditorium
 - o Minor closures of streets and alleys adjacent to the Coliseum
 - o 39th Street between Figueroa Street and Broadway--limited use by autos
 - o Flower Drive between 38th and 39th Streets--closed to autos

The closed segments of Jefferson Boulevard and Hoover Street (within the area of the athlete village on the USC Campus) and of Menlo Avenue were for the exclusive use of buses transporting athletes and for other necessary support vehicles.

The closure of Flower Drive and 39th Street was necessary to accommodate the storage and movement of the hundreds of SCRTD buses carrying passengers to and from the east Coliseum terminal.

There were no plans to close any street to traffic during the Olympic Games in the UCLA-Westwood Village area. However, a series of contingency closure plans were prepared that could have been activated if traffic or pedestrian congestion became severe enough to affect public safety or the welfare of the Olympic athletes.

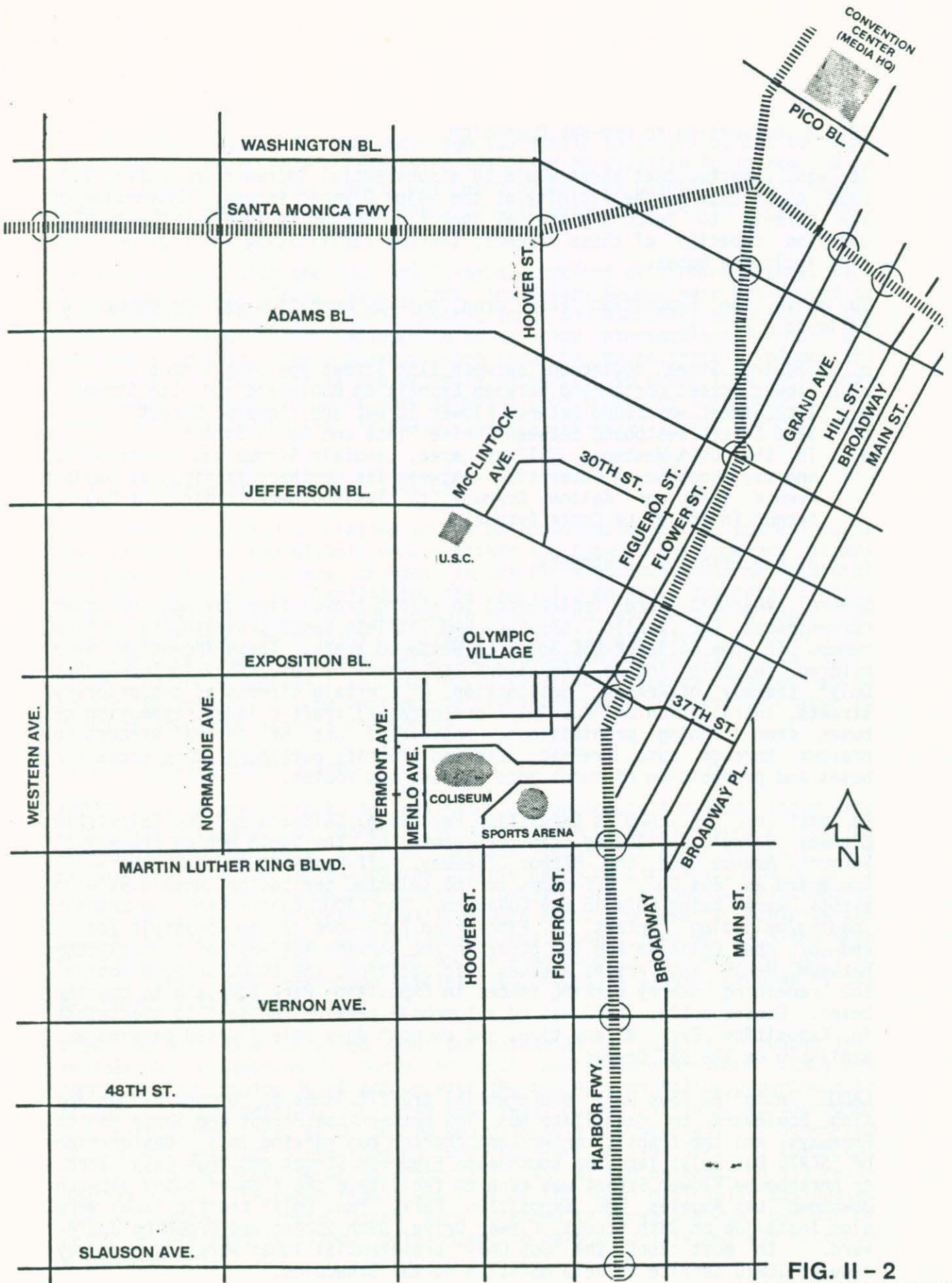


FIG. II - 2
EXPOSITION PARK
COMPLEX AREA

II.2.2 Conversion to One-Way Operation

It was expected that there would be a substantial increase in traffic volumes on streets in the vicinity of the major Olympic venues. Conversion of key streets to temporary one-way operation served to increase the traffic carrying capacity of those streets, thereby facilitating the flow of traffic, including buses.

To serve the Exposition Park area, one-way operation was implemented as follows:

- o Figueroa Street southbound between 11th Street and 38th Street
- o Flower Street northbound between Exposition Boulevard and 11th Street
- o 11th Street westbound between Flower Street and Figueroa Street
- o 32nd Street westbound between Shrine Place and Royal Street
- o In the UCLA-Westwood Village area, Landfair Avenue was converted to one-way southbound operation between its northern terminus at Gayley Avenue (east of Kelton Avenue) to its southern terminus at Gayley Avenue (north of Le Conte Avenue)

II.2.3 Bus Priority Treatments

Several measures were implemented to afford travel time savings and other conveniences for public, charter and athlete buses traveling to or from venues in the Coliseum-USC and UCLA-Westwood areas. These incentives were offered to help induce spectators to travel by bus. They included "Bus Only" freeway off-ramps, designation of certain streets as bus priority streets, installation of "Bus Only" preferential traffic lanes, exemption of buses from turning prohibitions, restricted use of several streets to prevent through auto traffic, reserved priority parking/loading areas for buses and prohibition of turns onto athlete bus routes.

As part of the LADOT's Exposition Park plan, Caltrans and the California Highway Patrol designated the off-ramps of the Santa Monica Freeway at Vermont Avenue and the Harbor Freeway, off-ramps at Martin Luther King Boulevard as "Bus Only" off-ramps during selected periods on those days when events were being held in the Coliseum. The LAOOC constructed two transit loading/unloading centers in Exposition Park--one at the Peristyle (east) end of the Coliseum and the other in the parking lot west of the Coliseum between Menlo and Vermont avenues. In addition, the LAOOC offered most of the remaining nearby parking spaces in Exposition Park for sale to charter buses. Consequently, there was no automobile parking for sale to spectators in Exposition Park at any time, and on most days only limited parking was available on the USC campus.

LADOT installed "Bus Only" preferential traffic lanes on Vermont Avenue and King Boulevard to facilitate bus flow between the Harbor and Santa Monica Freeways, and the transit centers and charter bus parking lots. Designation of "SCRTD Bus Only" lanes on southbound Figueroa Street and "Bus Only" lanes on northbound Flower Street was done to facilitate the flow of buses between downtown Los Angeles and Exposition Park. "Bus Only" traffic lanes were also installed on 38th Street, Flower Drive, 39th Street and Browning Boulevard. In most cases, the "Bus Only" preferential lanes were also used by regular SCRTD service to help maintain normal schedules.

To facilitate bus flow and encourage the public to travel by bus to UCLA, segments of "Bus Only" lanes were installed on Wilshire Boulevard and on Gayley Avenue. These lanes were used by special Olympic transit buses, private and sponsor charter buses, shuttle buses from nearby parking lots and regular public bus lines.

In conjunction with the "Bus Only" lanes, portions of Vermont Avenue, King Boulevard, Flower Drive, 39th Street, and Gayley Avenue were designated as bus priority streets. Turn restrictions and mandatory detours off the designated street were implemented at selected intersections for most all automobile traffic. These measures were taken to reduce traffic volumes and congestion in the critical bus priority segments. In order to give further preference to transit, buses were exempted from temporary turn prohibitions which were installed to increase traffic capacity in the Olympic venue areas.

II.2.4 Restriping and Channelization

The LADOT conducted a detailed review of non-Olympic traffic operations in the vicinity of the Olympic venues within the City of Los Angeles. It was concluded that temporary changes in traffic movements would be needed at certain locations to facilitate the anticipated heavy spectator traffic flow. These changes included double right-turn, and left-turn lanes from freeway off-ramps, restriping of streets to provide additional through traffic lanes, and installation of left- and right-turn channelization to facilitate turning movements. In addition, a reversible lane was implemented on Loyola Boulevard at the entrance to Loyola Marymount University campus to expedite spectator ingress and egress.

II.2.5 Parking Prohibitions

LADOT made every effort to minimize disruption to the local venue-area communities during the Games. The prohibition of parking and/or stopping was initiated on many arterial streets leading to major venues for the primary purpose of increasing the traffic carrying capacity. For security reasons, the LAPD requested that a number of parking restrictions be installed within the Westwood Village/UCLA area. In order to minimize the impact of the parking prohibitions on businesses, most of the signs were manufactured with effective dates on the sign faces. This enabled LADOT to install the signs early and complete its extensive signing program by the beginning of the Games.

LADOT was also very concerned about the potential for parking intrusion into residential neighborhoods bordering UCLA and Loyola Marymount (LMU) and committed to taking joint action with the Los Angeles Police Department to prevent illegal parking. In these two areas, as well as in areas surrounding Exposition Park, LADOT posted approximately 340 specially designed red and black warning signs reading "WARNING--Parking Laws Strictly Enforced, for Location of Towed Vehicles, Phone XXX-XXXX" at the entrance to all residential areas. The phone number was that of the local officially designated towing company. These signs were intended to serve the dual purpose of being a deterrent to illegal parking and to help motorists quickly retrieve a towed vehicle.

II.2.6 Automated Traffic Surveillance and Control (ATSAC)

Another planned improvement was the computerized signal control of 120 intersections in the Exposition Park area. This control measure was relatively expensive, but allowed for real-time monitoring of system operation and street traffic conditions from a remote operations center. This measure enabled the operations center to respond to changing traffic patterns and conditions and make changes in signal timing. The system was installed immediately prior to the Games thus there was only a brief period for testing and refinement.

II.2.7 Traffic Signal Modifications

In all venue areas, signal timing changes, upgrading and modernization of signal controller equipment, and improvement of signal interconnections were made to "fine-tune" the signal control strategies and prevent delay by better accommodation of changing traffic patterns and travel times.

II.2.8 Guide Signing

As part of the program to provide the public with information concerning Olympic-related travel and transportation, distinctive Olympic venue guide signs were installed to lead spectators along surface streets to the competition sites. These directions included sign "trails" from both primary freeway exit ramps and from secondary exits designed for use by spectators during heavy congestion periods.

Approximately 650 guide signs were installed on city streets. For non-English speaking spectators, the sports pictogram was included on all single venue signs to provide continuity with the ticketing for each event. The corresponding event name was also provided in English on these signs. For dual event signs, such as those directing spectators to the Coliseum and Sports Arena, the event names, and the LAOOC official Stars-in-Motion symbol were used. Directional arrows were also placed on all signs.

II.2.9 Marathon and Walk Event Controls

Certain traffic controls were implemented for management of traffic during the out-of-stadium events i.e., Women's and Men's Marathons and the 20- and 50-Kilometer Walks. Traffic control for the marathons was extensive due to the length of time streets were closed to enable both the lead and last runner to complete an unobstructed race. Control changes for the walking events were similar but not as extensive.

The planned traffic controls included posting of temporary stopping prohibitions along the routes, turning all signals to flashing operation along the routes one-half hour prior to the arrival of the lead runner, and installing "Detour" and "Road Closed" signs on barricades and various turn prohibitions to divert traffic from major cross streets in advance of the closure.

II.2.10 Curb Loading Zones

A number of changes in use of curbside spaces were made to accommodate the loading needs of buses, taxis, limousines and private passenger vehicles. Bus zone changes were made primarily to provide curb space for SCRTD's Olympic service program. New zones were installed and existing zones extended to accommodate both bus passenger pick-up/drop-off, and to provide space for the staging (storing) of buses while the event was in session.

Taxi and limousine zones were installed at venue-close locations in the Exposition Park and UCLA-Westwood areas. For taxi operations, a curbside staging zone was installed in each area and a call-up system employed for post-event passenger pick-up. In the Coliseum area, an off-street holding lot was established from which waiting limousines could be called to the limousine pick-up/drop-off zone.

II.3 Freeway Related Improvements

Caltrans did not have the luxury, from a capital outlay standpoint, of expanding the capacity of the Los Angeles freeway system in order to accommodate additional traffic expected for the Olympics. Therefore, Caltrans' major effort for the freeway system was to focus on reducing demand and then controlling and managing traffic. The center of this effort for controlling and managing was the Traffic Operation Center (TOC). This center displayed an automated map of the Southern California freeway system using electronic sensors indicating traffic flow conditions. The TOC was connected by telephone to the multiagency Traffic Coordination Center (TCC) where Caltrans, SCRTD, Los Angeles City Department of Transportation, California Highway Patrol, Los Angeles Police Department, the LAOOC and representatives from independent cities, monitored highway conditions. Thus, an immediate and coordinated decision could be made as soon as any highway slowing incident began. The TCC could also monitor the 12 closed circuit TV cameras (controlled by the TOC) on the Santa Monica Freeway and the three cameras located at major downtown freeway interchanges.

The TCC could immediately call for traffic officers and Caltrans field forces to close any on- or off-ramp on the system in an effort to alleviate excess traffic. On-ramps to the Santa Monica, San Diego, Ventura, Harbor and Hollywood Freeways were metered between 5:00 a.m. and 9:00 p.m. The metering rate could be adjusted as traffic warranted. Recently, the freeway system in the basin had been equipped with 50 permanent changeable message signs. These signs gave traffic conditions to venues, warned of heavy congestion ahead and recommended detours if needed. The messages on these signs could be directly controlled from the TOC.

Twice a day through multiagency press conferences held in the Olympic media center located in the Caltrans building, reports were issued to the press on all previous, current, and projected traffic conditions.

In addition to the traffic operations, Caltrans negotiated with the public school systems throughout southern California to operate park and ride lots in unused school parking lots. A total of 86 temporary lots were established during the Games. Carpool matching was coordinated by Commuter Transportation Service (Commuter Computer) and the Orange County Transportation

District.

II.4 Private Sector Transportation Efforts

Since limited physical improvements were made to the existing transportation system, it was necessary to target the private sector/employer with information that included forecasted congestion maps, information on route closures, venue site analyses, recommendations for staggering work hours, and summaries of traffic impacts by area.

As previously mentioned, an Olympics Communications Committee was formed to assimilate and disseminate this information. The information was intended to help major employers prepare transportation contingency plans and to urge employees to take vacations, go on modified work schedules, to carpool, use transit and to inform spectators about the plans for access to the venues. Ten thousand comprehensive information packages were distributed to firms in Los Angeles by Commuter Computer.

Prior to the start of the Olympics, the firms receiving these packages were surveyed as to the plans they had made for the period of the Games. The following section summarizes the findings of this survey:

- o Seventy percent of the firms had distributed the packets directly to their employees.
- o Fifty-three percent strongly encouraged their employees to use carpools, vanpools, and buses during the Games.
- o Thirty percent kept the standard five-day work week but modified their work schedules around event times.
- o Six percent of the firms indicated that they would switch to four-day work weeks.
- o Three percent would reduce operation and 4 percent would cease operations during the Olympics.

For two months prior to the Olympics, Caltrans conducted a public outreach program to promote changes in commuter behavior during the Olympics. A mobile unit containing traffic information about the Games visited 41 sites to encourage people to reduce their driving.

The California Highway Patrol and the California Trucking Association conducted "Operation Breezeway" which was aimed at encouraging the truckers to reroute through trucks away from central Los Angeles and to reschedule deliveries and local traffic during off-peak hours. In this effort, 584 information packets containing forecasts about congestion by day, time and location were distributed to trucking companies and 34 different presentations were given.

II.5 Government Actions

In order to facilitate transportation in the Los Angeles area, both the State of California and the City of Los Angeles passed temporary legislation

and ordinances. The State Legislature was aware that the three heaviest traffic days during the Olympics would be Friday, August 3, Monday, August 6, and Friday August 10. The Legislature took the following two actions to reduce the traffic on those days. Senate Committee Resolution 50 was developed to urge all State and County offices, as well as private companies, to operate on a 4-day/10-hour work week. The impact of this resolution would be to minimize background traffic on August 6 and August 10 as well as to spread the peak hours on the other work days. The second action taken by the Legislature was the passage of a bill by Senator Alan Robbins officially moving Admissions Day from Monday, September 10 to Monday, August 6. This legislation was aimed at reducing downtown traffic with heavy concentrations of banks and state offices.

The California Legislature also passed two other minor pieces of legislation that would impact the Olympics. The state had old legislation, dating back to the days of horse drawn delivery vehicles, which specifically banned night time delivery of beer. This law was rescinded and therefore, was important in helping get night time delivery of goods throughout Los Angeles. One final piece of Olympics related legislation, was the temporary lifting of the ban on the parking of mobile vehicles in public areas for more than 14 consecutive days. This helped keep R.V.s, press vans, and mobile homes in controlled locations for the duration of the Olympics.

The City of Los Angeles also passed several important ordinances that had a major impact on the flow of traffic. One of these was a moratorium placed on all road closures during the Olympics including building construction which would block lanes of traffic, road repairs, and utility construction or repair. The City also passed an ordinance, to allow property owner's around the Exposition Park area, upon obtaining a City permit, to rent parking spaces to spectators.

II.6 Traffic Control and Enforcement

The California Highway Patrol, the Los Angeles Police Department, the Los Angeles Department of Transportation, and Caltrans each put together coordinated enforcement and traffic management activities to respond to any incidences that could impede traffic. Emergency response teams from Caltrans and the Highway Patrol were prepared to respond to freeway blocking incidents through removal of vehicles and ramp control. The City Department of Transportation and the LAPD also put together an incident response team that had a goal of "2 minutes from stop to tow." The LAPD utilized 280 traffic control officers stationed at critical intersections around each of the venues. Their enforcement actions remained unchanged, from normal, and was aimed at preventing illegal driving activities especially on bus-only ramps, on one-way streets, bus lanes and the immediate removal of any vehicle that impeded the flow of traffic.

The CHP and Caltrans had joint responsibility for maintaining traffic around freeway and road closures due to certain Olympic events. The CHP escorted the torch relay through California and Los Angeles during the week preceding the games using a rolling road closure procedure as the torch progressed. The CHP and Caltrans were also totally responsible for street control during the cycling event through Mission Viejo and along S. R. 91. For the Artesia

Freeway closure, CHP officers and Caltrans maintenance and traffic operations field units had to close off mainline freeway and each ramp for the duration of the race and assure the smooth operations of adjacent streets and freeways.

II.7 Venue Plans

The essential key to the planning of the Olympics was the development of the venue plans. During the 16 days of the Games athletes competed in 24 events at 23 venue sites. The following are the specific plans developed for these venues, a total of 18 separate sheets. These plans are graphically depicted in Figures II-3 through II-18.

II.7.1 Exposition Park (See Figure II-3).

This venue complex contained three major facilities for the Olympics

Boxing -- Los Angeles Memorial Sports Arena
Track and Field -- Los Angeles Memorial Coliseum
Swimming and Diving -- USC Swim Stadium

The combined capacity for these facilities is approximately 120,750 spectators. On seven out of the 16 days the Games were in session, all three of these facilities were in operation at the same time. Since one of the Olympic Villages was located at USC, none of the parking lots normally used by event spectators were available during the Games. A survey showed that there were only 19,000 scattered parking spaces available in the area. For this reason, the LAOOC built a 63-acre remote parking lot for their employees with a 5,500 car capacity. The lot was connected to USC by a shuttle capable of carrying 7,500 passengers, using 45 leased buses.

This site received the most attention by planners. First a transit mode split was established in order to deal with the parking and roadway shortages. RTD was targeted to carry 40 percent of the spectators and private charter service was targeted to carry another 25 percent. To meet this target SCRTD service was instituted for this venue as shown in Table I.

<u>LINE</u>	<u>POINT OF ORIGIN</u>	<u>SERVICE TYPE</u>	<u>MAXIMUM HEADWAY</u>
710	1st and Spring Streets	Shuttle	5 minutes
711	Valley College	Park/Ride	20 minutes
712	Century City	Park/Ride	20 minutes
713	Hollywood Park	Park/Ride	20 minutes
714	Cerritos College	Park/Ride	20 minutes
715	Pasadena City College	Park/Ride	20 minutes
716	Crenshaw Center	Shuttle	10 minutes
718	1st Street and Grand Ave.	Shuttle	10 minutes
719	Alpine Village	Park/Ride	20 minutes

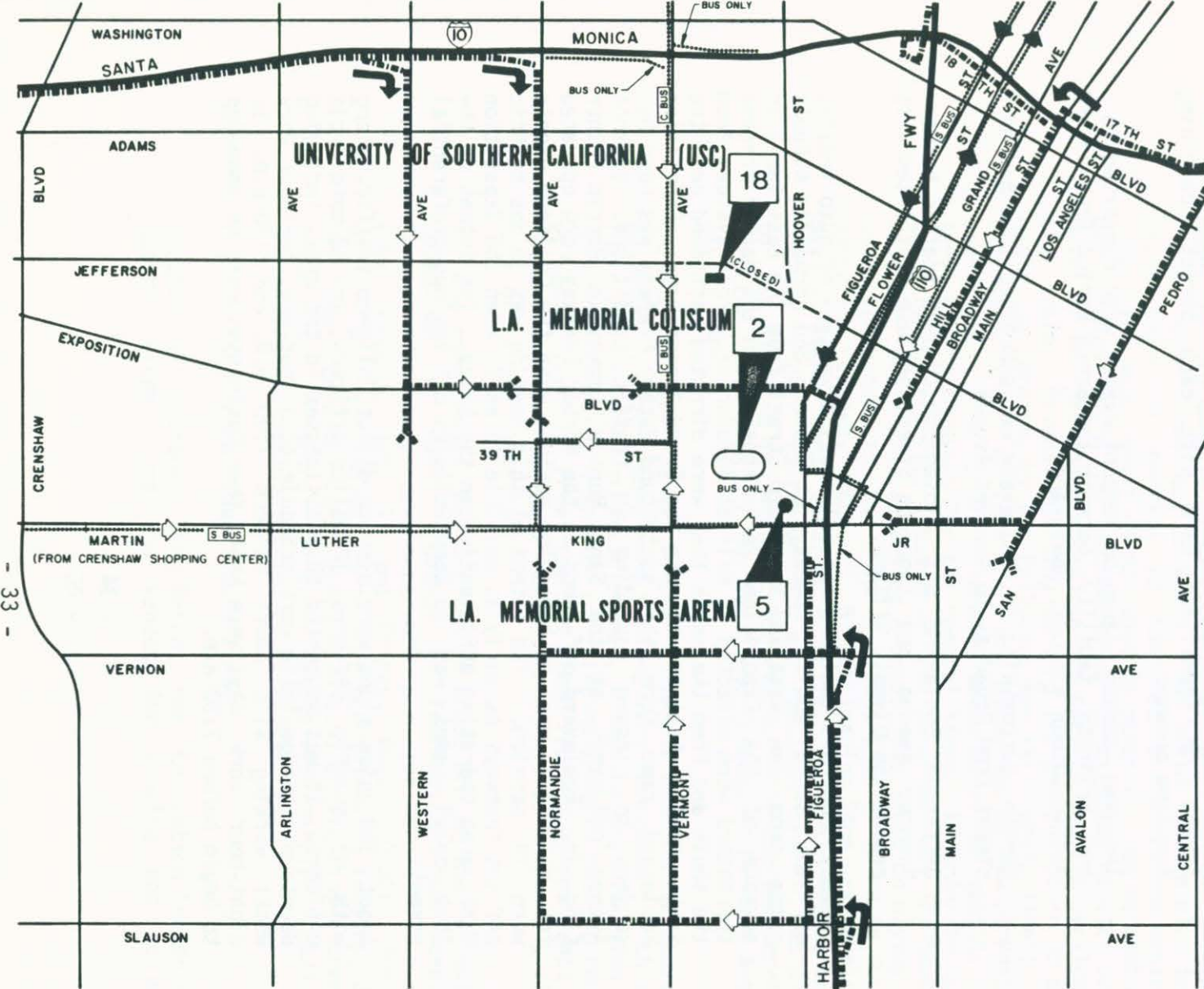


FIGURE II - 3



1984 SUMMER GAMES

SPECTATOR ROUTES

L.A. MEMORIAL COLISEUM

2

ATHLETICS

L.A. MEMORIAL SPORTS ARENA

5

BOXING

UNIVERSITY OF SOUTHERN CALIFORNIA (USC)

18

SWIMMING AND DIVING

LEGEND

- SPECTATOR ROUTE
- BUS ROUTE
- OLYMPIC TRAFFIC
- ONE WAY
- DIRECTION OF FLOW
- SHUTTLE BUS
- CHARTER BUS
- CHARTER PARKING

In order to accommodate the buses, the LA00C constructed two bus terminals adjacent to the Coliseum. The east facility, located between the peristyle and Figueroa Street (see Figure II-3) was constructed as a permanent improvement. A one-way loop was constructed with loading bays for 20 buses on the east side. A temporary terminal was constructed west of Menlo Avenue between 39th and Leighton which could accommodate up to 30 buses at one time.

In order to accommodate this level of activity the surface streets around Exposition Park were radically altered as follows:

- Figueroa and Flower Streets, which provide direct access from downtown were converted to a one-way street pair from 11th Street to Exposition Park with each street containing two-lane busways.
- The two center lanes on Vermont Avenue were converted to a bus priority facility between the Santa Monica Freeway and Martin Luther King Jr. Boulevard.
- Martin Luther King Jr. Boulevard was converted to a bus only street from Broadway to Vermont Avenue.
- Jefferson Boulevard was closed to through traffic between Vermont Avenue and Figueroa Street because of the security around the Olympic Village.

Freeway controls included the voluntary diversion of auto traffic off the Santa Monica Freeway at Western and Normandie Avenues ramps from the west and San Pedro Street from the east (well in advance of the Exposition Park area). On the Harbor Freeway spectators were directed to exit at Slauson or Vernon avenues from the south and from the north they were directed eastbound onto the Santa Monica Freeway to use the Grand Avenue ramp. Exposition Boulevard ramp from the southbound Harbor Freeway was open but subject to closure depending on traffic conditions. Vermont Avenue off-ramps at the Santa Monica Freeway and Martin Luther King Jr. Boulevard off-ramps at the Harbor Freeway were operated for exclusive use by buses for periods when the Coliseum events were in session. The intent of this routing was to get traffic off the freeways as early as possible so as to keep the Exposition Park area operating efficiently for the buses. The intent of the "bus only" ramps was to keep vehicles off the bus-preferential streets.

About 350 guide signs were used to direct Coliseum traffic, along with 68 traffic officers, 18 police officers, and 60 motorcycle officers. It was suggested that businesses in the area, including downtown, change their work schedule to a four-day, ten-hour work week; working with hours between 7:00 a.m. and 6:30 p.m. If eight-hour work days were kept, then businesses were recommended to begin before 7:30 a.m.

Deliveries and parking were restricted during the day on Vermont Avenue, Figueroa Street, Flower Avenue, Normandie Avenue, Martin Luther King Jr. Boulevard and Vernon Avenue.

II.7.2 UCLA-Westwood (See Figure II-4)

This venue site contained facilities for both gymnastics and tennis. The combined capacity for these facilities is about 18,000 spectators. Parking on the campus was available for 2,650 spectator autos. Two thousand additional parking spaces were available at the Federal Building, and the Los Angeles Department of Parks and Recreation which were connected to the UCLA campus by means of 15 shuttle buses operated by Santa Monica Municipal Bus Lines, under contract to SCRTD. The SCRTD service plan included three types of service to the area to achieve the desired bus ridership mode split of at least 40 percent. Ten percent of the bus riders would be accommodated on existing regular service. Half of the patronage would use the special shuttle services from the nearby Federal Building parking lot and the other 40 percent would be serviced by the following special Olympic lines: LA CBD Express, Valley College Park and Ride, and Hollywood Park, Park and Ride. The SCRTD allocated seven buses for special shuttle service and 18 buses for the special lines. In order to accommodate the bus traffic, a bus only left turn lane was implemented on Wilshire Boulevard at Gayley Avenue. Two lanes on Gayley Avenue were converted to bus priority lanes from Wilshire to UCLA with enforced tow-away zones. A bus loading lane was developed at Gayley Avenue and Strathmore Drive. Landfair Avenue became a one-way street southbound and all spectator traffic was directed to use Wilshire and Westwood Boulevards. All charter service was directed into UCLA off the San Diego Freeway at Montana Avenue to Gayley Avenue.

Because of the large volume of people expected to converge on Westwood Village, contingency plans were developed for this area. The plans included street closures, filtering and diversion of auto and bus traffic, diversion of existing transit routes, rerouting of auto traffic from the San Diego Freeway to the Santa Monica Freeway and restriction of vehicular access to Westwood Village in case of severe congestion.

It was recommended that businesses adopt one of the following two schedules for work. Change to four-day/ten-hour week, start before 7:30 a.m., leave after 6:00 p.m. (or before 4:30 p.m.) and take Tuesday, July 31 and Friday, August 10 off. The second option was a nine-day, nine-hour schedule with Tuesday, July 31 off and starting work before 7:30 a.m. and leaving either after 5:30 p.m. or before 4:30 p.m. (second week only). Access to all businesses and residences was to be maintained.

II.7.3 City of Long Beach (See Figure II-5)

Located in downtown Long Beach, the Convention Center and the Sports Arena were the venues for fencing and volleyball,

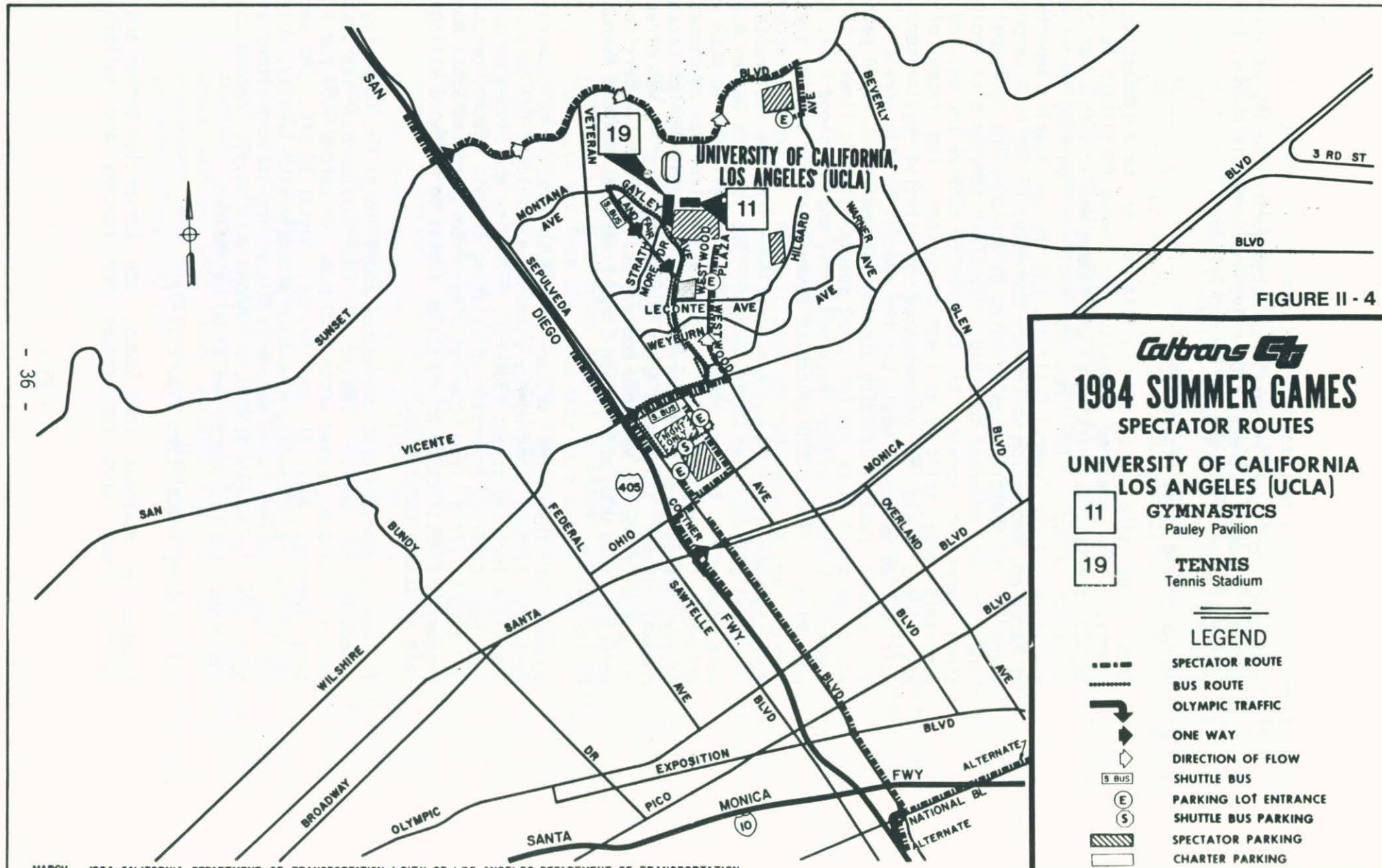


FIGURE II - 4

Caltrans

1984 SUMMER GAMES SPECTATOR ROUTES

**UNIVERSITY OF CALIFORNIA
LOS ANGELES (UCLA)**

11 **GYMNASICS**
Pauley Pavilion

19 **TENNIS**
Tennis Stadium

LEGEND

- SPECTATOR ROUTE
- BUS ROUTE
- OLYMPIC TRAFFIC
- ONE WAY
- DIRECTION OF FLOW
- SHUTTLE BUS
- PARKING LOT ENTRANCE
- SHUTTLE BUS PARKING
- SPECTATOR PARKING
- CHARTER PARKING

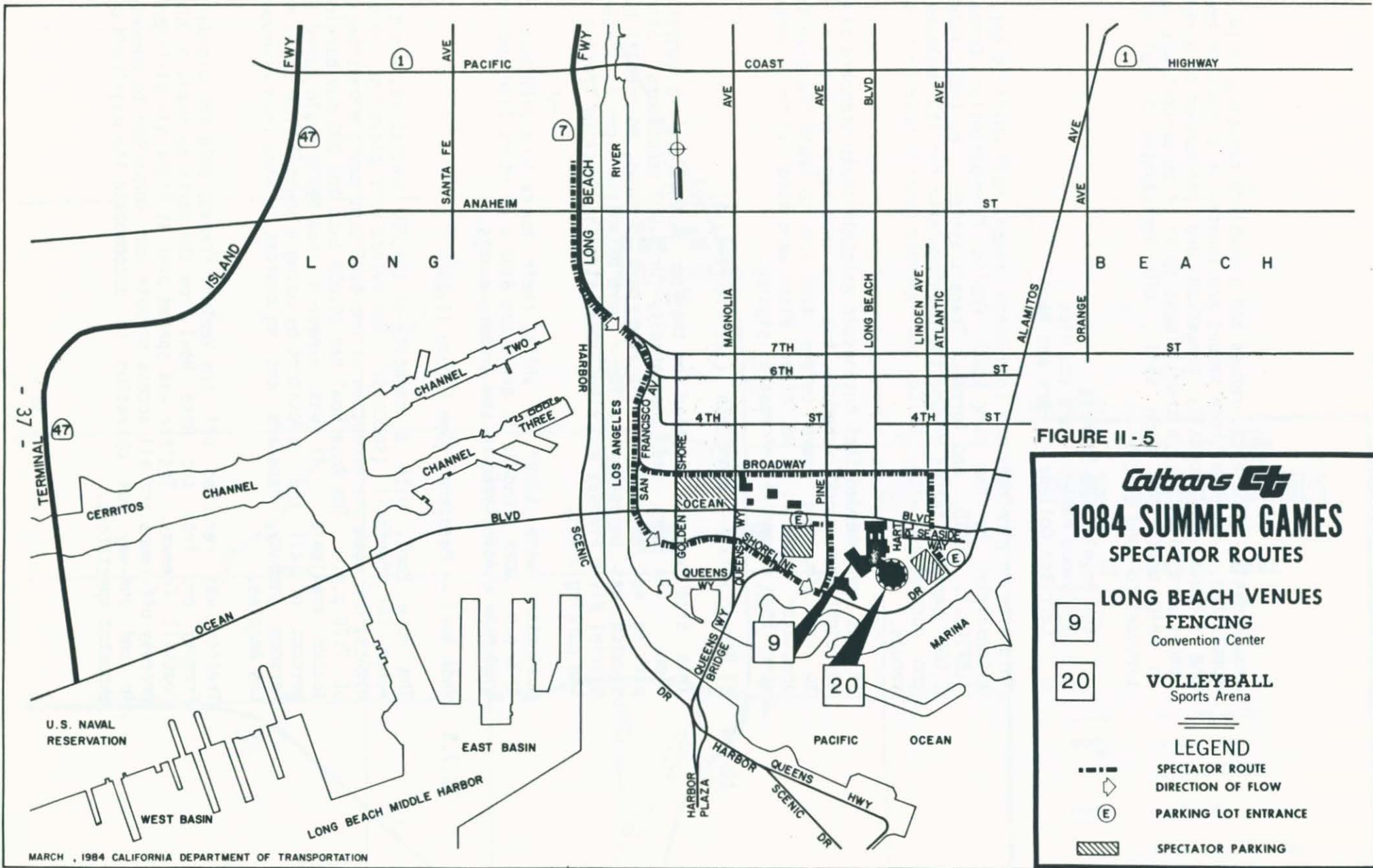


FIGURE II - 5

respectively. These two venues had a combined capacity of 14,300 spectators. Because these venues are located in a downtown area, the streets are normally congested and the number of parking spaces are limited, a transit mode split of 55 percent was set. To help meet this mode split, RTD implemented the following services to Long Beach:

- o Los Angeles CBD Express
- o Hollywood Park -- Park and Ride
- o Cerritos College -- Park and Ride

This site is also near the Long Beach Transit Mall which is served extensively by the Long Beach Public Transportation Company (LBPTCo.), SCRTRD, and Torrance Transit System. The LAOOC leased 1,600 parking spaces around the downtown area for its employees, and contracted with LBPTCo. to operate shuttle service to the venues.

It was recommended that businesses maintain their standard five-day/eight-hour work schedule, but were encouraged to begin prior to 7:30 a.m. and leave before 4:00 p.m. to avoid the expected spectator traffic. No other plans were made for these venues other than extensive information signing.

II.7.4 El Dorado Park -- Long Beach (See Figure II-6)

This site was the location for the four days of archery competition. The park had the capacity for 4,000 spectators. Since parking was adequate within the park grounds, no special bus service was necessary. There were extensive signs on the San Gabriel River Freeway and along local streets directing traffic to the parking areas.

Businesses were asked to shift their hours to a 7:00 a.m. to 4:00 p.m. work schedule to avoid the 8:00 a.m. start time and the 5:00 p.m. closing time of the archery events.

II.7.5 Rose Bowl -- Pasadena (See Figure II-7)

The Rose Bowl, with a capacity of 104,700 spectators, was the venue for football (soccer). The events were played on eleven nights, and with the exception of one 6:00 p.m. game, always began at 7:00 p.m. The Rose Bowl had 18,000 auto and 900 bus parking spaces available. It was expected that SCRTRD would carry 15 percent of all the spectators by using a shuttle from Ralph M. Parsons Company, Pasadena and an express service from downtown Los Angeles.

Traffic was rerouted off the Ventura Freeway onto the Glendale Freeway and into the Rose Bowl from the north by means of the Foothill Freeway. Traffic was spread over at least six different freeway off-ramps and all access streets were converted to one-way in and one-way out operation to accommodate the magnitude of expected spectators.

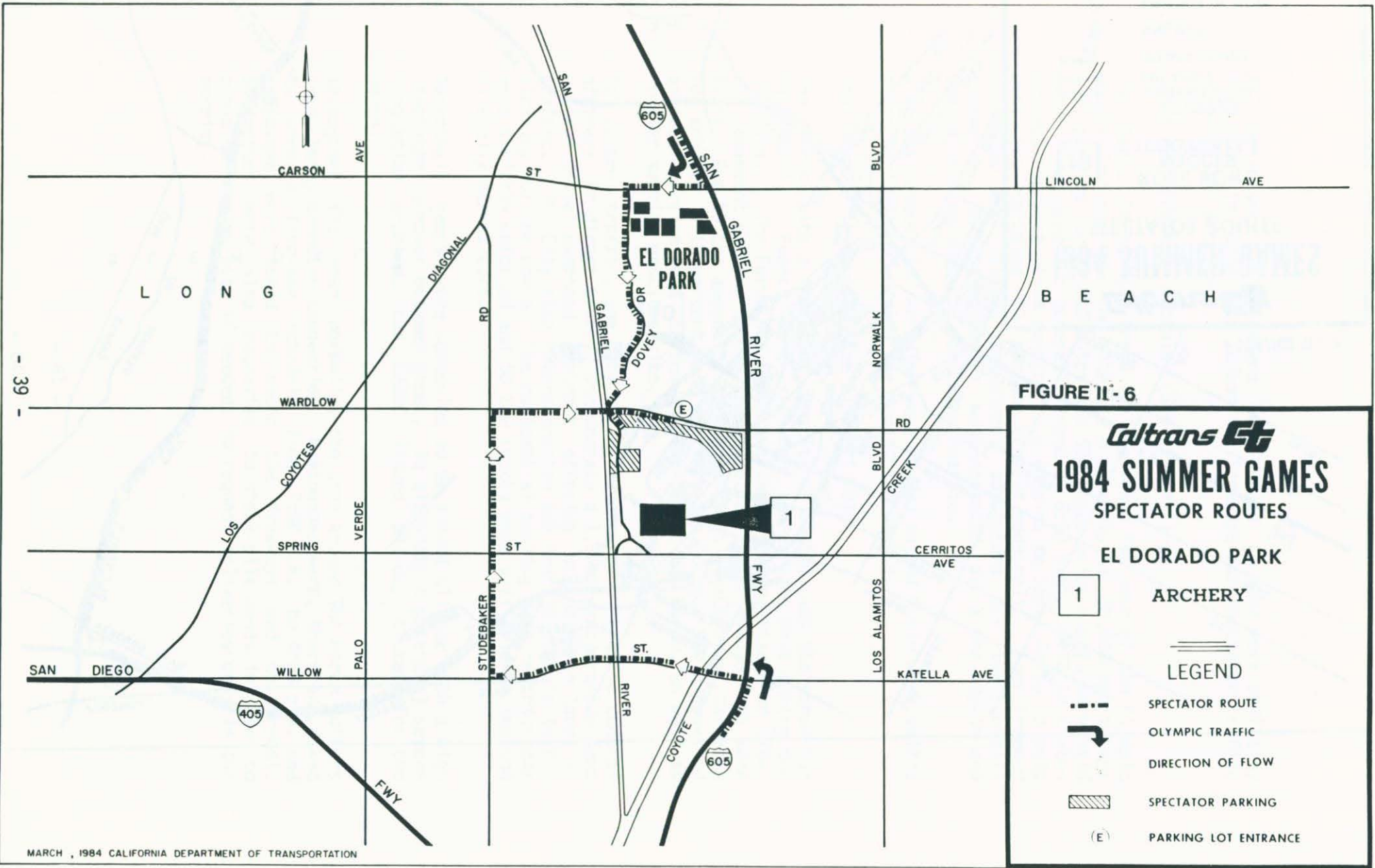


FIGURE II-6

Caltrans
1984 SUMMER GAMES
SPECTATOR ROUTES

EL DORADO PARK

- 1 ARCHERY
-  LEGEND
-  SPECTATOR ROUTE
-  OLYMPIC TRAFFIC
-  DIRECTION OF FLOW
-  SPECTATOR PARKING
-  PARKING LOT ENTRANCE

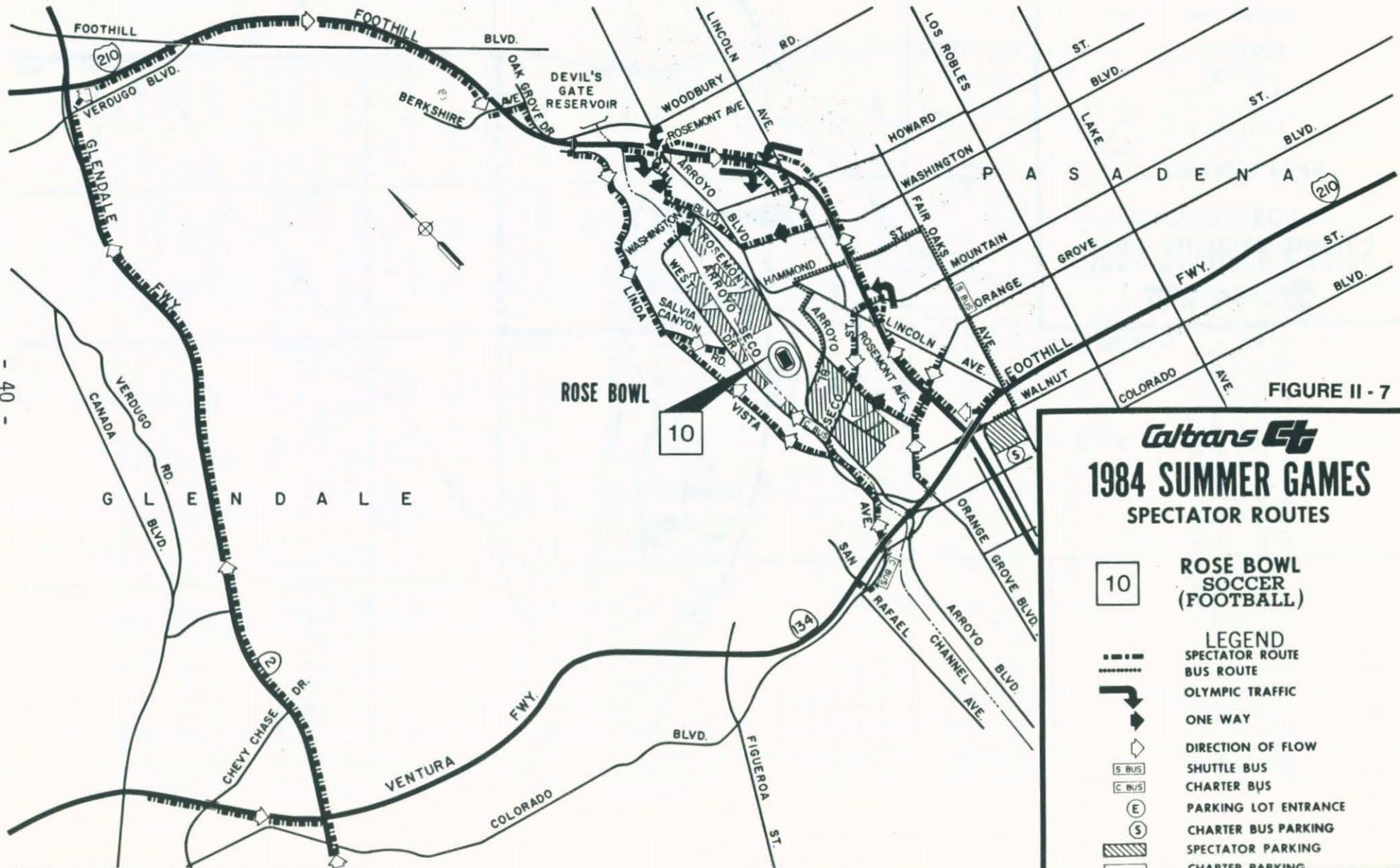


FIGURE II - 7

Caltrans
1984 SUMMER GAMES
SPECTATOR ROUTES

- 10 ROSE BOWL SOCCER (FOOTBALL)
- SPECTATOR ROUTE
- BUS ROUTE
- OLYMPIC TRAFFIC
- ONE WAY
- DIRECTION OF FLOW
- S BUS SHUTTLE BUS
- C BUS CHARTER BUS
- E PARKING LOT ENTRANCE
- S CHARTER BUS PARKING
- SPECTATOR PARKING
- CHARTER PARKING

All businesses in Pasadena were urged to end work shifts by 4:30 p.m. in order to clear the freeways for spectator traffic entering the Rose Bowl.

II.7.6 Santa Anita Park -- Arcadia (See Figure II-8)

The Santa Anita Race Track was the venue for most of the Olympic equestrian events. The site had a capacity for 50,000 spectators and parking for 22,000 autos and 500 buses. The events were held over five days and generally ended at 6:00 p.m. SCRTD initiated express service from downtown Los Angeles to Santa Anita to help meet its targeted 10 percent transit mode split. Four freeway off-ramps were signed to direct spectators off the Foothill Freeway. Huntington Drive was operated as a one-way-in and one-way-out roadway for spectator traffic.

All businesses in Arcadia were urged to end their work shifts prior to 4:00 p.m. during the equestrian events.

II.7.7 The Forum -- Inglewood (See Figure II-9)

The Forum, with a spectator capacity of 17,500, was the venue for basketball. Events were set for ten working days during the Olympics. The Forum has 5,000 available parking spaces on site, and abundant parking across the street at the Hollywood Park Race Track. Due to the amount of parking available, SCRTD was targeted to achieve a 10 percent mode split to the Forum. SCRTD provided express service from the Los Angeles CBD to the Forum, as well as regular service past the site.

To control traffic, the City of Inglewood used 50 traffic control officers to direct traffic and operate a 1.5 mile reversible lane system using overhead controls offering up to seven lanes of traffic. The City also interconnected 108 traffic signals in the vicinity of the Forum. The residential parking zone restrictions were strictly enforced and 50 tow trucks were available to impound illegally parked cars.

Basketball games were scheduled to be played all day with a high spectator turnover between games. To alleviate a potential severe congestion problem, the LAOOC issued all-day tickets for the games.

Throughout the year normally, the area around The Forum suffers from heavy commuter congestion. Businesses were, therefore asked to work a five-day schedule from 7:00 a.m. to 4:00 p.m. and employees were asked to avoid the freeways and to carpool. Businesses were also requested to stock-pile goods in order to avoid deliveries but, if needed, to request deliveries only in the morning.

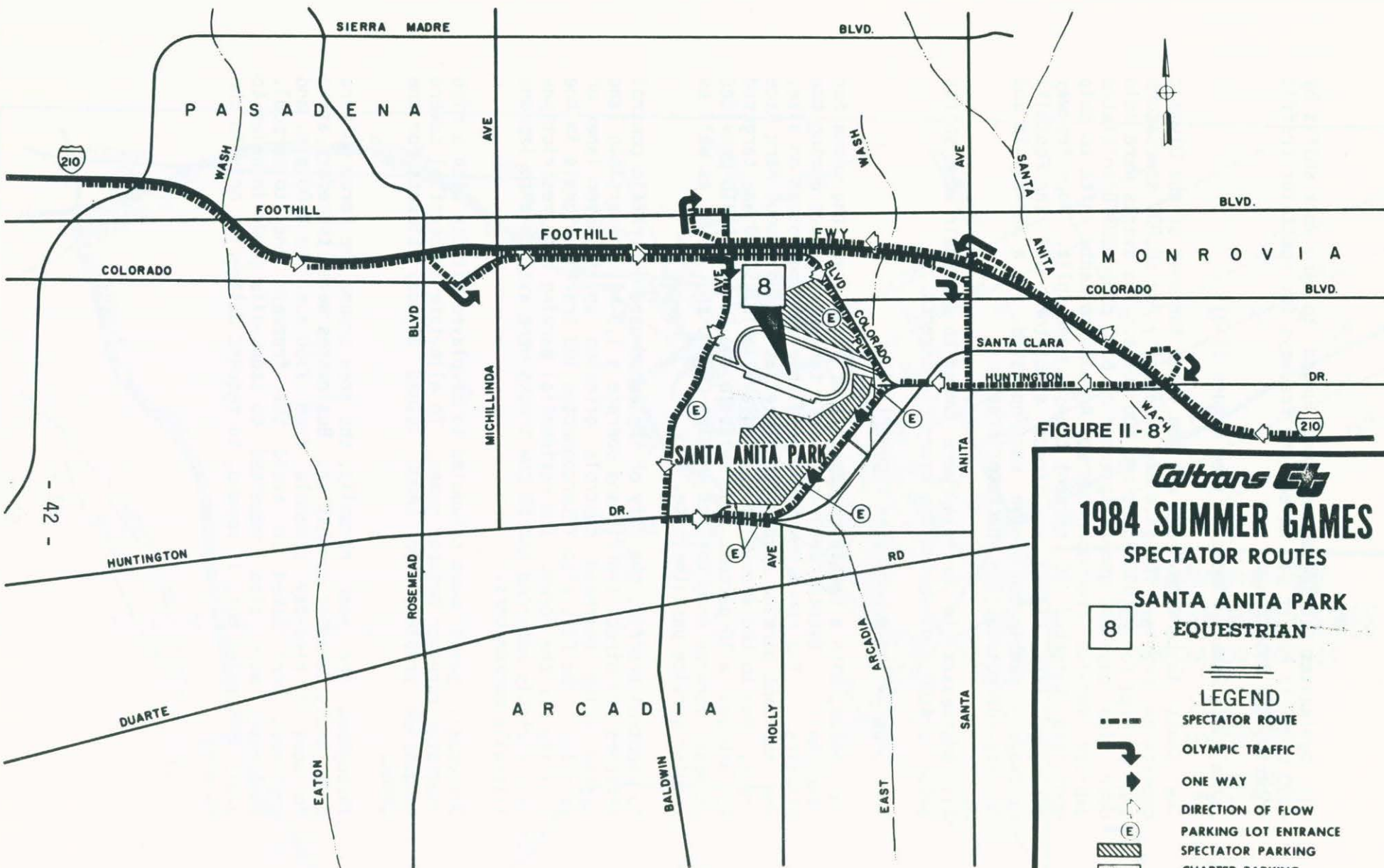


FIGURE II - 8

Caltrans
1984 SUMMER GAMES
SPECTATOR ROUTES

8 SANTA ANITA PARK
EQUESTRIAN

- LEGEND**
- SPECTATOR ROUTE
 - OLYMPIC TRAFFIC
 - ONE WAY
 - DIRECTION OF FLOW
 - PARKING LOT ENTRANCE
 - SPECTATOR PARKING
 - CHARTER PARKING

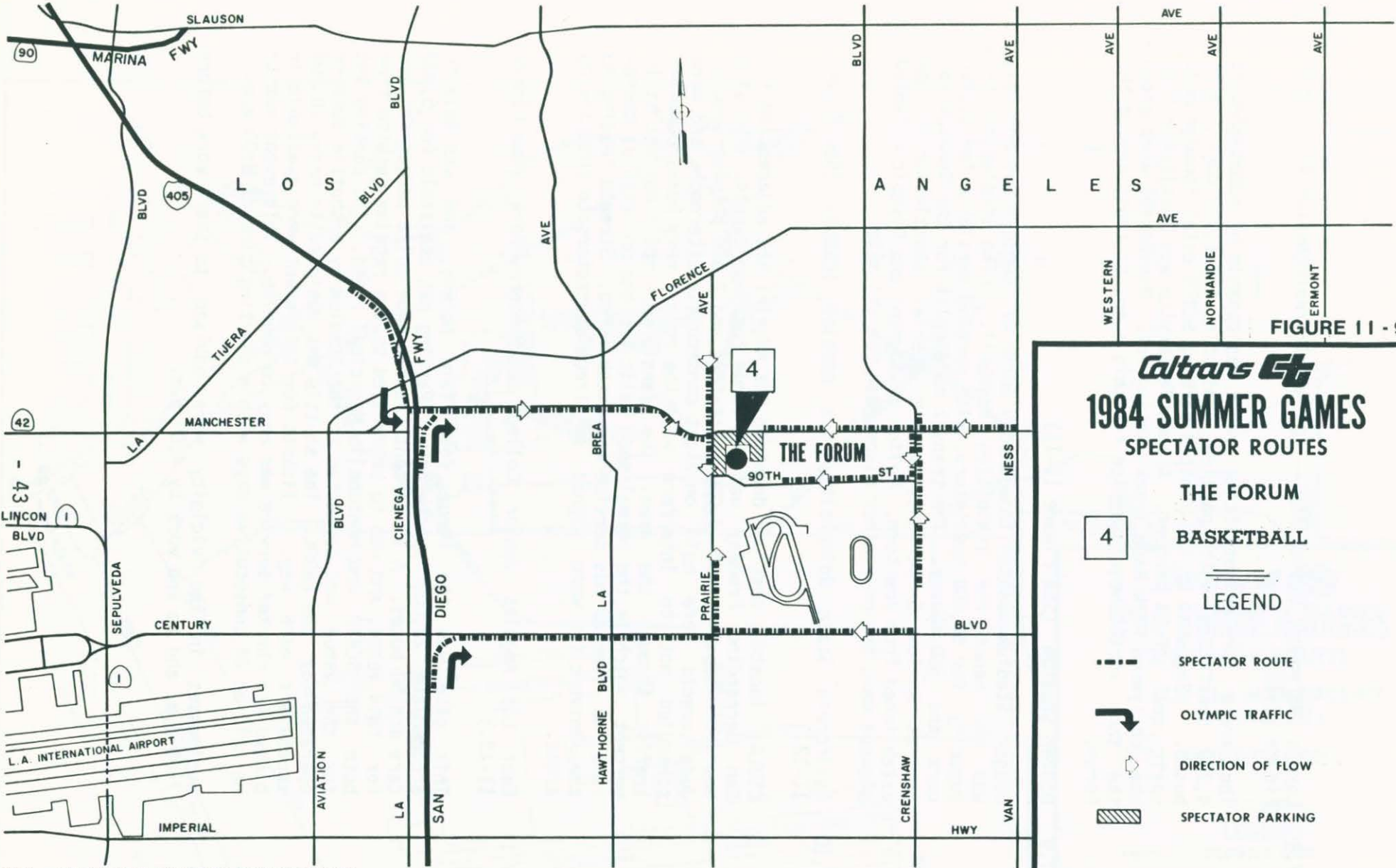


FIGURE 11 - 9

Caltrans
1984 SUMMER GAMES
SPECTATOR ROUTES

- THE FORUM**
- 4** BASKETBALL
- LEGEND
- SPECTATOR ROUTE
 - OLYMPIC TRAFFIC
 - DIRECTION OF FLOW
 - SPECTATOR PARKING

II.7.8 Loyola Marymount University -- Los Angeles/Westchester Area (See Figure II-10)

The arena for weightlifting events was capable of accommodating 4,200 spectators with parking available for 1,900 cars and 25 buses. Because of the limited parking SCRTD established a mode split goal of 25 percent. A shuttle service was instituted from the Hollywood Park Race Track parking lot. Businesses were given the same work schedule advice for this event as those around the Forum.

II.7.9 Dodger Stadium (See Figure II-11)

Dodger Stadium located immediately north of downtown Los Angeles, was the venue for exhibition baseball. The Stadium has the capacity for 56,000 spectators, with parking available for 15,000 cars and 500 buses. The transit mode split for the Stadium was set at a low 5 percent, and a special shuttle service was established from downtown. Police deployment and Olympic oriented signage were the only other plans made for the site.

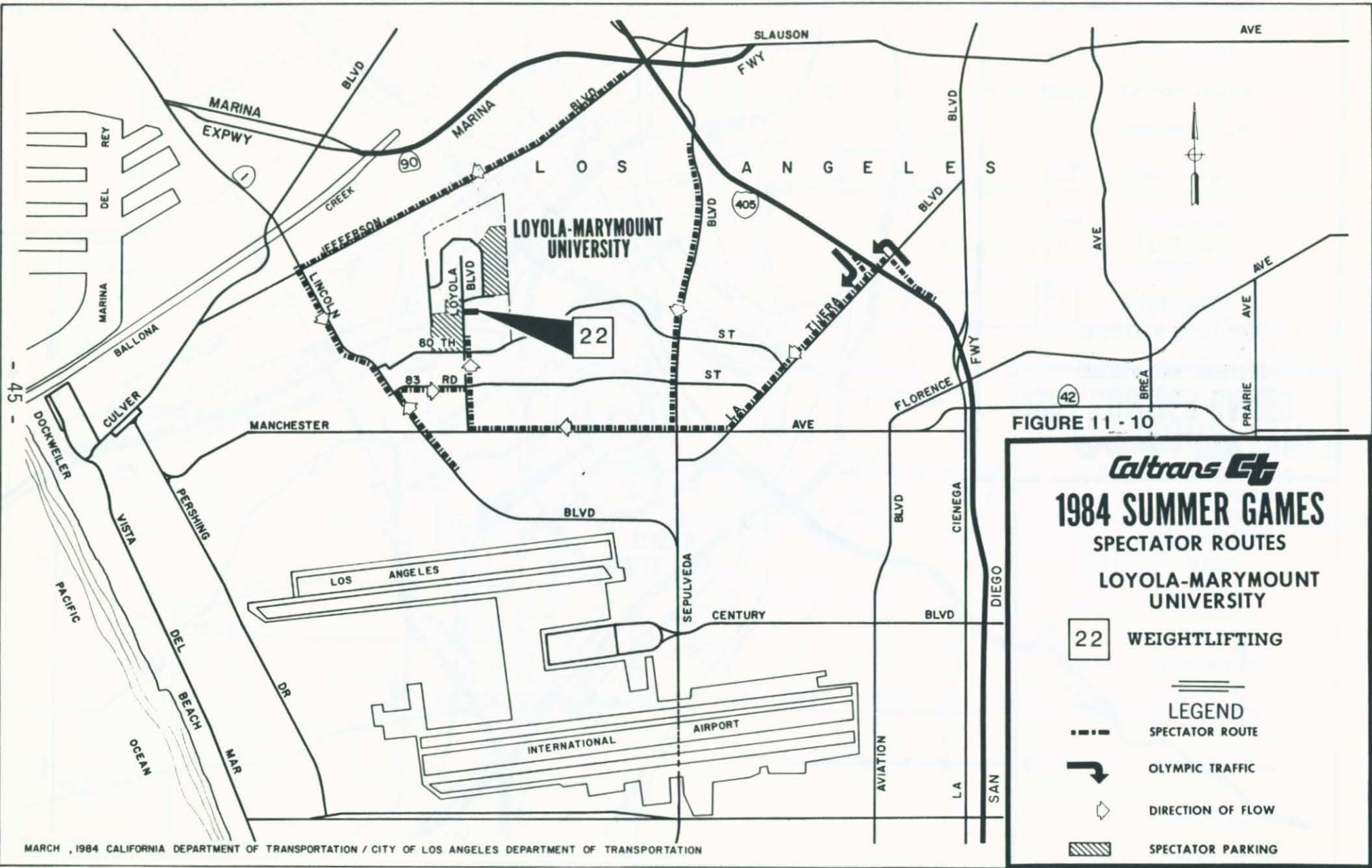
II.7.10 California State University, Los Angeles (CSULA) (See Figure II-12.)

CSULA, located east of downtown Los Angeles and adjacent to the San Bernardino Freeway was the venue for judo events. The site has the capacity of 4,000 spectators and 2,500 parking spaces. Judo events were held on eight consecutive afternoons and were scheduled not to interfere with the normal very heavy commuter traffic through the area. The transit mode split was set at 10 percent which is the normal mode split for the university, therefore no special bus service was established. Streets leading to the University were signed to direct spectators to the parking areas.

II.7.11 East Los Angeles Junior College -- Monterey Park (See Figure II-13.)

This site was the venue for field hockey, and was able to accommodate 22,000 spectators. Parking was available for 6,000 cars and 50 buses. A 10 percent transit mode split target was set for this venue, and was to be handled by the regular service from both the SCRTD and Montebello Municipal Lines. The parking lot for the venue was connected to the Stadium by a shuttle service operated by the LAOOC. The shuttle was designed to carry 10,000 spectators each way. Tickets for this event were available in blocks so charter service was easy to develop. This event was to be held on 14 consecutive days with a starting time of 8:00 a.m.

Businesses in the vicinity were advised to start work before 7:00 a.m. and to end work by 4:00 p.m.



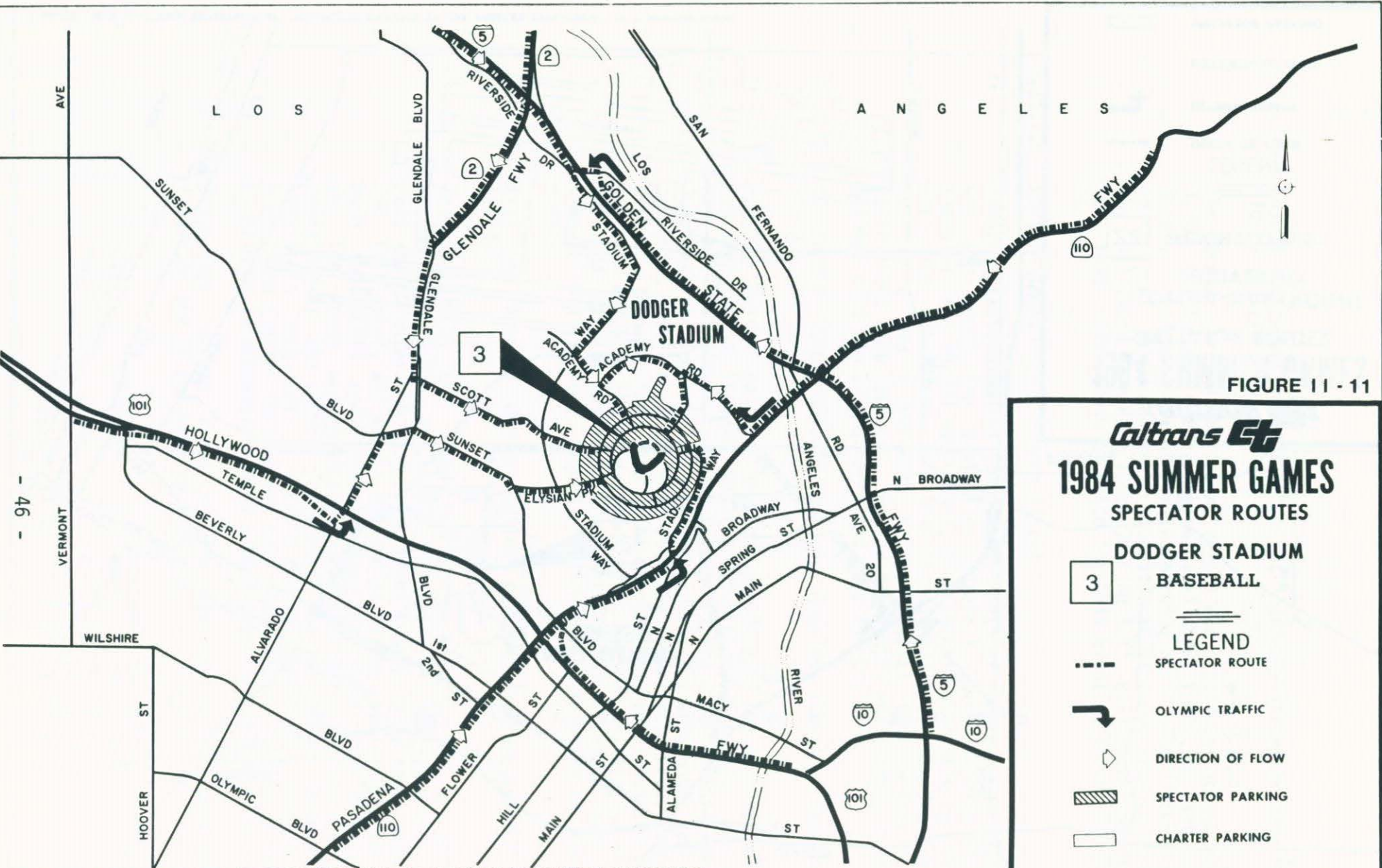


FIGURE 11 - 11

Caltrans
1984 SUMMER GAMES
SPECTATOR ROUTES

DODGER STADIUM
3 BASEBALL

- LEGEND**
- SPECTATOR ROUTE
 - OLYMPIC TRAFFIC
 - DIRECTION OF FLOW
 - SPECTATOR PARKING
 - CHARTER PARKING

CAL-STATE UNIVERSITY LOS ANGELES

LOS ANGELES

ALHAMBRA

MONTEREY PARK

14

Caltrans
1984 SUMMER GAMES
SPECTATOR ROUTES

CALIFORNIA STATE UNIVERSITY
LOS ANGELES
JUDO

14

LEGEND


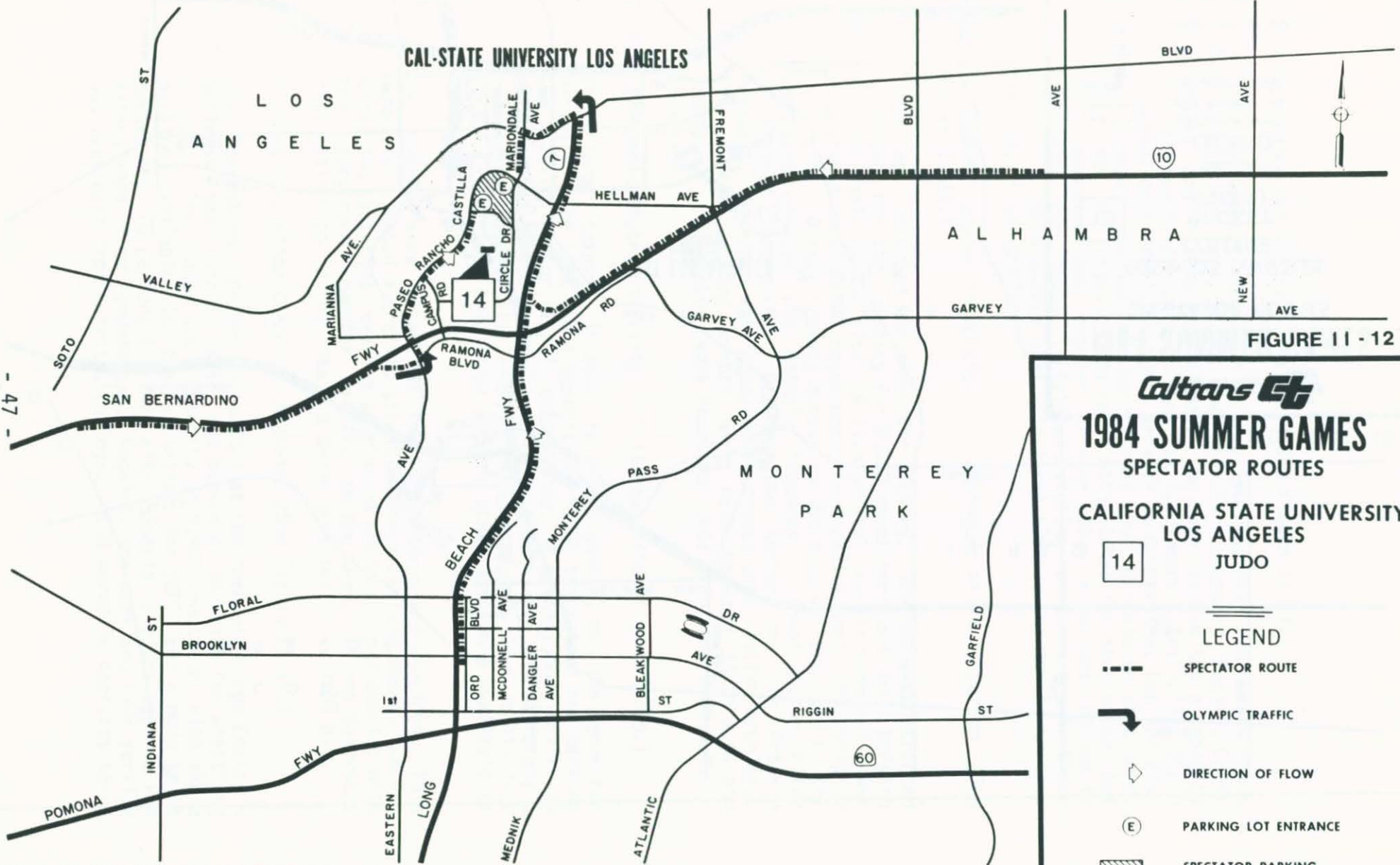
-  SPECTATOR ROUTE
-  OLYMPIC TRAFFIC
-  DIRECTION OF FLOW
-  PARKING LOT ENTRANCE
-  SPECTATOR PARKING

FIGURE 11 - 12



II.7.12. Pepperdine University -- Malibu (See Figure II-14.)

This site was the venue for water polo. The only two access roads to Pepperdine are along the heavily congested Pacific Coast Highway and Malibu Canyon Road. The swim stadium has a capacity of 5,000 spectators with parking for 2,000 cars. Initially, SCRTD attempted to establish express service to Pepperdine, but the plan was dropped because no operational routing could be developed. There was no transit mode split established for this venue, but SCRTD operated one regular service line from Santa Monica to Pepperdine for those individuals wishing to ride a bus to these events. These events were held three times a day for seven days over the 16 day period.

II.7.13. California State University -- Dominguez Hills -- Carson (See Figure II-15.)

CSUDH was selected the venue for cycling. The newly constructed velodrome has the capacity for 8,000 spectators and ample parking was available at the site. A five percent transit mode split was established for SCRTD based upon the normal transit ridership to this site. Direct freeway access to the site was provided by the San Diego, Harbor and Artesia Freeways. Construction on the interchange connection between the Harbor and the Artesia Freeways, however was expected to create some traffic problems. All of the cycling events were held between 10:00 a.m. and 3:00 p.m. Suggested work hours for this area were 8:00 a.m. to 5:00 p.m.

II.7.14. California State University -- Fullerton (See Figure II-16.)

This large campus, located in Orange County, was the venue for handball. The site had a capacity of 4,000 spectators and parking was available for 1,737 automobiles. A transit mode split was established at 10 percent which reflects the normal transit ridership to the site. Regular Orange County Transit District (OCTD) service by five lines and one SCRTD line were available to this site.

The events were scheduled for both middays and evenings. This schedule created a traffic situation where exiting midday spectators and entering evening spectators would mix and overlap with the background commuter traffic in the area. It was suggested that businesses in the area end their work shifts by 4:00 p.m.

II.7.15. Anaheim Convention Center -- Anaheim (See Figure II-17.)

The Convention Center is located at the core of Orange County's business and tourist area and served as the site for wrestling events. The Center has a capacity of 8,900 spectators with ample parking available in the vicinity. The SCRTD set a mode split target of 20 percent for this site. Special express service was established from downtown Los Angeles, and park and ride service was available from Cerritos College. OCTD normally operates seven

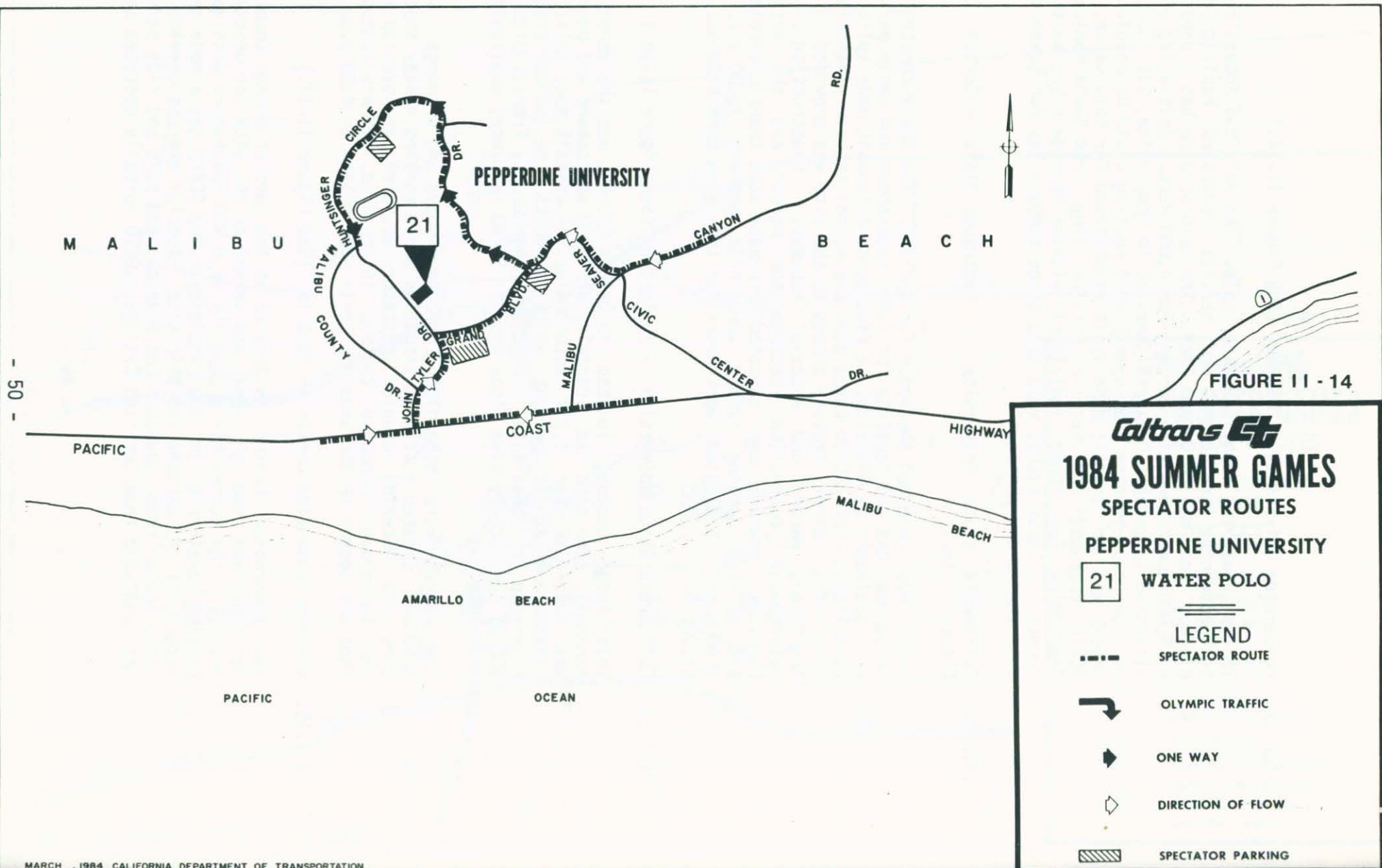


FIGURE II - 14

Caltrans
1984 SUMMER GAMES
SPECTATOR ROUTES

PEPPERDINE UNIVERSITY

21 WATER POLO

- LEGEND**
-  SPECTATOR ROUTE
 -  OLYMPIC TRAFFIC
 -  ONE WAY
 -  DIRECTION OF FLOW
 -  SPECTATOR PARKING

G A R D E N A

REDONDO

BEACH

COMPTON

BLVD.

FWY

ST.

ST.

ALONDRA

ST.

SAN BLVD.

PEDRO

BLVD.

AVE.

AVE.

AVE.

BLVD.

FE

SANTA

UNDER CONSTRUCTION

ARTESIA

CENTRAL

C O M P T O N

FIGURE 11-15

110

91

L O S

A N G E L E S

ST.

VICTORIA

CALIFORNIA STATE UNIVERSITY;
DOMINGUEZ HILLS

7

SAN

190 TH.

405

HARBOR

FIGUEROA

MAIN

DIEGO

AVALON

190 TH.

ST.

WILMINGTON

DEL

AMO

BLVD.

Caltrans 

1984 SUMMER GAMES SPECTATOR ROUTES

CALIFORNIA STATE UNIVERSITY DOMINGUEZ HILLS

7

CYCLING

LEGEND

SPECTATOR ROUTE

SPECTATOR ROUTE


OLYMPIC TRAFFIC

OLYMPIC TRAFFIC


DIRECTION OF FLOW

DIRECTION OF FLOW


PARKING LOT ENTRANCE

PARKING LOT ENTRANCE


SPECTATOR PARKING

SPECTATOR PARKING


CHARTER PARKING

CHARTER PARKING

- 51 -

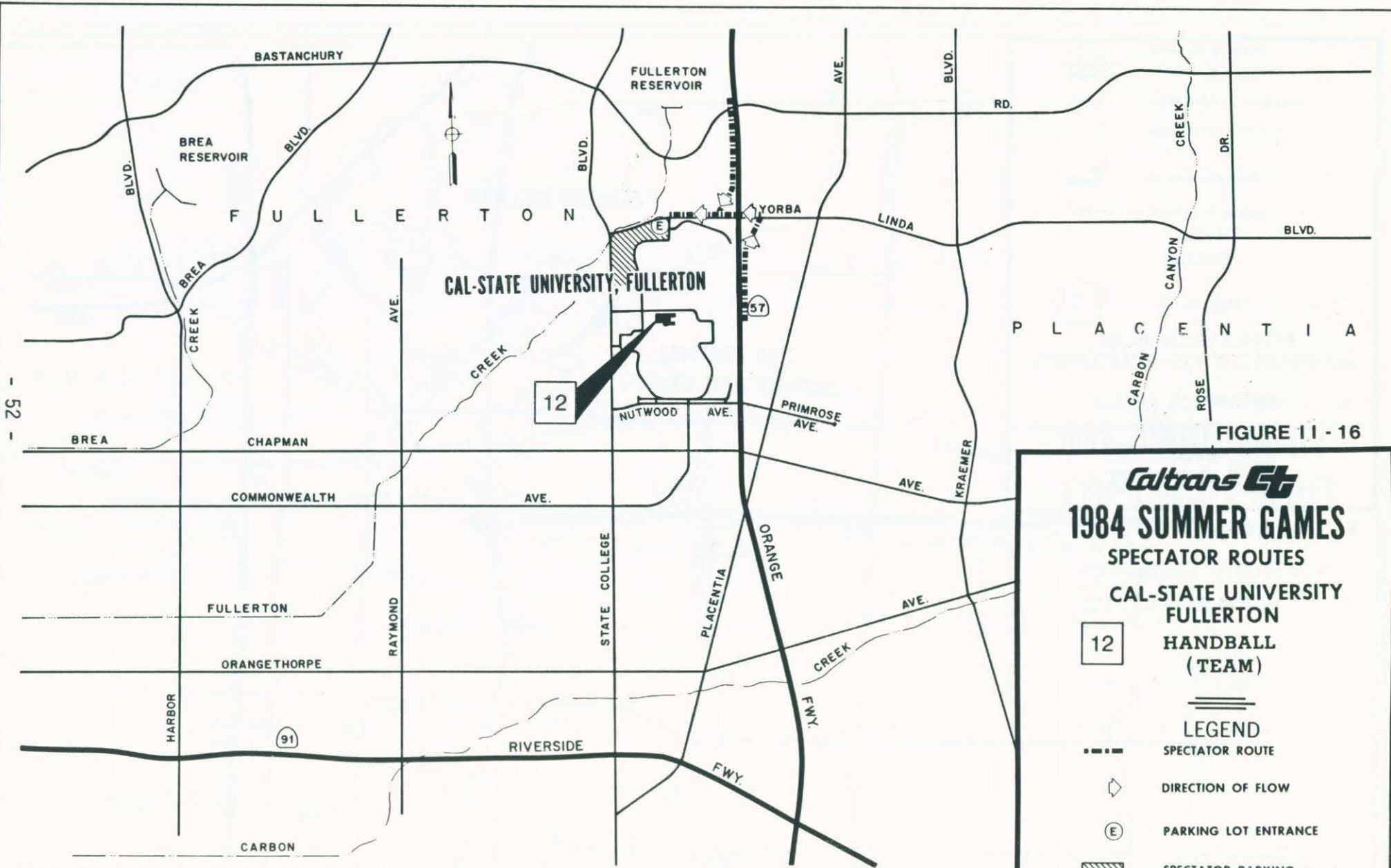



FIGURE 11 - 16





Caltrans 

1984 SUMMER GAMES
SPECTATOR ROUTES

CAL-STATE UNIVERSITY FULLERTON
HANDBALL (TEAM)

12

LEGEND

-  SPECTATOR ROUTE
-  DIRECTION OF FLOW
-  PARKING LOT ENTRANCE
-  SPECTATOR PARKING

- 52 -

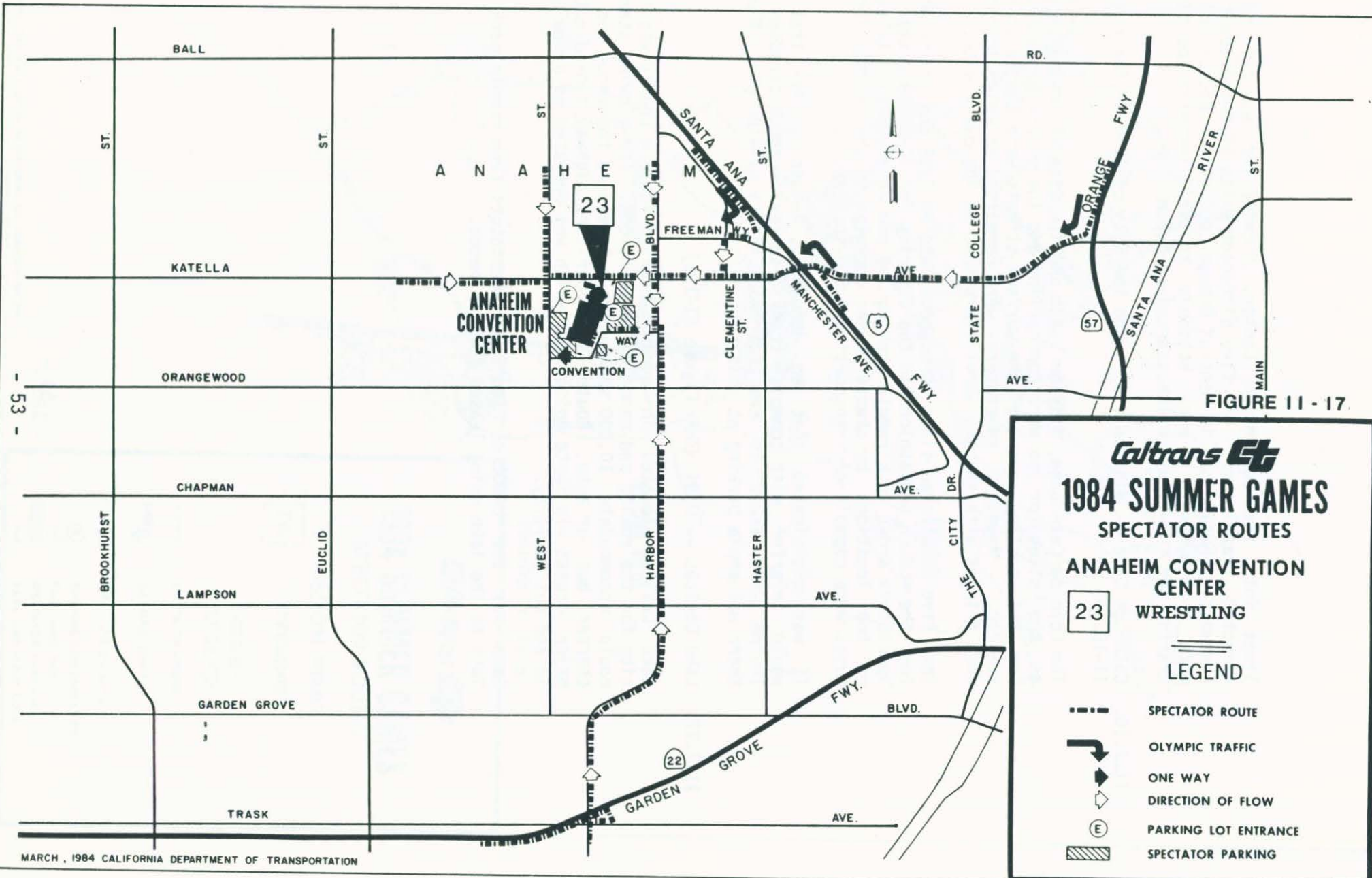


FIGURE 11-17.







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**1984 SUMMER GAMES
SPECTATOR ROUTES**

**ANAHEIM CONVENTION
CENTER
WRESTLING**

23

LEGEND

-  SPECTATOR ROUTE
-  OLYMPIC TRAFFIC
-  ONE WAY
-  DIRECTION OF FLOW
-  PARKING LOT ENTRANCE
-  SPECTATOR PARKING

lines into the Convention Center. Extensive use of signage directed traffic off of five different exits on three separate freeways. Businesses in central Orange County were encouraged to work a 7 a.m. to 4 p.m. schedule to avoid incoming spectator traffic for the events which started at 6 p.m.

II.7.16. Coto de Caza -- Mission Viejo and the City of Irvine (See Figure II-18.)

The Coto de Caza area, Mission Viejo and the City of Irvine served as the sites for the marathon cycling and the modern pentathlon. For the cycling events, the surface streets were closed to all traffic. However, spectators were permitted to drive into the area fringes with shuttle service provided to the event site.

The five scattered sites throughout Coto de Caza and Irvine used for the modern pentathlon had the capacity for 10,000 spectators. Spectators drove to a remote parking lot and were shuttled to each of the locations by charter buses operated by the LAOOC. These buses were capable of transporting 7,500 spectators.

It was anticipated that on Wednesday, August 1, 1984, traffic would interfere with commuter traffic in Irvine and businesses in Irvine were asked to end their work shifts by 4:00 p.m. Also, there was ample parking at this site.

II.7.17. Lake Casitas -- Ojai (See Figure II-19.)

Lake Casitas located in a rural area of Ventura County was the site for the rowing and canoeing competitions. The viewing stands could accommodate 10,000 spectators. Access to the venue was by charter bus or auto. Route 33, a four-lane highway provided the major access via Santa Anita road which was operated as a one-way in and out facility.

Each day the LAOOC carried 2,000 spectators from remote parking lots to the lake using leased charter buses.

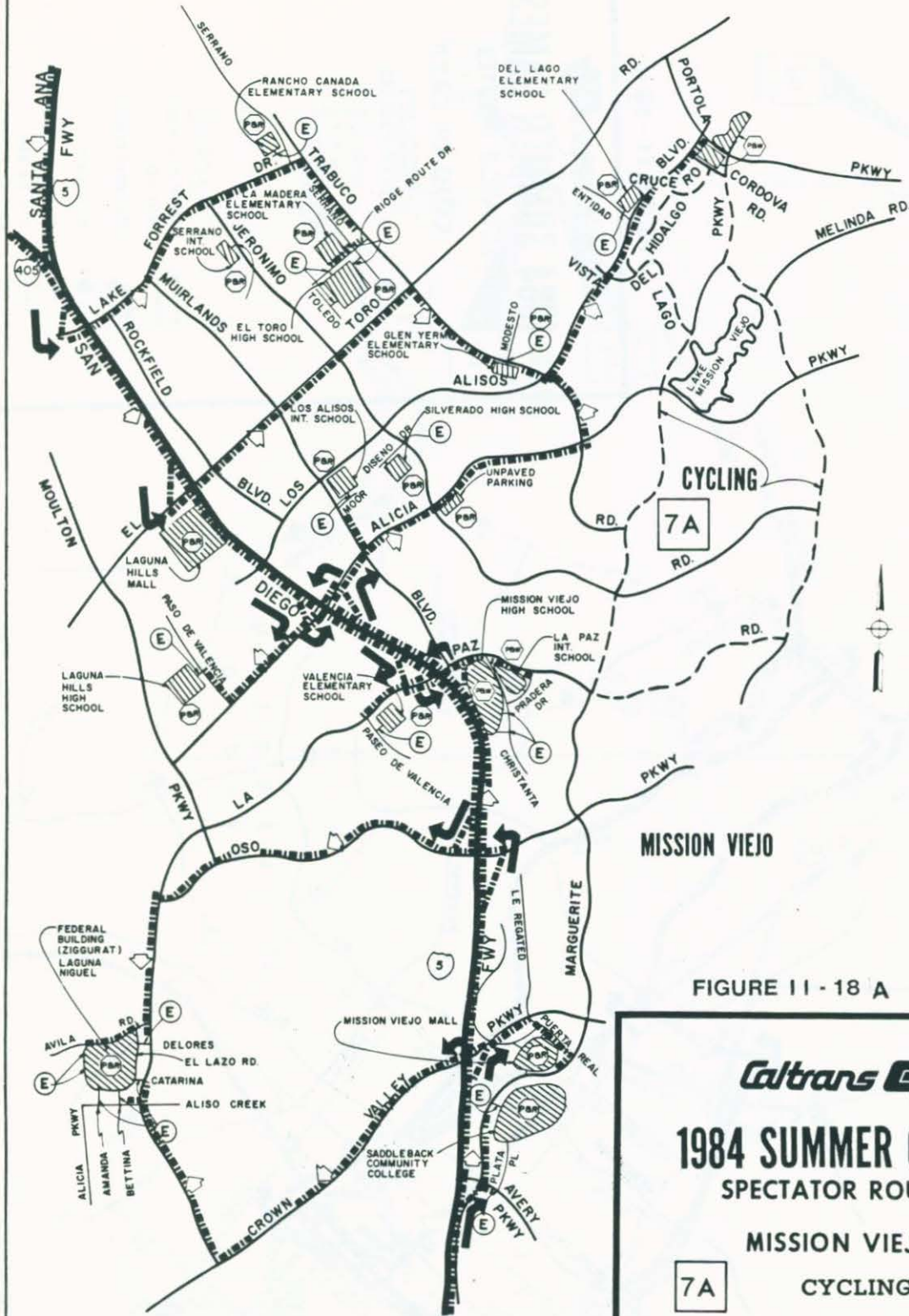


FIGURE 11 - 18 A

Caltrans

1984 SUMMER GAMES SPECTATOR ROUTES

MISSION VIEJO

7A

CYCLING

LEGEND

- SPECTATOR ROUTE
- OLYMPIC TRAFFIC
- DIRECTION OF FLOW
- PARKING LOT ENTRANCE
- PARK AND RIDE
- SPECTATOR PARKING
- PARK AND WALK LOTS

- 55b -

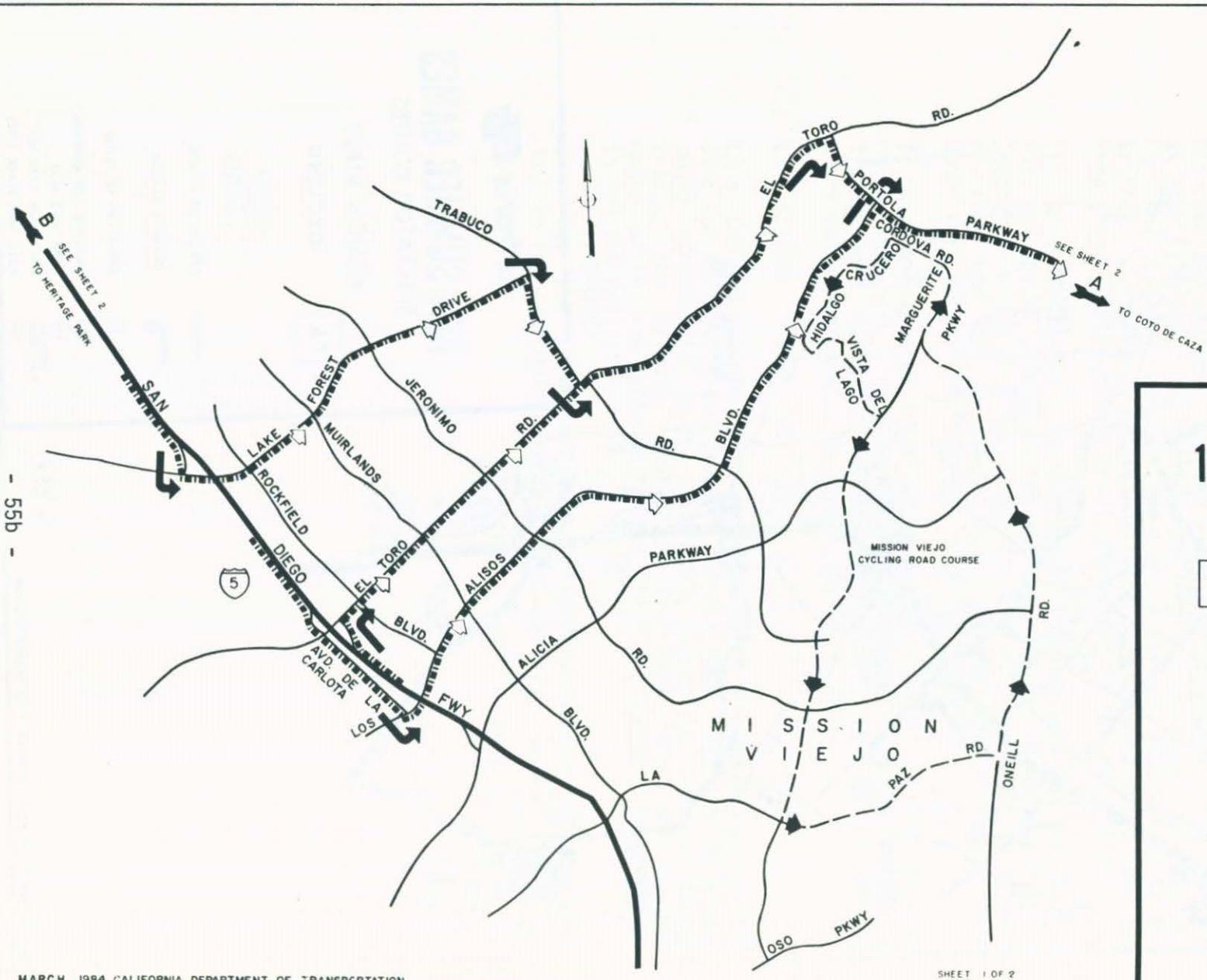


FIGURE 11-18 B

Caltrans 

1984 SUMMER GAMES

SPECTATOR ROUTES

COTO DE CAZA

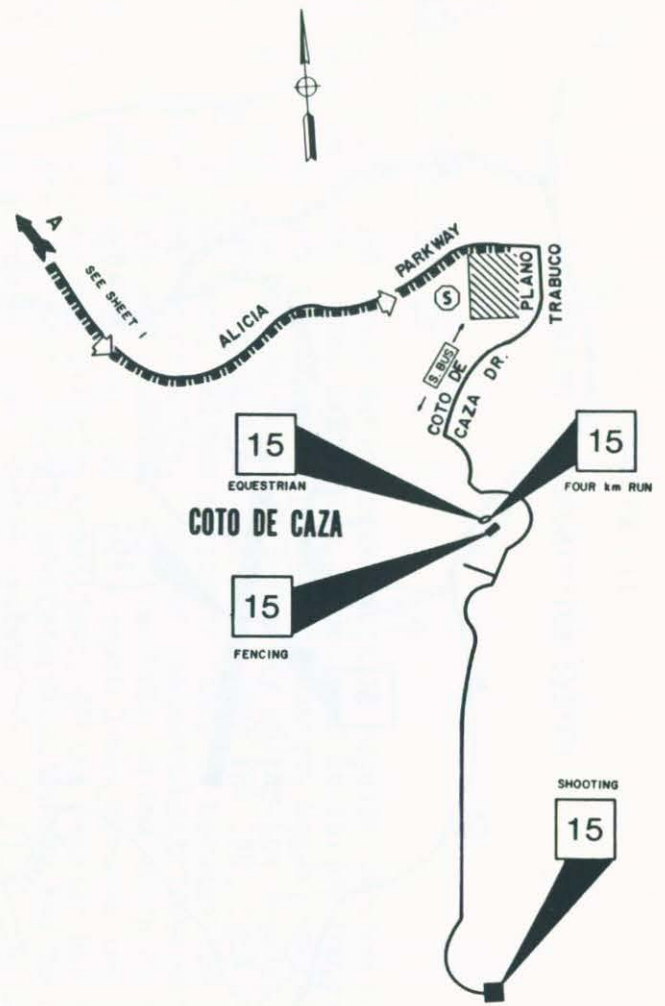
MODERN PENTATHLON

15

- LEGEND**
-  SPECTATOR ROUTE
 -  BUS ROUTE
 -  OLYMPIC TRAFFIC
 -  ONE WAY
 -  DIRECTION OF FLOW
 -  SHUTTLE BUS
 -  SHUTTLE BUS PARKING
 -  SPECTATOR PARKING



FIGURE 11-18 C
MODERN PENTATHLON



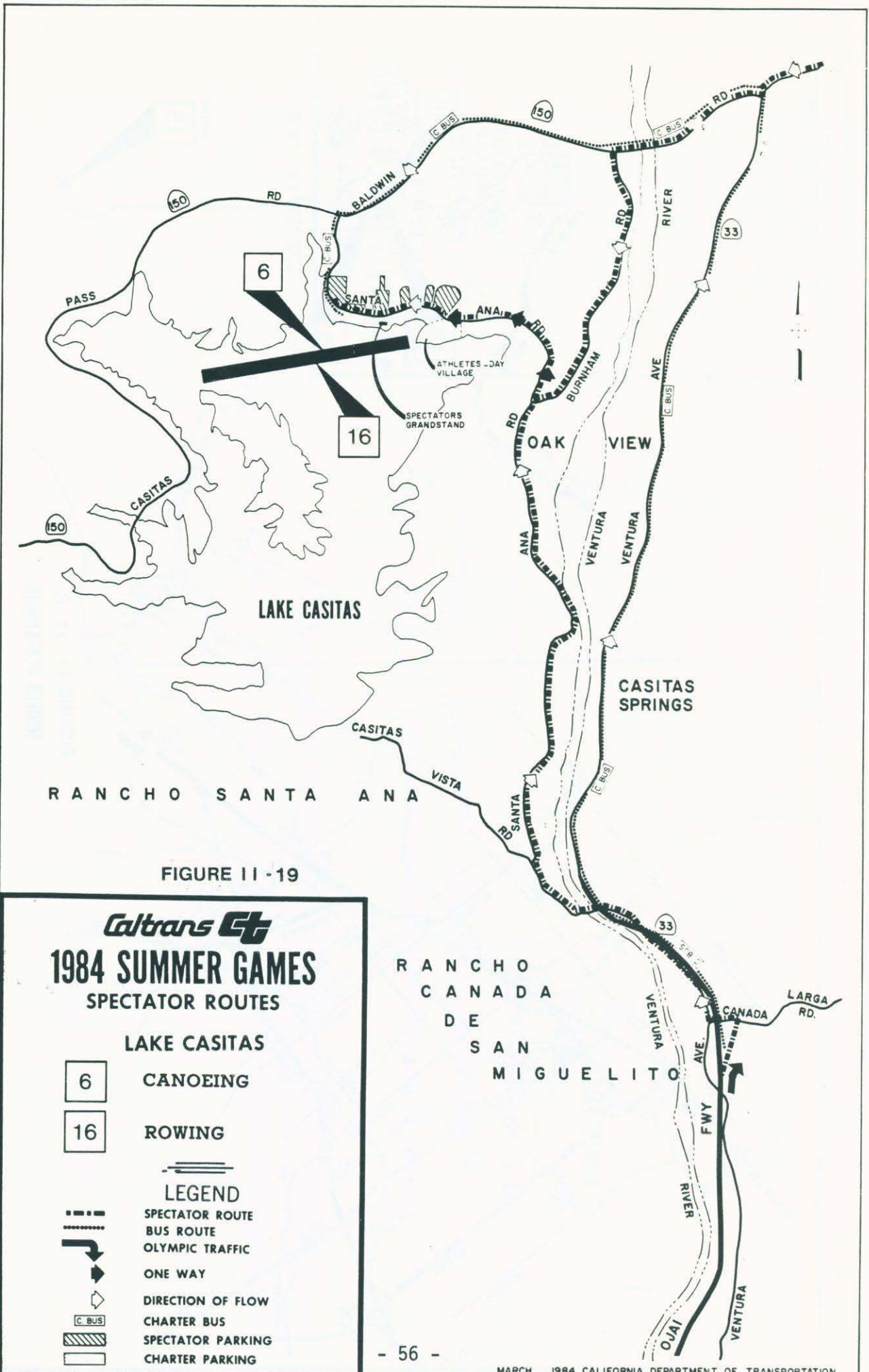


FIGURE 11-19

Caltrans
1984 SUMMER GAMES
 SPECTATOR ROUTES

- LAKE CASITAS**
- 6 CANOEING
 - 16 ROWING

- LEGEND**
- SPECTATOR ROUTE
 - BUS ROUTE
 - OLYMPIC TRAFFIC
 - ONE WAY
 - DIRECTION OF FLOW
 - CHARTER BUS
 - SPECTATOR PARKING
 - CHARTER PARKING

CHAPTER III

BACKGROUND TRANSPORTATION SYSTEM

III.1 SCRTD Regular Service

The SCRTD operates 2,161 buses during peak hours in regular service throughout Los Angeles County. The bus system is designed to follow the existing grid patterns, however an extensive network of express buses, operating on freeways and major arterials focusing primarily on the Los Angeles Central Business District (CBD). Most lines operating into the CBD, (and west and south of that area) carry maximum passenger loads of between 150 and 200 percent of their seating capacity. Most of the east-west lines operating between Wilshire Boulevard on the north and USC on the south carry high daily total boardings, as do the north-south lines between the CBD and Fairfax Avenue. Given these existing conditions, if the regular bus service had been used for spectator travel, spectators would have had to ride on some of the most overcrowded buses in the system.

Since the beginning of the 50 cents base fare system for RTD in 1980, average weekday ridership has grown from a little over one million daily riders to over 1.7 million. Due to summer vacation for the student riders, July and August ridership numbers are usually 4-8 percent lower than the rest of the year. Figure III-1 shows the average daily ridership trends on SCRTD service for the two years immediately prior to the Olympics. This lower summer ridership would provide some room for the additional patronage expected during the Olympics. However as previously noted, Olympic spectators were not expected to widely use RTD regular service.

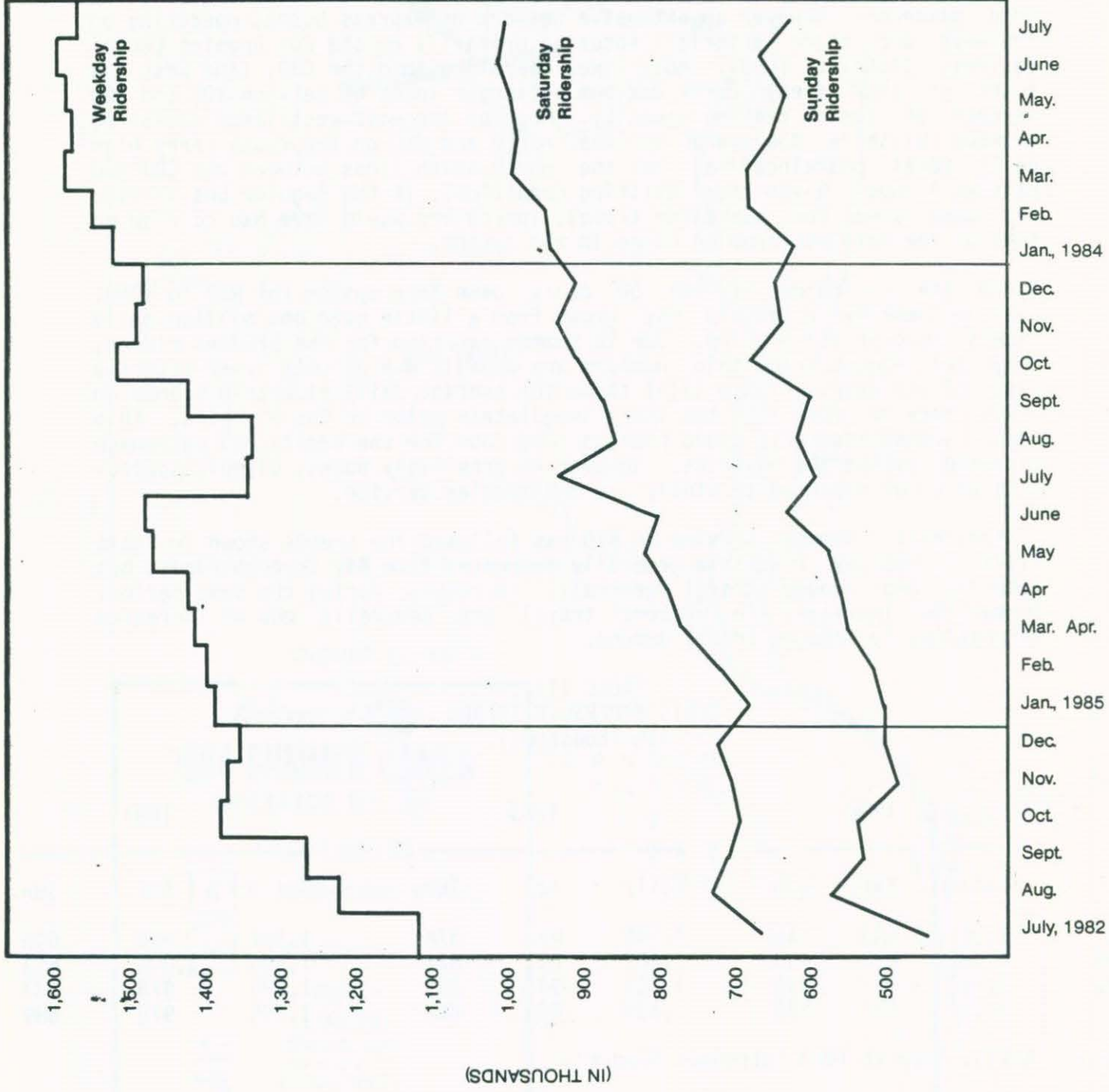
Historically, summer service on RTD has followed the trends shown in Table III-1. Weekday ridership generally decreases from May through August but Saturday and Sunday travel generally increases during the same period. Summertime increases in weekend travel are generally due to increased recreationally induced travel demand.

TABLE III-1
SCRTD RIDERSHIP TRENDS
(In Thousands)

	1982			1983			1984		
	Daily	Sat.	Sun.	Daily	Sat.	Sun.	Daily	Sat.	Sun.
May	1,093	643	416	1,445	825	578	1,567	994	646
June	1,085	659	430	1,462	811	621	1,590	1,001	651
July	1,107	663	458	1,350	942	499	1,524	978	637
Aug.	1,193	730	553	1,339	859	622	1,445	976	689

Source: SCRTD, "August 1984 Patronage Report".

FIGURE III - 1
SCRTD
AVERAGE DAILY
RIDERSHIP TRENDS



III.2 Surface Street System

III.2.1 Exposition Park Area

The roadway network which serves the Exposition Park Complex is basically a grid system, with major highways spaced at approximately one-mile intervals and secondary highways midway between the major highways. The Harbor Freeway (I-110) and the Santa Monica Freeway (I-10) provide expressway service in the north-south and east-west directions, respectively, and connect at their interchange about one and one-half miles northeast of the Exposition Park complex. (See Figure III-2). Collector and local streets are no more than 40 feet wide for curb-to-curb and reflect the residential character of the area, which is composed primarily of single-family residences with strip commercial development on the arterial highways. Much of the development is old, and many of the major and secondary highways have not been constructed to current standards.

Average daily traffic (ADT) volumes in the Exposition Park area are not especially significant when compared to citywide ADT. There are normally only two major traffic attractors in the area: the Exposition Park complex and the University of Southern California (USC) campus. Neither of these attractions are in full-time daily operation during the summer months. In addition, much through traffic is served by the Harbor and Santa Monica freeways, which reduces the demand on the adjoining surface street system.

Automatic (24-hour) traffic volume data were collected at 13 locations within the Exposition Park area to provide a basis for comparing Olympic period volumes with "typical" summertime volumes. These "typical" volumes were collected during the week of September 17, 1984, prior to the beginning of the fall term at USC, to correspond to the Olympic period condition when classes were not in session. The traffic count locations and corresponding 24-hour traffic volumes are shown in Table III-2. The volume data for the 13 locations were aggregated on an hour-by-hour basis and plotted graphically (see Figure III-3) to represent a typical volume profile for Exposition Park area. It is seen that peak traffic volumes occur for two-hour periods beginning at 7 a.m. and 4 p.m. and that the peaking of these volumes is fairly pronounced relative to other hourly volumes.

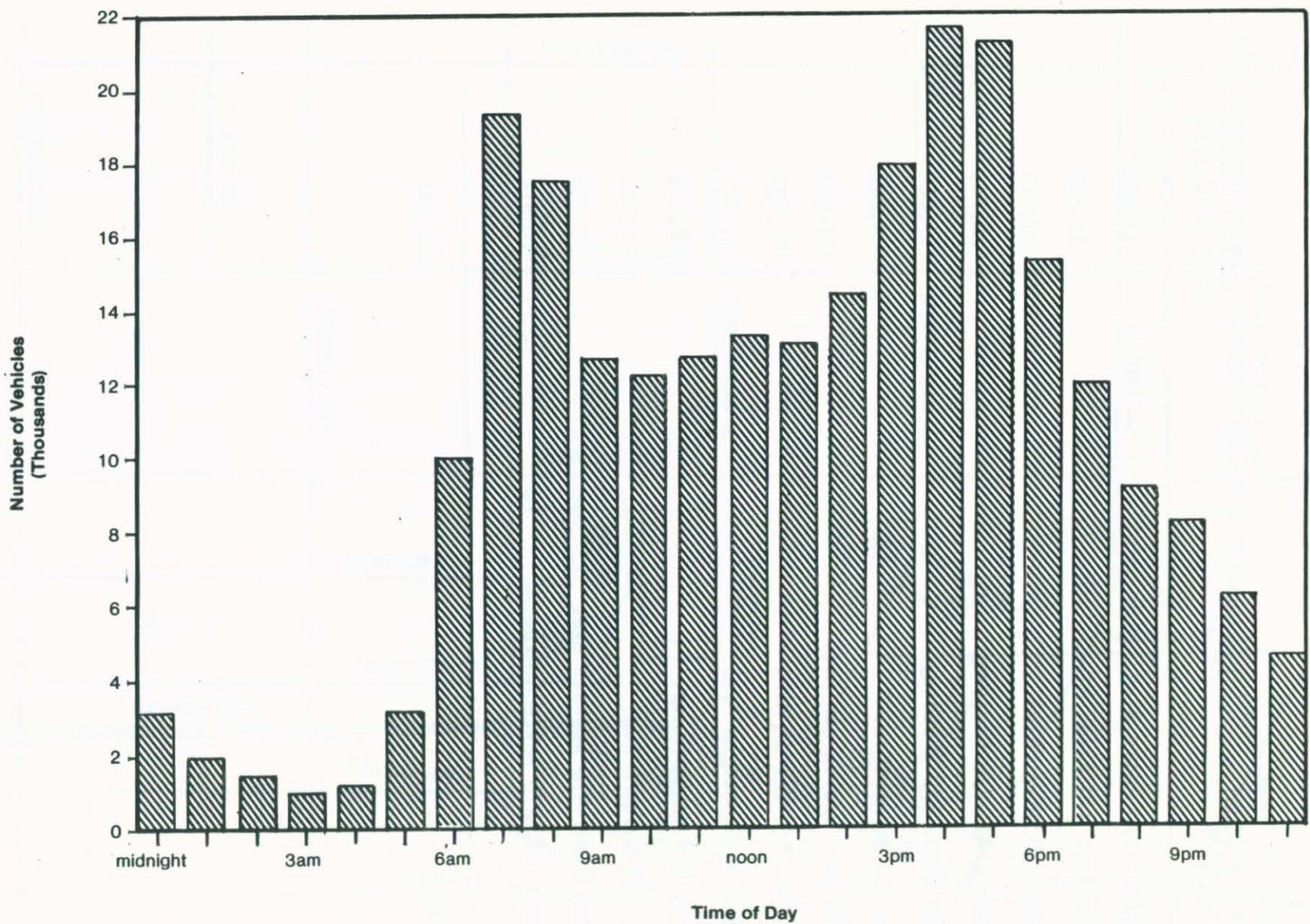
Average operating speeds were also determined for several streets in this area. The speeds were obtained from travel time runs made on August 29, 1984 for the midday (11 a.m. to 1 p.m.) and afternoon peak (4 p.m. to 6 p.m.) periods. The routes driven and the average operating speeds are shown in Table III-3.

III.2.2 UCLA Westwood Area

Wilshire Boulevard east of the San Diego Freeway (I-405) is the highest volume arterial street in the City, with an ADT of nearly 106,000 vehicles passing just west of Veteran Avenue. The number of trip attractors in the area and the lack of an adequate parallel major highway serving UCLA and Westwood Village indicate that volumes will remain high on Wilshire Boulevard and connecting arterials for the foreseeable future. Wilshire Boulevard provides service to and from UCLA, Westwood Village, high density commercial and residential developments, government facilities and the San

TABLE III-2
24-HOUR TRAFFIC VOLUMES: EXPOSITION PARK AREA

TRAFFIC COUNT LOCATION	TYPICAL VOLUME (WEEK OF 9/17/84)
Western Ave. N/O Adams Blvd. (N/B only)	14,028
Normandie Ave. N/O Adams Blvd.	22,730
Hoover St. N/O Adams Blvd.	27,019
Washington Blvd. E/O Broadway	28,749
Jefferson Blvd. E/O Broadway	11,224
Broadway S/O Vernon Ave.	18,241
Normandie Ave. S/O Vernon Ave.	21,696
Western Ave. S/O Vernon Ave.	25,683
Vernon Ave. W/O Western Ave.	15,923
King Blvd. W/O Western Ave.	28,003
39th St. E/O Western Ave.	4,347
Exposition Blvd. W/O Western Ave.	20,480
Jefferson Blvd. W/O Western Ave.	14,814
TOTAL	252,937



**FIGURE III - 3
TYPICAL
HOURLY VOLUMES
EXPOSITION PARK
AREA**

TABLE III-3
 NORMAL SUMMER SPEED STUDY
 EXPOSITION PARK AREA

STREET DRIVEN	ROUTE STUDIED		AVERAGE TRAVEL SPEED (MPH)	
	FROM	TO	(Typical Period	August 29, 1984)
			<u>11 a.m.-1 p.m.</u>	<u>4 p.m.-6 p.m.</u>
Adams Blvd.	Broadway	Western Ave.	24.5	23.1
Adams Blvd.	Western Ave.	Broadway	25.4	20.1
Western Ave.	Washington Blvd.	Vernon Ave.	25.6	21.7
Western Ave.	Vernon Ave.	Washington Blvd.	24.9	28.2
Broadway	Vernon Ave.	Pico Blvd.	23.3	23.8
Broadway	Pico Blvd.	Vernon Ave.	27.4	20.3
Vernon Ave.	Western Ave.	Broadway	30.6	25.9
Vernon Ave.	Broadway	Western Ave.	27.0	19.9
Figueroa St.	11th St.	38th St.	29.4	23.6
Flower St.	38th St.	11th St.	22.6	21.8
Figueroa St.	38th St.	Vernon Ave.	26.9	20.6
Figueroa St.	Vernon Ave.	38th St.	28.9	25.0
Normandie Ave.	Washington Blvd.	Vernon Ave.	28.3	21.9
Normandie Ave.	Vernon Ave.	Washington Blvd.	29.2	26.7

Diego Freeway. It is the only designated major highway in the area which is developed to major highway standards. Sunset Boulevard, a substandard major highway which parallels Wilshire Boulevard, is characterized by many curves along the roadway alignment but still carries substantial ADT. None of the north-south highways which connect Sunset and Wilshire Boulevards are improved to major highway standards (see Figure III-4).

Heavy vehicular turn movements are the rule rather than the exception in the Westwood area. As a result, signal timing is often complex and the number of lanes and amount of green signal time per signal cycle for through traffic is barely adequate. Much of Westwood's circulation system operates at or over capacity, particularly Wilshire Boulevard westbound between Glendon Avenue and Sepulveda Boulevard. There are also apparent capacity problems for southbound vehicles on arterials intersecting Wilshire Boulevard, notably Gayley Avenue, and also for northbound traffic on Sepulveda Boulevard.

Automatic (24-hour) traffic volume data were collected at 15 locations during the week of September 24, 1984, prior to the beginning of the fall term at UCLA, to correspond to the Olympic period condition when classes were not in session. The traffic count locations and corresponding 24-hour traffic volumes are shown in Table III-4. The volume data for the 15 locations were aggregated on an hour-by-hour basis and plotted graphically (See Figure III-5) to represent a typical non-Olympic period volume profile for the Westwood area. Unlike the Coliseum area with its pronounced AM and PM peak traffic periods, volumes in the Westwood area peak during the hours beginning at 8 a.m. and at 5 p.m. but remain high throughout the daytime hours.

Average operating speeds for six streets in the Westwood area were obtained from travel time runs made on September 25, 1984. School was not in session however, this was the middle of registration which ran from September 24 through September 28. The routes driven and the average operating speeds for the midday (11 a.m. to 1 p.m.) and afternoon peak (4 p.m. to 6 p.m.) periods are shown in Table III-5.

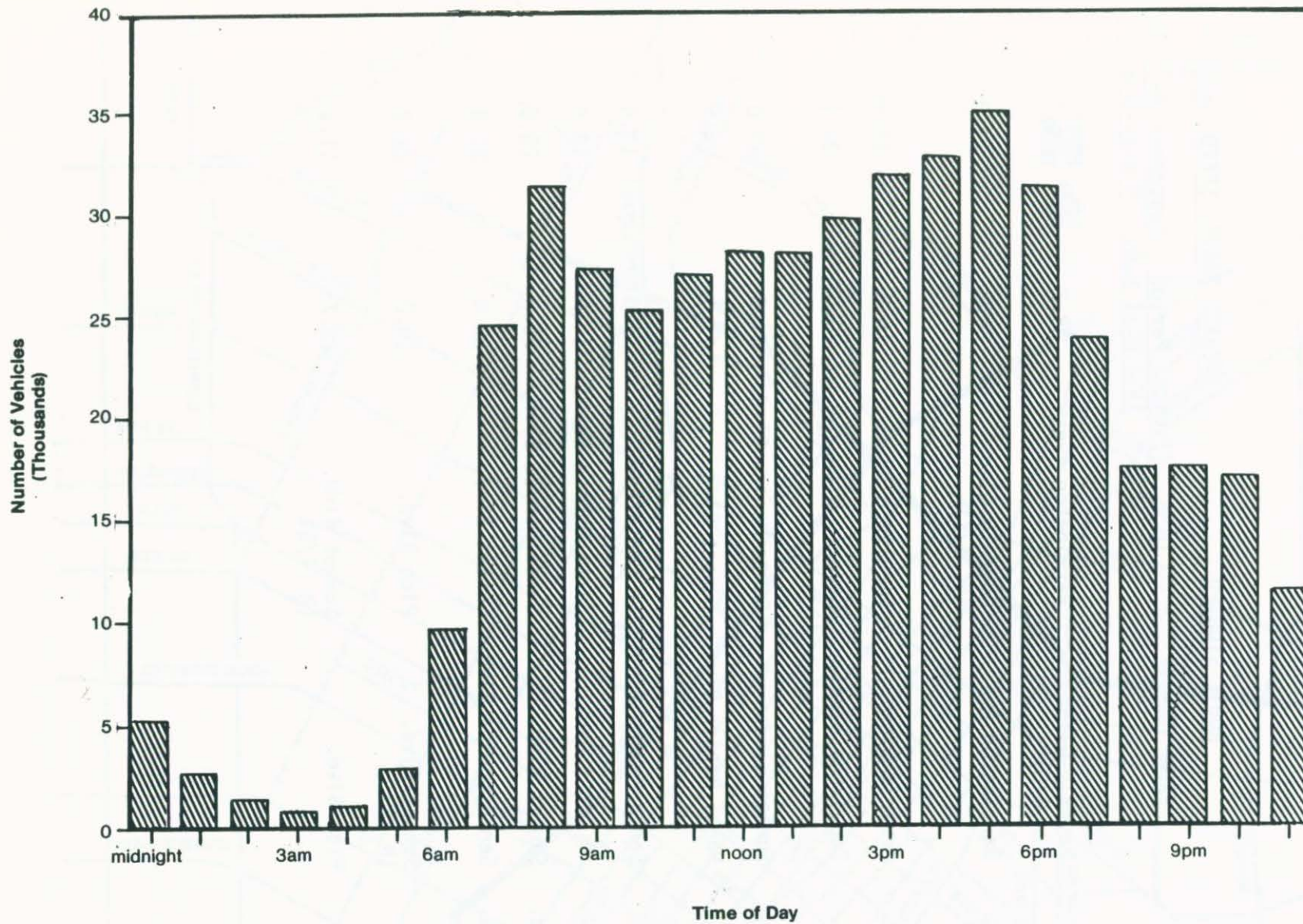
III.2.3 Central City Area

The Central City area of Los Angeles is the major activity center of the Los Angeles metropolitan region and represents the highest concentration of employment and commercial activity in Southern California. For purposes of this report, the area is bounded by Sunset Boulevard on the north, Alameda Street on the east, Venice Boulevard on the south and the Harbor Freeway on the west. (See Figure III-6).

The Central City area is highly accessible from all areas of the Los Angeles metropolitan region, mainly due to three major freeways serving the downtown area: the Santa Monica, Harbor and Hollywood/Santa Ana freeways. The area itself is served by a network of surface streets that form a basic grid pattern producing relatively uniform sized blocks. There are five one-way street pairs: Main and Spring streets (N-S), 3rd and 4th streets (E-W), 5th and 6th streets (E-W), 8th and 9th streets (E-W), and 11th and 12th streets (E-W).

TABLE III-4
24-HOUR TRAFFIC VOLUMES: WESTWOOD VILLAGE/UCLA

TRAFFIC COUNT LOCATION	TYPICAL VOLUME (WEEK OF 9/17/84)
Beverly Glen Blvd. N/O Sunset Blvd.	17,290
Beverly Glen Blvd. N/O Wilshire Blvd.	14,805
Beverly Glen Blvd. S/O Santa Monica Blvd. (So. Rdwy.)	16,753
Montana Ave. W/O Veteran Ave.	13,411
Ohio Ave. W/O Veteran Ave. (W/B only)	9,422
Santa Monica Blvd. (No. Rdwy.) W/O Veteran Ave.	49,957
Selby Ave. N/O Wilshire Blvd.	6,551
Sunset Blvd. E/O Thurston Ave.	39,654
Veteran Ave. S/O Sunset Blvd.	10,471
Veteran Ave. N/O Wilshire Blvd.	27,887
Veteran Ave. S/O Santa Monica Blvd. (So. Rdwy.)	8,123
Westwood Blvd. S/O Santa Monica Blvd. (So. Rdwy.)	29,442
Wilshire Blvd. W/O Veteran Ave.	105,788
Wilshire Blvd. W/O Westwood Blvd.	64,016
Wilshire Blvd. E/O Beverly Glen Blvd.	50,615
TOTAL	464,185

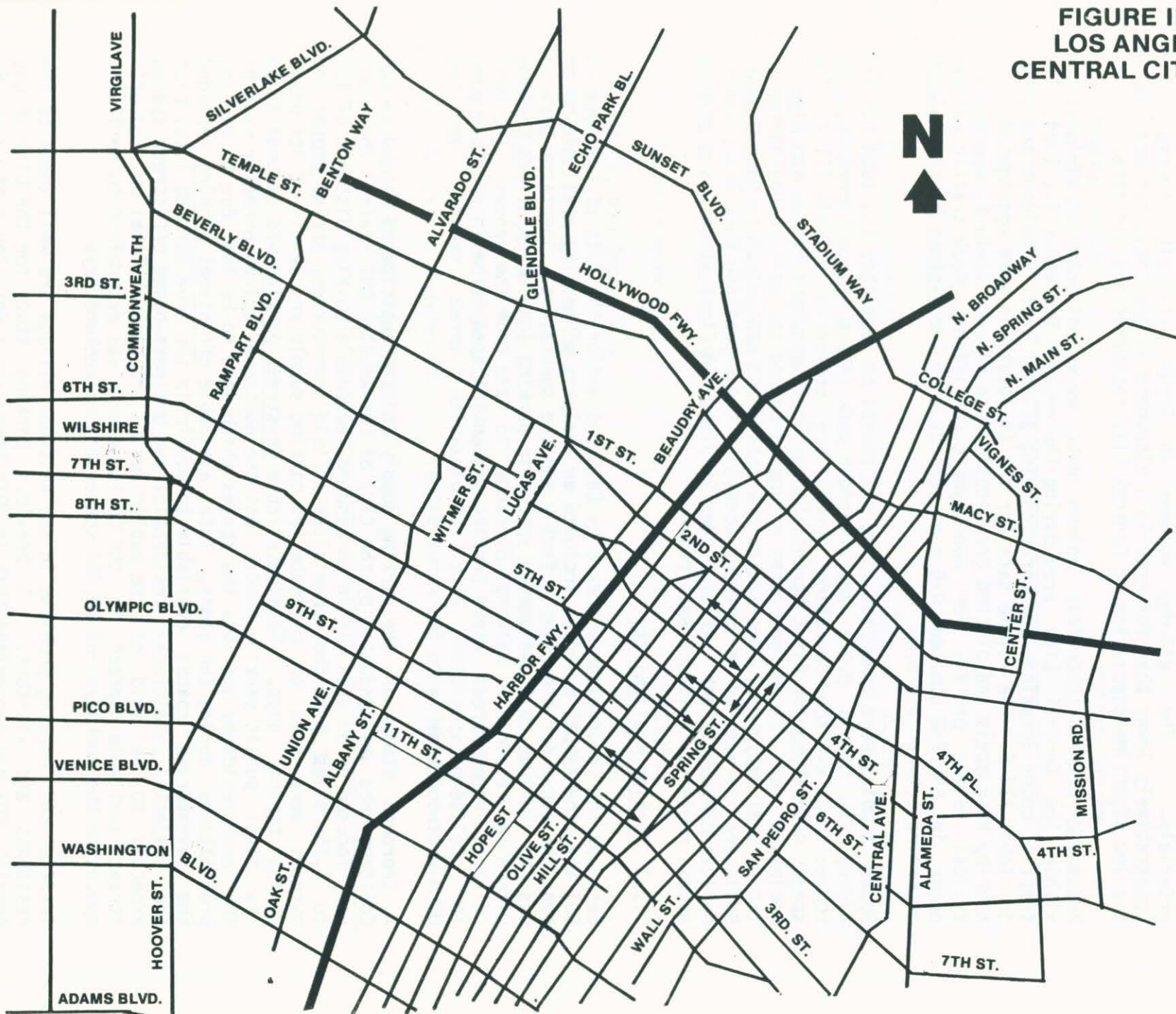


**FIGURE III - 5
TYPICAL
HOURLY VOLUMES
WESTWOOD AREA**

TABLE III-5
 NORMAL SUMMER SPEED STUDY
 WESTWOOD AREA

<u>STREET DRIVEN</u>	<u>ROUTE STUDIED</u>		<u>AVERAGE TRAVEL SPEED (MPH)</u>	
	<u>FROM</u>	<u>TO</u>	(Typical Period September 25, 1984)	
			<u>11 a.m.-1 p.m.</u>	<u>4 p.m.-6 p.m.</u>
Sunset Blvd.	Beverly Glen (E. I/S)	Barrington Ave.	28.2	26.0
Sunset Blvd.	Barrington Ave.	Beverly Glen (E. I/S)	25.3	24.3
Wilshire Blvd.	Beverly Glen.	Sepulveda Blvd.	18.8	15.6
Wilshire Blvd.	Sepulveda Blvd.	Beverly Glen.	20.6	24.1
Veteran Ave.	Sunset Blvd.	Santa Monica Blvd.	21.9	19.0
Veteran Ave.	Santa Monica Blvd.	Sunset Blvd.	21.1	18.7
Westwood Blvd.	Santa Monica Blvd.	Le Conte Ave.	9.5	14.4
Westwood Blvd.	Le Conte Ave.	Santa Monica Blvd.	14.9	10.5
Sepulveda Blvd.	Sunset Blvd.	Santa Monica Blvd.	26.6	28.8
Sepulveda Blvd.	Santa Monica Blvd.	Sunset Blvd.	28.8	24.9
Beverly Glen Blvd.	Sunset Blvd. (N. I/S)	Pico Blvd.	25.2	22.2
Beverly Glen Blvd.	Pico Blvd.	Sunset Blvd. (N. I/S)	23.7	17.1

FIGURE III - 6
LOS ANGELES
CENTRAL CITY AREA



Nearly one-half of traffic on surface arterials is classified as through traffic. The highest daily traffic volumes are found on east-west arterials. The all-day volumes on these arterials, however, are comparatively lower than for arterials elsewhere in the City, perhaps due to the low nighttime population of Central City residents and visitors.

Automatic (24-hour) traffic volume data were collected at 14 locations within the Central City area during the week of September 17, 1984. The traffic count locations and corresponding 24-hour traffic volumes are shown in Table III-6. The volume data for the 14 locations were aggregated on an hour-by hour basis and plotted graphically (see Figure III-7) to represent a typical volume profile for non-Olympic conditions. Peak traffic volumes occur in the 7-9 a.m. and 4-6 p.m. periods with the highest hourly volumes occurring between 3-6 p.m.

Speed studies were conducted along six routes on September 21, 1984 for the midday (11 a.m.-1 p.m.) and afternoon peak (4 p.m.-6 p.m.) periods. The routes and average operating speeds are presented in Table III-7. The speeds determined for First Street, Sunset Boulevard/Macy Street and Olympic Boulevard were based on routes extending beyond the defined boundaries of the Central City Area. The limits are considered meaningful in that Olympic Boulevard serves as a primary access to the Exposition Park area; Sunset Boulevard/Macy Street serves Dodger Stadium; and First Street is a primary access route to the Santa Ana Freeway.

III.3 Parking Availability

Each of the venue plans prepared by Caltrans and/or the City of Los Angeles DOT and other local agencies included an analysis of parking available at or near the venue for the Olympic family and the spectators. Spectator parking was to include all designated spaces in parking lots or on-street parking within a reasonable walking distance to and from the venues. The most critical venue areas where parking was anticipated to be in shortage were the Coliseum/Exposition Park Complex-with three venues- and the UCLA-Westwood area -with two venue sites.

A thorough study of the parking supply and the anticipated demand in the Coliseum area was conducted by the City of Los Angeles DOT staff. The study was focused on an area within an assumed reasonable walking distance of 1.5 to 1.75 miles from the venue sites. Field inventories, aerial photos and surveys were used to estimate the parking supply and levels of its usage during typical days. Total available on-street parking was assumed to be the total public parking spaces less the number of spaces normally used by the area residents and less the spaces which were to be lost due to parking prohibitions during the games. Total available off-street parking included the inventoried spaces available to public in the area parking lots, plus the projected additional residential-and business-based off-street spaces expected to be sold to the public during the games. Total on- and off-street available spaces in the Coliseum area was determined to be 17,861 spaces on the weekdays and 18,767 spaces on the weekend days.

Traffic and parking problems in the Westwood Village are well known to the residents and visitors. A previous parking study for the City of Los Angeles DOT had determined that in 1975 there was a deficiency of up to 160

TABLE III-6
 24-HOUR TRAFFIC VOLUMES: CENTRAL CITY AREA

TRAFFIC COUNT LOCATION	TYPICAL VOLUME (WEEK OF 9/17/84)
Main St. N/O Olympic Blvd.	21,154
Flower St. S/O Eighth St.	14,807
Eighth St. W/O Figueroa St.	22,748
Seventh St. W/O Figueroa St.	16,874
Wilshire Blvd. W/O Figueroa St.	21,353
Fifth St. W/O Figueroa St.	28,058
Second St. W/O Figueroa St.	19,161
First St. W/O Figueroa St.	21,935
N. Main St. N/O Temple St.	15,248
Temple St. E/O Los Angeles St.	13,389
First St. E/O Los Angeles St.	22,692
Fourth St. E/O Los Angeles St.	10,509
Sixth St. E/O Los Angeles St.	16,981
Seventh St. E/O Los Angeles St.	18,418
TOTAL	263,327

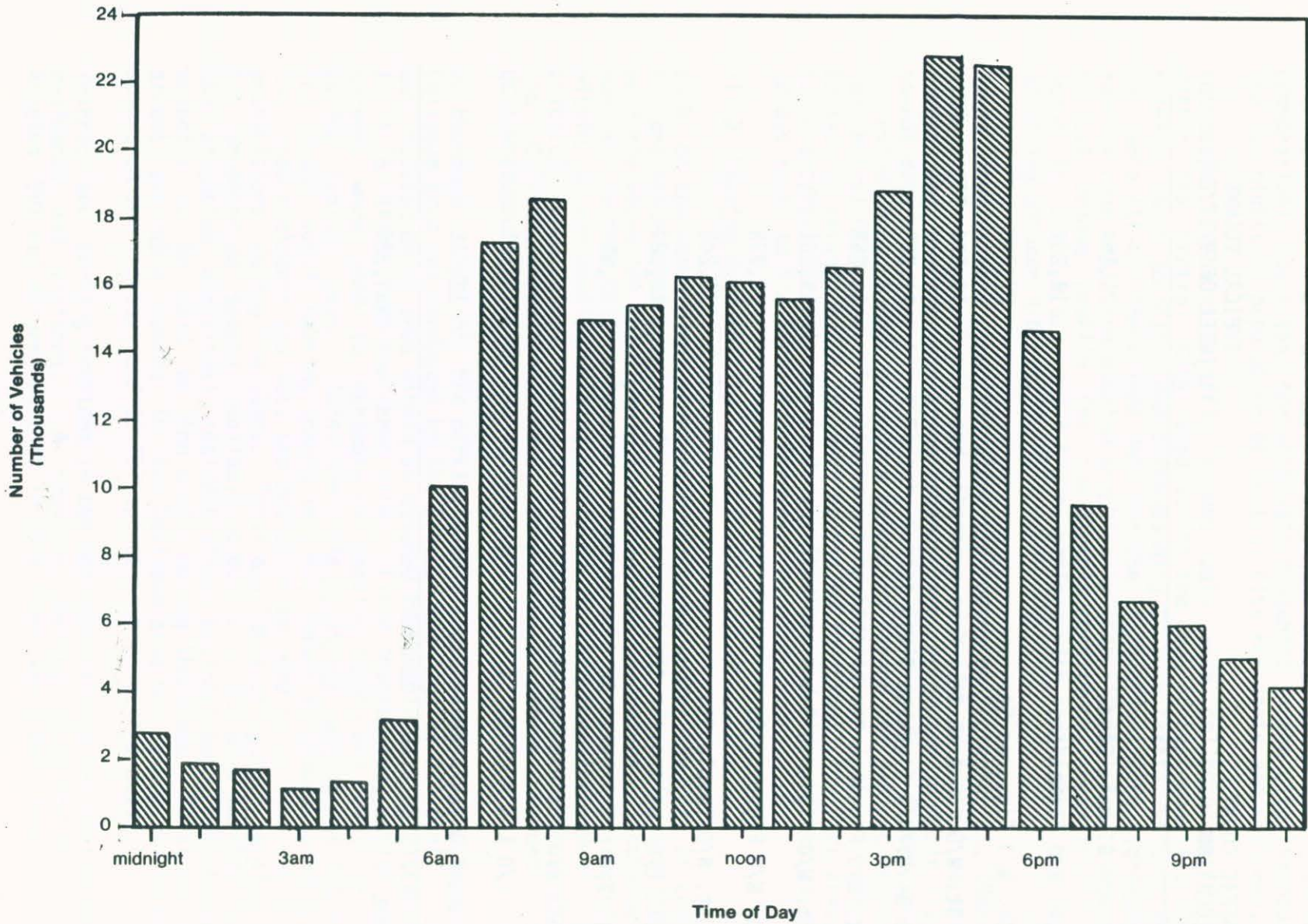


FIGURE III - 7
TYPICAL
HOURLY VOLUMES
CENTRAL CITY AREA

TABLE III-7
 NORMAL SUMMER SPEED STUDY
 CENTRAL CITY AREA

<u>STREET DRIVEN</u>	<u>ROUTE STUDIED</u>		<u>AVERAGE TRAVEL SPEED (MPH)</u>	
	<u>FROM</u>	<u>TO</u>	<u>(Typical Period 11 a.m.-1 p.m.)</u>	<u>September 21, 1984) 4 p.m.-6 p.m.</u>
Sunset Blvd./ Macy St.	Echo Park Ave.	Mission Rd.	25.5	21.4
Macy St./ Sunset Blvd.	Mission Rd.	Echo Park Ave.	24.0	18.7
First St.	Witmer St.	Boyle Ae.	19.3	19.0
First St.	Boyle Ave.	Witmer St.	21.5	20.3
Olympic Blvd.	Vermont Ave.	Main St.	23.2	17.4
Olympic Blvd.	Main St.	Vermont Ave.	21.2	14.9
Hope St./ Flower St.	Temple St.	11th St.	15.4	12.2
Flower St./ Hope St.	11th St.	Temple St.	13.4	12.2
Main St.	Ninth St.	Sunset Blvd.	22.4	14.3
Spring St.	Sunset Blvd.	Ninth St.	20.2	15.4
Grand Ave.	Sunset Blvd.	Olympic Blvd.	16.3	13.5
Grand Ave.	Olympic Blvd.	Sunset Blvd.	16.7	12.6

parking spaces during the peak accumulation period of 2 to 3 p.m. In 1980 that deficiency figure had increased to 460 spaces. Prior to the games Department of Transportation also conducted an additional parking supply inventory in an area bounded by Sunset Blvd., Beverly Glen Blvd., Wilshire Blvd., and Sepulveda Blvd. This area was larger than the one considered in the previous study and included all the parking facilities within a reasonable (1.4-1.6 miles) walking distance from the venue sites. The total parking supply was categorized as on-street curbside, off-street public, and all of the UCLA owned parking facilities either on- or off-campus.

The average time a spectator would require to park at an on-street space, walk to the venue site, watch an event and return to the vehicle was determined to be 3-4 hours, and a minimum of 2.5 hours. It was therefore determined that, for all practical purposes, more than 95% of the on-street parking supply could not be used legally by persons attending any of the Olympic events for longer than two hours. In general, reasons for unavailability of on-street parking for spectators included:

- o Posted time and location restrictions on parking
- o Normally very high demand for parking in the area
- o Peak demand occurring in the restricted hours
- o Confusing street system for the visitors
- o Long walking distances
- o Preferential parking districts in the residential areas

Due to the year-around demand for parking in the Westwood area, and the expectation that some of the public parking lots would be devoted to non-parking activities during the Games, it was assumed that few of the existing public off-street spaces would be available for spectator parking. The third category of available spaces was in the parking lots owned by UCLA. The estimated available supply at these lots was approximately 2650 spaces on weekdays and 3100 spaces on weeknights and weekends which constituted the bulk of available spectator parking in the Westwood area.

III.4 The Freeway System

The backbone of the transportation system in Southern California is its freeway network. Within the metropolitan area there are 722 miles of freeway. On a normal day 225 to 250 miles of the system are severely congested during peak periods. During both the a.m. and p.m. peak hours congestion radiates from the Los Angeles Central Business District along all of its major freeway routes (See Figures III-8 and III-9). Congestion is also severe along most of the San Diego and Ventura Freeways in Los Angeles County and around most of the freeway interchanges in Orange County.

The freeways within the system, which were to carry the majority of the spectator trips, are briefly described in the following paragraphs. All speeds are at peak period and volumes are based on average annual daily traffic.

III.4.1 Santa Ana Freeway I-5

This freeway provided primary access to the Olympic events at Mission Viejo, Cota de Coza, Anaheim, and Fullerton. Within Orange County, this freeway



COITA DE CAZA

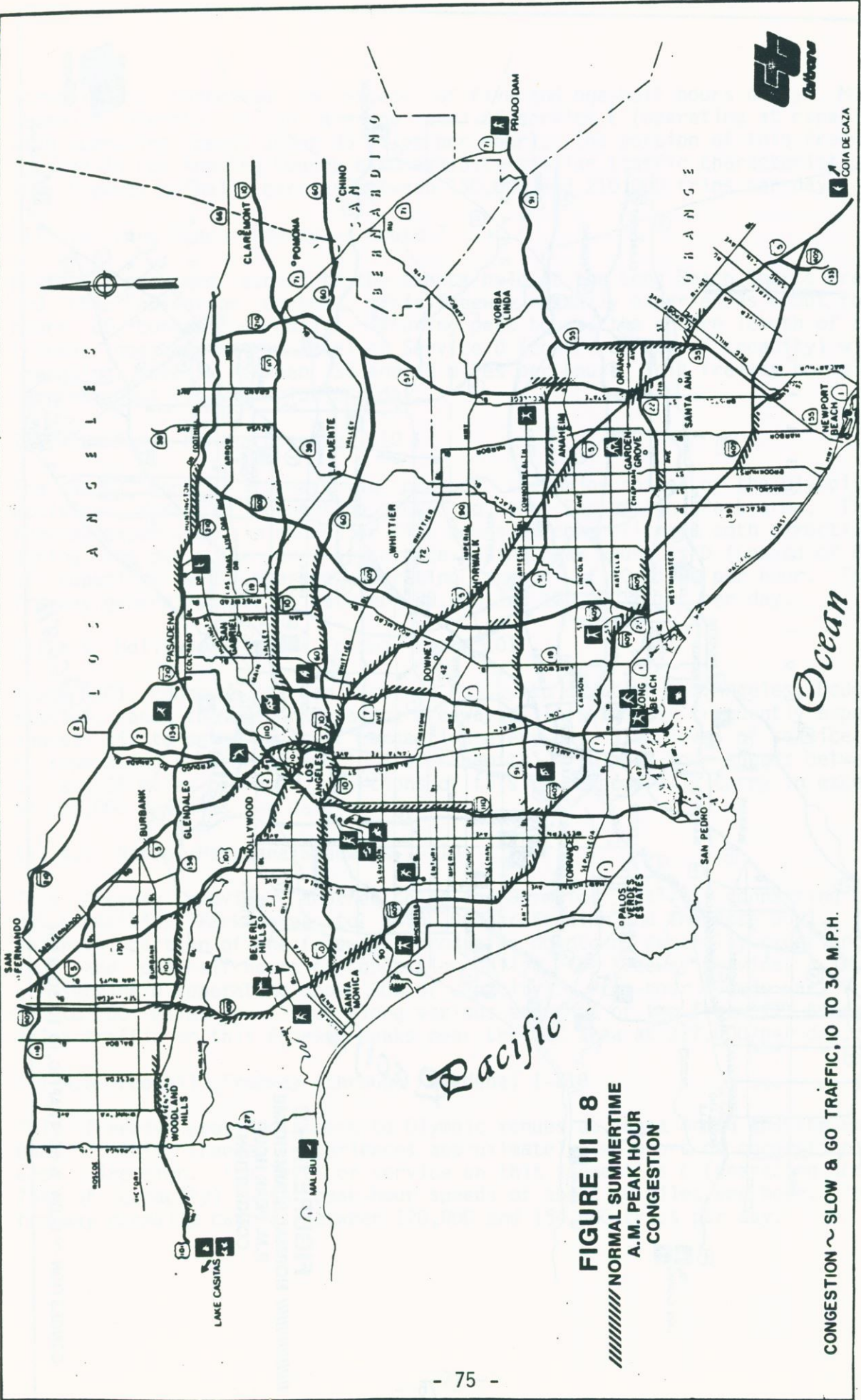
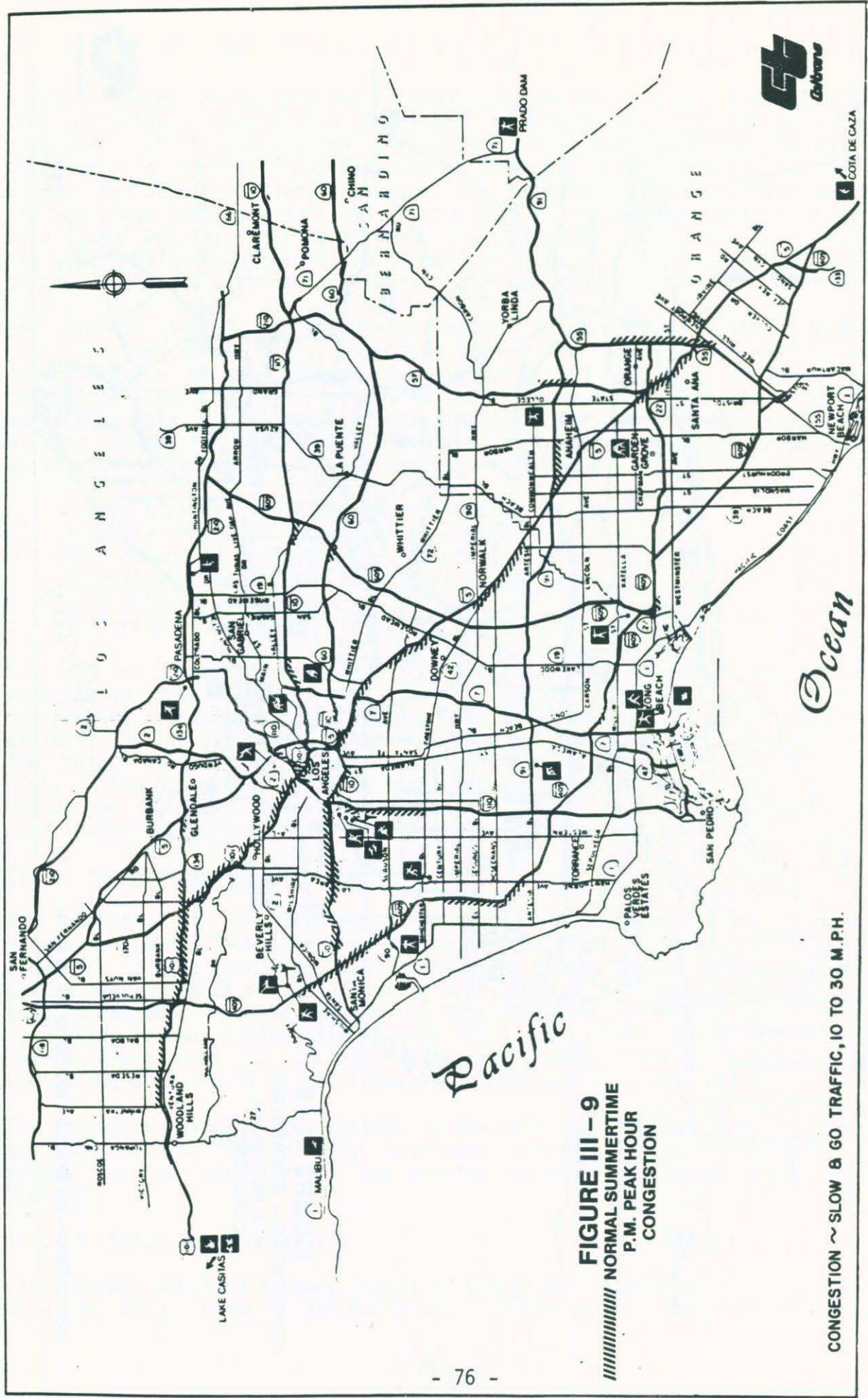


FIGURE III - 8
 NORMAL SUMMERTIME
 A.M. PEAK HOUR
 CONGESTION



CONGESTION ~ SLOW & GO TRAFFIC, 10 TO 30 M.P.H.



COTA DE CAZA

Ocean

Pacific

FIGURE III - 9
 NORMAL SUMMERTIME
 P.M. PEAK HOUR
 CONGESTION

CONGESTION ~ SLOW & GO TRAFFIC, 10 TO 30 M.P.H.

normally is congested in excess of five and one-half hours daily. Most segments operate at an average level of service E (operating at capacity with operating speeds under 35 miles per hour). The portion of this freeway located in Los Angeles County also exhibits similar traffic characteristics. This freeway normally carries between 150,000 and 210,000 trips per day.

III.4.2 Long Beach Freeway -- Route 7

Route 7 provided access to the events held at the Long Beach Sports Arena and the Convention Center. This freeway normally experiences about four hours of congestion daily. During peak hours, the entire length of the freeway operates at a level of Service D (upward of 80% of capacity) with operating speeds between 35 and 40 miles per hour. This freeway normally carries about 155,000 trips per day.

III.4.3 Santa Monica Freeway-I-10

The Santa Monica Freeway was one of the major spines of the Olympics' activity, directly connecting UCLA to the Exposition Park area. This freeway experiences in excess of five hours of congestion in both directions during the day. The level of service during peak hours is D (upward of 80% of capacity) with average operating speeds of 40 miles per hour. This freeway generally carries between 180,000 and 190,000 trips per day.

III.4.4 Hollywood/Ventura Freeway-Route 101

Route 101 connects the San Fernando Valley to downtown Los Angeles, Dodger Stadium, and the Harbor/Pasadena Freeways. This freeway frequently experiences six to seven hours of congestion every day. The level of service is E (operating between 90 and 100% of capacity) with peak-hour speeds between 12 and 35 miles per hour. Portions of this route generally carry in excess of 226,000 vehicles per day.

III.4.5 Harbor/Pasadena Freeways-I-110

This freeway provided another spine for Olympics' activity connecting the USC-Exposition Park area to both Dodger Stadium and the Rose Bowl. The southern portion of the freeway approaching downtown, generally experiences four and one-half hours of congestion daily. The freeway provides a level of service D (operating above 80% of capacity). Peak-hour speeds vary from 28 to 50 miles per hour along various segments of the freeway. Average daily traffic on this freeway peaks near the USC area at 227,000/per day.

III.4.6 Foothill Freeway (through Pasadena) I-210

This freeway provided access to Olympic venues at Santa Anita and the Rose Bowl. This freeway experiences approximately two hours of congestion in each direction. The level of service on this segment is C (operating about 75% of capacity) with peak-hour speeds of about 40 miles per hour. This freeway normally carries between 120,000 and 154,000 trips per day.

III.4.7 San Diego Freeway-I-405

The San Diego Freeway connected Olympic activity at UCLA, Loyola-Marymount University, Los Angeles International Airport, the Forum and to the Long Beach venues. Normally this portion of the freeway between these venues experiences in excess of nine hours of congestion daily in many segments. This entire segment operates at level of service E (at capacity) during peak hours and has average peak hour speeds of 25 to 35 miles per hour. The facility generally carries in excess of 200,000 daily trips along the entire route.

III.4.8 The 42 Mile Freeway Loop

For the purpose of this report, most of the specific data collected on the freeway system comes from the segment called the 42-mile loop, which is made up of the Santa Monica Freeway west from the Harbor Freeway; the San Diego Freeway south from the Santa Monica Freeway; and the Harbor Freeway between the San Diego and Santa Monica Freeways. This portion of the system is equipped with loop detectors located in the pavement which provide continuous electronic traffic count monitoring. This system of traffic data collection has been extended to other portions of the freeway network and data is available for various locations. (Figure III-10 shows the 42-mile loop and Figure III-11 shows the locations used for additional Olympic counts.)

During the summer of 1983, the 42-mile loop carried daily traffic volumes of about 610,000 vehicles. During the two months preceding the 1984 Summer Olympic Games, the same loop was carrying daily volumes of about 650,000 vehicles, nearly a ten-percent growth in traffic.

III.4.9 Vehicle Occupancy

Vehicle occupancy rates on freeways as recorded at selected representative locations in Los Angeles and Orange counties are presented in Table III-8. These figures indicate that auto occupancy rates vary between 1.18 and 1.25 in the Los Angeles area and between 1.15 and 1.19 in Orange County. Overall vehicle occupancy vehicle- and bus-facility are considerably higher, in the order of 1.36 to 1.48 persons per vehicle.

During the summer months vehicle occupancies are generally slightly higher. This may be attributable to higher percentage of recreational trips in the summer, which usually have higher auto occupancy rates.

Caltrans studies have indicated that the vehicle occupancies observed at the count station on Golden State Freeway (I-5) at Griffith Park are the best representative of systemwide occupancy variations and trends.

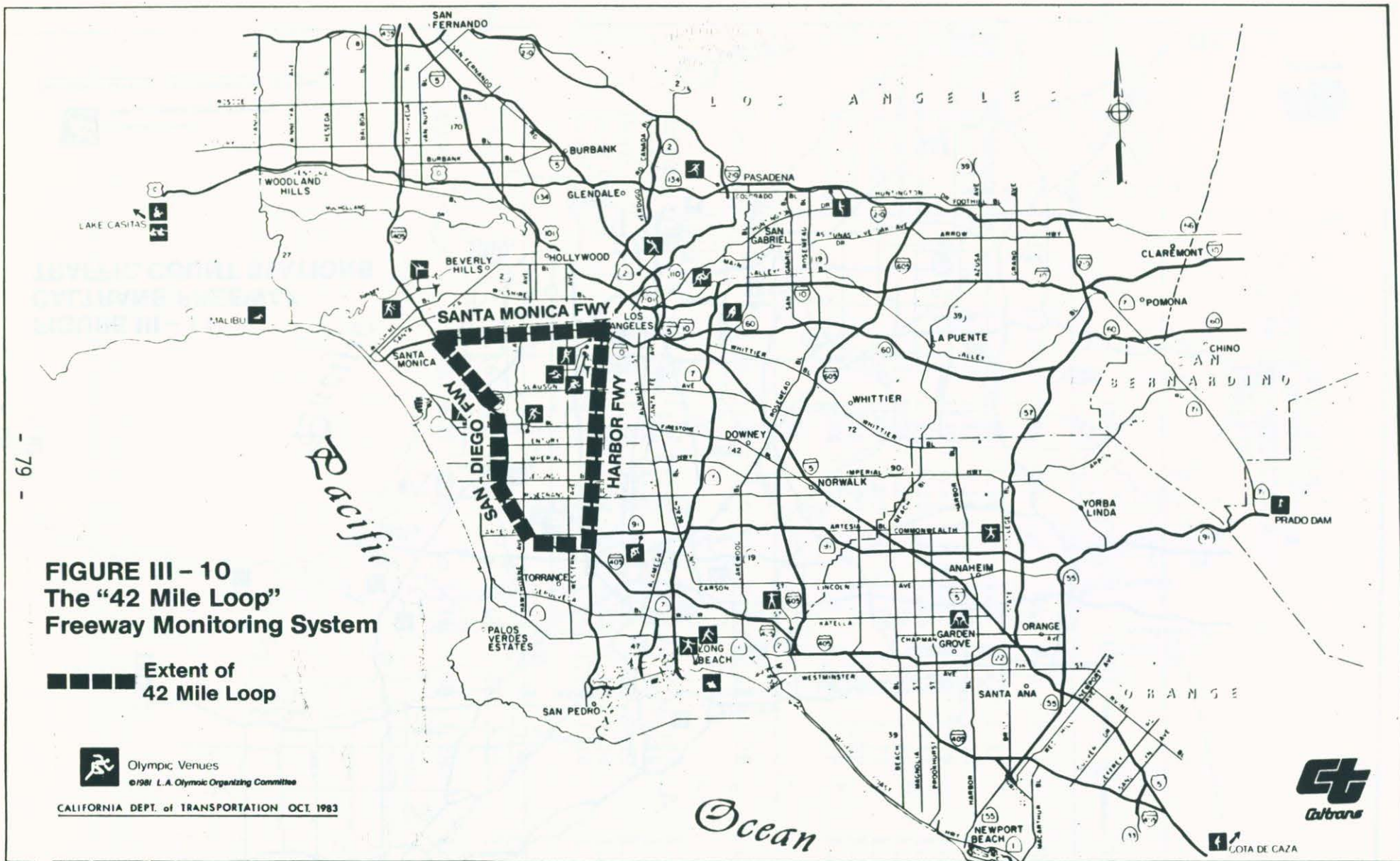


FIGURE III - 10
The "42 Mile Loop"
Freeway Monitoring System

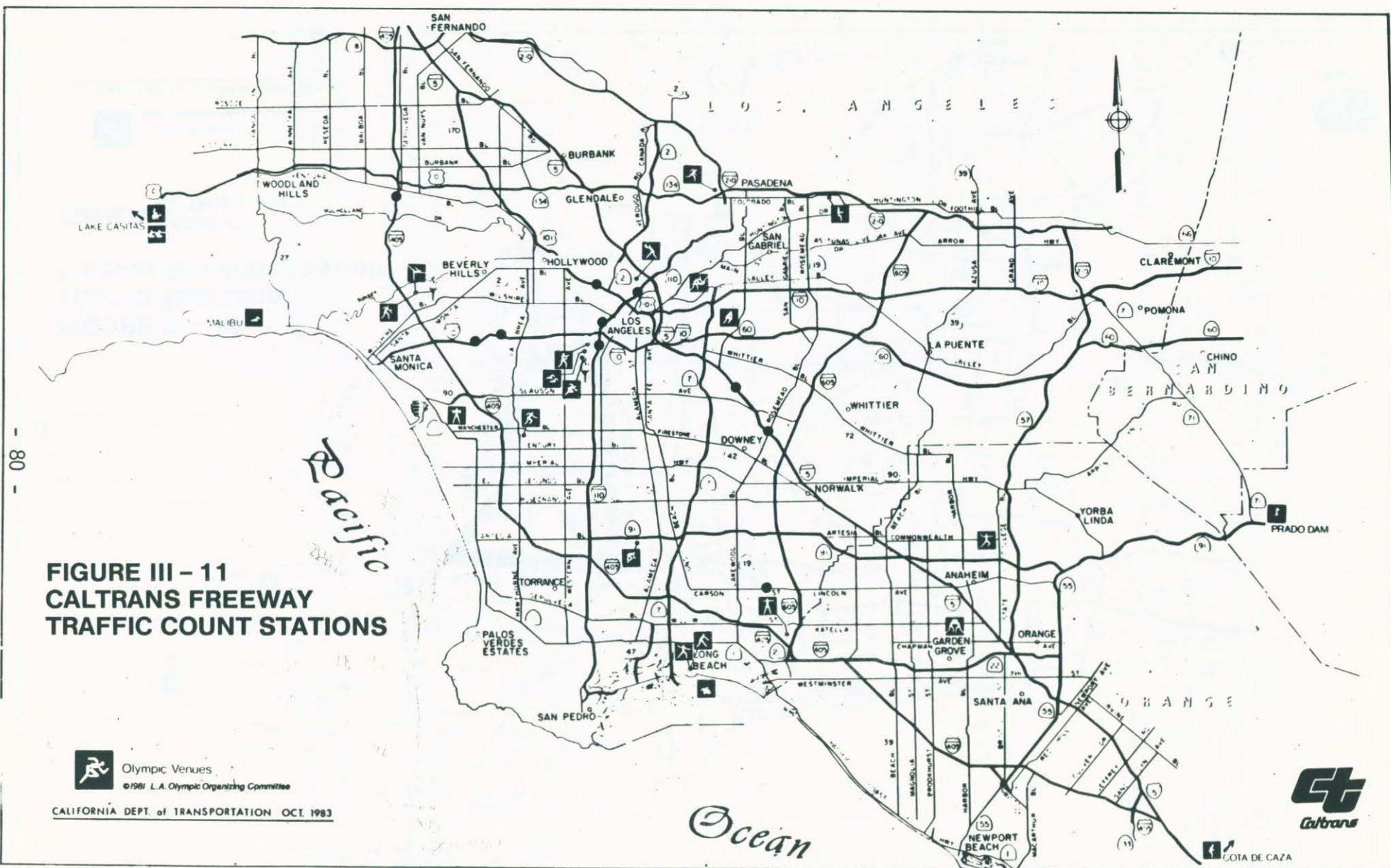
■ ■ ■ ■ ■ Extent of
 42 Mile Loop

 Olympic Venues
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 LOTUS DE CAZA



**FIGURE III - 11
CALTRANS FREEWAY
TRAFFIC COUNT STATIONS**



Olympic Venues
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COTA DE CAZA

- 80 -

TABLE III-8
VEHICLE OCCUPANCY DATA
ON LOS ANGELES AREA
FREEWAYS

CO./RTE.	FWY. LOC.	1982			1983			1984
		May	Aug.	Nov.	May	Aug.	Nov.	May
LA 5	Greenwood	1.20	1.25	1.16	1.17	1.21	1.17	1.19
LA 5	Griffith Pk.	1.15	1.17	1.18	1.14	1.17	1.15	1.15
LA 7	Gage	1.22	1.19	1.22	1.20	1.22	1.16	1.17
LA 10	Sixth Ave.	1.13	1.17	1.15	1.16	1.15	1.11	1.13
LA 11	42nd St.	1.21	1.23	1.21	1.19	1.24	1.22	1.22
LA 11	Sycamore Gr.	1.19	1.20	1.19	1.15	1.20	1.17	1.17
LA 60	Belvedere	1.22	1.22	1.20	1.20	1.22	1.22	1.15
LA 101	Edgeware	1.21	1.24	1.21	1.22	1.24	1.22	1.22
* LA County Subtotal		1.19	1.21	1.19	1.18	1.21	1.18	1.18
ORA 5	Jeffery N/B	1.13	1.17	1.14	1.15	1.17	1.13	1.14
ORA 5	Broadway S/B	1.19	1.22	1.17	1.18	1.20	1.15	1.16
ORA 55	Meats	1.20	1.22	1.19	1.19	1.19	1.19	1.17
ORA 405	Sand Canyon	1.14	1.12	1.14	1.11	1.16	1.14	1.14
ORA 405	Ward	1.15	1.20	1.19	1.15	1.15	1.14	1.16
* ORA County Subtotal		1.16	1.19	1.17	1.16	1.17	1.15	1.15
LA 10	Busway	1.48	1.37	1.39	1.39	1.38	1.39	1.36

CHAPTER IV

OLYMPICS CONDITIONS AND VARIATIONS

IV.1 Venue Attendance

The Los Angeles Olympic Organizing Committee estimated that a total of 5,797,923 people attended the events during the sixteen days of the Olympic Games. These attendance figures were based on venue information and ticket sales for the various events held at stadiums with known spectator capacities. For other events such as yachting, cycling, and marathons, where events were held outdoors with no ticket sales or limitations on spectators, approximate number of attendees were estimated by agencies. All of the venue sites were located in the general Los Angeles area with the exception of the preliminary football (soccer) matches held at Annapolis, Maryland, Cambridge, Massachusetts, and Palo Alto, California. Total attendance for these events was 728,906 and just over five million spectators (5,069,017) attended the Games in the Los Angeles area.

Table IV-1 indicates the estimated total attendance for each of the Olympic events. Soccer (football) games accounted for the highest number of spectators (1,421,627), however over half of these spectators visited the games in stadiums outside the Los Angeles area. Second highest spectator attendance was 1,129,465 at the track and field events at the Los Angeles Coliseum. Smallest number of crowds were present at the modern pentathlon games.

Attendance estimates by day are presented in Table IV-2. For purposes of this study numbers do not reflect attendance at the soccer games outside the Southern California area. The heaviest attendance day was Sunday, August 5, when over one-half million people attended Olympic Games at fifteen venue sites. It should be mentioned that this total included estimates of 60,000 and 75,000 spectators for the womens' marathon and cycling events respectively. The heaviest daily total attendance for a weekday was on Wednesday, August 8, with over 400,000 spectators at sixteen venue sites.

Spectators at the Exposition Park complex, which included three major venue sites (swim stadium, the Coliseum, and the Sports Arena), frequently accounted for a sizeable portion of the total daily attendance. On its heaviest day (Saturday, August 11), the sports complex was attended by over 200,000 spectators--over half of the total Game attendance for that day. During the second week of the Games an average of over 160,000 spectators attended the Games at the complex daily. For reference purposes total daily attendances for the Exposition Park Complex and the UCLA area are also included in Table IV-2. Figure IV-1 graphically represents the data depicted in Table IV-2.

IV.2 Transit Services

IV.2.1 Regular Transit Services

Systemwide ridership on regular RTD services indicated a decline during the period of the Olympic Games compared to the immediate period prior to the

TABLE IV-1
ATTENDANCE BY EVENT AT
THE 1984 SUMMER OLYMPIC GAMES

Opening Ceremonies	92,655	Closing Ceremonies	92,655
Archery	36,000	Athletics (Track/Field)	1,129,465
Baseball	385,290	Basketball	386,093
Boxing	230,868	Canoeing	54,144
Cycling	317,000*	Diving	119,524
Equestrian	282,158	Fencing	39,141
Football (Soccer)	1,421,627	Gymnastics	110,133
Handball	69,352	Hockey	142,495
Judo	34,400	Modern Pentathlon	21,385
Rowing	68,385	Shooting	24,826
Swimming	131,123	Synchronized Swimming	42,831
Tennis	31,186	Volleyball	300,825
Water Polo	73,475	Weightlifting	42,376
Wrestling	94,997	Yachting	(attendance not kept)

* Includes 275,000 estimate for Road Cycling events from California Highway Patrol.

TABLE IV-2
1984 SUMMER OLYMPIC ATTENDANCE
BY DAY

<u>DAY</u>	<u>DATE</u>	<u>COLISEUM AREA</u>	<u>WESTWOOD AREA</u>	<u>ALL GAMES IN L. A.</u>
1 SAT	July 28	92,655	-----	92,655
2 SUN	July 29	36,065	22,002	396,892
3 MON	July 30	32,697	16,551	182,285
4 TUES	July 31	32,930	16,738	258,400
5 WED	Aug. 1	12,404	17,930	276,402
6 THU	Aug. 2	37,409	9,732	250,410
7 FRI	Aug. 3	148,692	9,023	385,867
8 SAT	Aug. 4	198,876	8,997	410,336
9 SUN	Aug. 5	206,719	9,160	509,438
10 MON	Aug. 6	182,100	5,000	392,174
11 TUE	Aug. 7	43,295	4,941	228,804
12 WED	Aug. 8	185,203	5,132	418,092
13 THU	Aug. 9	135,320	14,666	261,164
14 FRI	Aug. 10	177,250	13,947	425,562
15 SAT	Aug. 11	216,271	14,996	423,810
16 SUN	Aug. 12	92,665	-----	145,812

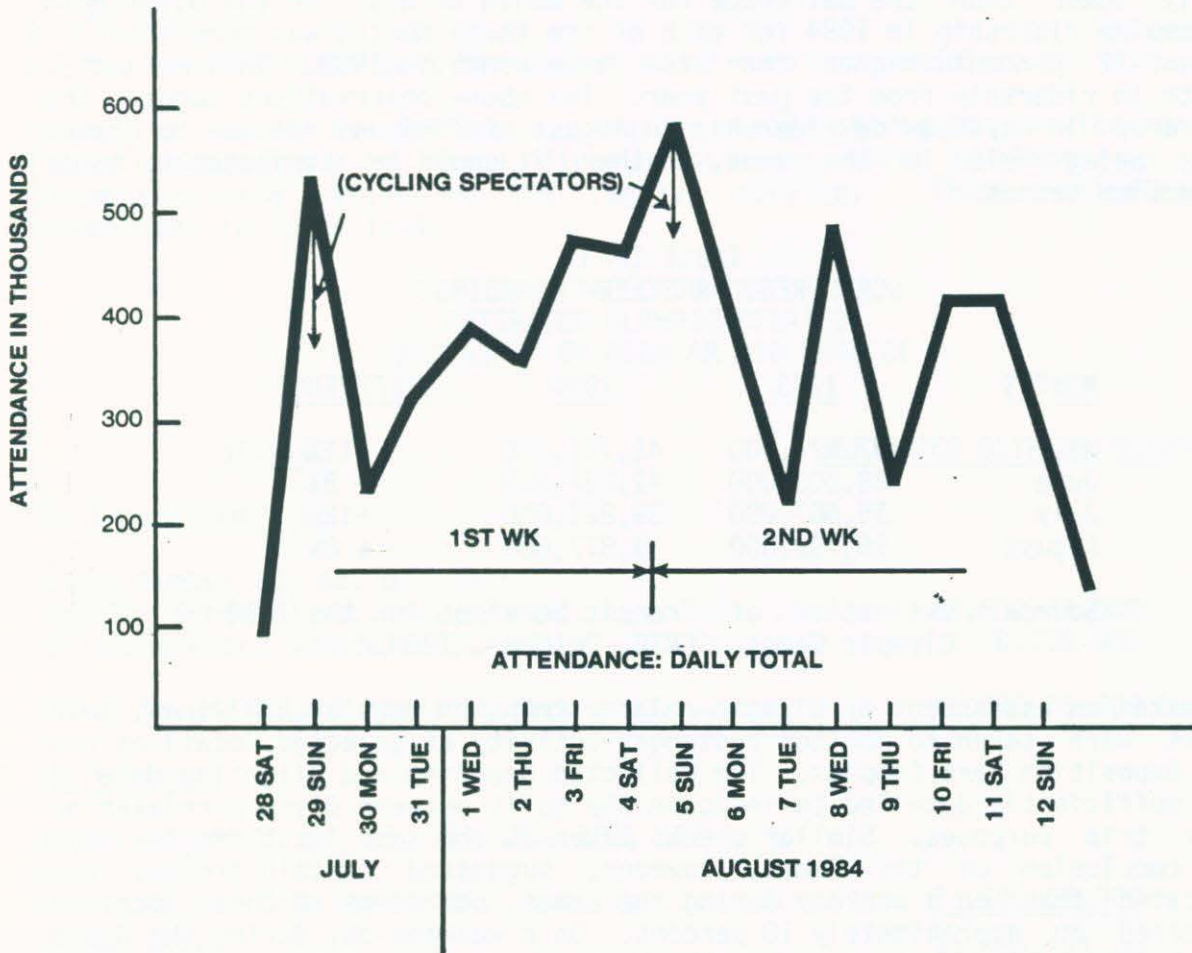


FIGURE IV. 1 OLYMPICS ATTENDANCE BY DAY

games. This was, however, consistent with trends in transit ridership in the summer. Bus patronage figures for summer months are historically lower than those recorded during the spring and fall seasons. This is mainly due to the schools not being in session during the summer. Student riders account for a major portion of regular transit ridership.

In the previous chapter (Chapter III), the average daily system ridership by month was presented in Table III-1. In addition, Table IV-3 below, depicts monthly ridership for 1983 and 1984. As reflected in this table July and August patronage figures for both years were 2 percent and 5 percent respectively lower than the patronage for the month of May. On the other hand, systemwide ridership in 1984 for each of the three months was consistently 8 percent-12 percent higher than the same month in 1983. This reflects a growth in ridership from the past year. The above observations suggest that the drop in systemwide ridership in August of 1984 was not due to Olympic Games being held in the area, rather it could be attributed to normal summertime trends.

TABLE IV-3
SCRTD REGULAR SYSTEM BOARDINGS

<u>MONTHS</u>	<u>1983</u>	<u>1984</u>	<u>DIFFERENCE</u>
May	37,474,000	41,751,000	+11%
June	38,005,000	41,037,000	+ 8%
July	35,607,000	39,821,000	+12%
August	36,792,000	39,877,000	+ 8%

Source: Evaluation of Transit Services for the 1984 Olympic Games, SCRTD, October, 1984.

To make an assessment of Olympic-related trips on regular RTD lines, point checks were taken to monitor passenger activity at selected locations near the Exposition Park Complex. The collected boarding and alighting data was not sufficiently detailed to indicate the split between Olympic-related and other trip purposes. Similar checks taken at the same locations following the conclusion of the Games, however, suggested certain trends. Data indicated that on a weekday during the Games, boardings at these locations increased by approximately 10 percent. On a weekend day during the Games, the boardings at the same locations were almost twice the number of boardings during regular summer weekends.

The above observations were consistent with the number of the extra service schedules added on regular RTD lines during the period of the Games. A total of 178 extra morning and afternoon assignments were added to the regular service runs in this period due to increased demand. The majority of these extra assignments (71%) were made on the weekends. This further confirmed that Olympic ridership demand on the regular lines was greater during the weekends. Ridership also showed some growth on several lines which did not provide direct service to the venues, but served as feeder lines for special Olympic service lines.

As mentioned earlier, due to manpower shortages, RTD was not able to conduct on-board surveys to determine the exact nature of Olympic-related boardings on its regular service lines. Systemwide patronage during the Games was lower than pre- or post-levels. However, ridership was up on the lines in the vicinity of the venues. It was therefore assumed that this increase was mainly due to Olympic-related traffic. RTD planners made reasonable estimates on possible number of Olympic-related passengers on each service in the vicinity of the venues as follows:

- o Five to ten passengers per trip on regular schedules between 8 a.m. and 5 p.m.
- o One hundred passengers per day on added service schedules.

Based on these assumptions, using the number of regular service runs and added schedules on these lines, estimates were developed on total Olympic-related trips on the regular service. These estimates are summarized in Table IV-4.

TABLE IV-4
ESTIMATED OLYMPIC-RELATED
RIDERSHIP ON REGULAR RTD SERVICE

<u>SERVICE</u>	<u>ESTIMATED OLYMPIC BOARDINGS</u>
<u>At Exposition Park</u>	
Lines Number 40, 42, 81, 204:	
Regular Schedule	38,500-77,000
On added extra schedules	8,300-400
Total to and from Exposition Park	46,800-85,400
<u>At Westwood</u>	
Lines number 2, 20, 21, 22, 320, 322, 560	
Total to and from Westwood	<u>27,600-55,300</u>
GRAND TOTAL	74,500-141,00

Regular SCRTD local lines also operated near other Olympic venue sites at Cal-State Fullerton, East Los Angeles College, Cal-State Los Angeles, Cal-State Dominguez Hills, Pepperdine University in Malibu, the convention centers in Long Beach and Anaheim, the Forum in Inglewood, and the Santa Anita Racetrack in Arcadia. RTD planners, however, believe that Olympic-related ridership on these lines were negligible for several reasons:

- o Most of the venues served by these lines had adequate parking supply.
- o Campus venues had small spectator capacities.

- o The regular lines did not operate as frequently, or did not have a long enough spread of service to be useful to the Olympic spectators attending these venues.
- o These venues did not have the extensive festive developments that would attract visitors, unlike the Exposition Park and Westwood areas.
- o No additional services or equipment was deployed on these regular lines during the games.

Other municipal bus lines providing service to venue areas also experienced modest ridership increases over the same period in 1983 as follows:

Culver City Line #6	5.3%
Long Beach Transit	3.0%
Santa Monica Bus Lines	3.6%
Torrance Transit	
Line #1 (to Downtown L. A.)	16.0%
Line #2 (to Downtown L. A.)	12.9%

Torrance Transit also provided 58 park and ride trips to the Coliseum for \$10 roundtrip; and two trips to the soccer semi-finals and finals for 2,233 tickets.

Montebello Municipal Bus Lines did not foresee any increase in passenger volume and therefore did not institute planned additional bus service during the Games.

These increases suggest Olympic-related ridership on municipal bus lines. However, sufficient data was not available to estimate spectator related patronage.

IV.2.2 SCRTD Special Olympic Transit Services

By Type of Service

Ridership on the 24 special Olympic lines during the 16 day Olympic period totalled over 1.13 million boardings. Shuttle services carried half of the total riders while park and ride services carried most of the other riders. Ridership was split between the three types of services offered as follows:

<u>TYPE OF SERVICE</u>	<u>BOARDINGS</u>	<u>% SHARE</u>
Park & Ride	438,578	39%
Express	127,311	11%
Shuttle	<u>564,528</u>	<u>50%</u>
TOTAL	1,130,417	100%

Source: Evaluation of Transit Services for the 1984 Olympic Games, SCRTD, October 1984.

Total ridership figures by individual line for each type of service is presented in Table IV-5.

TABLE IV-5
TOTAL SCRTD RIDERSHIP BY LINE

<u>TYPE</u>	<u>LINE #</u>	<u>LINE NAME</u>	<u>TOTAL RIDERSHIP</u>
SHUTTLE	710	Los Angeles CBD-Exposition Park	370,093
	716	Crenshaw Center-Exposition Park	78,454
	718	Grand Avenue-Exposition Park	30,543
	727	Westwood-U.C.L.A.	30,861
	743	Hollywood Park-Loyola Marymount University	2,142
	770	Los Angeles CBD-Dodger Stadium	9,394
	795	Pasadena-Rose Bowl	43,041
TOTAL			566,662
PARK & RIDE	711	Valley College-Exposition Park	97,225
	712	Century City-Exposition Park	63,869
	713	Hollywood Park-Exposition Park	77,341
	714	Cerritos College-Exposition Park	85,510
	715	Pasadena City College-Exposition Park	75,501
	719	Alpine Village-Exposition Park	19,229
	721	Valley College-U.C.L.A.	7,271
	723	Hollywood Park-U.C.L.A.	5,538
	753	Hollywood Park-Long Beach	2,959
	754	Cerritos College-Long Beach	3,419
764	Cerritos College-Anaheim	686	
TOTAL			438,578
EXPRESS	720	Los Angeles CBD-U.C.L.A.	16,298
	740	Los Angeles CBD-Forum	16,290
	750	Los Angeles CBD-Long Beach	21,058
	760	Los Angeles CBD-Anaheim	50,687
	780	Los Angeles CBD-Santa Anita	6,198
	790	Los Angeles CBD-Rose Bowl	16,780
TOTAL			127,311

Source: Evaluation of Transit Services for the 1984 Olympic Games, SCRTD, October 1984.

Daily transit ridership varied depending on the schedule of the Olympic events, particularly those held at the Exposition Park venues. Daily ridership by service type is tabulated in Table IV-6 and graphically represented in Figure IV-2. The lowest total daily ridership was 15,747 on Wednesday, August 1, when both the Coliseum and the Swim stadium were inactive. The maximum daily ridership was 132,454 on Saturday, August 11, when all the three Exposition Park venues were holding two sessions of finals in their respective events. Peak ridership on all three types of services occurred on that same Saturday (August 11). Each type of service however experienced its low ridership on a different day.

TABLE IV-6
DAILY BOARDINGS ON RTD
SPECIAL TRANSIT SERVICES

DATE	PARK/RIDE	EXPRESS	SHUTTLES	TOTALS
7-28	29,964	2,286	27,691	59,941
7-29	11,063	7,792	17,964	37,369
7-30	10,555	6,135	13,282	29,972
7-31	9,262	6,381	15,843	31,486
8-1	3,617	5,264	6,866	15,747
8-2	9,530	5,102	11,576	26,208
8-3	37,364	10,884	46,595	94,843
8-4	38,394	9,373	61,088	108,855
8-5	39,107	10,513	53,376	102,996
8-6	42,242	9,839	49,129	101,210
8-7	11,939	5,477	13,218	30,634
8-8	40,843	10,989	49,506	101,338
8-9	36,760	9,375	39,086	85,221
8-10	40,827	11,835	58,235	110,897
8-11	47,520	13,355	71,579	132,454
8-12	29,051	2,711	29,484	61,246
TOTALS	438,578	127,311	564,528	1,130,417

Source: Evaluation of Transit Services for the 1984 Olympic Games, SCRTD, October 1984.

By Destination

Nearly 80 percent of all the RTD special service ridership was to and from the Exposition Park Complex. The U.C.L.A. and the Rose Bowl in Pasadena were next in passenger destination with each accounting for approximately 5 percent of the overall ridership. Table IV-7 lists total transit boardings associated with each destination.

FIG. IV - 2
Daily Ridership on
RTD Special Transit Services

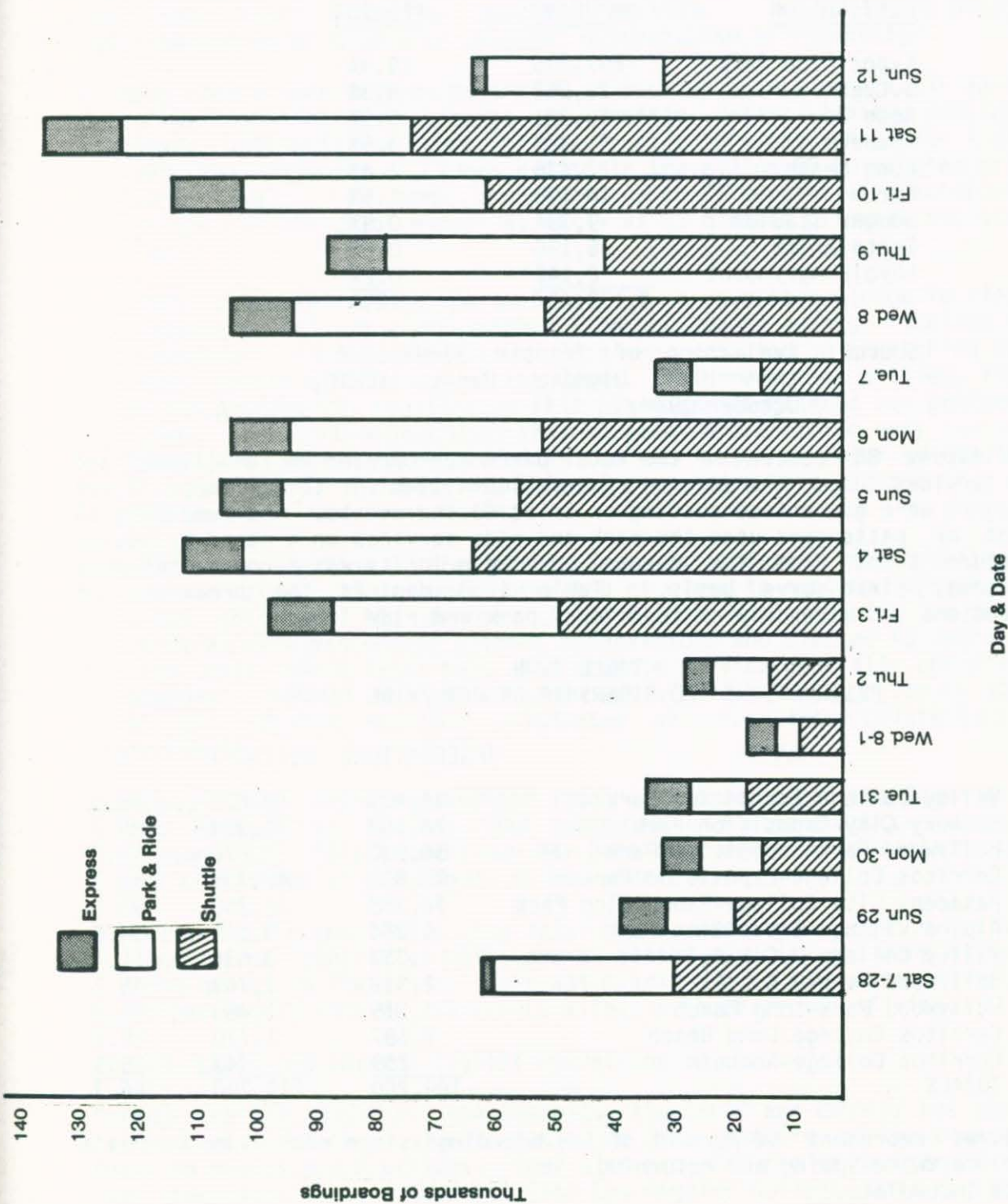


TABLE IV-7
 SCRTD OLYMPIC
 RIDERSHIP BY DESTINATION

<u>DESTINATION</u>	<u>BOARDINGS</u>	<u>PERCENT</u>
Exposition Park	897,795	79.4%
U.C.L.A.	59,968	5.3%
Rose Bowl	59,821	5.3%
Anaheim	51,373	4.5%
Long Beach	27,436	2.4%
Forum	16,290	1.5%
Dodger Stadium	9,394	0.8%
Santa Anita	6,198	0.6%
Loyola Marymount	2,142	0.2%
	<u>1,130,417</u>	<u>100%</u>

Source: Evaluation of Transit Services for the 1984 Olympic Games, SCRTD, October 1984.

Approximately 86 percent of the total patronage carried on the 11 park and ride services used the advance reservation system for their rides. These passengers were guaranteed seating on trips to the events. The remaining 14 percent of passengers used the park and ride services on a stand-by basis. On return trips from the events seating priority was accommodated on a first-come, first-serve basis. Table IV-8 depicts the breakdown of reservations and ridership on individual park and ride lines.

TABLE IV-8
 RESERVATIONS AND RIDERSHIP ON PARK/RIDE LINES

<u>LINE</u>	<u>NAME</u>	<u>RESERVATIONS</u>	<u>RIDERSHIP*</u>	<u>%</u>
711	Valley College-Exposition Park	36,499	48,628	75.1
712	Century City-Exposition Park	28,156	31,934	88.2
713	Hollywood Park-Exposition Park	36,930	38,670	95.5
714	Cerritos College-Exposition Park	37,838	42,755	88.5
715	Pasadena City College-Exposition Park	34,358	37,750	91.0
719	Alpine Village-Exposition Park	5,254	9,615	54.6
721	Valley College-U.C.L.A.	4,052	3,636@	111.4
723	Hollywood Park-U.C.L.A.	2,912	2,769@	105.2
753	Hollywood Park-Long Beach	1,315	1,480	88.9
754	Cerritos College-Long Beach	1,687	1,710	98.7
764	Cerritos College-Anaheim	259	343	75.5
	<u>TOTALS</u>	<u>189,260</u>	<u>219,290</u>	<u>86.3</u>

* Figures represent 50 percent of the boardings since each rider boards a service twice--going and returning.

@ Data incomplete.

Source: Evaluation of Transit Services for the 1984 Olympic Games, SCRTD, October 1984.

Temporal Distribution of Transit Ridership

Several representative Olympic lines were analyzed by SCRTD to determine how and when riders used the special services. The following paragraphs describe the major trends in temporal distribution of ridership:

- o Many riders were induced to arrive at pick-up points especially early due to well-publicized forecasts of traffic delays, limited parking, and ticket sell-outs on some of the transit services. Analysis indicated that the majority of riders did their travelling 30-90 minutes prior to event times. On some occasions up to 55 percent of spectators were arriving at the major events as early as 90 minutes prior to the starting time.
- o SCRTD schedule design parameters set a two-hour window to clear out passengers following the conclusion of major events. Surface street congestion in the Exposition Park area resulted in stretching of this limit on the opening day of the Games. To remedy this problem, the City of Los Angeles DOT modified traffic plans and lengthened bus preferential lanes. On subsequent days this strategy proved to be very successful. Passengers were cleared out after the conclusion of major events in less than two hours. The vast majority of passengers were accommodated within 75 minutes of the event ending.
- o With the exception of the Opening day, most trips on the Olympic express and park/ride lines were operated at close to seating capacity on the trips going to the events. Those individuals standing on park/ride services were passengers without reservations who elected to stand rather than wait for a later bus. The shuttle service generally operated with standees on days when the Coliseum was active. The majority of standees on the shuttle services originated at stops intermediate to the two terminals.
- o Higher than average passenger loads were observed on the Opening day of the Games, but loading rates subsequently flattened out. Two possible reasons for this experience may have been addition of early trips, and the confidence of passengers in bus schedules.
- o Following the conclusion of a major event, passenger loads on the Olympic lines were generally well above seated capacity and were higher than loads going to the event. This was mainly due to compressed distribution of passengers leaving the events within a short period of time.

IV.2.3 LAOOC and Charter Transit Operations

During the 16 days of the Olympics, the LAOOC and charter bus operators transported athletes, dignitaries, and the members of the press to all Olympics events and functions. They also provided the major transit service for spectators to Lake Casitas, East Los Angeles College, Coto de Caza, and the Prado Dam from remote parking sites.

Extensive operating data on this major portion of the Olympics transit services were not available due to the disbandment of the LAOOC after the

Games and the decentralized record-keeping of the charter operators. The following data was obtained through telephone conversations with individual representatives of the LAOOC and some charter operators.

Charter services carried an estimated average 33,000 spectators per day. The LAOOC buses for the 12,000 athletes made 46,860 bus trips for about 1,874,400 passenger trips and logged 1,032,317 miles during the Games. The press delegation of 8,800 made approximately 80 percent of all their trips on charter buses. These transit services made 196,580 passenger trips and logged 537,987 miles. During this period, these operations combined carried about 2,424,260 passenger trips. These trips were carried on 1,640 school buses and full size transit coaches.

IV.3 Surface Streets

A comparative evaluation of traffic flow on streets in the Coliseum (Exposition Park-USC), Westwood and Central City areas was performed by analyzing traffic volume and speed data collected along key routes during the period of the Olympic Games and several weeks after the conclusion of the Games when traffic flows had stabilized to "typical" summertime conditions. The analysis includes tables and graphs of traffic volumes and route speeds for each area, and vehicle occupancy data for the Coliseum area.

For purposes of this evaluation, absolute value of the traffic volume and speed data are not important since the collected data do not permit a concise and detailed statement of where and when existing roadway capacity was exceeded and delay experienced. What is meaningful in understanding the performance of the transportation system during the Olympics is the relative change in volumes and speeds from the summer 1984 base condition. Since the volumes and speeds are representative of areawide traffic as a whole during each period, a comparative evaluation allows conclusions to be drawn regarding the impact of the Olympics on transportation.

The following material presents a "snapshot" look at traffic operations and aids in understanding the beneficial effects of the efforts by the Los Angeles City Department of Transportation (LADOT) in developing, implementing and operating the various components of its Olympic Transportation Plan.

IV.3.1 Coliseum Area

Automatic (24-hour) traffic volume data were collected at 13 locations within the Coliseum area during the Olympic Games on August 16, 1984 and again during the week of September 17, 1984, prior to the beginning of the fall term at USC, to correspond to the Olympic period condition when classes were not in session. The traffic count locations and corresponding 24-hour traffic volumes are shown in Table IV-9. These summary data indicate that during the Olympics a volume increase on the order of 10 percent was experienced and that the most significant increase occurred on Normandie Avenue, a designated primary access route for Olympic spectators to the Coliseum Complex.

Table IV-10 provides the volume data for the 13 locations aggregated on an hour-by-hour basis and quantifies the volume and percent change from the typical to the Olympic conditions. Figure IV-3 presents the same information plotted graphically to represent a comparative view of traffic volume profiles for the Coliseum area. As indicated by this data during the Olympics the volumes decreased between 6 a.m.-9 a.m. and 4 p.m.-7 p.m. while all other hourly volumes increased.

Average operating speeds were also determined for several streets in the Coliseum area. The speeds were calculated from travel time runs made on August 6, 1984 and on August 29, 1984 for the midday (11 a.m.-1 p.m.) and afternoon peak (4 p.m.-6 p.m.) periods. The routes driven and the route average operating speeds are shown in Table IV-11. These data show that in nearly all cases traffic speeds during the Olympics were slower than during typical conditions with no activity in the Coliseum Complex. With some minor exceptions, speeds decreased on all streets studied in the Coliseum area. The decreases ranged from 9.0 percent to 66.9 percent in the 11 a.m.-1 p.m. period, and from 3.2 percent to 49.8 percent in the 4 p.m.-6 p.m. period. The average Olympic period speed was 20 mph during the 11 a.m.-1 p.m. period, compared to 26.7 mph in the "typical" period, a reduction of 25.1 percent. During the 4 p.m.-6 p.m. period, the average Olympic speed was 16.9 mph, a reduction of 26.5 percent from the typical speed of 23.0 mph. During the Olympics, most measured speeds were near the averages listed, with the largest deviations occurring on southbound Figueroa Street between 38th Street and Vernon Avenue in both the 11 a.m.-1 p.m. and 4 p.m.-6 p.m. periods, on westbound Adams Boulevard during the 4 p.m.-6 p.m. period, and on southbound Figueroa Street between 11th and 38th Streets during the 4 p.m.-6 p.m. period. The section of Figueroa Street between 11th and 38th Streets was one way southbound, while the section southerly from 38th Street to Vernon Avenue was two way. The large reduction in southbound Figueroa Street speeds in both of these sections can be attributed to pedestrian activity on the reach of Figueroa Street between Jefferson and Martin Luther King Boulevards, which is directly adjacent to the Coliseum and USC. This portion of Figueroa was impacted by large numbers of pedestrians crossing from the Coliseum complex to the many sales booths set up on the east side of Figueroa.

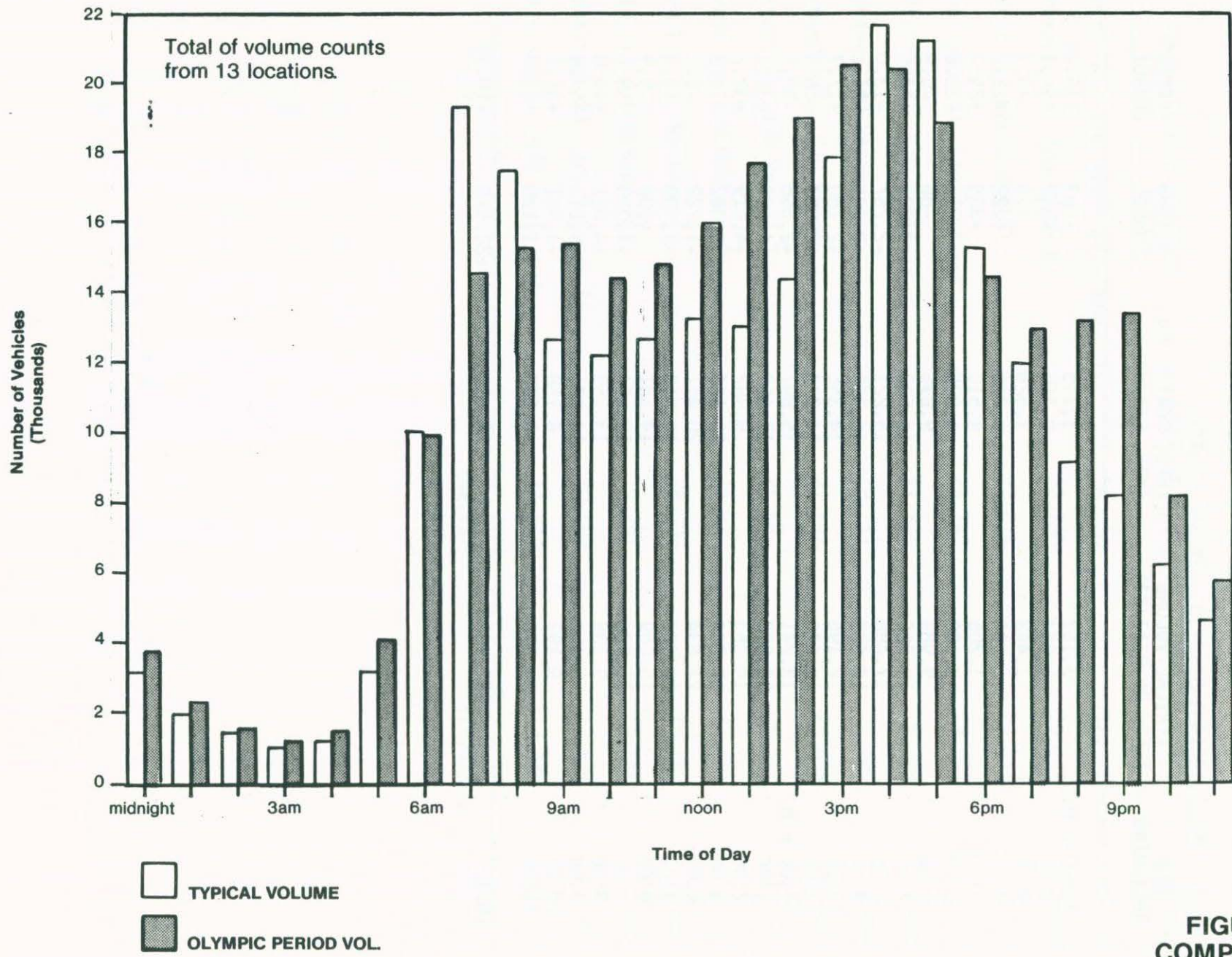
Table IV-12 shows vehicle occupancy data collected at two locations on August 11, 1984, and at three locations (parking lot driveways) adjacent to the coliseum on March 6, 1983 during the spectator arrival period for a professional football game. The data collected on Western Avenue at Adams Boulevard are not representative of Olympic spectator traffic as a whole, since this location is not proximate to any venue, and the traffic stream would include some proportion of regular Saturday traffic in the area. The other study data, from Figueroa Street at Adams Boulevard, can be considered to be a measurement of almost exclusively Olympic traffic, because of the proximity to the Exposition Park-USC venues and the nearly total use of this portion of Figueroa Street by spectator traffic.

TABLE IV-9
24-HOUR TRAFFIC VOLUMES: COLISEUM AREA

TRAFFIC COUNT LOCATION	TYPICAL VOLUME (WEEK OF 9/17/84)	OLYMPIC PERIOD VOLUME (MON. 8/6/84)	VOLUME CHANGE	PERCENT CHANGE
Western Av. N/O Adams Bl. (N/B only)	14,028	17,197	+3,169	+22.6
Normandie Av. N/O Adams Bl.	22,730	39,768	+17,038	+75.0
Hoover St. N/O Adams Bl.	27,019	24,845	-2,174	-8.0
Washington Bl. E/O Broadway	28,749	24,659	-90	-0.3
Jefferson Bl. E/O Broadway	11,224	9,339	-1,885	-16.8
Broadway S/O Vernon Av.	18,241	22,486	-4,245	-23.3
Normandie Av. S/O Vernon Av.	21,696	25,696	+4,000	+18.4
Western Av. S/O Vernon Av.	25,683	28,647	+2,964	+11.5
Vernon Av. W/O Western Av.	15,923	19,289	+3,366	+21.1
King Bl. W/O Western Av.	28,003	25,263	-2,740	-9.8
39th St. E/O Western Av.	4,347	4,666	+319	+7.3
Exposition Bl. W/O Western Av.	20,480	19,237	-1,243	-6.1
Jefferson Bl. W/O Western Av.	14,814	13,420	-1,394	-9.4
TOTAL	252,937	278,512	+25,575	+10.1

TABLE IV-10
COLISEUM AREA TRAFFIC VOLUMES
(Sum of 13 Locations)

HOUR BEGINNING	TYPICAL VOLUME (WEEK OF 9/17/84)	OLYMPIC PERIOD VOL. (MON. 8/6/84)	VOLUME CHANGE	PERCENT CHANGE
12:00 A.M.	3,162	3,745	+583	+18.4%
1:00	1,954	2,269	+315	+16.1
2:00	1,448	1,526	+78	+5.4
3:00	998	1,220	+222	+22.2
4:00	1,205	1,510	+305	+25.3
5:00	3,180	4,095	+815	+28.8
6:00	9,984	9,898	-86	-0.9
7:00	19,328	14,532	-4,796	-24.8
8:00	17,488	15,221	-2,267	-13.0
9:00	12,673	15,358	+2,685	+21.2
10:00	12,196	14,356	+2,160	+17.7
11:00	12,675	14,772	+2,097	+16.5
12:00 P.M.	13,241	15,897	+2,656	+20.1
1:00	13,033	17,657	+4,624	+35.5
2:00	14,363	18,982	+4,619	+32.2
3:00	17,864	20,526	+2,662	+14.9
4:00	21,634	20,411	-1,223	-5.7
5:00	21,227	18,818	-2,409	-11.3
6:00	15,289	14,381	-908	-5.9
7:00	11,926	12,954	+1,028	+8.6
8:00	9,138	13,159	+4,021	+44.0
9:00	8,158	13,371	+5,213	+63.9
10:00	6,197	8,158	+1,961	+31.6
11:00	4,576	5,696	+1,120	+24.4
TOTAL	252,937	278,512	+25,575	+10.1%



**FIGURE IV - 3
COMPARISON OF
HOURLY TRAFFIC
VOLUMES
COLISEUM AREA**

TABLE IV-11
OLYMPICS SPEED STUDY
COLISEUM AREA

ROUTE STUDIED			AVERAGE TRAVEL SPEED (MPH)					
STREET DRIVEN	FROM	TO	11 A.M.-1 P.M.			4 P.M.-6 P.M.		
			TYPICAL	OLYMPIC	% CHANGE	TYPICAL	OLYMPIC	% CHANGE
Adams	Broadway	Western	24.5	19.5	-20.4	23.1	11.6	-49.8
Adams	Western	Broadway	25.4	21.9	-13.8	20.1	20.4	+1.5
Western	Washington	Vernon	25.6	21.8	-14.8	21.7	16.2	-25.3
Western	Vernon	Washington	24.9	19.9	-20.1	28.2	21.0	-25.5
Broadway	Vernon	Pico	23.3	21.2	-9.0	23.8	17.8	-25.2
Broadway	Pico	Vernon	27.4	20.1	-26.6	20.3	15.6	-23.2
Vernon	Western	Broadway	30.6	20.7	-32.4	25.9	20.0	-22.8
Vernon	Broadway	Western	27.0	18.9	-30.0	19.9	17.2	-13.6
Figueroa	11th	38th	29.4	21.7	-26.2	23.6	13.0	-44.9
Flower	38th	11th	22.6	22.5	0.0	21.8	21.1	-3.2
Figueroa	38th	Vernon	26.9	8.9	-66.9	20.6	10.7	-48.1
Figueroa	Vernon	38th	28.9	17.2	-40.5	25.0	15.2	-39.2
Normandie	Washington	Vernon	28.3	25.1	-11.3	21.9	16.4	-25.1
Normandie	Vernon	Washington	29.2	20.9	-28.4	26.7	20.0	-25.1

TABLE IV-12
VEHICLE OCCUPANCY

EXPOSITION PARK-USC AREA

DATE	LOCATION	NUMBER OF VEHICLES	NUMBER OF PERSONS	AVERAGE VEHICLE OCCUPANCY	AREA AVERAGE VEHICLE OCCUPANCY
Sat. 8/11/84	S/B Figueroa N/O Jefferson	7,189	17,919	2.49	2.26
Sat. 8/11/84	S/B Western S/O Adams	6,240	12,481	2.0	
Sun. 3/6/83	S/B Menlo N/O 39th	1,083	2,904	2.68	2.69
Sun. 3/6/83	N/B Hoover N/O King	732	1,972	2.69	
Sun. 3/6/83	E/B 36th E/O Vermont	145	390	2.69	

IV.3.2 Westwood Area

Automatic (24-hour) traffic volume data were collected at 15 locations in the Westwood area. During the Olympics they were collected on July 31, 1984 when three separate ticketed Gymnastics competitions were held at U.C.L.A. The data were collected again during the week of September 24, 1984, prior to the beginning of the fall term at U.C.L.A., to correspond to the Olympic period condition when classes were not in session. The traffic count locations and corresponding 24-hour traffic volumes are shown in Table IV-13. These data indicate that on a representative Olympics period weekday, traffic volumes in the Westwood area were nearly six percent lower than the volumes on a typical summertime weekday.

TABLE IV-13
24-HOUR TRAFFIC VOLUMES: WESTWOOD AREA

TRAFFIC COUNT LOCATION	TYPICAL VOLUME (WEEK OF 9/24/84)	OLYMPIC PERIOD VOLUME (TUES. 7/31/84)	VOLUME CHANGE	PERCENT CHANGE
Beverly Glen Bl. N/O Sunset Bl.	17,290	16,968	-322	-1.9%
Beverly Glen Bl. N/O Wilshire Bl.	14,805	15,024	+219	+1.5
Beverly Glen Bl. S/O Santa Monica Bl. (So. Rdwy.)	16,753	16,143	-610	-3.6
Montana Av. W/O Veteran Av.	13,411	8,445	-4,966	-37.0
Ohio Av. W/O Veteran Av. (W/B only)	9,422	10,442	+1,020	+10.8
Santa Monica Bl. (No. Rdwy.) W/O Veteran Av.	49,957	45,378	-4,579	-9.2
Selby Av. N/O Wilshire Bl.	6,551	5,519	-1,032	-15.8
Sunset Bl. E/O Thurston Av.	39,664	41,738	+2,084	+5.3
Veteran Av. S/O Sunset Bl.	10,471	11,447	+976	+9.3
Veteran Av. N/O Wilshire Bl.	27,887	17,757	-10,130	-36.3
Veteran Av. S/O Santa Monica Bl. (So. Rdwy.)	8,123	7,389	-734	-9.0
Westwood Bl. S/O Santa Monica Bl. (So. Rdwy.)	29,442	26,746	-2,696	-9.2
Wilshire Bl. W/O Veteran Av.	105,788	93,027	-12,761	-12.1
Wilshire Bl. W/O Westwood Bl.	64,016	68,593	+4,577	+7.1
Wilshire Bl. E/O Beverly Glen Bl.	50,615	52,987	+2,372	+4.7
TOTAL	464,185	437,603	-26,582	-5.7%

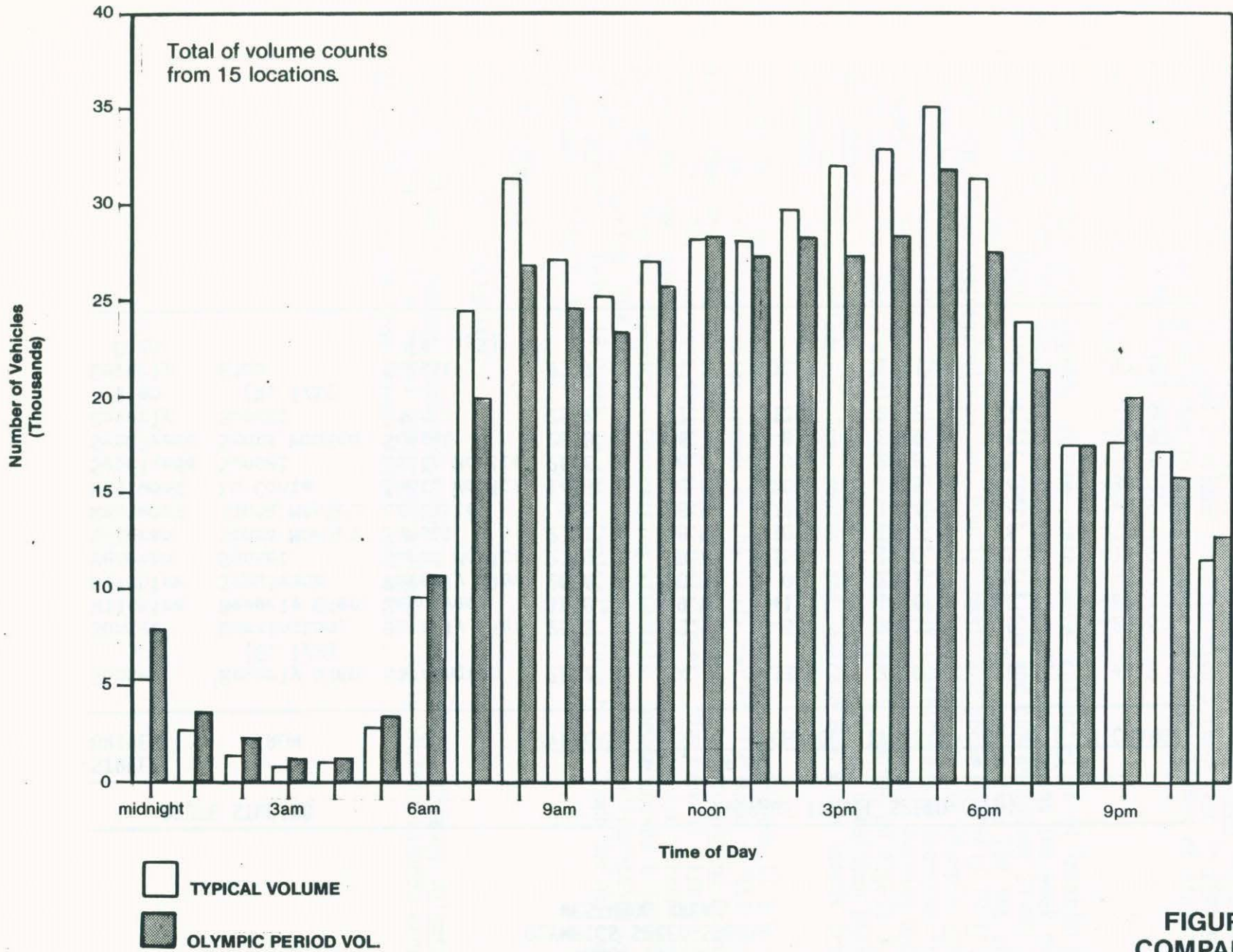
The volume data for the 15 locations were also aggregated on an hour-by-hour basis (see Table IV-14) and plotted graphically (see Figure IV-4) to present 24-hour volume distributions for the Westwood area. Figure IV-4 also includes the non-Olympic period traffic profile previously presented in Chapter III, for comparison.

Average operating speeds for six streets in the Westwood area were calculated from travel time runs made on Tuesday, July 31, 1984 (Olympic period) and Tuesday, September 15, 1984 (typical condition). The routes studied and the average operating speeds for the midday (11 a.m. to 1 p.m.) and afternoon (4 p.m. to 6 p.m.) peak periods are shown in Table IV-15.

While the collected volume data indicate a relative volume decrease of approximately six percent, examination of Table IV-13 shows that nearly all of this reduction was due to decreases on Wilshire Boulevard west of Veteran Avenue and on Veteran Avenue north of Wilshire Boulevard. Volume data collected at other locations do not show an overall pattern of increase or decrease during the Olympics in the U.C.L.A.-Westwood area. However, Table IV-14 shows that areawide volumes generally increased during the nighttime (9 p.m. to 7 a.m.) hours and decreased during daytime hours, including the peak period. During the 11 a.m. to 1 p.m. and 4 p.m. to 6 p.m. periods, areawide traffic volumes decreased 2.3 percent and 11.4 percent, respectively. Changes in speed during the corresponding periods included a 3.2 percent reduction during 11 a.m. to 1 p.m. (22.05 to 21.34 mph) and an

TABLE IV-14
WESTWOOD AREA TRAFFIC VOLUMES
(Sum of 15 Locations)

HOUR BEGINNING	TYPICAL VOLUME (WEEK OF 9/24/84)	OLYMPIC PERIOD VOL. (MON. 7/31/84)	VOLUME CHANGE	PERCENT CHANGE
12:00 A.M.	5,279	7,918	+2,639	+50.0%
1:00	2,672	3,616	+944	+35.3
2:00	1,348	2,278	+930	+69.0
3:00	817	1,245	+428	+52.4
4:00	1,037	1,255	+218	+21.0
5:00	2,859	3,444	+585	+20.5
6:00	9,526	10,770	+1,244	+13.1
7:00	24,563	19,989	-4,574	-18.6
8:00	31,429	26,891	-4,538	-14.4
9:00	27,189	24,652	-2,537	-9.3
10:00	25,274	23,380	-1,894	-7.5
11:00	27,093	25,716	-1,377	-5.1
12:00 P.M.	28,189	28,274	+85	+0.3
1:00	28,061	27,312	-749	-2.7
2:00	29,821	28,259	-1,562	-5.2
3:00	32,007	27,331	-4,676	-14.6
4:00	32,872	28,421	-4,451	-13.5
5:00	35,052	31,778	-3,274	-9.3
6:00	31,331	27,521	-3,810	-12.2
7:00	23,908	21,501	-2,407	-10.1
8:00	17,507	17,459	-48	-0.3
9:00	17,640	20,044	+2,404	+13.6
10:00	17,151	15,808	-1,343	-7.8
11:00	11,560	12,741	+1,181	+10.2
TOTAL	464,185	437,603	-26,582	-5.7%



**FIGURE IV - 4
COMPARISON OF
HOURLY
TRAFFIC VOLUMES
WESTWOOD AREA**

TABLE IV-15
OLYMPICS SPEED STUDY
WESTWOOD AREA

ROUTE STUDIED			AVERAGE TRAVEL SPEED (MPH)					
STREET DRIVEN	FROM	TO	11 A.M.-1 P.M.			4 P.M.-6 P.M.		
			TYPICAL	OLYMPIC	% CHANGE	TYPICAL	OLYMPIC	% CHANGE
Sunset	Beverly Glen (E. I/S)	Barrington	28.2	24.4	-13.5	26.0	26.3	+1.2
Sunset	Barrington	Beverly Glen	25.3	23.9	-5.5	24.3	18.1	-25.5
Wilshire	Beverly Glen	Sepulveda	18.8	19.0	+1.1	15.6	19.1	+22.4
Wilshire	Sepulveda	Beverly Glen	20.6	20.7	0.0	24.1	22.9	-5.0
Veteran	Sunset	Santa Monica	21.9	18.6	-15.1	19.0	15.6	-17.9
Veteran	Santa Monica	Sunset	21.1	18.9	-10.4	18.7	16.7	-10.7
Westwood	Santa Monica	Le Conte	9.5	16.9	+77.9	14.4	15.1	+4.9
Westwood	Le Conte	Santa Monica	14.9	18.0	+20.8	10.5	14.6	+39.0
Sepulveda	Sunset	Santa Monica	26.6	26.5	0.0	28.8	25.5	-11.5
Sepulveda	Santa Monica	Sunset	28.8	26.3	-8.7	24.9	15.7	-36.9
Beverly Glen	Sunset (N. I/S)	Pico	25.2	21.7	-13.9	22.2	21.1	-5.0
Beverly Glen	Pico	Sunset (N. I/S)	23.7	21.2	-10.5	17.1	14.1	-17.5

8.5 percent reduction during 4 p.m. to 6 p.m. (20.47 to 18.73 mph). The most critical east-west route, Wilshire Boulevard, experienced an average volume decrease during the Olympics and a corresponding speed increase. Sunset Boulevard experienced a volume increase with a reduction in average speed. This was possibly due to the presence of large volumes of athlete buses traveling along Sunset Boulevard.

IV.3.3 Central City Area

Automatic (24-hour) traffic volume data were collected at 14 locations within the Central City area on August 3, 1984 and during the week of September 17, 1984. The traffic count locations and corresponding 24-hour traffic volumes are shown in Table IV-16. The volume data for the 14 locations were aggregated on an hourly basis and shown in Table IV-17. Figure IV-5 presents a comparison of the volume profiles for the Olympic and non-Olympic conditions. This figure shows a peak traffic period decrease in volumes during the Olympic Games and an increase during evening and nighttime hours. Speed studies were conducted along six routes on August 3, and September 21, 1984 for the midday (11 a.m.-1 p.m.) and afternoon peak (4 p.m.-6 p.m.) periods. The routes and average operating speeds are presented in Table IV-18.

Figure IV-5 reveals minimal changes in measured volumes during the 11 a.m.-1 p.m. period. Vehicular speeds on the study routes also show relatively minor changes, ranging from a 15.0 percent reduction on northbound Grand Avenue to a 22.3 increase on eastbound First Street. The overall "typical" speed average during this period was 19.9 mph, increasing 1.0 percent to 20.1 mph during the Olympics. Contrasting with this, speeds showed a larger variation during the 4 p.m.-6 p.m. period, with the average increasing by 16.9 percent, from 16.0 mph in the "typical" study to 18.7 mph during the Olympics. Volumes, however, decreased by a greater amount.

IV.4 Freeways

IV.4.1 Traffic Volumes

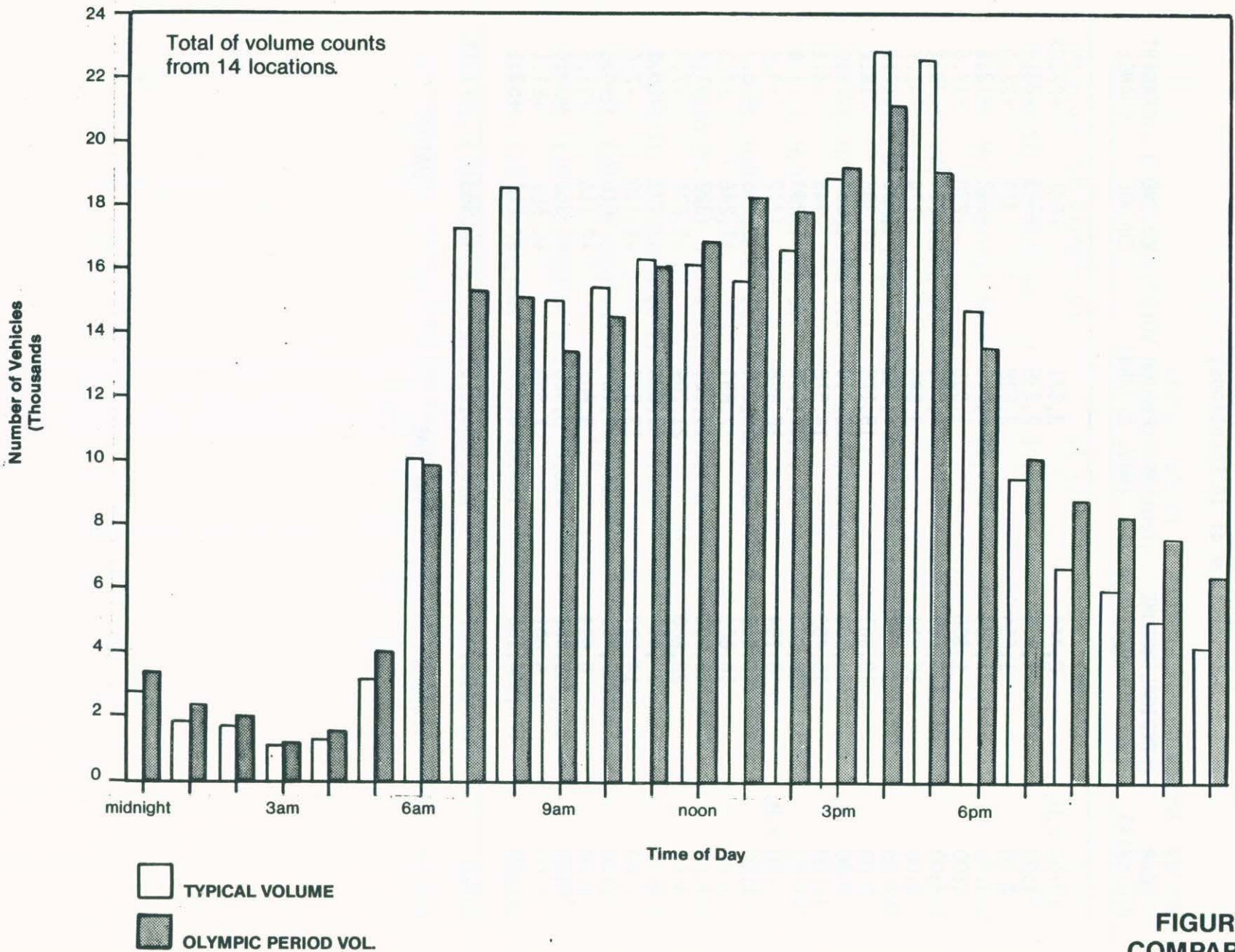
As the Olympic Games commenced, contrary to projections, freeway volumes indicated a drop from normal summertime volumes. Daily traffic volumes were down by 2-3 percent from normal August conditions.

TABLE IV-16
24-HOUR TRAFFIC VOLUMES: CENTRAL CITY AREA

TRAFFIC COUNT LOCATION	TYPICAL VOLUME (WEEK OF 9/17/84)	OLYMPIC PERIOD VOLUME (TUES. 8/3/84)	VOLUME CHANGE	PERCENT CHANGE
Main St. N/O Olympic Bl.	21,154	29,401	+8,247	+39.0%
Flower St. S/O 8th St.	14,807	16,921	+2,114	+14.3
8th St. W/O Figueroa St.	22,748	21,448	-1,300	-5.7
7th St. W/O Figueroa St.	16,874	17,270	+396	+2.3
Wilshire Bl. W/O Figueroa St.	21,353	15,561	-5,792	-27.1
5th St. W/O Figueroa St.	28,058	31,437	+3,379	+12.0
2nd St. W/O Figueroa St.	19,161	19,536	+375	+2.0
1st St. W/O Figueroa St.	21,935	15,539	-6,396	-29.2
N. Main St. N/O Temple St.	15,248	14,785	-463	-3.0
Temple St. E/O Los Angeles St.	14,389	-263	-2.0	
1st St. E/O Los Angeles St.	22,692	22,257	-435	-1.9
4th St. E/O Los Angeles St.	10,509	10,982	+473	+4.5
6th St. E/O Los Angeles St.	16,981	22,053	+5,072	+29.9
7th St. E/O Los Angeles St.	18,418	15,900	-2,518	-13.7
TOTAL	263,327	266,216	+2,889	+1.1%

TABLE IV-17
CENTRAL CITY AREA TRAFFIC VOLUMES
(Sum of 14 Locations)

HOUR BEGINNING	TYPICAL VOLUME (WEEK OF 9/21/84)	OLYMPIC PERIOD VOL. (MON. 8/3/84)	VOLUME CHANGE	PERCENT CHANGE
12:00 A.M.	2,744	3,371	+627	+22.8%
1:00	1,815	2,338	+523	+28.8
2:00	1,654	2,028	+374	+22.6
3:00	1,084	1,226	+142	+13.1
4:00	1,306	1,536	+230	+17.6
5:00	3,169	4,063	+894	+28.2
6:00	10,054	9,880	-174	-1.7
7:00	17,327	15,342	-1,985	-11.5
8:00	18,561	15,175	-3,386	-18.2
9:00	15,064	13,410	-1,654	-11.0
10:00	15,463	14,518	-945	-6.1
11:00	16,302	16,039	-263	-1.6
12:00 P.M.	16,154	16,896	+742	+4.6
1:00	15,653	18,268	+2,615	+16.7
2:00	16,605	17,851	+1,246	+7.5
3:00	18,901	19,223	+322	+1.7
4:00	22,880	21,209	-1,671	-7.3
5:00	22,587	19,096	-3,491	-15.5
6:00	14,693	13,577	-1,116	-7.6
7:00	9,492	10,107	+615	+6.5
8:00	6,694	8,807	+2,113	+31.6
9:00	5,958	8,320	+2,362	+39.6
10:00	5,001	7,558	+2,557	+51.1
11:00	4,166	6,377	+2,211	+53.1
TOTAL	263,327	266,215	+2,888	+1.1%



**FIGURE IV - 5
COMPARISON OF
HOURLY
TRAFFIC VOLUMES
CENTRAL CITY AREA**

TABLE IV-18
OLYMPICS SPEED STUDY
CENTRAL CITY AREA

ROUTE STUDIED			AVERAGE TRAVEL SPEED (MPH)					
STREET DRIVEN	FROM	TO	11 A.M.-1 P.M.			4 P.M.-6 P.M.		
			TYPICAL	OLYMPIC	% CHANGE	TYPICAL	OLYMPIC	% CHANGE
Sunset/ Macy	Echo Park	Mission	25.5	26.0	+2.0	21.4	23.8	+11.2
Macy/ Sunset	Mission	Echo Park	24.0	25.4	+5.8	18.7	23.5	+25.7
First	Witmer	Boyle	19.3	23.6	+22.3	19.0	20.2	+6.3
First	Boyle	Witmer	21.5	21.8	+1.4	20.3	19.4	-4.4
Olympic	Vermont	Main	23.2	21.9	-5.6	17.4	20.3	+16.7
Olympic	Main	Vermont	21.2	23.4	+10.4	14.9	21.0	+40.9
Hope/ Flower	Temple	11th	15.4	16.9	+9.7	12.2	15.4	+26.2
Flower/ Hope	11th	Temple	13.4	12.3	-8.2	12.2	17.1	+40.2
Main	9th	Sunset	22.4	19.6	-12.5	14.3	19.8	+38.5
Spring	Sunset	9th	20.2	19.2	-5.0	15.4	13.3	-13.6
Grand	Sunset	Olympic	16.3	17.0	+4.3	13.5	14.8	+9.6
Grand	Olympic	Sunset	16.7	14.2	-15.0	12.6	15.6	+23.8

Table IV-19 and Figure IV-6 indicate the variation in daily traffic volumes as registered by the traffic monitoring network on the 42 mile loop freeway system (Figure III-10). The dashed line through the graph in Figure IV-6 represents the August 1983 average daily volume level for comparison purposes.

TABLE IV-19
 VARIATION IN OLYMPIC PERIOD
 FREEWAY VOLUMES COMPARED
 TO NORMAL AUGUST CONDITIONS

<u>DAY</u>	<u>DATE</u>	<u>VOLUME DIFFERENCE</u>
SAT	7-28	-25%
SUN	7-29	-25%
MON	7-30	- 3%
TUE	7-31	- 1%
WED	8- 1	0%
THU	8- 2	0%
FRI	8- 3	+ 2%
SAT	8- 4	- 6%
SUN	8- 5	-13%
MON	8- 6	+ 5%
TUE	8- 7	+ 5%
WED	8- 8	+ 8%
THU	8- 9	+ 8%
FRI	8-10	+11%

As seen on the graph, by Wednesday, August 1 the combined background and Olympic Traffic was about equal to pre-Olympic daily volumes. On Friday, August 3, with the beginning of the Coliseum events, the average daily traffic (ADT) rose to slightly above normal (+2%).

The second week of the games began with a 5 percent increase in daily volumes on the freeway system. The ADT rose to 8 percent above normal on Wednesday, August 8. Daily volumes continued to climb and peaked at 11 percent above normal by Friday, August 11 before the end of the Games.

Peaking patterns of freeway traffic during the first week of the Games demonstrated drastic changes from normal conditions. The a.m. peak was flatter and was beginning 30-45 minutes earlier. This caused the in a.m. peak one hour volumes to drop by as much as 7 percent below normal levels. Count stations were set up at several major interchanges to analyze the hourly variations in traffic. Results from two of these stations are indicated below. Figure IV-7 depicts the variation in hourly volumes on I-110 (Harbor Freeway) at El Segundo for Monday, Tuesday, and Thursday during and after the Games. Counts during the Games were taken for the second week of the Games when the overall daily volumes were higher than usual for that time of the year. Significant observations were as follows:

- o Generally volumes during the Games exhibit a flatter profile.

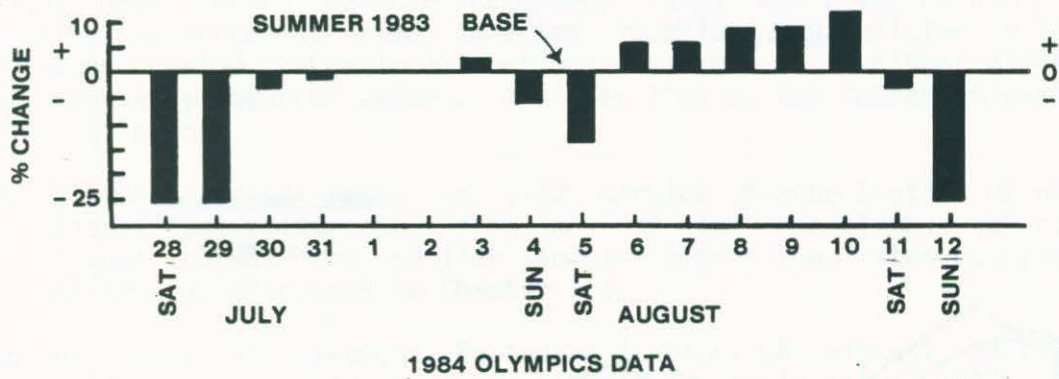
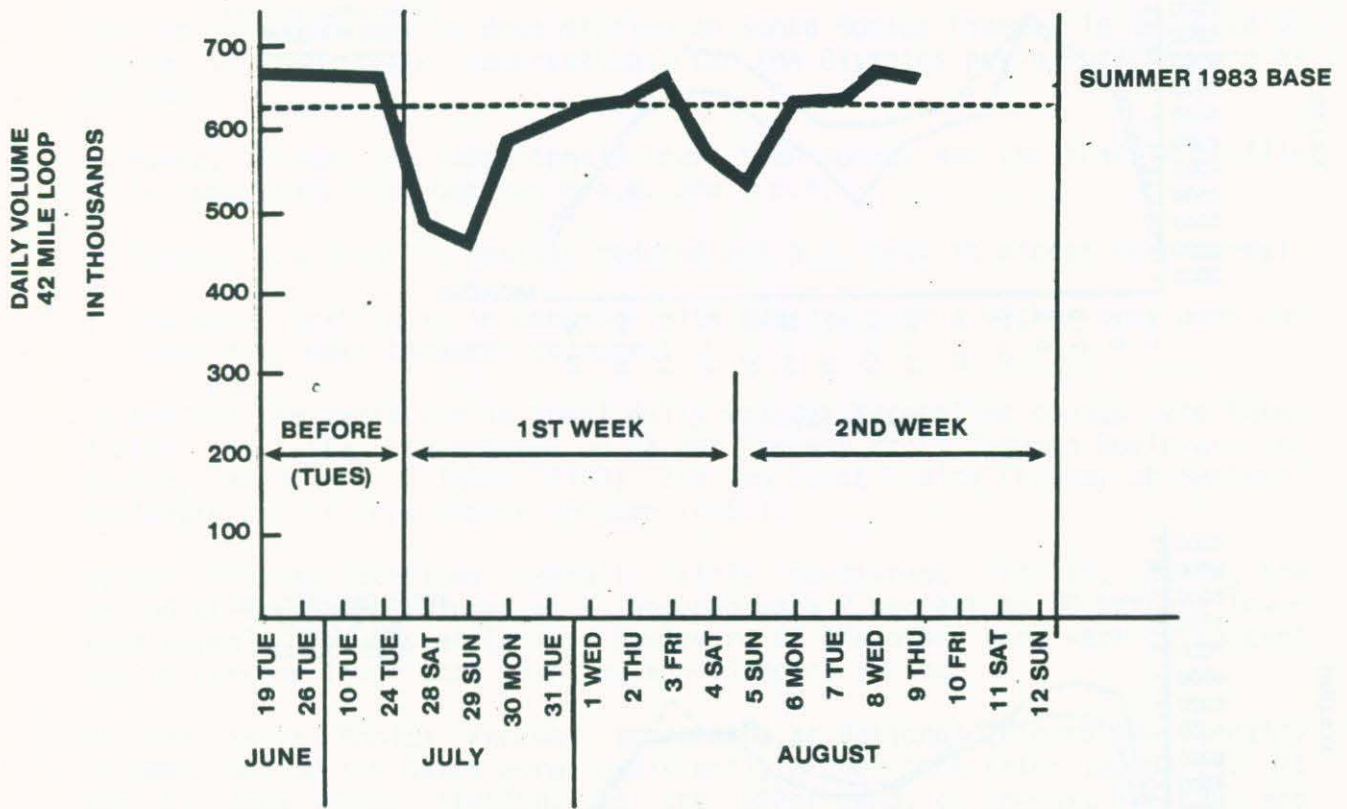
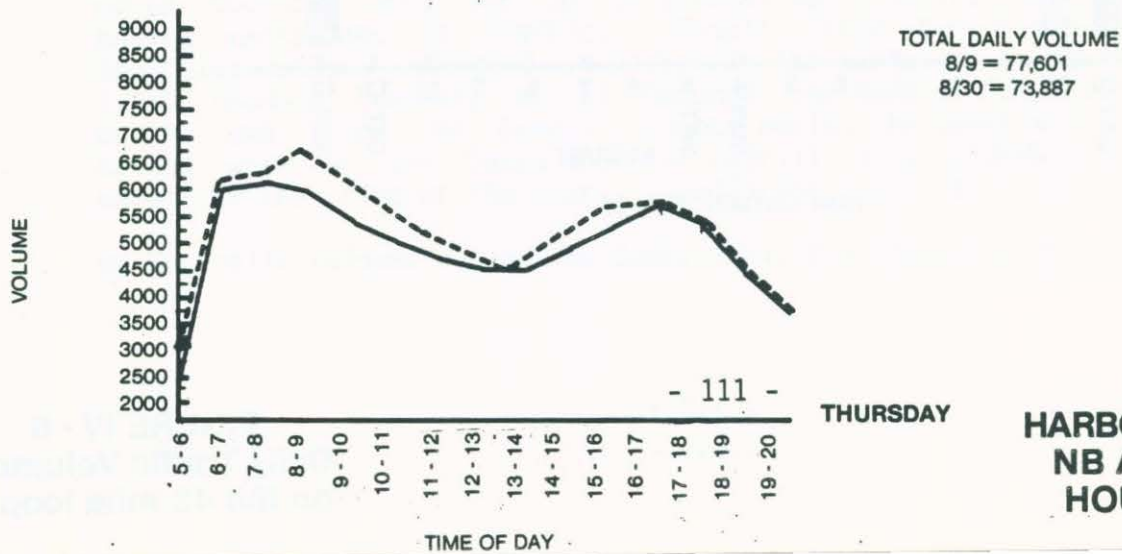
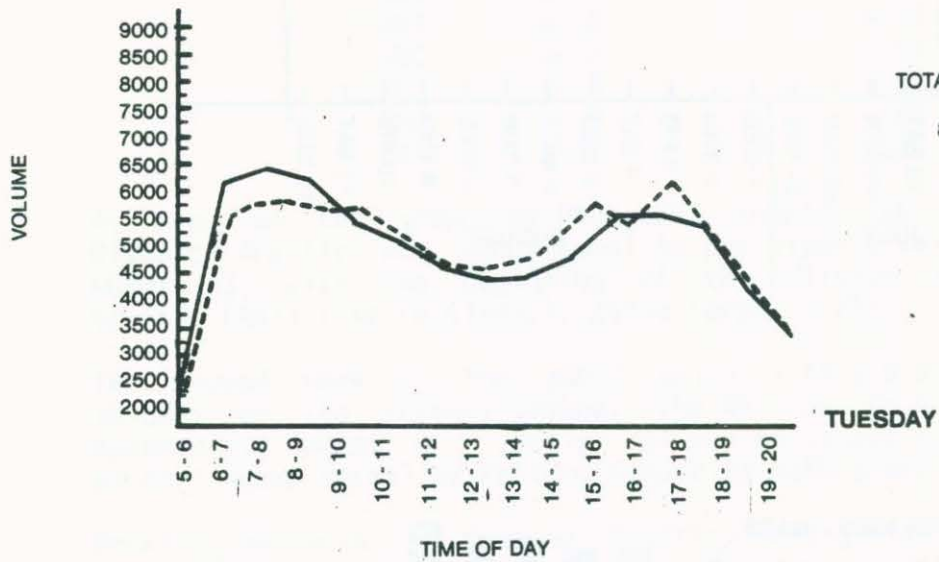
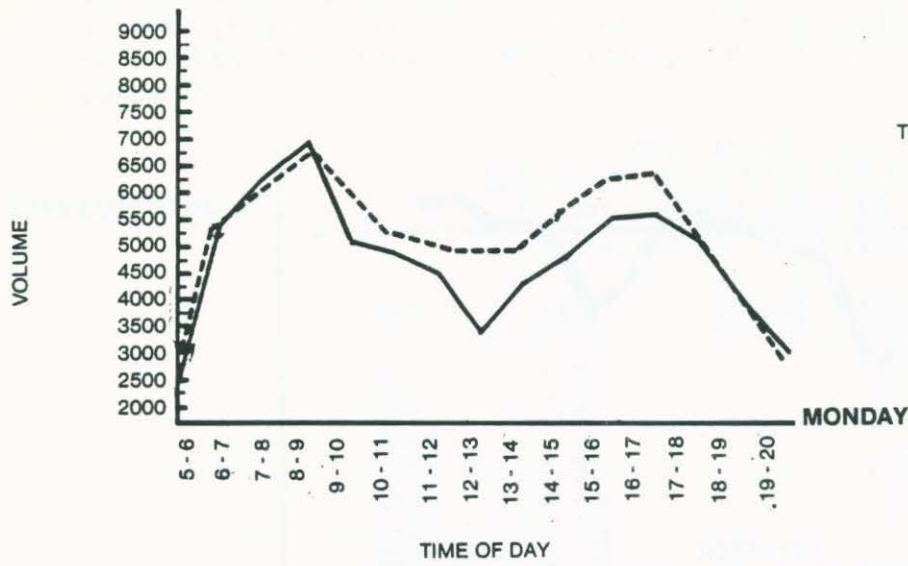


FIGURE IV - 6
Daily Traffic Volumes
on the 42 mile loop.



111

**FIGURE IV - 7
HARBOR FREEWAY (110)
NB AT EL SEGUNDO
HOURLY VOLUMES**

- o There is noticeably more traffic between 9 a.m. and 3 p.m. during the Games than usual.
- o P.M. peak periods during the games have consistently higher volumes. The volumes however are more evenly distributed than during usual p.m. peak periods.

Similar data from the La Brea station on Santa Monica Freeway is depicted on Figure IV-8. Major observations for the Olympics period traffic are as follows:

- o Monday volumes are consistently lower than normal and the traffic profile is remarkably flat between 8 a.m. and 7 p.m.
- o Tuesday a.m. peak is heavily reduced but p.m. peak is higher than normal
- o Thursday traffic is in contrast with Tuesday with a higher a.m. peak and lower p.m. peak compared to normal.

To analyze the variation in total daily volumes screenline counts were taken during and after the Games on Harbor Freeway at El Segundo Boulevard and Century Boulevard (Figure IV-9) and on Santa Monica Freeway at National Boulevard and La Brea Avenue (Figure IV-10).

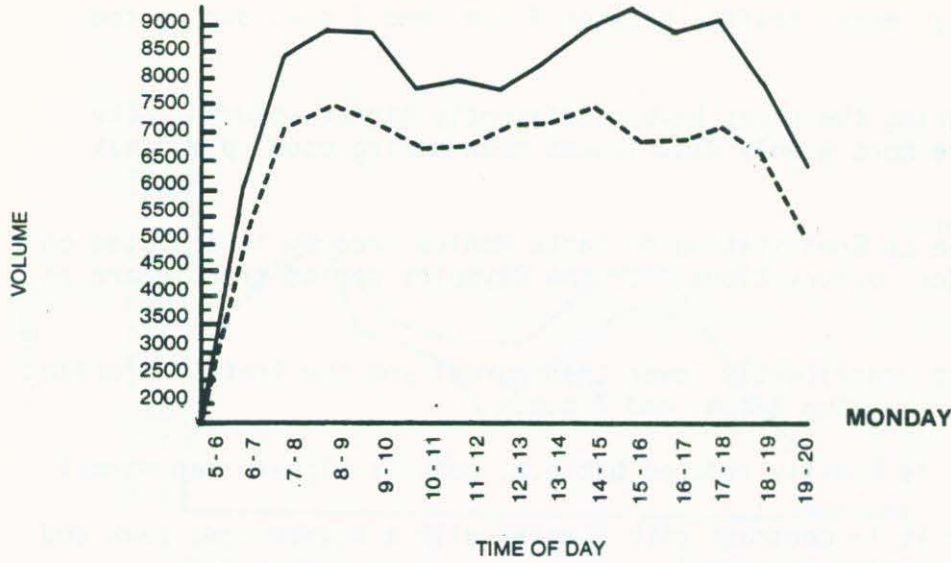
Harbor Freeway stations exhibit fairly consistent results. During the period of the Games volumes at El Segundo were 2 percent to 10 percent lower than normal. Volumes at Century Boulevard on the other hand were 10 percent and 30 percent lower than the non-Olympics period.

At the Santa Monica Freeway screenline at National (Figure IV-10) daily volumes during the Games were consistently higher than after the games. At the La Brea count station, on the other hand, on Monday, Tuesday, and Wednesday Olympic period volumes were lower, but on Thursday and Friday the Olympics period volumes were higher. In all cases, however, the variation in volumes was less than 20 percent.

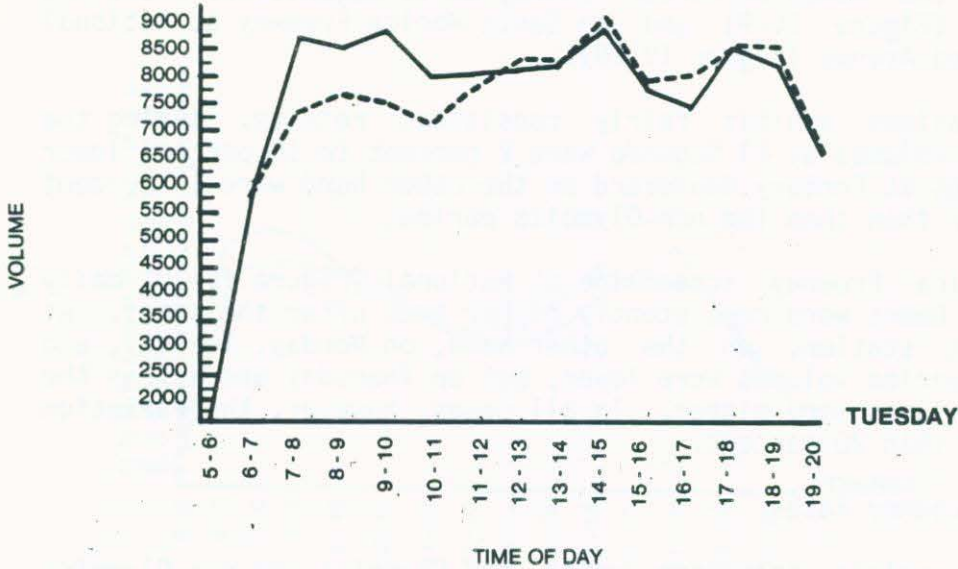
IV.4.2 Vehicle Occupancy Rates

A.M. peak period vehicle occupancy rates for Olympics and non-Olympics period observed at five selected locations are depicted in Table IV-20. Olympic period rates in all but one case seem to be either higher or equal to regularly observed values. A closer look at the numbers however, reveals the following:

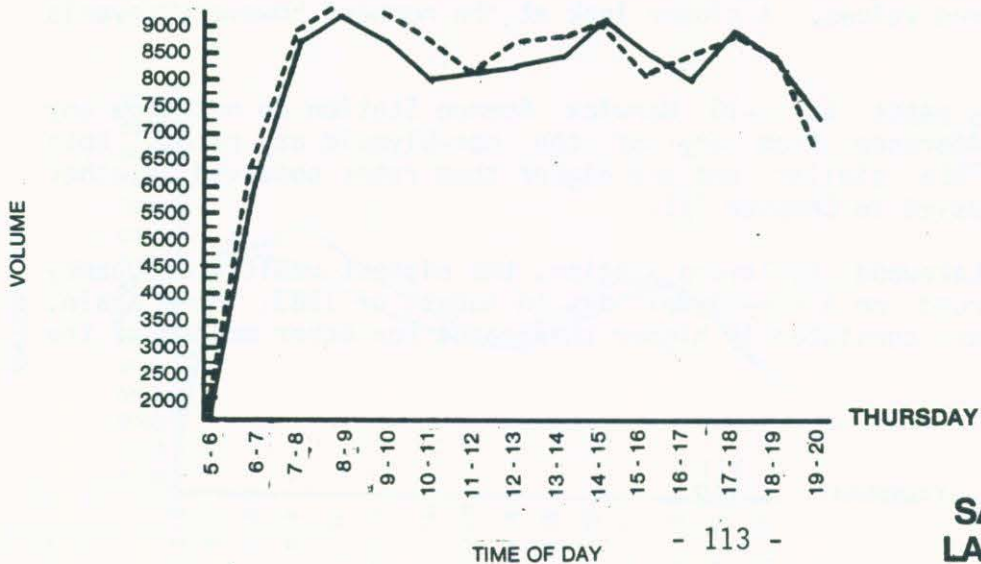
- o Olympic period rates at I-10 Warwick Avenue Station do not show any significant difference from any of the non-Olympic day rates. Both August counts are similar and are higher than rates observed in other months, as discussed in Chapter III.
- o At Route 91 Lakewood Boulevard Station, the highest vehicle occupancy rate was recorded on a non-Olympic day in August of 1983. Here again, August rates are consistently higher than rates for other months of the year.



TOTAL DAILY VOLUME
 8/6 = 95,394
 8/27 = 115,682

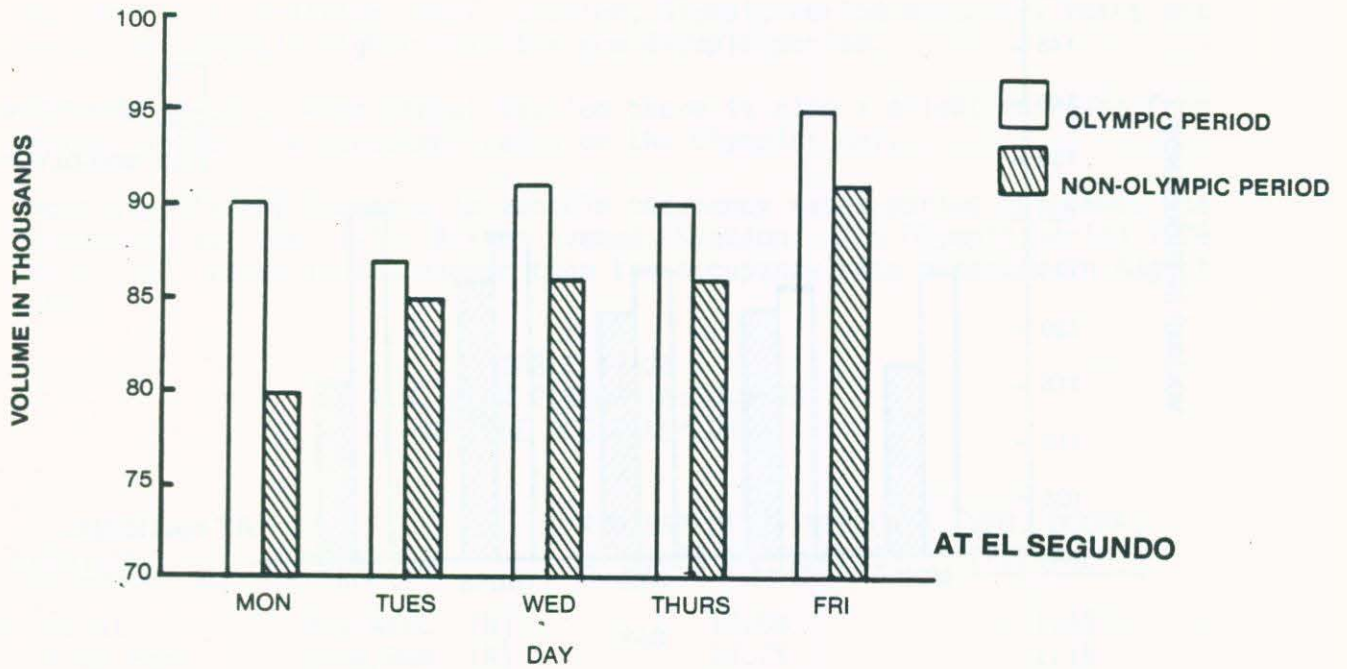


TOTAL DAILY VOLUME
 8/7 = 110,014
 8/28 = 114,254

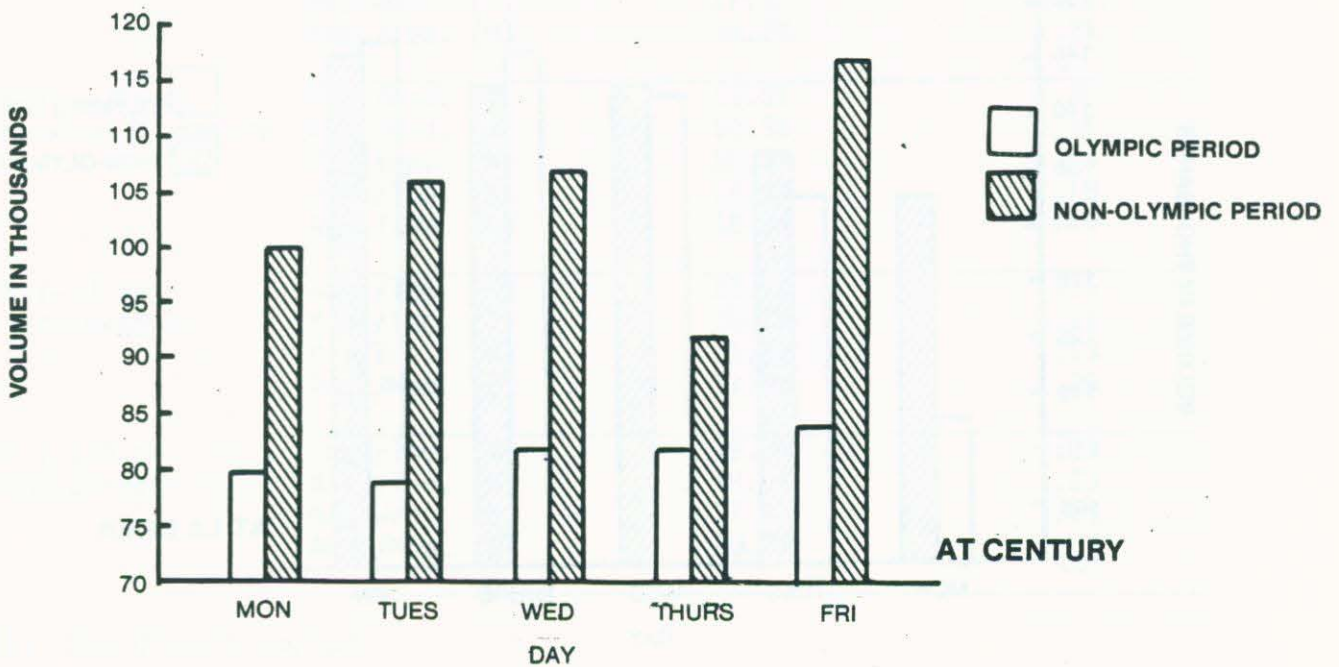


TOTAL DAILY VOLUME
 8/9 = 120,060
 8/30 = 117,661

FIGURE IV - 8
SANTA MONICA (10) EB AT
LA BREA HOURLY VOLUMES

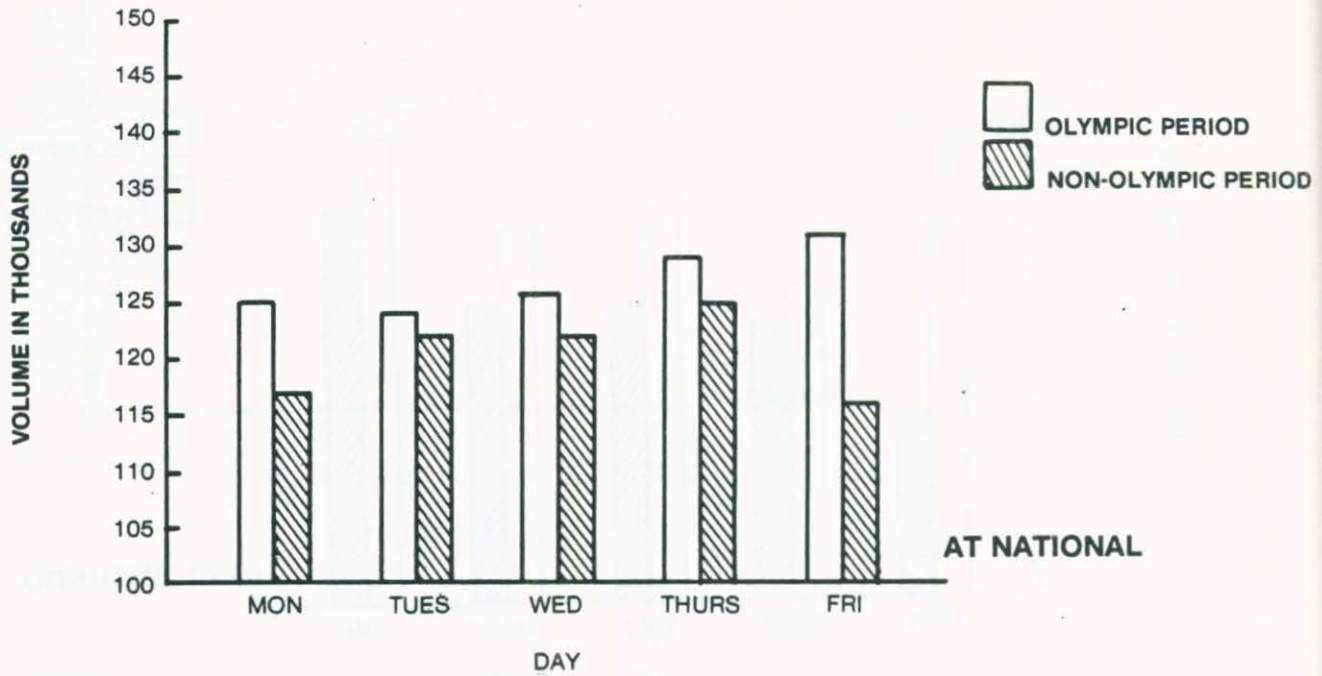


OLYMPIC PERIOD, AUGUST 6-10
 NON-OLYMPIC PERIOD, AUGUST 27-30, JUNE 30

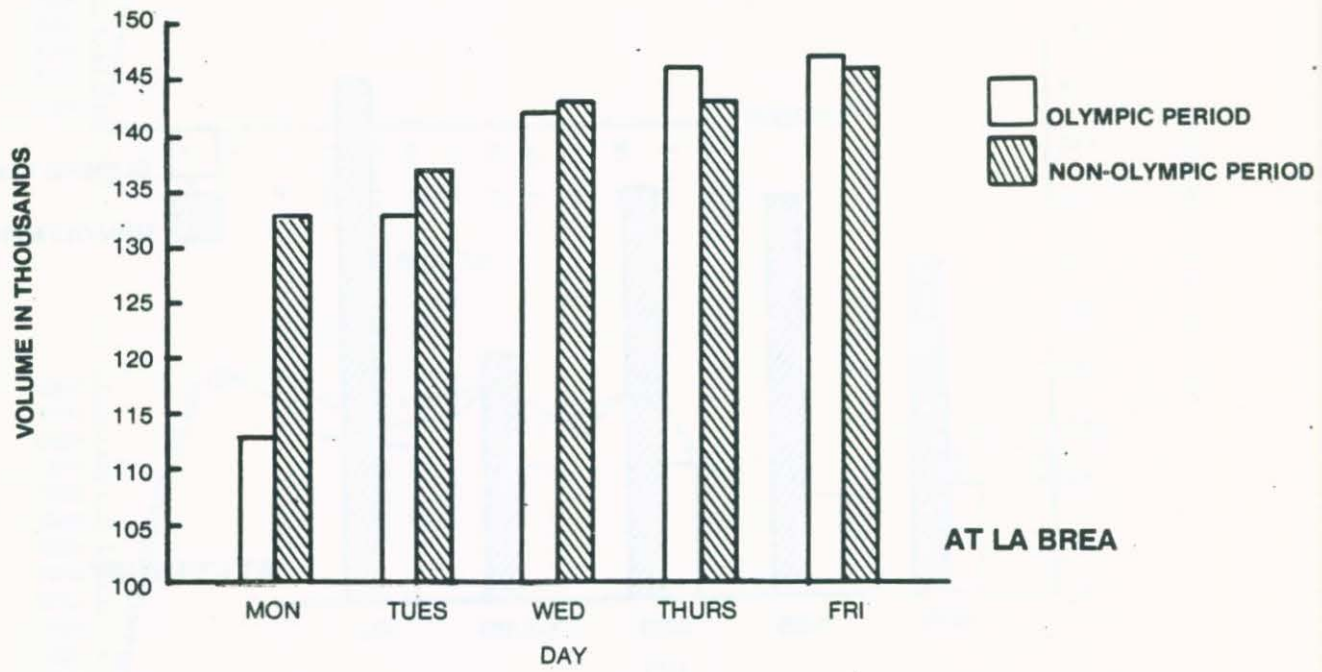


OLYMPIC PERIOD, AUGUST 6-10
 NON-OLYMPIC PERIOD, AUGUST 27-30, JUNE 30

FIGURE IV - 9
HARBOR FREEWAY NB
DAILY VOLUMES
MONDAY thru FRIDAY



OLYMPIC PERIOD, AUGUST 6-10
NON-OLYMPIC PERIOD, AUGUST 27-30, JUNE 30



OLYMPIC PERIOD, AUGUST 6-10
NON-OLYMPIC PERIOD, AUGUST 27-30, JUNE 30

FIGURE IV - 10
SANTA MONICA FREEWAY EB
DAILY VOLUMES
MONDAY thru FRIDAY

- o At the I-5 Griffith Park Station, Olympic period occupancy rates are equal or slightly higher than the non-Olympic period.
- o At the I-110, 42nd Street Station there is also a slight increase from normal in vehicle occupancy rates on the Olympics day.
- o Most significant increase in vehicle occupancy rates during the Games was observed at the I-10 Sixth Avenue Station. The Olympic period 1.29 pers./veh. rates is 12% higher than the occupancy rate observed in August 1983.

TABLE IV-20
A.M. PEAK PERIOD (6:30-9:30)
VEHICLE OCCUPANCY DATA

<u>LOCATION</u>	<u>MONTH/DAY</u>	<u>PERCENT OF 2+ PERSON VEHICLES IN TRAFFIC</u>	<u>VEH. OCCUP. (PERS/VEH)</u>
SB I-5 at Griffith Park	May/Wed. (N)	13.0%	1.15
	June/Wed. (N)	14.7%	1.18
	July/Wed. (N)	14.2%	1.17
	July/Wed. (N)	14.6%	1.19
	Aug./Wed. (N)	15.2%	1.18
	Aug./Fri. (O)	16.4%	1.22
	Aug./Wed. (O)	15.9%	1.19
WB I-10 at Warwick Avenue	Aug./Wed. (N)	19.7%	1.21
	Nov./Wed. (N)	18.1%	1.20
	May/Wed. (N)	17.1%	1.18
	Aug./Tue. (O)	19.2%	1.21
WB Rte. 91 at Lakewood Boulevard	Aug./Wed. (N)	13.0%	1.20
	Nov./Wed. (N)	10.3%	1.16
	May/Tue. (N)	10.6%	1.16
	June/Thu. (N)	12.4%	1.18
	Aug./Tue. (O)	12.8%	1.19
EB I-10 at Sixth Avenue	Aug./Thu. (N)	13.7%	1.15
	Nov./Tue. (N)	10.1%	1.11
	May/Tue. (N)	11.2%	1.13
	Aug./Mon. (O)	17.8%	1.29
NB I-110 at 42nd Street	Aug./Thu. (N)	19.2%	1.25
	Nov./Tue. (N)	18.5%	1.23
	May/Wed. (N)	17.8%	1.24
	Aug./Mon. (O)	20.3%	1.27

(N) Non-Olympic period.

(O) Olympic period.

Table IV-21 presents a breakdown of vehicle occupancy rates by each half hour in the a.m. peak period. Data shown in this table corresponds to the same aggregated results in Table IV-20. As evidenced by the numbers, occupancy rates for the late parts of the peak period are considerably higher than the earlier rates. This reflects the change in mix of vehicles from commuters to Olympic spectators towards the end of the peak period. The I-10 Sixth Avenue and I-110 42nd Street count stations are located close to the Exposition Park complex and counts were made of inbound traffic immediately prior to events.

TABLE IV-21
A.M. PEAK PERIOD VEHICLE OCCUPANCY
RATES BY TIME PERIOD

	<u>I-5/GRIFFITH PARK</u>		<u>I-10/6TH AVENUE</u>		<u>I-110/42ND STREET</u>	
	<u>OLYMPICS</u>	<u>NON-OLYMPICS</u>	<u>OLYMPICS</u>	<u>NON-OLYMPICS</u>	<u>OLYMPICS</u>	<u>NON-OLYMPICS</u>
6:30-7:00	1.20	1.21	1.18	1.14	1.22	1.41
7:00-7:30	1.18	1.17	1.16	1.10	1.28	1.21
7:30-8:00	1.21	1.13	1.24	1.15	1.23	1.21
8:00-8:30	1.25	1.17	1.34	1.10	1.32	1.20
8:30-9:00	N/A	N/A	1.40	N/A	1.40	N/A

IV.4.3 Truck Operations

Truck operations on the Los Angeles Freeways were monitored at several locations. Monitoring was done at Caltrans traffic count stations and CHP weigh stations. Videotape data of traffic were also available at some locations. Full 12-hour data were obtained at Santa Monica Freeway east of Harbor Freeway and are depicted in Table IV.22.

TABLE IV-22
TRUCK COUNTS ON SANTA MONICA FREEWAY
EAST OF HARBOR FREEWAY

<u>TIME PERIOD</u>	<u>OLYMPIC DAY</u>		<u>NON-OLYMPIC DAY</u>		<u>PERCENT CHANGE</u>	
	<u>AUGUST 6</u>		<u>AUGUST 30</u>			
	<u>EB</u>	<u>WB</u>	<u>EB</u>	<u>WB</u>	<u>EB</u>	<u>WB</u>
7:30 a.m.-9:00 a.m.	457	623	441	693	+ 3.6%	-10.1%
9:00 a.m.-3:00 p.m.	2,527	2,395	2,860	2,891	-11.6%	-17.2%
3:00 p.m.-6:00 p.m.	435	629	857	511	-49.2%	+23.1%
6:00 p.m.-7:30 p.m.	268	194	190	98	+41.1%	+98.0%
All day	3,687	3,841	4,348	4,193	-15.2%	- 8.4%
Avg. per hour	307	320	362	349		

During the Games, overall daily truck volumes at this location were down by over 15 and 8 percent in the eastbound and westbound directions respectively. Consistent changes were observed during the base period (9 a.m.-3p.m.) and in the evening (after 6 p.m.). Base period truck operations at

this location were down by 11 percent and 17 percent. Truck traffic was, on the other hand, 41 and 98 percent higher after the evening peak period.

Trucks were also counted at four other stations for the a.m. peak period before and after the Games. Results are summarized in Table IV.23.

TABLE IV-23
TRUCK COUNTS IN THE A.M. PEAK PERIOD

TIME PERIOD	NB 110 @ 42ND ST.		EB 10 @ 6TH AVE.		WB 91 @ LAKEWOOD		SB 5 @ GRIFFITH PARK		
	OLY.	REG.	OLY.	REG.	OLY.	REG.	OLY.	OLY.	REG.
6:30-7:00 a.m.	38	50	44	41	144	159	193	158	178
7:00-7:30 a.m.	42	66	49	29	132	131	164	156	145
7:30-8:00 a.m.	35	49	46	31	143	148	144	136	156
8:00-8:30 a.m.	42	50	60	44	174	174	147	150	152
Total a.m. peak	157	215	199	145	593	612	648	600	631
% change	-27%		+37%		-3%		+3% -5%		

OLY. -- Olympic Period
REG. -- Regular Non-Olympic

The most noticeable decrease was on I-110. Truck counts for each one-half hour were consistently down between 16 percent and 24 percent with an average of -27% for the peak period. Route 91 and Route 5 showed the least amount of variation from normal. Increases of +13% to a decrease of -13% was noticed on one-half hour basis at this location. Overall, a.m. peak hour truck volumes were down by 3 percent and 5 percent and up by 3 percent in one case at these two locations.

The eastbound I-10 station at 6th Avenue showed a sizeable increase in a.m. peak hour truck traffic on the day counted (Monday, August 6). One-half hour volumes were up consistently between 7 and 69 percent which produced an overall 37 percent increase in truck volumes for the a.m. peak period.

Monthly total truck counts for 1984 at freeway weigh stations were made available by the CHP. They are summarized in Table IV-24. In most cases, the truck counts for the month of August were either higher or approximately the same as other months of the year.

TABLE IV-24
MONTHLY TRUCK TRAFFIC IN 1984

	I-405 @ CARSON		ROUTE 101 VENTURA @ CONEJO		ROUTE 91		I-5 NEWHALL
	SB	NB	SB*	NB	EB	WB	NB
January	13,372	17,241	12,574	28,788	12,854	15,820	101,887
February	11,711	15,226	10,001	28,910	12,297	15,186	106,417
March	11,386	13,450	12,077	31,728	14,082	13,522	119,411
April	12,879	14,400	12,522	28,987	15,518	9,945	117,982
May	13,118	13,271	7,502	32,300	14,271	14,119	115,674
June	12,993	14,744	5,672	28,420	12,252	11,797	124,890
July	12,819	15,442	11,952	27,594	8,230	14,573	129,207
August	19,527	21,026	5,824	33,046	11,370	13,496	131,017
September	14,177	18,830	5,209	27,330	13,378	13,898	110,105
9 month Avg.	13,554	15,959	9,263	29,678	12,361	13,595	118,066
August as % of 9 month Avg.	+44%	+32%	-37%	+11%	-8%	-1%	+11%

* Scales in operation only eight hours per day.

August figures were generally higher than averages for the first nine months of 1984. This suggests the possibility that, there was either no change or even an increase in overall truck operations on the Los Angeles freeways during the Games compared to normal.

Caltrans traffic operation center reported only seven truck accidents during three weeks including the Olympic period (July 25-August 16) for an average of 2.33 accidents per week. The normal average for the year, however, is four accidents per week. This indicates a 42 percent reduction in truck related accidents during the period of the games.

IV.4.4 Freeway Incidents

More major incidents were reported for the two-week period of the Games than the usual average for a comparable period in the summer. There were 33 reported major incidents on the freeway system for the two-week period compared to an average norm of 25, representing a 32 percent increase. The trouble detection and response time, however, was considerably faster than usual due to the continuous freeway monitoring. The clearest example, was the expeditious removal of the CHP helicopter which crashed at the Exposition Boulevard exit from the Harbor Freeway on the closing day of the Games. No major or extended back-ups or traffic jams resulted from this incident.

Table IV-25 depicts the total accidents reported on five freeways in the Los Angeles area during the two weeks of the Olympics period. Total accidents reported for a non-Olympic base period are presented on the second line. In

all cases, accidents were down during the period of the Games. Reductions ranged between a high of -25% on Harbor Freeway to a low of -4% on Santa Monica Freeway. The average reduction in accidents on all five of these freeways was 16 percent.

TABLE IV-25
TOTAL ACCIDENTS

	<u>I-10</u>	<u>I-110</u>	<u>RTE. 101</u>	<u>I-5</u>	<u>RTE. 60</u>	<u>TOTAL</u>
Olympics	46	83	50	77	14	270
Non-Olympics	48	104	67	85	16	320
Difference	- 4%	- 20%	- 25%	- 9%	- 13%	- 16%

As mentioned earlier, truck related accidents, which are included in the above figures, were reduced drastically by 42 percent during the period of the Games.

IV.4.5 Traffic Congestion

Overall Conditions

The unprecedented traffic congestion levels, gridlocks and the total breakdown of the transportation system, as anticipated by many never materialized during the Olympics. As the Games commenced the entire freeway system operated free of congestion during both peak and non-peak periods, due to the drop in daily volumes and drastic changes in the peaking patterns. The free flow conditions continued through the first week of the Games. The shifts in peak hour patterns, however, were slowly beginning to return to normal conditions. The system continued to operate with less than usual summertime congestion problems.

During the second week of the Games moderate congestion occurred on several occasions. Operational monitoring and adjustments were conducted continuously to ameliorate localized congestion which was associated with accessing crowded venue sites. On Wednesday, August 8, the system operated well through the morning and into the afternoon even though the daily traffic volume was 8 percent above normal. That evening with over 97,000 spectators headed towards the Rose Bowl, in Pasadena, the first patterns of extensive and persistent congestion materialized on the area freeways.

Through the remainder of the week, the system continued to operate well although the ADT continued to climb and more moderate congestion developed, particularly during the peak periods. The frequency of problems and the magnitudes of congestion were, however, much lower than for normal peak periods.

Specific Problems

The following paragraphs present a more detailed account of the day-by-day specific traffic congestion problems on the freeway system.

- o Saturday July 28 -- Some congestion developed on the surface streets around the Coliseum but considerably less than that of a regular Coliseum event. There was some light congestion on the Santa Monica Freeway due to early arrivals for the Opening Ceremonies.
- o Wednesday August 1 -- Localized congestion developed at some interchanges around the region.
- o Thursday August 2 -- Localized congestion occurred around some venue locations.
- o Friday August 3 -- Morning congestion developed on the Harbor and Santa Monica Freeways leading into and out of the Los Angeles central business district.
- o Saturday August 4 -- Some congestion developed on the Pasadena, Hollywood and Golden State Freeways near Dodger Stadium and the Coliseum. Congestion from activities at Westwood caused the closure of the San Diego Freeway off-ramps to Wilshire Boulevard from 11 p.m. to 12:30 a.m.
- o Sunday August 5 -- Very light-spotty congestion developed on the Harbor Freeway approaching the Coliseum and the Santa Monica Freeway near La Brea Avenue. Light to moderate congestion was associated with the Dodger Stadium event on Northbound Pasadena/Harbor freeways and the off-ramps to Stadium Way from the Golden State Freeway.
- o Monday August 6 -- Morning peak period congestion persisted until approximately 11 a.m. on the in-bound Hollywood, northbound Harbor and parts of Santa Monica Freeways.
- o Tuesday August 7 -- Around 6:30 a.m., a truck-trailer separation on southbound 110 Freeway resulted in blockage of lanes, causing traffic congestion on southbound 110 and westbound 10 Freeways.
- o Wednesday August 8 -- In the morning heavy congestion developed on the northbound Pasadena Freeway near the Golden Sate Freeway. This congestion spread back along the northbound Harbor Freeway into the Coliseum area and on the eastbound Santa Monica Freeway to the northbound and southbound San Diego Freeway. In the evening considerable congestion was experienced on the eastbound Ventura Freeway and the westbound 210 (Foothill Freeway) approaching the Rose Bowl. Freeways leading to the Rose Bowl area were heavily saturated around 6 p.m. and for some time after.
- o Friday August 10 -- Light to moderate congestion was experienced on Santa Monica and San Diego Freeways in the morning. In the evening there was moderate congestion on the northbound Pasadena and Harbor freeways in the downtown area and on the Harbor and Santa Monica freeways near the Coliseum. Heavy congestion built-up in the Westwood area in the late evening, off-ramps from the northbound San Diego Freeway however, remained open because it was determine that their closure would lead to heavy congestion on the freeway.

- o Saturday August 11 -- Some congestion developed on the Harbor Freeway from Slauson to the four-level interchange and on parts of the Santa Monica Freeway. Localized congestion developed near the off-ramps to the Rose Bowl in Pasadena prior to the soccer event.
- o Sunday August 12 -- A helicopter crash early in the afternoon on the Harbor Freeway near the Coliseum caused some backups, but the quick clearance of the wreckage averted a major conflict with the spectator traffic arriving for the Closing Ceremonies.

Variations in Levels of Congestion

For the purposes of analysis and comparison, traffic congestion is quantified by measuring average delay experienced by vehicles on the freeway as a function of traffic volumes and average speeds. In Los Angeles speed and volume data from the 42 mile loop traffic monitoring system are used to calculate total daily vehicle-minutes of delay. These daily delay figures are reasonable representation of levels of congestion on the freeway system in the entire area. On an average summer day in 1983, the delay experienced on the 42 mile loop was in the order of 1.1 million vehicle minutes per day.

Figure IV-11 indicates the daily delay measured on the 42 mile loop system for each day of the two week Olympics period. Table IV-26 also shows the difference in levels of congestion during this period with normal summertime congestion levels. As evidenced by these figures, daily congestion was down by 35 percent to 60 percent on weekdays and by as much as 85 percent to 90 percent on the weekends. The numbers also indicate that congestion levels were lower at the beginning of each week than towards the ends. On the second week of the games the system was relatively more congested than the first week.

TABLE IV-26
OLYMPIC PERIOD FREEWAY CONGESTION COMPARED
TO NORMAL AUGUST CONDITIONS

	<u>DAY</u>	<u>DATE</u>	<u>CONG. DIFF.</u>
<u>FIRST WEEK</u>	SAT	7-28	-90%
	SUN	7-29	-90%
	MON	7-30	-62%
	TUE	7-31	-47%
	WED	8- 1	-55%
<u>SECOND WEEK</u>	THU	8- 2	-41%
	FRI	8- 3	-61%
	SAT	8- 4	-86%
	SUN	8- 5	-85%
	MON	8- 6	-60%
	TUE	8- 7 -	-55%
	WED	8- 8	-50%
	THU	8- 9	-30%
	FRI	8-10	-35%

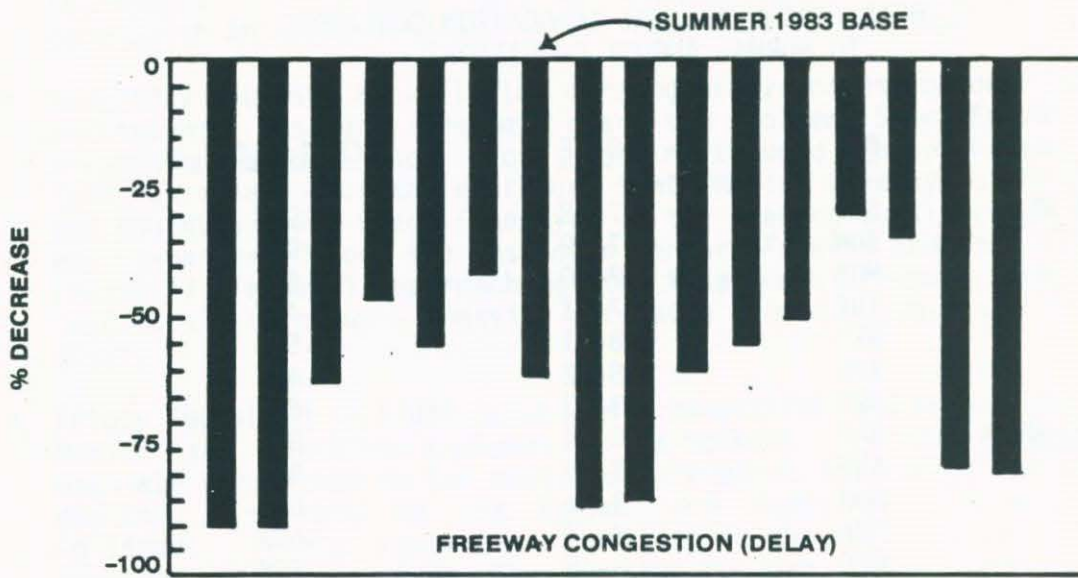
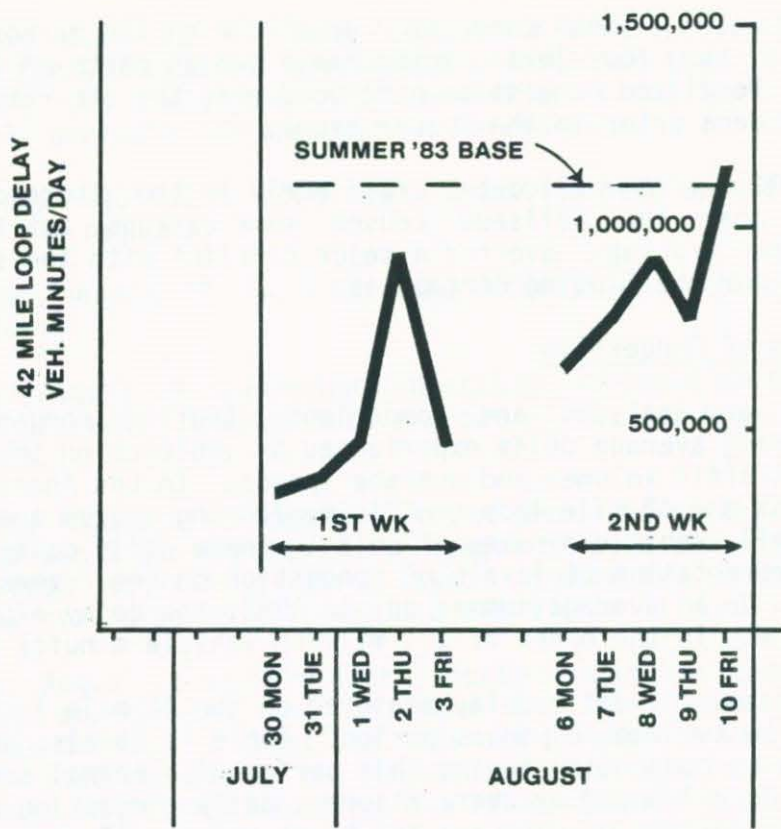


FIGURE IV - 11
FREEWAY CONGESTION ON
THE 42 MILE LOOP.

Projected vs. Actual Congestion Levels

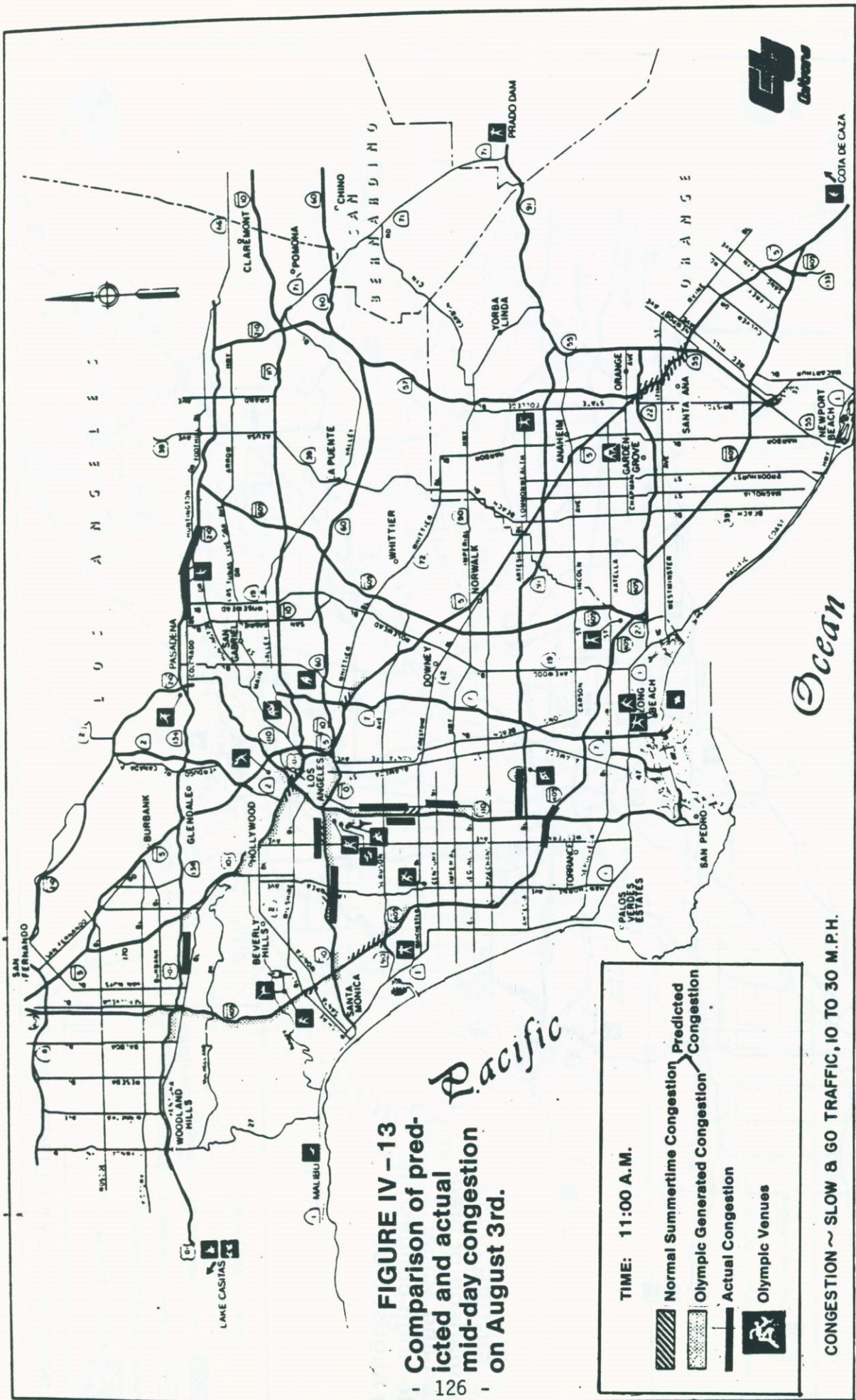
The 12 Traffic Condition Maps (Figures II-1 through II-12) were developed depicting anticipated traffic congestion problems on the freeway system for some typical Olympic days. These graphs were based on historical data for typical August traffic, upon which best estimates of the effects of the Olympic-related traffic were superimposed. These estimates assumed no adjustments in historical traffic patterns or travel demand.

To examine the extent to which these predictions materialized, conditions on one of the busiest Olympic days are presented in the following paragraphs as an example. Figures IV-12 through IV-15 compare the observed congestion patterns with the predicted conditions for Friday, August 3.

- o Morning peak congestion (see Figure IV-12) was considerably less than normal. Two segments which experienced moderate congestion were Harbor Freeway northbound south of the Santa Monica Freeway and San Diego Freeway northbound north of the Harbor Freeway. These segments are normally heavily congested at this time of the day. Other usually congested freeways such as the Pomona, Santa Ana, Ventura, Foothill, and Artesia were basically congestion free in the morning peak hour. One unpredicted congestion spot was at the junction of Santa Ana, Garden Grove and Orange Freeways.
- o Midday congestion (see Figure IV-13) occurred on mostly isolated segments and was considerably less than predicted. These scattered congestion spots were basically on the Harbor (in both directions), Santa Monica (in both directions) and San Diego Freeways. The predicted extensive congestion on the Hollywood Freeway and the San Diego Freeway through the Sepulveda Pass did not materialize.
- o Afternoon congestion (see Figure IV-14) occurred on scattered segments along the Santa Monica-San Diego-Harbor Freeway loop. Heavy congestion on Santa Ana, Golden State, Hollywood and southbound San Diego (north of Santa Monica) Freeways did not occur as predicted.
- o Evening peak congestion (see Figure IV-15), or the lack of it, produced the most surprising results. Heavy congestion was predicted on practically every freeway radiating from Downtown Los Angeles and around the metropolitan areas in Orange County. Instead freeways were less congested than at any time during that day. With the exception of some localized congestion spots on Santa Monica Freeway and Santa Ana Freeway in Orange County, the entire freeway system was operating virtually congestion free.

IV.4.6 Controlled Freeway Ramp Operations

Freeway access to the Exposition Park Olympics sports complex is via Interstate Freeways 10 (Santa Monica Freeway) and 110 (the Harbor Freeway). As seen on Figure IV-16 the complex is located in the southwest quadrant of the interchange of these two freeways. Access to the complex from Santa Monica Freeway is via the Normandie Avenue, Vermont Avenue and Hoover Street



COTA DE CAZA

L O S A N G E L E S

FIGURE IV - 13
 Comparison of predicted and actual mid-day congestion on August 3rd.

Pacific

TIME: 11:00 A.M.

-  Normal Summertime Congestion
-  Predicted Congestion
-  Olympic Generated Congestion
-  Actual Congestion
-  Olympic Venues





CONGESTION ~ SLOW & GO TRAFFIC, 10 TO 30 M.P.H.

Ocean

127

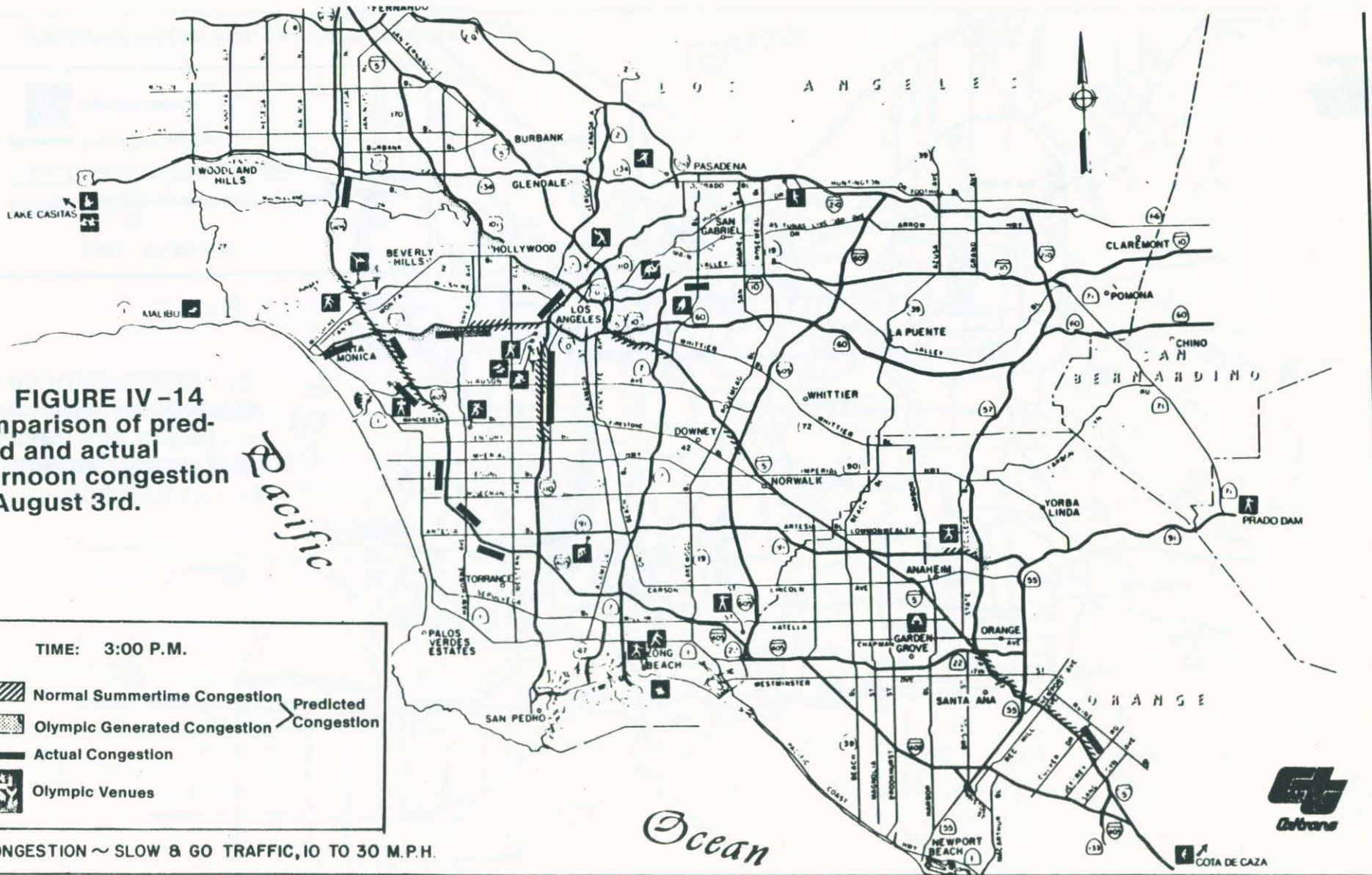
FIGURE IV-14
Comparison of predicted and actual afternoon congestion on August 3rd.

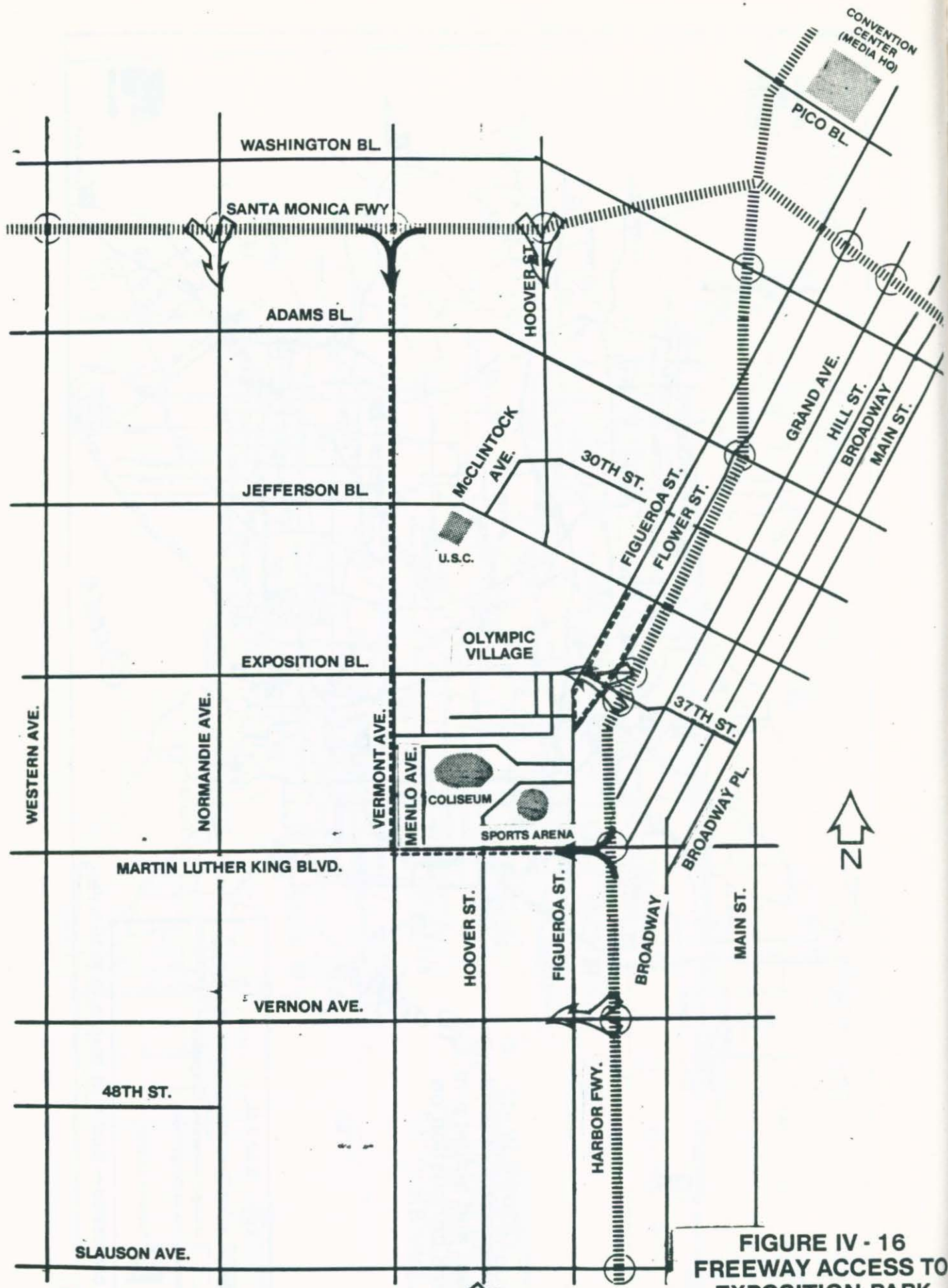
TIME: 3:00 P.M.

-  Normal Summertime Congestion
-  Olympic Generated Congestion
-  Actual Congestion
-  Olympic Venues

} Predicted Congestion

CONGESTION ~ SLOW & GO TRAFFIC, 10 TO 30 M.P.H.





○ Denotes Freeway Interchanges

--- Bus Priority Treatments.



Auto Access Ramps.

Bus Only Ramps During Coliseum Operation.

**FIGURE IV - 16
FREEWAY ACCESS TO
EXPOSITION PARK
COMPLEX AREA**

interchanges. Access from the Harbor Freeway is through interchanges at Vernon Avenue, Martin Luther King, Jr. (MLK) Boulevard and Exposition Boulevard/37th Street.

According to the venue plan for the Exposition Park complex, during the days that the Coliseum was in operation, Vermont Avenue and M. L. K. Boulevards were designated as bus priority streets. On these streets automobile traffic was limited to local access during the peak periods. Accordingly, the Vermont Avenue and M. L. K. Jr. Boulevard off-ramps from Santa Monica and Harbor freeways were limited to bus traffic during the same periods.

Traffic counts taken by Caltrans during and after the Olympics at the above ramps were used to analyze the operation of this access strategy. The main purpose of this analysis was to determine the effects of ramp closures and automobile restrictions on the operation of the adjacent ramps.

Figure IV-17 presents the hourly variation of traffic volumes at the Vermont Avenue off-ramp from the Santa Monica Freeway. Data from three different Wednesdays are indicated. The graphs for the post Olympic Wednesday (August 15) and the Wednesday of the first week of the Games are remarkably similar. This is mainly due to the fact that on the first Wednesday of the games, no Olympic events were held at the Coliseum. On Wednesday, August 8, however, the Coliseum was holding morning, afternoon, and evening track and field sessions. On this day traffic volumes demonstrated entirely different patterns. Closure of the ramp to automobiles is evident by the two large drops in volumes between 7 a.m. and 11 a.m. and again between 2 p.m. and 5 p.m. The volumes climb to normal levels by 7 p.m. in the evening.

Figure IV-18 represents volumes on the same three Wednesdays for the M. L. K. Boulevard off-ramp from the Harbor Freeway. Volumes on the Olympic non-Coliseum day again closely follow the traffic pattern on a non-Olympic day. The traffic volumes after 10 a.m. are, however, consistently and substantially lower than normal. This could perhaps be rationalized based on screenline counts on Harbor Freeway. As discussed in Section IV.4.1 and Figure IV-9, during the games, traffic counts indicated that a considerable amount of Harbor Freeway traffic was being diverted to surface streets as they approached the central business district. On Figure IV-18, again the drop in volumes during the morning, afternoon and evening peaks on the Olympic-Coliseum day indicates the periods when the off-ramps were restricted to bus operation only.

To see the effects of these ramp restrictions on the adjacent streets and ramps, graphs in Figures IV-19 and IV-20 were developed. All graphs represent hourly variation of traffic on the ramps during Wednesday, August 8, when the Coliseum events were in full operation. Solid lines in each case represent volumes on the "bus-only" ramps to Vermont Avenue and M. L. K. Boulevard.

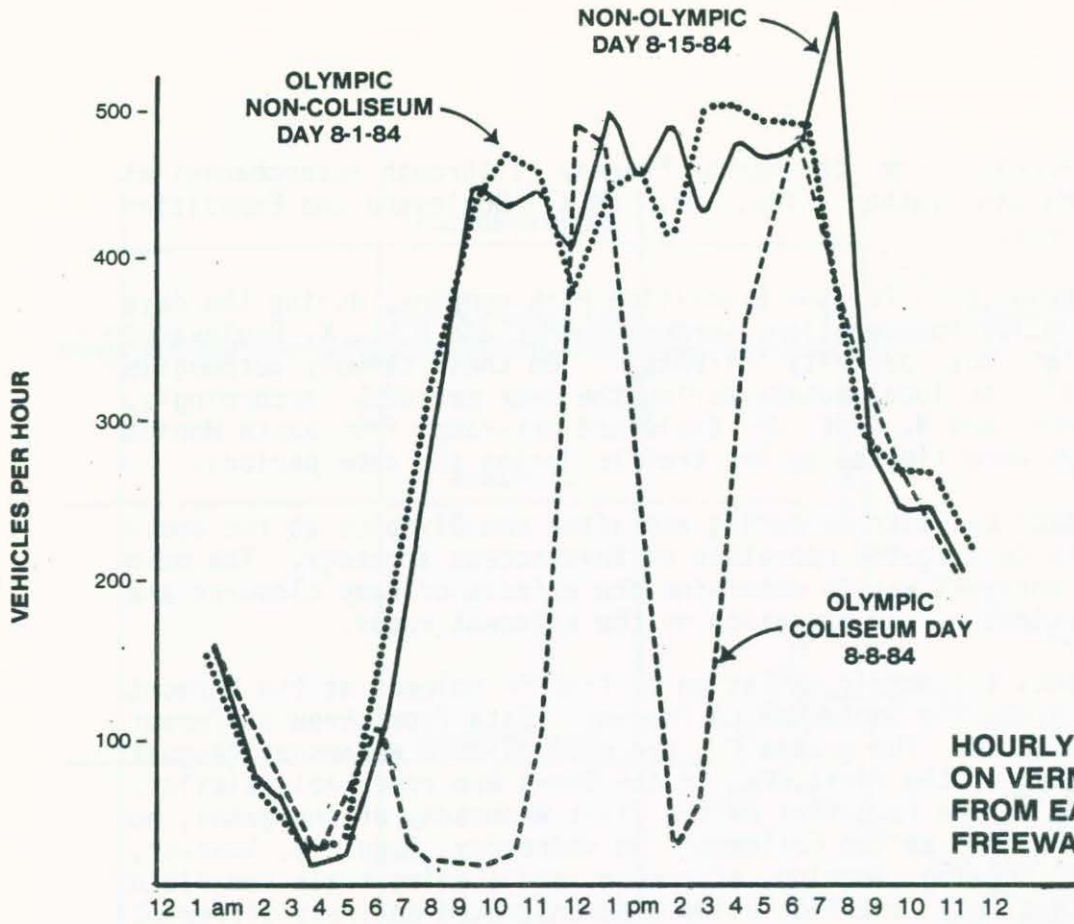


FIGURE IV - 17
 HOURLY DISTRIBUTION OF VOLUME
 ON VERMONT AVE. OFF-RAMP
 FROM EASTBOUND SANTA MONICA
 FREEWAY.

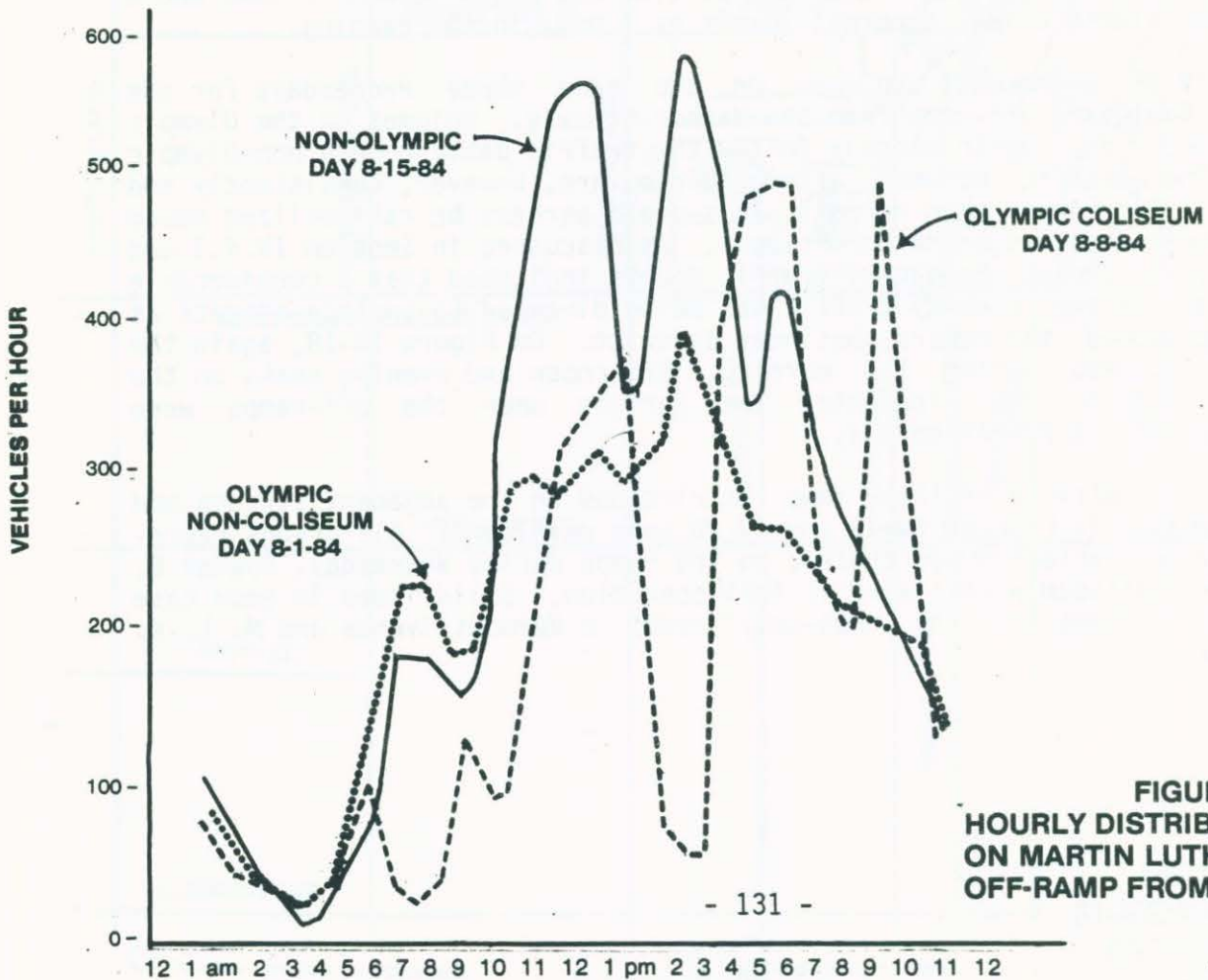


FIGURE IV - 18
 HOURLY DISTRIBUTION OF VOLUME
 ON MARTIN LUTHER KING BLVD.
 OFF-RAMP FROM NB HARBOR FWY

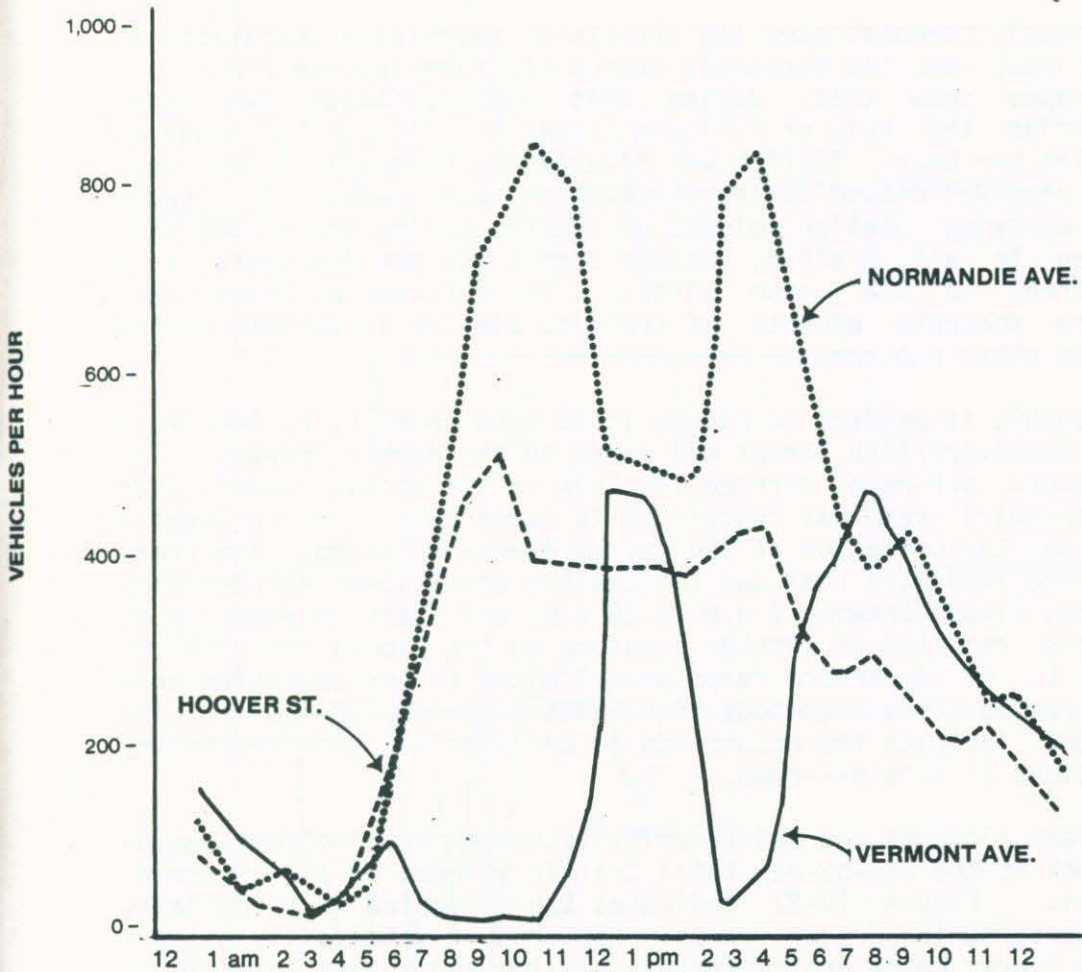


FIGURE IV - 19
HOURLY VARIATION OF
OFF-RAMP VOLUMES
FROM SANTA MONICA
FREEWAY ON WED. 8-8-84.

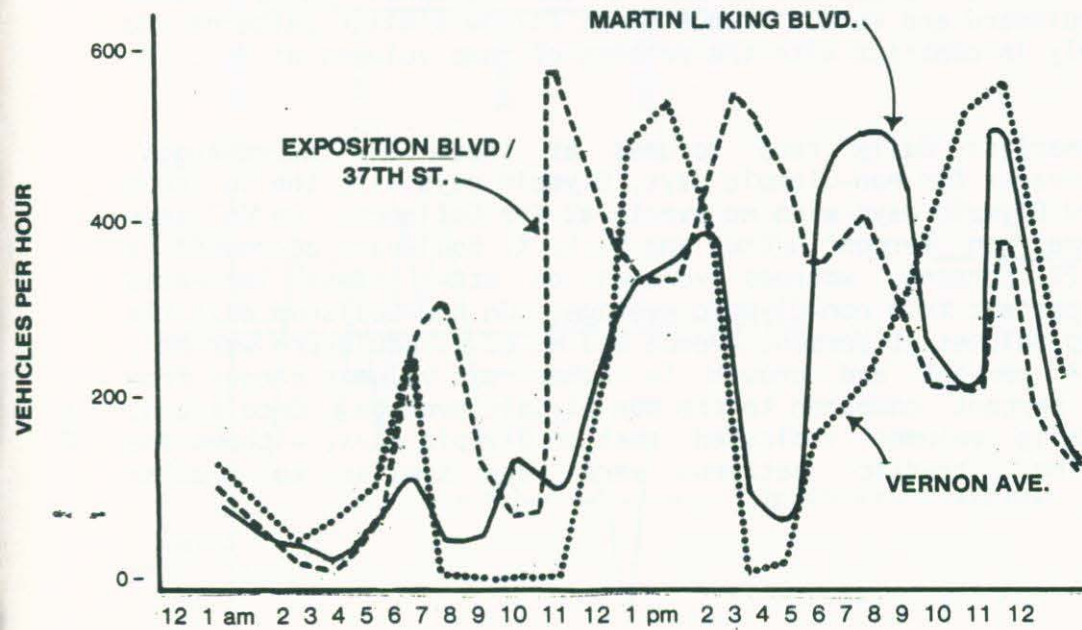


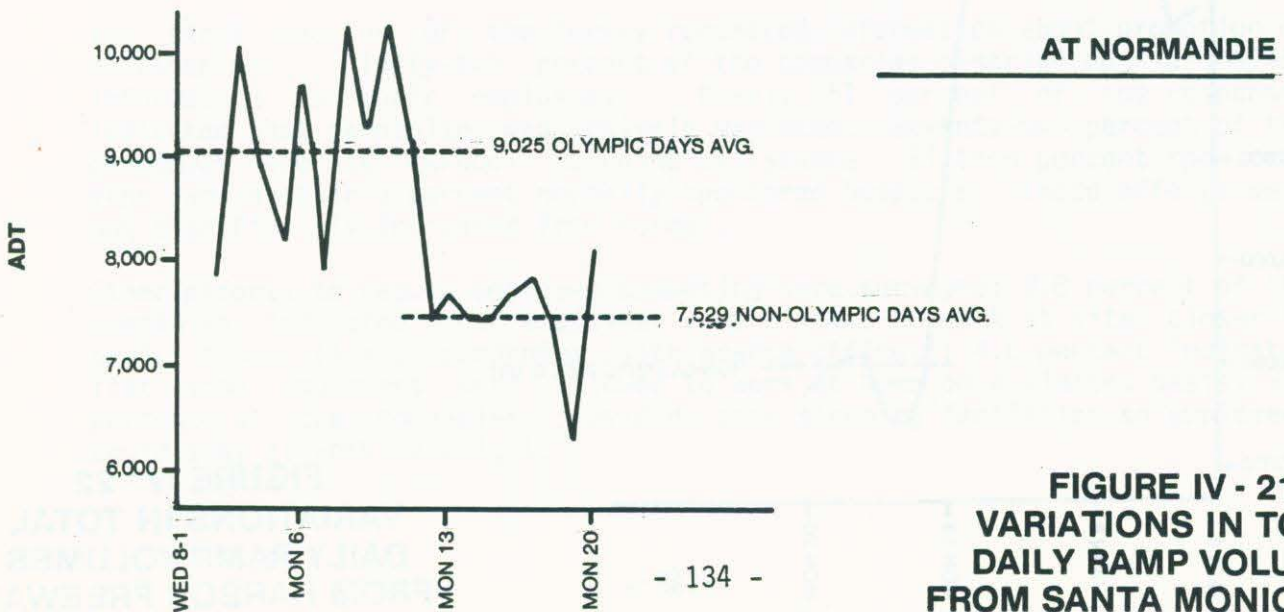
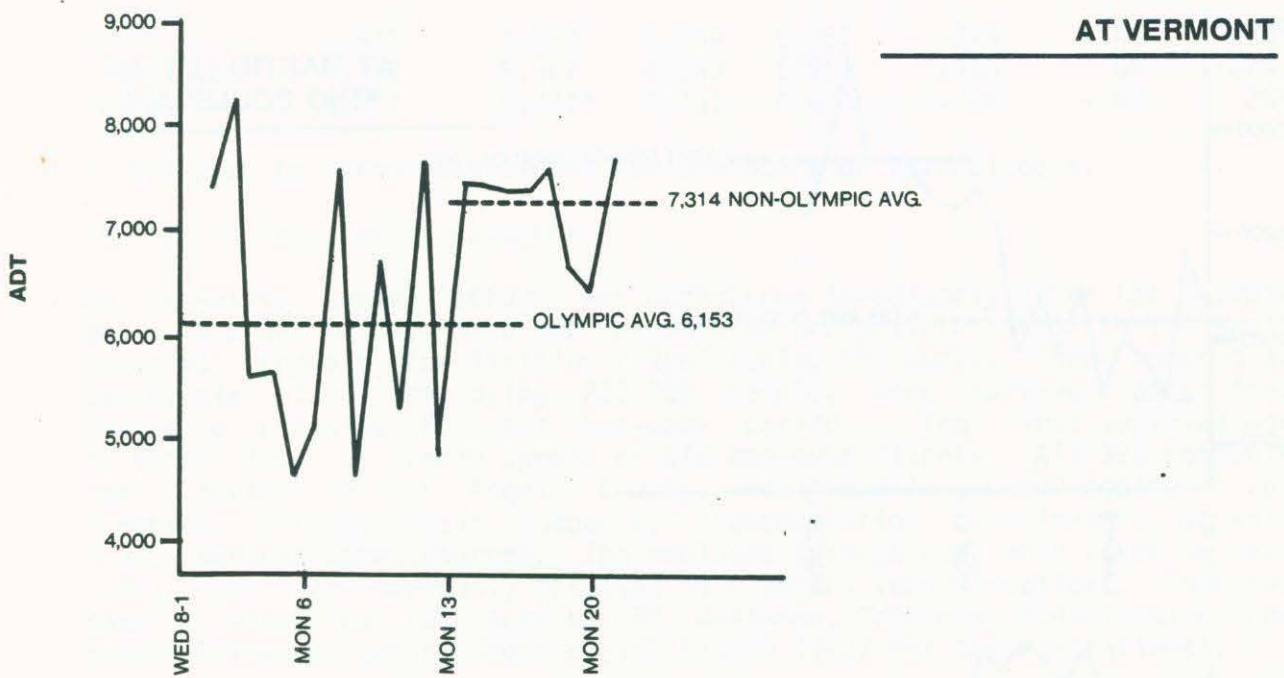
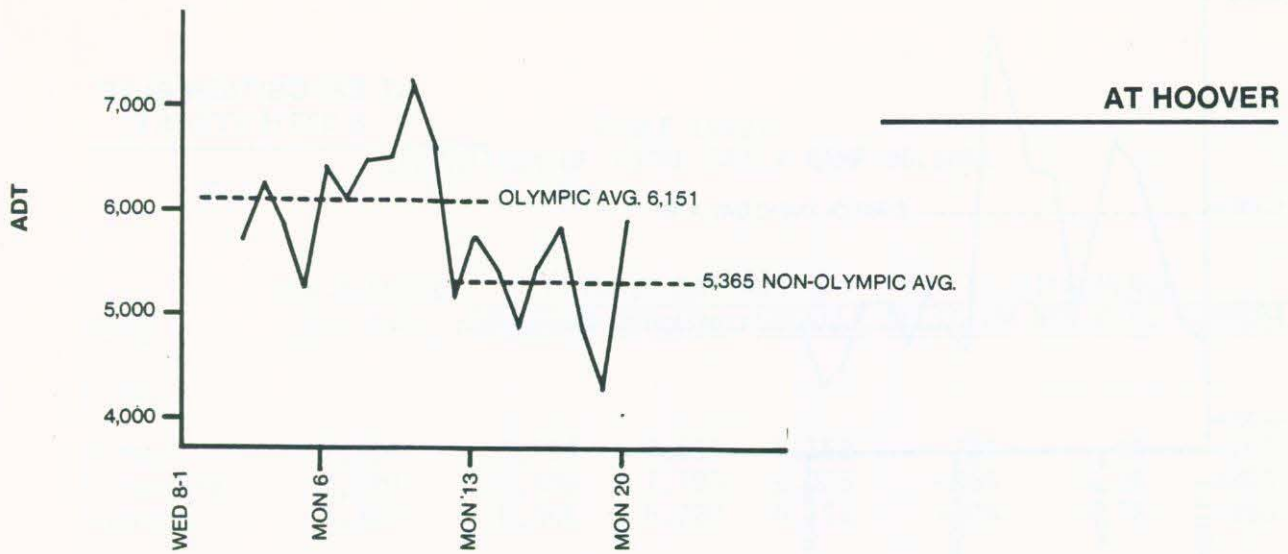
FIGURE IV - 20
HOURLY VARIATION OF
OFF-RAMP VOLUMES
FROM HARBOR FREEWAY
ON WED. 8-8-84.

Figure IV-19 clearly demonstrates the effects of restricted operations at the Vermont off-ramp on the Normandie Avenue off ramp between 7 a.m. and 8 p.m. The graphs show that, during this period, these two ramps collectively carried the bulk of Coliseum access traffic, in the range of 800-1,000 vehicles per hour. Traffic was diverted to Normandie Avenue when Vermont Avenue ramp was closed during the a.m. and p.m. peaks. Both ramps were, however, carrying similar volumes of traffic during the midday when Vermont was open to all traffic. Hoover Street was not designated as a major access street to the venue sites. The off-ramp at Hoover was, however, carrying moderate amounts of traffic, similar in pattern to the combination of the other two ramps.

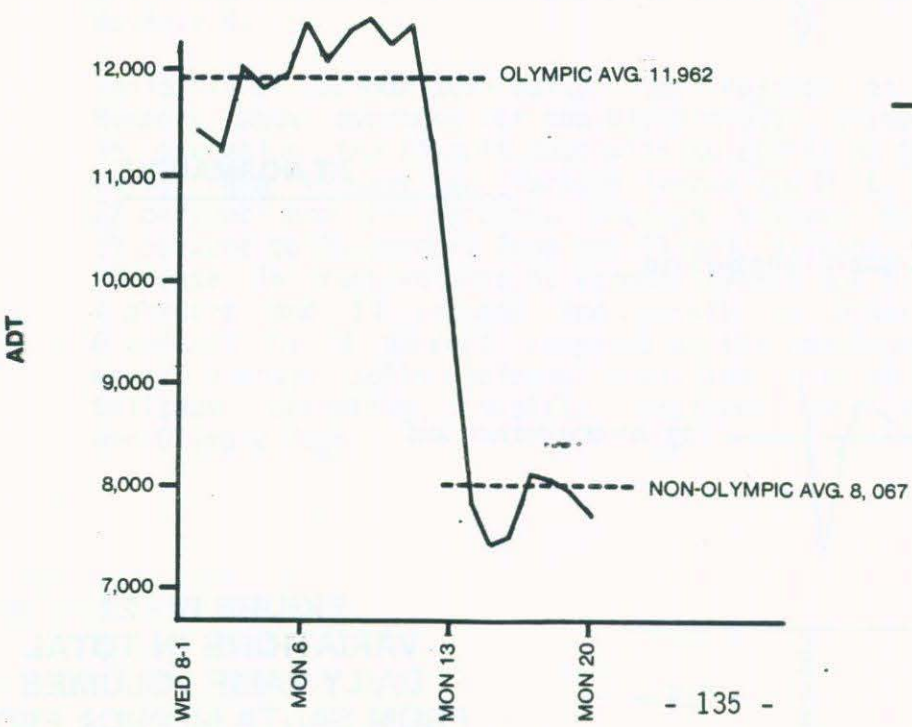
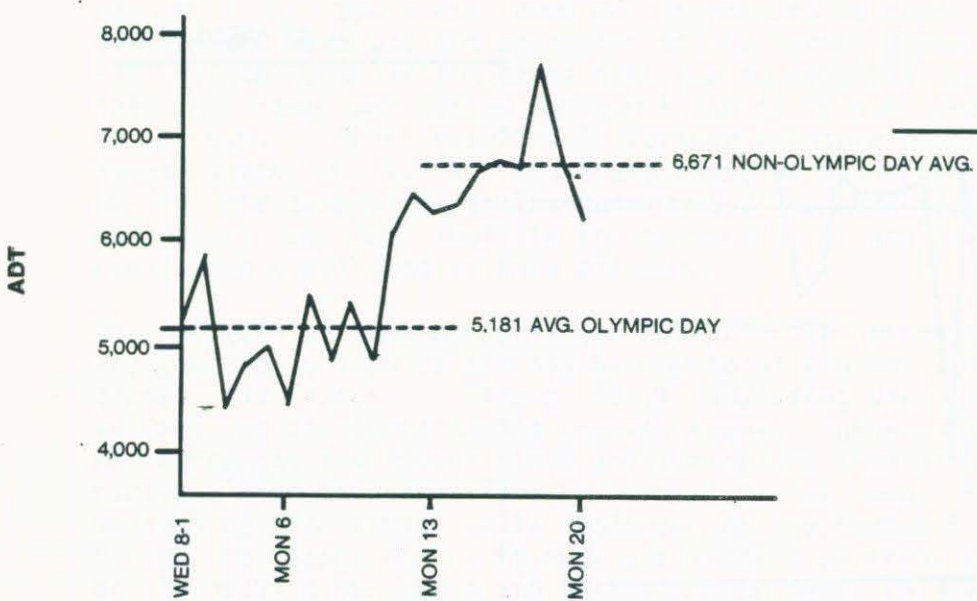
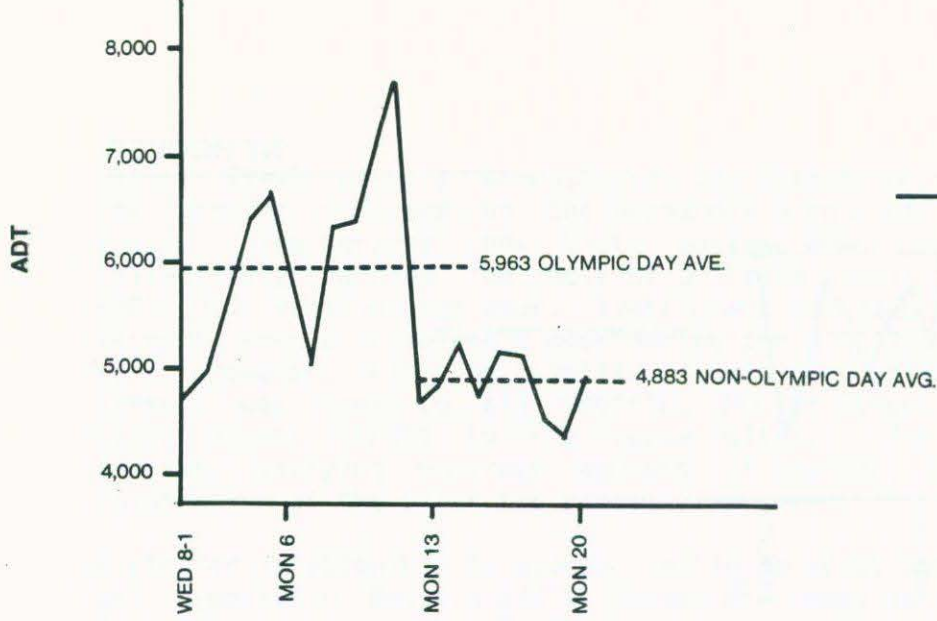
A similar relationship is evident in Figure IV-20 between M. L. K. Boulevard and Exposition Boulevard/37th Street off ramps to the Harbor Freeway. The Exposition Boulevard off-ramp carried the bulk of the access traffic when the M. L. K. Boulevard ramp was restricted to buses only. One noticeable difference here was the operation of the Vernon Avenue off-ramp. The traffic volume profile indicates that due to possible operational difficulties this off-ramp was closed between 7 a.m. to 10 a.m. and again between 2 p.m. to 5 p.m. This resulted in further pressure on the Exposition/37th off ramps since M. L. K. Boulevard ramps were limited to bus operation only during the same period. The magnitude of volumes (between 500-600 vehicles per hour) do not indicate the occurrence of any specific problems or any overloaded conditions at this off-ramp.

The effects of ramp closures and bus priority system on ramp volumes can be analyzed by a look at the day-by-day total traffic volumes on the aforementioned six ramps. Figure IV-21 indicates the variation in total daily volumes on the Santa Monica Freeway ramps. Patterns of total daily volumes on Normandie and Hoover ramps are remarkably similar and almost entirely in contrast with the variations on Vermont Avenue ramp. Figure IV-22 shows the variations in total daily volumes on the Harbor Freeway ramps. Similar trends to Santa Monica Freeway are evident on these graphs. Daily volumes on Exposition Boulevard and Vernon Avenue ramps follow similar patterns and are almost entirely in contrast with the pattern of ramp volumes at M. L. K. Boulevard.

Table IV-27 summarizes daily ramp volumes at these six interchanges. Numbers show averages for non-Olympic days, Olympic days with the Coliseum in operation and Olympic days with no events at the Coliseum. On Coliseum days, ramp volumes on Vermont Avenue and M. L. K. Boulevard decreased by 22 percent and 27 percent, whereas volumes on other ramps increased 19 percent to 33 percent from non-Olympic average. On non-Coliseum days the decrease in ramp volumes at Vermont Avenue and M. L. K. Boulevard was only 4 percent and 14 percent and growth in other ramp volumes ranged from 0 percent to 8 percent compared to the non-Olympic average. Once again, these average daily volumes indicated that on Olympic days, without the Coliseum operating, traffic patterns were very similar to regular non-Olympic days.



**FIGURE IV - 21
VARIATIONS IN TOTAL
DAILY RAMP VOLUMES
FROM SANTA MONICA FWY.**



**FIGURE IV - 22
VARIATIONS IN TOTAL
DAILY RAMP VOLUMES
FROM HARBOR FREEWAY**

TABLE IV-27
COMPARISON OF TOTAL DAILY RAMP VOLUMES

RAMPS	NON-OLYMPIC DAY AVG.	OLYMPIC DAY AVG.			% DIFFERENCE		
		COLISEUM	NON-COL.	OVERALL	COLISEUM	NON-COL.	OVERALL
<u>I-10</u>							
Vermont	7,314	5,714	7,030	6,153	-22%	- 4%	-16%
Normandie	7,529	9,489	7,790	9,025	+26%	+ 3%	+20%
Hoover	5,365	6,366	5,720	6,151	+10%	+ 7%	+15%
<u>I-110</u>							
M. L. K. Jr.	6,671	4,892	5,759	5,181	-27%	-14%	-22%
Exposition	4,883	6,502	4,883	5,963	+33%	0%	+22%
Vernon	6,577	8,081*	7,131	6,430	- 8%	+ 8%	- 2%*

* Off ramp to Vernon was closed for 5-6 hours on several days.

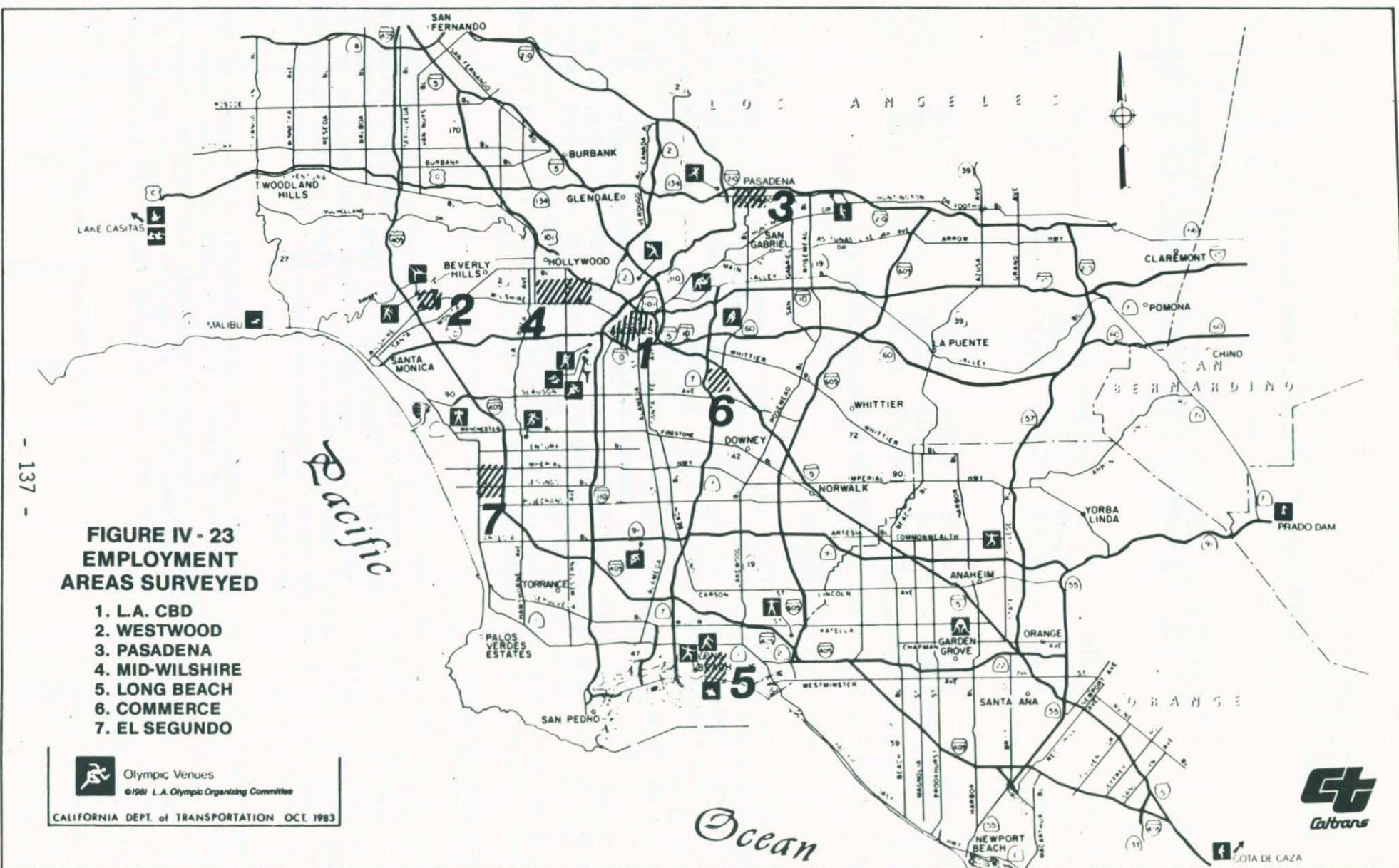
IV.4.7 Private Sector Response

An extensive survey effort was undertaken immediately after the Olympics ended in order to determine the response of the private sector to the public agencies' request for limiting travel during the Games. Three hundred and twenty-six firms, employing 233,700 people, were surveyed as to their operating policies for the two-week period. The firms surveyed were selected from a random sample of CTS employer clients. All 326 companies were located in Los Angeles County. Additionally, 16,900 employees were surveyed, through their companies transportation coordinators, of which 6,325 surveys were returned. The employee surveys were only taken in seven areas that were seriously affected by Olympics venue locations. The areas sampled were the Los Angeles CBD, Westwood, Pasadena, Mid-Wilshire, Long Beach, Commerce, and El Segundo (see Figure IV-23 for these locations).

Employer Surveys

The first section of the survey requested information about promotion of ridesharing. Ninety-two percent of the companies distributed ridesharing information to their employees. Nearly 51 percent of the responses indicated that carpooling was actively marketed. Seventy-two percent of the companies provide carpool matching assistance. Sixteen percent sponsored vans and another 5 percent normally sponsored buspools. These efforts were not significantly increased from normal.

Other efforts to reduce employee commuting were surveyed: 3.8 percent of the companies indicated that employees were allowed to work at sites closer to their homes (i.e., companies with branch offices); 4.6 percent indicated that some employees were allowed to work at home on a limited basis; 3.5 percent of the companies provided some sleeping facilities so employees could stay at work overnight.



**FIGURE IV - 23
EMPLOYMENT
AREAS SURVEYED**

- 1. L.A. CBD
- 2. WESTWOOD
- 3. PASADENA
- 4. MID-WILSHIRE
- 5. LONG BEACH
- 6. COMMERCE
- 7. EL SEGUNDO



Olympic Venues
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CALIFORNIA DEPT. of TRANSPORTATION OCT. 1983



COTA DE CAZA

The private sector made a major effort to shift the peak hours on the freeways in Los Angeles. Prior to the games, only 12 percent of the companies had implemented staggered shifts for their employees. During the Games 24 percent of the companies surveyed had implemented staggered work shifts. Another 16 percent were already using some type of flextime. During the games, however, 33 percent allowed flextime. Compressed work weeks are usually found in conjunction with some form of flextime or staggered shifts. Since labor laws in California specifically allow 4 10-hour day (4/40) work weeks without requirements for daily overtime pay, this form of compressed work-week is the most common. Prior to the Games, 6.5 percent of the survey respondents were on a 4/40 week, during the Olympic period, 11.2 percent were using this strategy. The (nine nine-hour days for a two week period) 9/80 work week is not exempted from overtime by labor laws and is typically not found among businesses, but is fairly common among governmental agencies. Less than 1 percent of those surveyed used the 9/80 work week before the games and 1.2% implemented this modified work situation for the Olympics.

The following table summarizes the use of staggered work hours and work weeks. It is important to note that these strategies overlap and are used in conjunction with each other and are, therefore, not additive.

TABLE IV-28
MODIFIED WORK SCHEDULE POLICIES

<u>Strategy</u>	<u>Before Games</u>	<u>During Games</u>
Staggered Shifts	12.3%	24.2%
Flextime	19	33
4/40 Work Week	6.5	11.2
9/80 Work Weeks	.4	1.2
5 Day/Unusual Hrs.	7.3	21.2

One of the major traffic reduction strategies urged by the LAOOC and by the public sector was to encourage the use of vacations during the two weeks of the Olympics. The survey showed that firms in Los Angeles County adopted the following vacation policies:

- o 53.8 percent of the responses indicated no change in their vacation policies.
- o 22.7 percent actively encouraged scheduling vacation time.
- o 15.8 percent left vacation schedules up to individual departments to arrange as needed.
- o 4.6 percent actively discouraged vacations.
- o 1.2 percent required vacations to be scheduled.
- o 6.5 percent made additional vacation days available during the Olympics.

Another strategy for the reduction of traffic which required private sector cooperation was better management of deliveries. Around several of the venue sites deliveries were specifically prohibited during certain hours, but throughout the region, traffic tie-ups caused by stopped delivery trucks needed to be curtailed. Governmental agencies requested that deliveries voluntarily be limited.

Thirty-one percent of the companies indicated that they altered their receiving schedules during the Games, and 22.3 percent stockpiled supplies prior to the Games so that deliveries were not needed. Thirty percent indicated that they accelerated shipping schedules before the Games started, and thirty-eight percent changed their delivery schedules to avoid peak-hour traffic and expected spectator traffic.

Firms made other attempts to reduce business-related travel during the Olympics. Of the firms surveyed, 48 percent indicated that they had made attempts to reduce travel. There is no indication of how much travel was reduced by their efforts, however. Thirty-one percent indicated that they had cutback or eliminated outside meetings, and 20 percent cutback field operations and business appointments.

Very few of the employers shut down to avoid the expected Olympics congestion. Five point eight (5.8) percent of the respondents indicated that some departments within their companies shut down at some point during the games. Three point five (3.5) percent of the respondents shut down their entire operations for anywhere between one and five days. Only 1.5 percent of the companies shut down entirely for the two-week period.

Employee Surveys

A total of 13.6 percent of the available work time during the Games was taken off by people surveyed. For the purposes of analysis, it was assumed that people normally would work 10 days during the sixteen-day period of the Olympics. The Admissions Day Holiday and days off, because of modified work weeks, were accounted for separately in the survey. Twenty percent of the employees sampled took an average of 5 days of vacation during the games. In downtown Los Angeles 25 percent took an average of 6.1 days off for vacation. Overall, only 3.8 percent of the sample called in sick during the Games, and those who called in took an average of 2.4 days off. In downtown Los Angeles, only 0.2 percent called in sick, but took an average of 3.3 days off. Eight percent of the downtown sample had two days off due to modified work week, while in the other six areas surveyed 5 percent of the employees had two days off due to modified work weeks. Admissions Day was taken off by less than 2 percent of the sample. One point four (1.4) percent of the sample did not work for "other reasons," an average of 4.3 days. Of the 6,300 individuals surveyed each employee did not travel to or from work 1.4 days. If the sample held true for Los Angeles County, this would indicate a 14 percent reduction in peak-hour traffic for commuter trips on any given day. Looking at specific centers, the following leave times were taken: Pasadena -- 17.6 percent; Mid-Wilshire -- 17.4 percent; Westwood -- 16.7 percent; Los Angeles CBD -- 16 percent; Long Beach -- 14 percent; El Segundo -- 12.8 percent; and Commerce -- 11.6 percent.

When leave was not taken, employees had been encouraged to provide alternative working situations for the employees. These are summarized in Table IV-29.

TABLE IV-29
DISTRIBUTION OF TIME WORKED AT VARIOUS LOCATIONS

	<u>AT SITE</u>	<u>AT HOME</u>	<u>ALTERNATE SITE</u>	<u>IN FIELD</u>
Westwood	83%	.4%	--	.6%
El Segundo	85%	.25%	.21%	.7%
Long Beach	86%	.5%	.46%	.5%
Mid-Wilshire	82%	.9%	--	2.6%
Pasadena	80%	.44%	.84%	.5%
Commerce	88%	.67%	.71%	.4%
TOTAL NON-CBD*	84%	.4%	.3%	.7%
TOTAL CBD*	83%	.8%	.2%	1.8%

* Totals do not add to 100% due to leaves taken.

The media and the public sector strongly encouraged individuals to find alternative modes of travel to work during the Olympics. The surveys showed the following mode choices for before and during the Olympics period:

TABLE IV-30
WORK TRAVEL MODE SHIFTS

<u>Mode</u>	<u>CBD</u>		<u>Non-CBD</u>	
	<u>Before</u>	<u>During</u>	<u>Before</u>	<u>During</u>
Drive Alone	53.6%	51.3%	75.8%	73.7%
Carpool	26.3%	22.0%	17.2%	17.4%
Bus	18.2%	20.0%	4.3%	5.1%
Walk/Bike	.7%	1.4%	2.0%	2.4%
Other	1.0%	2.8%	1.0%	1.4%

Outside of the Los Angeles CBD only minor shifts in modes were apparent. Before the Games, Mid-Wilshire had the highest, non-CBD transit ridership -- 12 percent, and Westwood had the highest carpool rates -- 19 percent. Long Beach, Mid-Wilshire, and Commerce all experienced increases in ridesharing during the games. The other areas, including the CBD, experienced decreased in ridesharing, probably because of the increase in leaves taken and the wide use of staggered work hours. Carpool size, generally between 2.5 and 2.9, did not vary significantly during the Games from pre-Game periods.

One of the prime strategies for the private sector was to encourage employers to modify their working hours. Figure IV-24 through IV-30 show how employees shifted their work hours during the Olympics. Prior to the Games, the surveys showed sharp peaks in work hours in the work centers of El Segundo, Mid-Wilshire, Pasadena, Commerce, and the Los Angeles CBD. Only Westwood and Long Beach already had fairly staggered work hours. During the Olympics the Mid-Wilshire and Pasadena areas showed radical flattening and shifts in the peaks. El Segundo and Commerce (both basically industrial areas) showed almost no flattening or shifts of the peak periods.

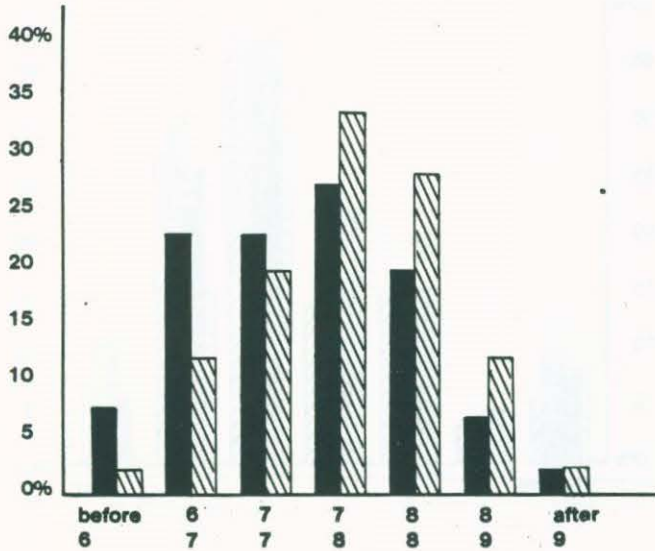
The survey also gathered information on work-trip length and travel times before and during the Olympics. The reader should be cautioned that travel time estimates are subjective and are frequently overestimated under congested conditions and underestimated during free flow travel. So the following data may indicate a perception of congestion as much as real minutes of travel time saved.

TABLE IV-31
AVERAGE TRAVEL TIME TO AND FROM WORK
(in minutes)

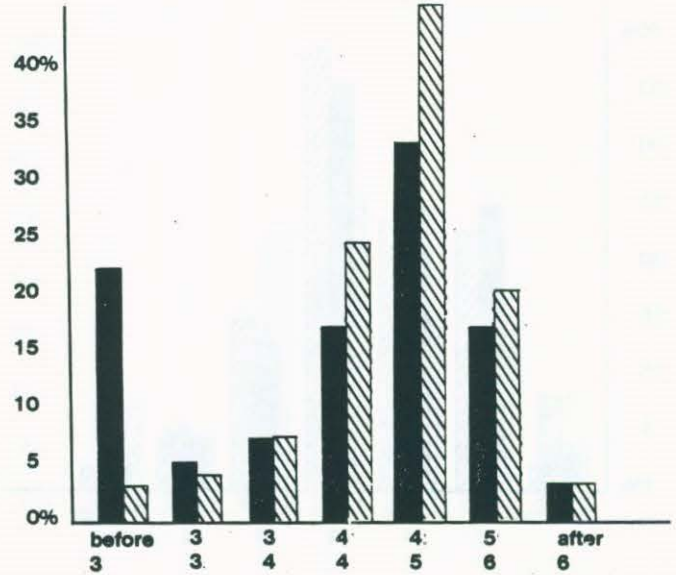
WORK CENTER	TRIP LENGTH (MILES)	TO WORK			FROM-WORK		
		BEFORE	DURING	% SAVINGS	BEFORE	DURING	% SAVINGS
Westwood	13.8	25	22	12%	30	30	--
El Segundo	15.8	30	25	16%	38	30	21%
Long Beach	12.8	20	20	--	25	25	--
Mid-Wilshire	16.7	35	30	14%	40	30	25%
Pasadena	14.8	25	20	20%	30	25	16%
Commerce	14.8	25	23	8%	30	28	6%
CBD	20	40	30	25%	46	39	15%

The results of the surveys show that the combination of strategies resulted in very real savings to the commuters.

USUAL TIME ARRIVED AT WORK



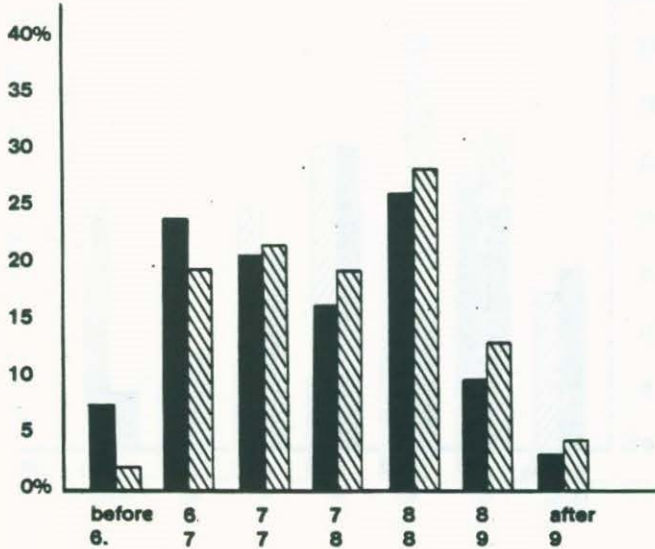
USUAL TIME LEFT WORK



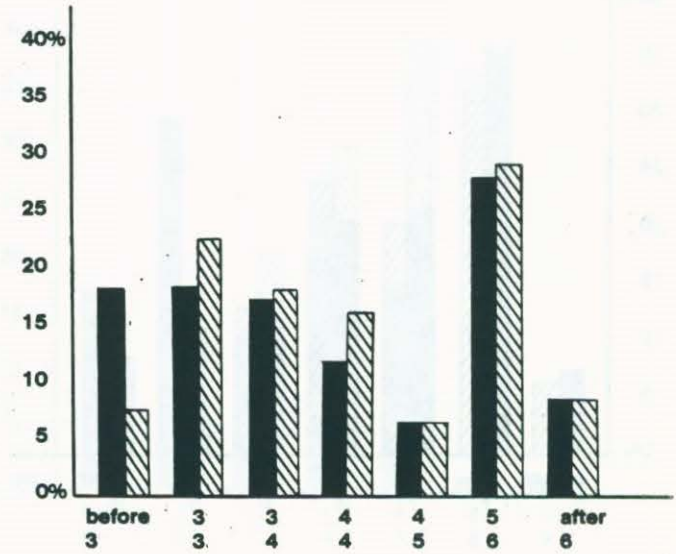
Time of Day

**FIGURE IV - 24
WORK HOURS: DOWNTOWN**

USUAL TIME ARRIVED AT WORK





USUAL TIME LEFT WORK

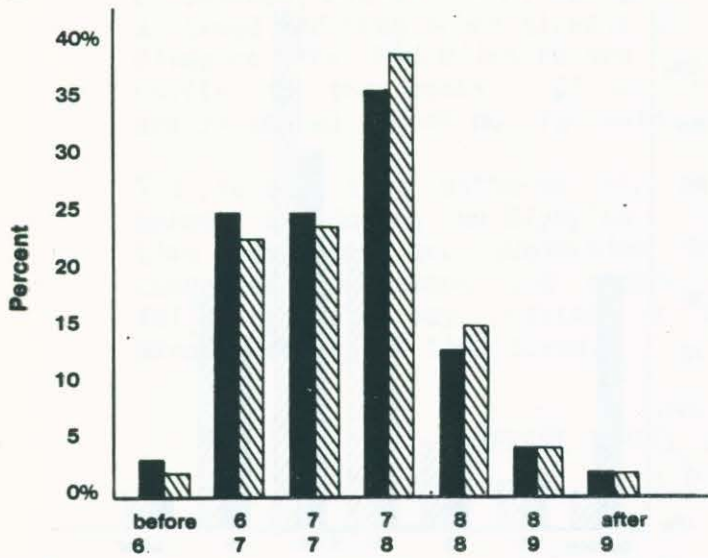


Time of Day

**FIGURE IV - 25
WORK HOURS: WESTSIDE**

 Before Olympics
 During Olympics

USUAL TIME ARRIVED AT WORK



Time of Day

USUAL TIME LEFT WORK

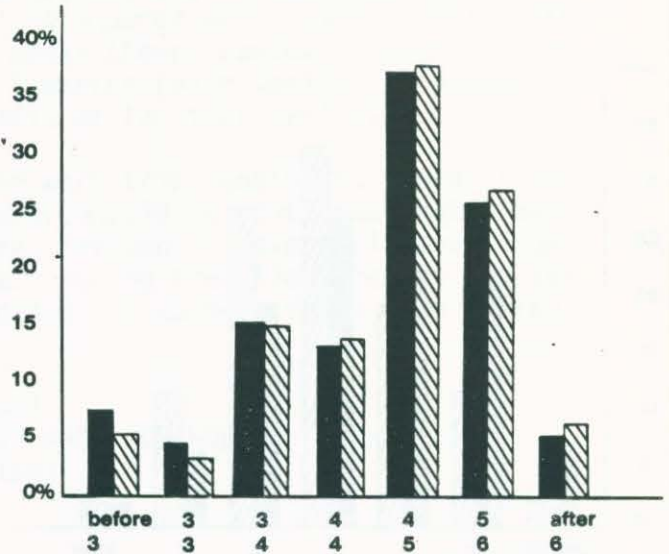
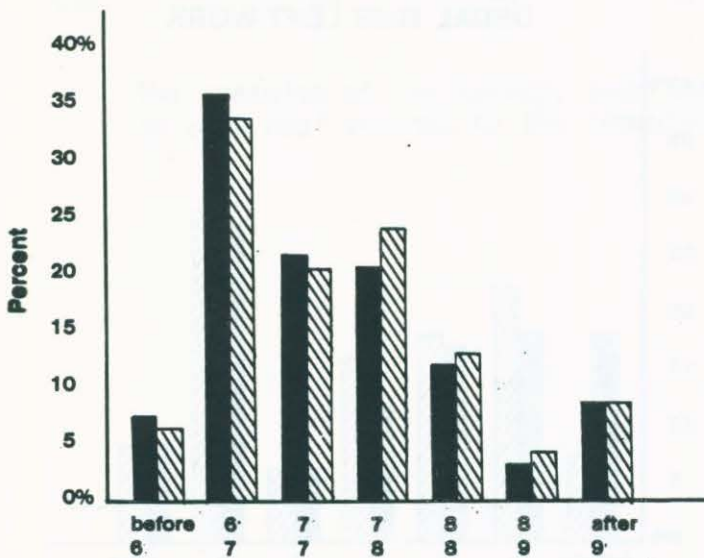


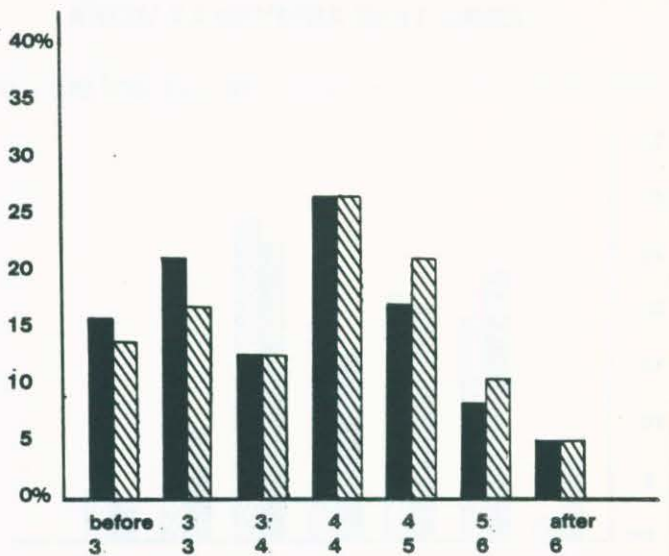
FIGURE IV - 26
WORK HOURS: EL SEGUNDO

USUAL TIME ARRIVED AT WORK



Time of Day

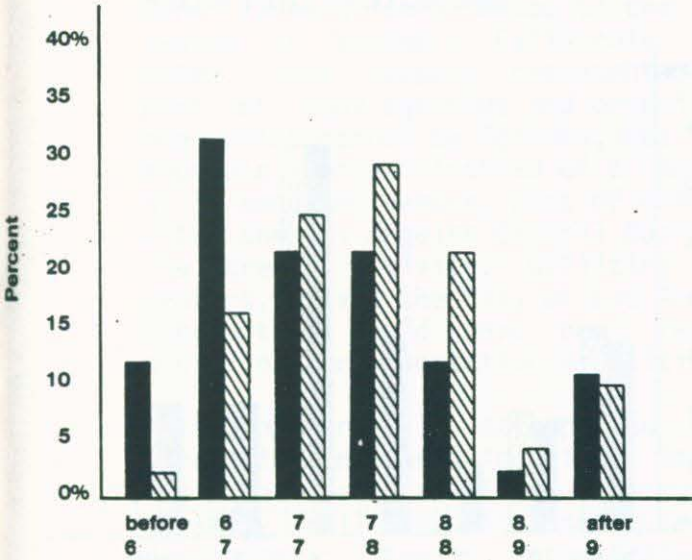
USUAL TIME LEFT WORK



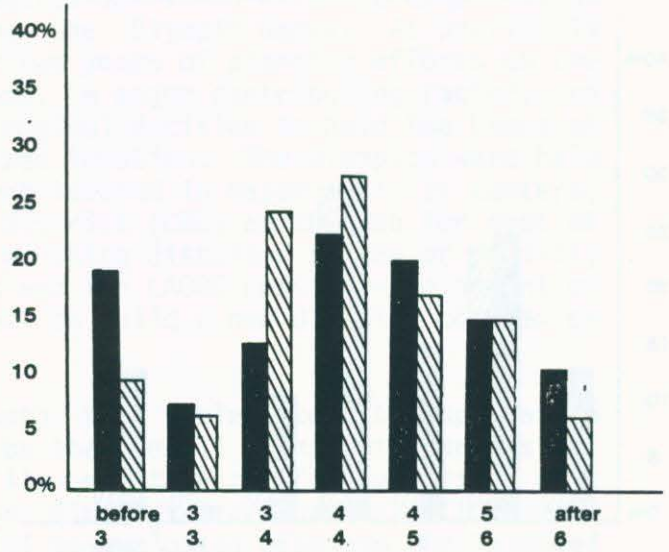
 Before Olympics
 During Olympics

FIGURE IV - 27
WORK HOURS: LONG BEACH

USUAL TIME ARRIVED AT WORK



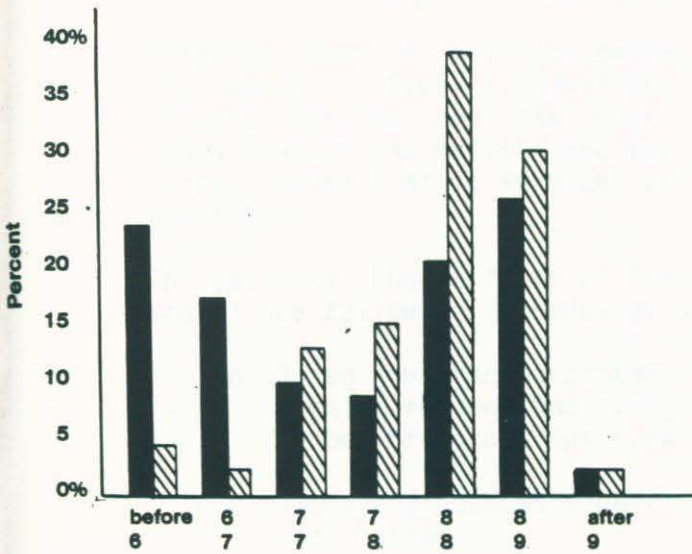
USUAL TIME LEFT WORK



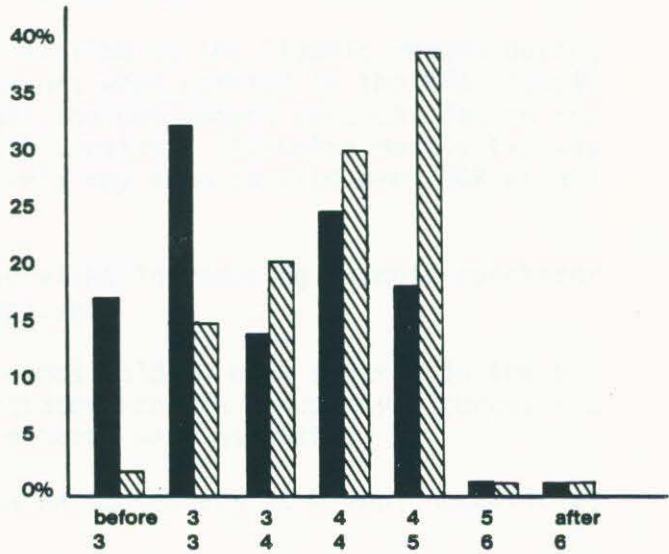
Time of Day

**FIGURE IV - 28
WORK HOURS: MID-WILSHIRE**

USUAL TIME ARRIVED AT WORK



USUAL TIME LEFT WORK

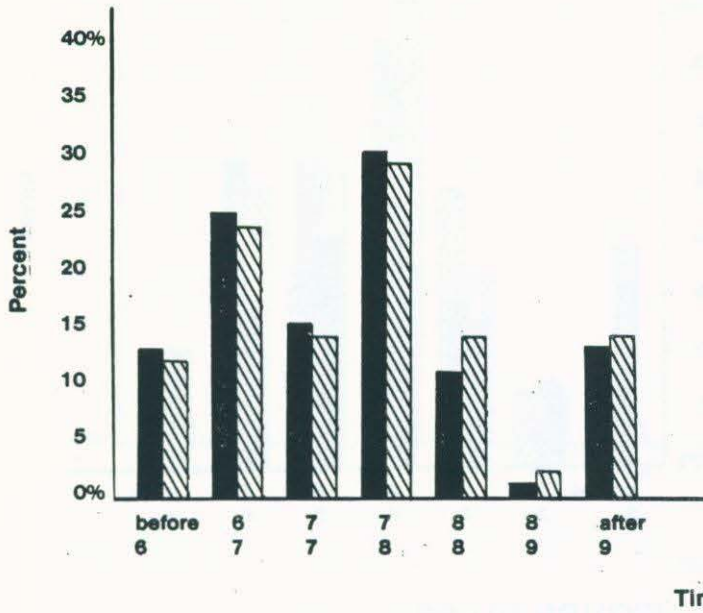


Time of Day

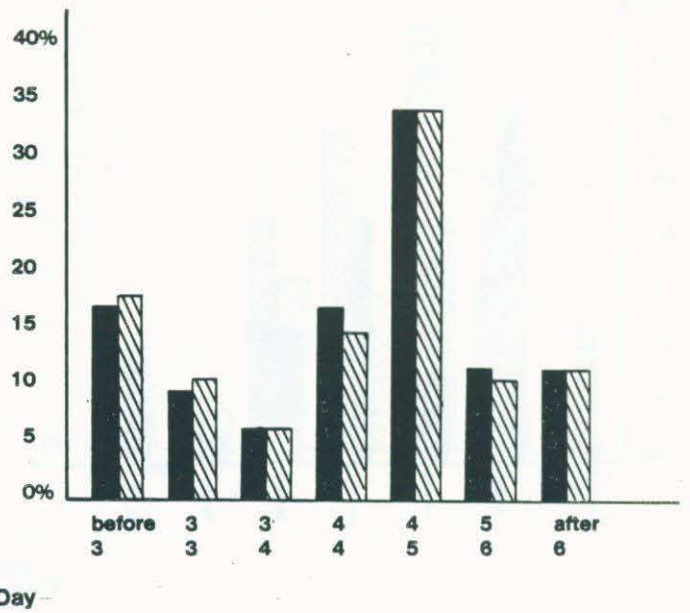
 Before Olympics
 During Olympics



**FIGURE IV - 29
WORK HOURS: PASADENA**

USUAL TIME ARRIVED AT WORK



USUAL TIME LEFT WORK



 Before Olympics
 During Olympics

**FIGURE IV - 30
WORK HOURS: COMMERCE**

CHAPTER V

EVALUATION OF STRATEGIES

V.1 Introduction

Many factors contributed to the successful operation of the transportation system in Southern California during the Olympic Games. As previously noted, this success represented over two years of planning efforts on the part of many agencies and organizations. A major contributing factor, and one which cannot be ignored, was the original decision to hold the Games at separate venues instead of a centralized location. The Olympics were held at 24 separate venues, most of which were located in major activity centers, with the Los Angeles Central Business District (CBD) as the hub for most of the transit activity. Utilizing this existing dispersed system of activity centers, saved the City of Los Angeles and the LAOOC considerable amount of funds that would have been required to build a new Olympics complex or additional transportation facilities.

This Chapter will attempt to evaluate the implemented transportation strategies and their individual impact on the overall transportation system. Goals of each specific strategy will be stated; effectiveness of each strategy will be discussed based on findings from Chapter IV (Olympics Conditions); finally, each strategy will be evaluated based on the level of achievement of the specific goals.

V.2 Transit Services

Goals:

- o To minimize traffic volumes and congestion on freeways and surface streets especially in the vicinity of Olympic venues.
- o To minimize the impacts of parking shortage at venues.

Slightly over 5 million spectators travelled to the Olympic venues during the Games. Over 1.13 million spectators were carried on the RTD Olympic Transit Service and the over 2.4 million passengers were carried on the LAOOC charter and private charter transit services. Assuming mostly two-way trips, these transit services collectively may have carried over 30% of all spectators.

To estimate the effects of transit services in reducing Olympic spectator travel the following methodology was employed:

- o Based on the percentage of tickets sold to each subarea in the Los Angeles region, and average spectator vehicle occupancy figures, the number of auto trips from each subarea were estimated.
- o Average distances from each subarea to centers of Olympic activities were estimated.

- o Average distances were applied to total trips from each area to calculate vehicle-miles of travel.

This analysis focused on August 10, the busiest attendance weekday during the Games. Table V-1 summarizes the results.

TABLE V-1
IMPACT OF TRANSIT SERVICES ON TOTAL
OLYMPIC-RELATED TRAVEL ON
FRIDAY, AUGUST 10

Total Daily Attendance	425,562
Gross Person-Trips	787,292
Gross Auto Trips	393,646
Gross Vehicle-miles Traveled (VMT)	10,500,000
 <u>RTD SPECIAL TRANSIT SERVICES</u>	
Person-trips	110,800
Saved Vehicle Trips	55,400
Saved VMT	1,478,600
Percent Savings in Olympic VMT	14.1%
 <u>CHARTER BUS SERVICES</u>	
Person-trips	33,000
Saved Vehicle Trips	16,500
Saved VMT	440,400
Percent Savings in Olympic VMT	4.2%
 <u>RTD REGULAR SERVICES</u>	
Person-trips	8,800
Saved Vehicle Trips	4,400
Saved VMT	117,400
Percent Savings in Olympic VMT	1.1%
Net Auto Trips	317,346
Total VMT Saved	2,036,400
Net VMT	8,463,6000
Percent Savings in Olympic VMT	19%

Using estimated average auto occupancy rate for spectator traffic (2.0 persons per vehicle--as observed) and average trip length (26.7 miles) for spectator trips, vehicle trips, and vehicle miles of travel (VMT) were estimated for this day. The estimated 393,600 daily vehicle trips and the over 10.5 million vehicle miles hypothetically represent the total amount of spectator travel expected if all of the trips to the Games were made by private automobiles.

Vehicle trips and VMT savings by each transit mode and by total transit services were discounted from the estimated total numbers expected to produce the actual auto trips and vehicle miles travelled to and from the

venues. The estimates were approximately 317 thousand vehicle trips and over 8.5 million vehicle miles of travel respectively.

Transit services to the Olympic Games resulted in daily savings of over two million vehicle miles of travel in the Los Angeles area. This amounted to a 19% savings in total Olympic Games related travel due to transit.

A more localized look at transit impacts at the Exposition Park Venues reveals the following. Bus terminals at this site unloaded 17,000 passengers per hour. Considering spectator vehicle occupancy rates, in the absence of transit, this would have meant the influx of approximately 8,500 additional vehicles into the area. This would require over 10 lanes of additional surface street capacity to accommodate the demand. This amount of additional street capacity was certainly not available. Without the help of the transit services, surface street traffic would have come to a near standstill.

Targeted transit mode splits were set based on venue capacity and parking supply. The extent to which these targets were met is an indication of the achievement of the second goal. Ridership data from the special Olympic transit services and estimates of Olympic related trips on regular RTD services were compared against the venue attendance data. This provided information on the actual mode splits achieved by transit. Table V-2 presents a summary of mode splits achieved at major venues.

TABLE VI-2
TRANSIT MODE SPLITS

<u>Venue</u>	<u>Target Mode Split</u>	<u>Highest Mode Split</u>	<u>Usual Range of Achieved Mode Split</u>
Exposition Park	40%	45%	35%-40%
Westwood/UCLA	40%	35%	25%-30%
Rose Bowl	15%	9%	2%-4%
Dodger Stadium	5%	2.2%	1.2%-2%
Santa Anita	10%	3%	1.8%-2.5%
Long Beach	55%	30%	4%-10%
Anaheim	25%	40%	10%-25%

Since the transit services were planned around venue capacity and parking supply, it was not unexpected that the venues that received the highest mode splits were those with the greatest shortage of parking spaces.

At most of the venue sites the achieved mode splits fell short of the targeted goals. However, no parking shortage problems were reported or observed during the Games, even at the most crowded venues. A more detailed day-by-day analysis of transit patronage and mode splits by RTD¹ showed that the significantly higher transit patronage and mode splits played a crucial role in relieving potential traffic congestion and parking problems.

Shuttles were operated to venues from sites up to three miles away. This \$2.00 service accounted for 50% of the Olympic service provided by RTD. The relatively high price of the shuttle service did not seem to be a deterrent to transit riders, even after the first several days, when parking did not seem to be in short supply. The success of this operation should be examined to determine the willingness of the commuters to use remote parking sites with shuttle services.

V.3 Transit Priority Treatment

Goals:

- o To increase the person carrying capacity of surface streets, free-ways, and ramps.
- o To provide a faster bus route to venue sites, thereby making transit use more attractive.

The bus priority system on the Figueroa Street and Flower Street one-way couplet consisted of two lanes on each street in the same direction of flow. During its peak operation, SCRTD moved 17,500 people per hour in these two traffic lanes at an average speed of 25 miles per hour. A normal lane of traffic, on the other hand, would carry 600 to 800 vehicles per hour for a maximum carrying capacity for two lanes of 3,520 people or 2.25 people per vehicle. The bus priority treatment, therefore, effectively increased the passenger carrying capacity of these lanes 5 times above normal. The bus lanes on the Figueroa/Flower couplet operated very well after initial adjustments were made to lengthen the entrance of the bus lanes to enable buses to avoid downstream congestion. The adjustment was accomplished through lengthening the merge lane with cones and additional signage.

The Vermont Avenue bus lanes operated with more flexibility between the southern edge of the Coliseum and the Santa Monica Freeway to the north. The bus lane consisted of the center two lanes of the roadway, while vehicular travel was allowed in the outside lanes, but with forced right turns at certain intervals to discourage through traffic. During heavy traffic periods, the bus lanes operated at 25-mph while vehicular traffic in adjacent lanes operated at much lower speeds. During their peak operation, the Vermont Avenue bus lanes carried a maximum of 200 buses per hour carrying 14,000 passengers.

The preferential treatment of the buses was further augmented by personnel at the entrance and exit to the two Coliseum terminals. The personnel were essential in helping the buses get through the crush of pedestrians and the automobile traffic. The combination of all of these efforts enabled SCRTD to load and unload 30,000 passengers in under two hours, several times a day.

During the period of July 28 through August 12, 1984, 42 accidents were

¹ "Evaluation of Transit Services for the 1984 Olympic Games," SCRTD, October 1984.

reported in the vicinity of the preferential lanes on Figueroa or Vermont. All of the accidents involved automobiles making contact with the buses in the exclusive lanes; however, none of the accidents were major, nor were any major injuries reported. The safety performance was exceptional given the local congestion in the area around the Coliseum and the high load factors (average 166% of seated capacity) on the buses.

High transit patronage and the consistency of ridership on later days of the Games also testifies to the fact that riders continued taking transit, despite the fact that traffic congestion and parking problems were not as severe as predicted. This suggests that spectators recognized the advantages of transit services over auto travel to the venues.

V.4 Ramp Operations and Signage

Goals:

- o To keep traffic away from congested interchanges.
- o To dry up the traffic congestion on freeways or surface streets.
- o To separate and minimize conflicts between commuter and spectator traffic.
- o To direct spectator traffic to venue sites and regular traffic away from congested areas.
- o To minimize traffic-congestion by spreading approaching spectator traffic over several interchanges.

The discussion presented in this section will be specifically related to the Exposition Park Area activities due to limitations in data.

Major freeway access to the center of Olympic activities--the Exposition Park Complex--was via the Santa Monica and Harbor Freeways. As discussed previously, detailed auto and transit access plans were developed for accessing the Complex from these freeways. Every attempt was made in these plans to limit the conflict of regular commute traffic with the Olympic related activities in this area. In general, commuters destined for downtown were urged to avoid Santa Monica and Harbor Freeways in the vicinity of the Coliseum. This was mainly aimed at keeping additional traffic from the usually very congested interchange of these two freeways.

Operational data related to ramp closures and traffic diversion strategies in the Exposition Park Complex area were presented in the previous chapter. These data, freeway volume counts on Santa Monica and Harbor Freeways and surface street traffic data were used to evaluate these traffic management strategies.

Screenline counts (Chapter IV, Figure IV-10) made on the Santa Monica Freeway indicated that on the first three days of the second week during the Games, freeway volumes were up at National, but decreased at La Brea. This suggests that, in compliance with the given directions, traffic approaching the Coliseum area was being diverted off the freeway and on to the surface

streets. The freeway, however, was relatively uncongested downstream and the speeds were faster than those on parallel surface streets. Recognizing this, commuters reverted back to the Santa Monica Freeway to take advantage of the better travel times. This is demonstrated by an increase in Thursday and Friday freeway volumes at La Brea consistent with increases at National Blvd. Traffic volumes on parallel surface streets also decreased accordingly, which further substantiated the above observations.

The Western and Normandie Ave. exits from the Santa Monica Freeway were designated and signed as the primary auto access routes to the Coliseum area. Traffic counts on these two streets just south of the freeway showed increases of 22 percent to 75 percent in traffic volumes, respectively. This was also consistent with patterns of ramp volumes presented in the previous chapter. Hoover Street, being a secondary access route, did not have signed off-ramps leading to the Olympic venues. Olympic period traffic counts on Hoover showed a decrease of 8 percent from normal. Local drivers familiar with the area, however, seem to have utilized the Hoover off-ramp for Olympic access, to some extent. Ramp volumes showed a moderate increase from non-Olympic conditions, as reflected in Figure IV-20.

Overall, there was very good compliance with the signing and ramp closure strategies related to Santa Monica Freeway. The above observations also indicate that drivers retained the flexibility to adjust their routes according to day-by-day conditions.

The Harbor Freeway is another major access route to Downtown Los Angeles as well as to the Exposition Park Olympics Complex. Here again, the commuters were urged to avoid the Harbor Freeway in the Coliseum area. This appears to be exactly what the commuters did. Screenline counts at El Segundo and Century Boulevards, (presented in the previous chapter) show that there were substantial drops in freeway volumes as traffic approached this activity area. Off-ramp volumes at Vernon Ave. also dropped during the games on a non-Coliseum day, possibly due to lower freeway traffic volumes. In addition, traffic counts on Broadway, a parallel surface street to the freeway, showed increases of up to 23 percent for the Olympics period. On Harbor Freeway, unlike the Santa Monica Freeway, the drivers did not revert back to the freeway during the later days of the week. Drivers avoided the freeway and complied with the plans throughout the entire week, as seen in Figure IV-9 in the previous chapter.

In summary, no major traffic congestion problems occurred on the Harbor and Santa Monica Freeway interchanges. Bus-only and other auto access ramps operated smoothly despite substantial increases in peak hour volumes. Freeways in the Coliseum area were able to deliver spectator crowds to the venues on time. All of the above testify to the overall good compliance of Olympic spectator and commuter traffic to venue access and route diversion strategies.

V.5 Employee Vacations, Holiday, and Days Off

Goals:

- o To minimize commuter travel during peak periods and total daily traffic.

The employee surveys conducted after the Games (see Chapter IV.4.7) indicated that a total of 14 percent of the available working time was taken off during the Olympics. If the survey was at all representative, then this would indicate that on any given day, traffic volumes for home-to-work travel would be down by about 14 percent. Traffic counts on the surface streets in downtown Los Angeles (Table IV-17) showed that traffic was 13 to 14 percent less during the Games than normal for the period between 7:00 a.m. and 9:00 a.m. Traffic around the Coliseum was 24.8 percent less than normal between 7:00 a.m. and 8:00 a.m. (See Table IV-10.) Finally, in Westwood, (Table IV-14), traffic between 7:00 a.m. and 9:00 a.m. was 16.3 percent below normal during the Olympics. The most critical east-west route in this area, Wilshire Boulevard experienced an average volume decrease of 12 percent during the Olympics and a corresponding speed increase.

In the major business areas of Downtown and Westwood, evening peak hour speeds on major thoroughfares in the outbound directions ranged between 15-22 percent better during the Olympics. These higher speeds allowed commuter trips to clear from the streets in time for spectator traffic arriving for morning and evening events.

On the freeways around the Coliseum, traffic volumes were generally 10 percent lower during the peak periods during the Games. This would also tend to indicate the general magnitude of work leave taken during the Games. The decrease in peak hour volumes is an indication of the success of the program to provide traffic information to the residents of Los Angeles prior to the Olympics. The pattern of volume changes indicates that commuting and other regular volumes decreased while the increase in traffic resulting from spectator travel took place. Had this not occurred, the combination of the two types of traffic would have completely overwhelmed the capacity of the street system.

Residents in the Los Angeles area make over 38.9 million person trips every day. Considering regional auto occupancy rates and average trip length, these amount to approximately 27.4 million total auto trips and 220.7 million vehicle miles travelled each day. Just over seven million of these daily person trips are work related. An assumed 14 percent reduction in daily work trips would represent a decrease of over 985 thousand daily person trips for the region. This would reduce daily vehicle trips by over 800 thousand, which would result in savings of over 6.9 million vehicle miles of travel every day. Savings of 6.9 million vehicle miles corresponds to a 3.1 percent reduction in daily travel in the Los Angeles area. This is remarkably close to the observed 2-3 percent decrease in daily traffic volumes on the freeway system during the first two weekdays of the Games. Recognizing that during these two days Olympic-related travel was presumably lighter, these estimated effects appear to be reasonable. Table V-3 summarizes most of the above figures.

TABLE V-3
 IMPACTS OF EMPLOYEE
 TIME OFF ON REGIONAL TRAVEL
 (ALL DAILY FIGURES)

Total Person-Trips	38,935,000
Total Vehicle Miles of Travel	220,748,000
Work Person-Trips	7,041,422
Savings in Work Person-Trips (14%)	985,799
Savings Wk. Pers.-Trips by Auto (93.5%)	921,776
Savings in Auto Trips (1.134 Veh. Occ.)	812,100
Savings in VMT (8.5 Mile/Trip Length)	6,902,850
Net Daily VMT during Games	213,845,000
Percent Savings in Regional Daily VMT	3.1%

The employee survey results led to the assumption that, Monday, August 6, Admissions Day was observed by about 2 percent of the labor force. Comparisons of traffic volumes on the Harbor Freeway between Monday, August 6 and Tuesday, August 7, show that traffic was about 1 percent less during the early a.m. peak on Monday than on Tuesday. However, on the Santa Monica Freeway, early peak hour traffic was 30 percent higher on Monday than on Tuesday, but Monday was a peak Coliseum day as opposed to Tuesday. Therefore, the impact of the Admissions' Day holiday on reducing traffic was minimal.

V.6 Modified Work Schedules

Goals:

- o To spread peak period traffic and decrease traffic during peak hours.
- o To avoid conflicts between commuter and spectator traffic.

The employer survey indicated that the number of firms in Los Angeles that offered some type of modified employee work schedules more than doubled during the Olympics (see Table IV-28). The employee surveys revealed major shifts in starting and ending times for employees in the Los Angeles Central Business District, in Pasadena, and in Mid-Wilshire, all of which were areas heavily impacted by venues (see figures in Section IV.4.7).

On the freeway system leading to Downtown, traffic during the Games was 30 percent higher than usual between 6:00 and 6:30 a.m. The sharpest peak in commuter traffic occurred between 6:30 and 7:00 a.m. Additionally, commuter traffic began to drop off after 7:30 to 8:00 a.m. period without the usual second 8:00-8:30 a.m. peak. Even with the high percentage of people on vacation leave, there was more total traffic on the freeway between 6:00 a.m. and 7:00 a.m. than usual.

Surface street counts (Tables IV-10, IV-14 and IV-17) in all cases indicated that in every hourly time frame from midnight to 6:00 a.m., during the Games, traffic was higher than usual, but was substantially lower than normal between 7:00 a.m. and 9:00 a.m. In addition to the lower total volumes during the morning peak, the Olympics were also accompanied by a flatter morning traffic profile where the 6:00-7:00 a.m. and the 7:00-8:00 a.m. traffic volumes were the same. Normally, the highest peak on the surface streets occur between 7:00 and 8:00 a.m. It is interesting to note that in the three areas where ground counts were taken, in almost every time frame from 9:00 a.m. to 6:00 p.m. Olympic period volumes were higher than morning peak hour volumes. Between 6:00 a.m. and 7:00 a.m. around the region traffic on the surface streets was 13-28 percent higher than normal and between 7:00 a.m. and 9:00 a.m. traffic was 11-24 percent lighter during the Games. This shift in the morning peak hour, especially in the Coliseum area, helped to clear the commuter traffic for morning events, starting at 9:30 a.m. at the Coliseum.

Improved peak period operations on freeways and surface streets, as mentioned in the previous section (V.4) and travel time savings indicated by surveyed employees (Table IV-30) are all indicative of good awareness of and voluntary compliance by the public with the advised travel plans. The combination of the staggered work hours and leave taking made significant changes in the peak travel patterns and was the major factor in improvement of traffic operations.

V.7 Operation Breezeway (Trucks)

Goals:

- o To divert trucks from the crowded activity areas and from peak periods.
- o To minimize traffic congestion caused by major truck accidents.

The California Highway Patrol, in conjunction with the California Trucking Association, successfully negotiated with the Teamsters Union for a five-week labor contract waiver that allowed truckers in Southern California to shift their travel routes and schedules during the Olympics.

As discussed in Chapter IV.4.3, there were major hourly and directional variations in truck traffic during the Games compared to normal. At the Santa Monica Freeway count station, near the Olympic activities, truck volumes were up 41 percent inbound and 98 percent outbound after 6:00 p.m. During the midday truck volumes were down 10-49 percent varying by predicted directional congestion. Overall truck traffic was down 15 percent inbound and 8 percent outbound on the Santa Monica Freeway. (Table IV-22).

On the other hand, during the months of July and August 1984, more large trucks passed through Southern California than in other similar period in the past. Scale records (Table IV-24) indicate that August truck volumes at all locations averaged almost 12 percent higher than June counts. The only scale location that did not show an increase in traffic for August was the Santa Ana location on Route 91. The decline in truck traffic at this location is probably an indication of route variation from this more

congested urban location. The fact that overall truck traffic was up significantly on the system, but was down on urban freeways indicates the success of the route diversion portion of Operation Breezeway. The shifts in traffic during the day also shows the extent to which the provided congestion information was utilized.

The Santa Monica Freeway is not a major through route for trucks, but serves basically to connect Santa Monica to downtown Los Angeles and to the rest of the region. Thus, much of the truck traffic on this freeway would be involved in local deliveries. The employer surveys stated that 23 percent of surveyed companies accelerated their shipping schedules before the Games and 38 percent of companies that received goods changed their delivery schedules to avoid peak hour or Olympic traffic. Truck counts on Santa Monica Freeway tend to verify these statements.

One bonus of the Operation Breezeway Program was from the safety point of view. During the three-week period around the Games only seven truck accidents were reported in Southern California. This is a 58 percent decrease in the normal accident rate, in conjunction with a 12 percent increase in truck volumes in the region. The decrease in truck accidents, especially during the peak hours, greatly reduced truck-related freeway congestion problems.

V.8 Enforcement and Emergency Response

Goals:

- o To ensure the safety and security of the transportation system.
- o To facilitate the clearance of traffic blocking incidents.

The California Highway Patrol, the Los Angeles Police Department, the various County Sheriffs Departments, and other municipal police departments were responsible for all law enforcement during the games. Seven hundred, eighty-nine CHP personnel were relocated to Los Angeles to augment the normal enforcement duties. Over eighty percent of the LAPD civilian traffic officers were assigned to Olympics-related duties. Their combined traffic control operation was very labor intensive. Law enforcement groups switched from 8-hour to 12-hour shifts to gain manpower. Officers were stationed at selected ramps on freeways accessing the major venues. At times, three helicopters were in the air for freeway surveillance. Two hundred eighty traffic officers were assigned to intersection posts around venues to direct traffic. Two hundred fifty two trucks were on roving assignment to remove illegally parked or disabled automobiles.

The strict parking enforcement around the venues was essential to allowing 4-lane streets like Normandie to carry nearly 40,000 vehicles/day. This figure would mean that for over 12 hours during the day, all four lanes were operating at or near the capacity of 800 vehicles per hour.

The presence of officers at bus-only freeway off ramps and along bus priority streets proved essential to the efficient operation of the bus priority system in the Coliseum area.

The overall 16 percent decrease in accidents (Table IV-25) and the resultant smoother traffic operations could also be credited to the increased presence of law enforcement officers.

The fact that freeway incidents were up by 33 percent (Chapter IV.4.4) during the Games, but overall congestion was down, is indicative of the success of the surveillance and emergency response operations.

V.9 Telecommunications

Goals:

- o To minimize Olympic-related or non-Olympic travel.
- o To create a quick-response data feedback system.

The 1984 Summer Games in Los Angeles utilized telecommunications on a major scale. The impact of telecommunications is difficult to assess. It allows information exchange to occur without the need for travel and personal presence to gain first-hand experience, or have face to face communication. Thus, telecommunications negates trips and trips that are not made are difficult to measure.

In preparation for the Games, Pacific Telephone, in conjunction with IBM, Motorola, AT&T, and General Telephone installed 300 miles of fiber optics cable between the venues, the Los Angeles Convention Center, and the Traffic Command Center. This created a huge electronic information system that distributed mail, messages, and data. The ease of information exchange was such that it made the spread-out Olympics activities all seem to be occurring in one centralized location. Reporters, traffic controllers, athletes, dignitaries, and LAOOC staff could input information into the computer from any number of locations or extract information on any Olympic related topic. LAOOC bus schedules could be coordinated, accident information disseminated, Olympic family traffic control coordinated, events reported, and statistics retrieved without having to leave a fixed post.

The information exchange was only one small aspect of the telecommunications system in place. Two hundred miles of freeway in Los Angeles continued to be electronically monitored for congestion. Fifteen closed circuit TV cameras also recorded information on traffic movement on the freeways. Fifty changeable message signs controlled from the TOC instantly relayed information to motorist about route information and congestion. The 120 computerized signal controllers at intersections around the Coliseum allowed real-time monitoring of street conditions and allowed traffic engineers to make changes in signal timing from one central location. These devices eliminated very few trips, but greatly facilitated those trips that were made.

The smooth operation of the transportation system, minimal traffic problems and the ease of operational adjustments, especially in the vicinity of the most crowded venues, all testify to the successful use of telecommunication technology to aid the traffic monitoring and surveillance system.

V.10 Public Information and Communications

Goals:

- o To have a coordinated planning process.
- o To minimize public confusion.
- o To minimize non-Olympic travel and avoid congested areas.
- o To distribute complete venue and traffic information to spectators, etc.

The successful implementation of many of the planning strategies during the Games can be attributed to the massive communications effort, and especially the intergovernmental agency communications. The initial planning for systemwide transportation needs included the California Highway Patrol and Caltrans, but it was soon recognized that every agency that would potentially be impacted must be involved.

Various committee and subcommittee structures, as discussed in Chapter I, brought together representatives from all the involved agencies. These groups held numerous lengthy meetings for over two years. These efforts resulted in development of detailed operational plans, many of which involved implementation by more than one agency. Plans were carried out in a coordinated and timely fashion. Smooth operation of the Traffic Operation Center and the Traffic Command Center were testimonials to the success of these efforts. The continued post-Olympic agency coordination process through the Inter-Agency Transportation Task Force (see Chapter I) was a direct dividend of the successful pre-Olympic agency coordination experiences.

Communications with the private sector, through coordinated agency presentations, daily agency press briefings and Commuter Computer's Olympics transportation information package, were an outstanding success. The voluntary programs, such as Operation Breezeway, company policy changes, and public compliance with travel advisories, all contributed to the successful operation of the transportation system. Traffic patterns, volumes, survey results, and other data represented in Chapter IV and discussed in the previous sections of this chapter all indicate that there was excellent public awareness of the expected conditions and compliance with the recommended plans. Some of these included:

- o Compliance of truckers with truck diversion plans.
- o Modification of work schedules.
- o Use of transit for Olympic trips.
- o Use of vacation and leave time.
- o Awareness of venue plans and directions.
- o Awareness of possible congested locations.

Other strategies and recommendations such as carpooling and public mode shifts to transit may not have been accomplished as successfully.

Overall, there was no appreciable change in regional vehicle occupancy rates on the freeway system as a result of the Games being held in the Los Angeles area (see Chapter IV.4.2). The slightly higher vehicle occupancy rates observed at limited locations were either normal, due to generally higher summertime rates, or due to the mix of spectator vehicles with observed occupancy rates as high as 2.49 persons-per-vehicle. Employee Survey results also substantiated the above observations. In some cases, number of riders per carpool dropped during the Games, mostly due to taken vacations and work schedule shifts.

The extent of additional transit ridership by the public was hard to assess. The surveys did not indicate any significant mode shifts (see Section IV.4.7) increases of less than 2 percent were reported). The overall uncongested operation of the transportation system had definitely contributed to these observed relatively low mode shifts.

V.11 Summary of Overall Conditions

The following is a day-by-day recap of the major trends on the transportation system during the two weeks of the Games. The discussion is summarized in Table V-4.

V.11.1 The First Week

On the first two weekdays of the Games (July 30, July 31) bus ridership on the regular system was up 8 percent and 5 percent respectively, over the August 1984 average. Freeway volumes were down 3 percent and 1 percent. These two days experienced very low attendance at the events; 182,000 on Monday and 258,400 spectators on Tuesday. Special transit services carried a total of 29,900 and 31,400 attendees to the various events. The high regular bus service patronage suggested mode shifts due to concern about the Olympics traffic and could be part of the reason for the low freeway volumes.

On Wednesday and Thursday (August 1 and 2) bus ridership on the regular system was drastically down--13 percent both days. The reason could be reversion of some transit riders to their cars due to the very light traffic. Freeway volumes rose to their August 1983 average levels. Wednesday and Thursday were also days with very low event attendance--276,400 and 250,400, respectively. On these days, RTD Olympic service carried 15,700 and 26,200 passengers. These accounted for the very lowest patronage levels recorded during the Games.

On Friday, August 3--"Black Friday," all Olympic venues including Track and Field at the Coliseum, were in session. This day had been particularly worrisome for planners. Olympic attendance was 385,800. Ridership on the special bus lines jumped to 94,800. For individuals who chose to switch to modified work schedules this was to be a day off (8 percent of employees surveyed indicated this day off). Bus ridership on the regular RTD system fell 2 percent below the August average, but freeway traffic increased by 2 percent above the August 1983 normal. The Friday off and the high total transit ridership probably contributed to the relatively low freeway volumes, despite the number of spectators going to the Games.

V.11.2 The Second Week

Monday, August 6 was selected by the State Legislature as the temporary date for the 1984 Admission's Day holiday. This holiday would normally be taken by all State, and bank employees. The State agencies had, however, all traded the Admissions Day holiday for a free floating holiday. The surveys indicated that only 2 percent of the workers took this day off. On this day, commuter traffic on the local RTD service was exactly at the August 1984 average and freeway volumes were their highest yet--5 percent above the August baseline. Most of the venues were in operation on this day and drew 392,000 spectators. RTD special transit services carried 101,200 passengers on this day.

Tuesday was not a Coliseum event day and total Olympic attendance was only 228,000. Special transit service lines only carried 30,600 one-way passengers. Local RTD lines also carried 1 percent fewer passengers than the August average and freeway traffic was up by 5 percent above normal. This day shows a seeming reversion to previous driving habits; traffic volumes were higher than any day of the previous week even though Olympics attendance was lower than on most of the previous days.

On Wednesday, August 8, the Coliseum was again in full operation and total Game attendance climbed to 418,000. This was the highest weekday attendance up to this date. The Olympic bus service carried 101,300 passengers. Local bus service and freeways carried identical loads as the previous day. The higher attendance accompanied by much higher special service ridership helped to keep traffic down to the level of the prior day.

On Thursday, freeway volumes climbed to 8 percent above the normal August base while regular bus ridership fell to 3 percent below normal August ridership. The higher freeway volumes are puzzling since Olympics attendance was only 261,100 and the special transit services carried 85,200 spectators.

On Friday, August 10, the last weekday of Olympic events, all venues were again in operation. Traffic volumes on the freeways reached their maximum level--11 percent above normal conditions. Over 425,000 spectators attended the Games, with 110,800 passengers being carried by RTD Olympics service. Regular RTD service carried 1 percent more riders than usual on this day--1,461,000 boardings. This Friday, similar to the previous one, was taken off by 8 percent of the surveyed labor force as a part of the modified schedule.

Weekend trends during the Olympics were very consistent, characterized by low traffic on the freeway, 6 percent more ridership than normal (for weekends) on regular SCRTD lines, and vary high ridership on the Olympics transit services. Except for the first Saturday (the Opening Ceremonies only) and the last Sunday (Marathon and the Closing Ceremonies) Olympics attendance on weekends was higher than on the weekdays.

The scheduling of the Games, such that the highest attendance fell on the weekends, definitely helped traffic conditions. The scheduling of two Fridays off, through modified work weeks, helped traffic conditions tremendously on the first Friday of the Games. The Admissions Day holiday on Monday seems to have had only a minor impact on traffic.

The examination of vacations taken (from the employee survey) showed that 20 percent of the labor force took an average of five days off. It would appear, due to the very light traffic during the first week of the Games, that most of the vacation was scheduled in advance for the period of July 30 through August 3. Wednesday, August 8 and Thursday, August 9 seem to represent traffic volumes with relatively full participation of the labor force superimposed on the Olympics schedule. If this is the case, the impact of the extensive staggered work hours could be clearly shown on this busy Wednesday. Every day prior to Wednesday, August 8, freeway congestion and delay ran 40 percent to 70 percent below normal. However, on Wednesday with daily traffic volumes up by 8 percent from average, traffic congestion still remained 20 percent below normal.

TABLE V-4

DAILY CONDITIONS ON MAJOR
COMPONENTS OF THE OLYMPIC TRANSPORTATION SYSTEM

Date	Venue Attendance (1000s)	RTD Special Bus Boardings (1000s)	Regular RTD System		Freeways	
			Daily Boardings (1000s)	Percent Variations ¹	Daily ² Volumes (1000s)	Percent Variation
Sat. 7/28	92.6	59.9	977	0	495	-25%
Sun. 7/29	396.8	37.3	685	+ 6%	495	-25%
Mon. 7/30	182.2	29.9	1,563	+ 8%	640	- 3%
Tue. 7/31	258.4	31.4	1,517	+ 5%	653	- 1%
Wed. 8/1	276.4	15.7	1,266	-13%	660	0
Thur. 8/2	250.4	26.2	1,268	-13%	660	0
Fri. 8/3	385.8	94.8	1,414	- 2%	673.2	+ 2
Sat. 8/4	410.3	108.8	973	- 1%	620.4	- 6
Sun. 8/5	509.4	103.0	688	+ 6%	574.2	-13
Mon. 8/6	392.1	101.2	1,454	0	693	+ 5
Tues. 8/7	228.8	30.6	1,433	- 1%	693	+ 5
Wed. 8/8	418.1	101.3	1,433	- 1%	712.8	+ 8
Thur. 8/9	261.1	85.2	1,406	- 3%	712.8	+ 8
Fri. 8/10	425.5	110.8	1,461	+ 1%	732.6	+11
Sat. 8/11	423.8	132.4	1,037	+ 6%	N.A.	N.A.
Sun. 8/12	145.8	61.2	701	+ 8%	N.A.	N.A.

1 From August 1984 Average for Weekdays, Saturdays, and Sundays.

2 For the 42-mile freeway loop.

3 From August 1983 Average.

N.A. Not Available.

RECOMMENDATIONS

VI.1 Introduction

The 1984 Olympic Games were a non-recurring event that required the marshalling of a significant amount of resources for a short period of time. The event and its transportation outcome should prove a point to everyone concerned with improving the flow and efficiency of the transportation system. The transportation management techniques and demand management strategies have been available to public agencies for years and are immediately available for implementation. What is frequently needed is the political will to implement these strategies. Policy makers demand better transportation within their areas, but frequently lack the political initiative to implement low-visibility and sometimes unpopular improvements. The following recommendations reflect those strategies, which were implemented during the Games, that proved to be the most effective in alleviating traffic problems. It is the intent of this section to encourage policymakers to fund and implement these strategies, and for members of the private sector to analyze their ability to initiate better transportation demand management of the work site.

VI.2 Communications

The success of the demand management strategies was, in part, the result of a gigantic communication effort. The public and private sectors, both employers and employees, were well educated as to the pending transportation problem and were given very concrete solutions as to how to deal with the problem. The new Olympic bus service was heavily publicized to facilitate its use, suggested work hours were distributed and congested routes were identified for route diversion. This information was available in packets to all employers. The communications efforts given these strategies were time consuming, but the benefits were tremendous. It is, therefore, highly recommended that transportation agencies utilize every avenue of communications to educate members of the public in demand management and to provide them with concrete solutions.

VI.3 Venue Planning

Jurisdictions can gain many benefits by providing funds to develop integrated venue plans for major events, such as large concerts and sporting events. These plans should be developed and implemented through the cooperative efforts of the operational staffs of cities, transit operators, highway agencies, and the law enforcement agencies. Each unique site should have its own plan which should include the creation of traffic control response teams comprised of appropriate staffs.

VI.4 Interagency Planning

The concept of the 3C planning process (Continuing, Comprehensive, and Coordinated) has long been a part of federal requirements, however, in most locations this only occurs on long-range regional efforts. Integrated

agency planning, especially for implementation, can facilitate that implementation and maximize efficient use of any new or modified facility. Each potentially affected agency, whether it is a transit operator, or law-enforcement agency, should be involved in the planning of such improvements as one-way streets, ramp modification, and signal synchronization.

This level of cooperative interagency planning requires additional funds, which should be made available to enhance implementation and efficient operation.

VI.5 Transportation Plans for Activity Centers

Cities should fund the development of transportation specific plans for activity centers where warranted because of congestion or anticipated growth. These localized plans, like the venue plans, should be developed jointly by affected agencies (as well as affected business interests) and should include many of the demand management and traffic management strategies listed below, such as peripheral parking and specific flextime proposals. This plan should also be supported by city ordinances for transportation impact mitigation. Where appropriate, management associations should be established to implement demand management strategies.

VI.6 Flexitime

Cities should actively promote the institution of flexitime programs as a traffic mitigation measure. Specific plans should be developed with the private sector that include recommended hours either for activity centers or on an industry basis depending, upon specific needs. Legislative action may be needed to support this effort in the instance where modified schedules require overtime pay. Frequently the 4/40 work week (working 4 ten-hour days) and the 9/80 work schedule (working 9 nine-hour days in a two-week period) will require legislative exemption from overtime pay requirements to make them more acceptable to employers.

VI.7 Parking Enforcement

Most major cities have parking restrictions on their major arterials during peak hours to help the flow of rush-hour traffic. The added capacity for streets, when not impeded by parked cars, can be as high as 30-50%. The active enforcement of parking and stopping restrictions will facilitate not only traffic flow, but bus operations as well. When the additional road capacity is needed, cities should be willing to fund separate parking officers and extensive towing operations.

VI.8 Traffic Signals

Prior to the Olympics the City of Los Angeles implemented a computer-controlled traffic signal system between the downtown area and the Coliseum. The system utilizes sensors in the pavement to provide real timing synchronization. This system provided a 7-10% improvement in traffic carrying capacity where it was implemented. From this experience it is recommended that where existing congestion levels warrant the expenditure of money for this system of signal synchronization that cities should expand or implement computer-controlled traffic signals.

VI.9 One-Way Streets

Many cities already have extensive networks of one-way streets in their downtowns. It is already documented that one-way streets in activity centers minimize the need to widen streets, speed traffic flow, decrease delay due to turning movements, and facilitate the implementation of bus priority treatments. This report urges policymakers to accept the responsibility of implementing one-way street operations within activity centers, despite temporary opposition by local landowners.

VI.10 Bus Treatment

Cities should investigate the implementation of preferential bus lanes in activity centers where warranted and feasible. Preferential lanes have proved to be very effective in increasing the person-carrying capacity of local streets and improving transit operations. Where demand warranted, these lanes worked particularly well with transit terminals at either end of the priority treatment.

Where severe congestion occurs at the destination, there was a higher demand for park-and-ride and park-and-pool lots. This was found to be the case at several Olympic venues. This report strongly recommends the expansion of both of these programs in conjunction with bus operations to several activity centers.

VI.11 Shuttle Service

The shuttle service operated by SCRTD during the Olympics was a tremendous success. The minimum interpretation is that people are willing to park several miles from a destination and pay to ride a bus to special events in order to avoid congestion or parking problems. This report recommends that local jurisdictions undertake detailed feasibility studies to examine the transferability of this strategy to the commute trip. This strategy has costs involved for setting up the parking facilities and operating the shuttle service. Additionally, political decisions must determine who will fund and operate any peripheral parking/shuttle service.

VI.12 Restricted Truck Deliveries

Cities should examine the impacts of restricting truck delivery hours in activity centers. Restricting truck deliveries from busy areas during the peak hours, like enforcing parking restrictions, can keep traffic lanes open for vehicular movement. Additionally, this restriction can reduce traffic slowing caused by large trucks attempting turns and maneuvering in peak-hour traffic.

On a regionwide basis, the following recommendations should be examined for implementation.

VI.13 Freeway Conditions Advisements

Public awareness of congestion, accidents, and road closures can greatly moderate the impact of these problems. It is urged that public agencies

provide the support for a variety of public information programs. On free-ways the use of changeable message signs and portable signs should be maximized to provide motorists with advance warnings of problems and route diversion information when necessary. Agencies also need to work with radio stations to improve the rush-hour traffic advisements given to commuters by providing more detailed information about incidences and local lane closures. Finally, it is suggested that newspapers carry daily route closure information and other traffic advisories for commuters.

VI.14 Truck Diversion Program

Agencies should study the congestion-mitigation effects of restricting through-trucking operations to certain freeway routes during the AM and PM peak hours. The extent of congestion problems caused by truck accidents warrants such restrictions. This program will require the cooperation of the trucking industry and should be approached by proving potential savings for the trucking industry.

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THE COMMITTEE:

Rick Richmond -- LACTC
Heinz Heckeroth -- Caltrans
Don Howery -- SCRTD
Dr. John Dyer -- SCRTD
Commander Jim Jones -- LAPD
Chief Ray Johnson -- CHP
Tad Widby -- Commuter Computer

SCAG STAFF:

Mark Pisano -- Executive Director
Jim Gosnell -- Director of Transportation
Renee Simon -- Deputy Director of
Transportation
Larry Foutz -- Program Manager
Viggen Davidian -- Transportation Planner
Carol Hunt -- Transportation Planner

AGENCY STAFF:

Steve Parry -- SCRTD
Byron Lee -- SCRTD
Alice Lepis -- City of Los Angeles, DOT
Ed Rowe -- City of Los Angeles, DOT
Bob Camou -- City of Los Angeles, DOT
Chuck O'Connell -- Caltrans
Don Juge -- Caltrans
Dave Roper -- Caltrans
Patty Chaplin -- Commuter Computer
Adele Pearlstein -- Commuter Computer
Lt. Gary Townsend -- CHP
Jim Sims -- LACTC