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DRAFT FINAL REPORT

Union Station Area Transportation Study

Prepared for

Los Angeles Community Redevelopment Agency
LAUPT Development Committee
United States Postal Service

Prepared by

Parsons Brinckerhoff Quade & Douglas, Inc.
TDA Inc.

In association with

Kaku Associates
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December 1986

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EXECUTIVE SUMMARY

Los Angeles Union Station and the Terminal Annex Post Office were built concurrently during the 1930's close to the original site of the City (El Pueblo de Nuestra Senora la Reina de Los Angeles). As the downtown expanded (there is increased pressure for development of large land holdings, such as the Union Station and Terminal Annex sites. The City of Los Angeles and the owners (USPS and the three railroads that own LAUPT) are interested in furthering the development potential of the two properties.

The purpose of the Union Station Transportation and Traffic Study is to establish a package of realistic and effective transportation improvements which will allow for a level of development on the LAUPT and USPS properties that is consistent with the results of the master planning process. The recommendations from this study will be used along with those from the market and urban design studies to identify the character, density and phasing of future development on these properties.

A summary of key study findings is presented below.

EXISTING CONDITIONS

Union Station presently serves AMTRAK and Trailways, and provides auxiliary parking for El Pueblo State Park, the Terminal Annex and nearby Federal offices. Current postal functions at the Terminal Annex post office, a major sorting center, are being moved to South Los Angeles. Principal features of the existing transportation setting are:

- The U.S. 101 freeway, adjacent to the site on the south, is at capacity for upwards of four hours per day and heavily utilized for much of the rest of the day. Nearby arterial streets on the west side have some reserve capacity; but not a great deal. On the east side, the Ramirez/Vignes intersection experiences visible congestion which ~~apparently~~ can be remedied by a planned traffic signal and channelization improvement.

- The site is well served by busway express lines to the east and local lines to from Mission Road and Huntington Drive ~~points.~~ Most buses on these lines ~~are~~ are filled to seating ~~full to seating~~ capacity and beyond in the peak hours, inbound in the morning and outbound in the evening. Some lines continue through downtown Los Angeles to the south. Traffic and boarding/discharging delays slow bus connections to downtown proper, and the need to transfer affects bus travel times to the east and west.

- AMTRAK service is fast and comfortable. There are seven trains a day each way between Los Angeles and San Diego, two each way between Los Angeles and Chicago, and one each way to and from Northern California. The early morning (7:50 AM arrival) from San Diego and the complementary late afternoon and early evening trains are popular and are well-filled between Union Station and Fullerton. Long distance trains are growing in popularity and are often full in the summer and on weekends. not so, ridership

- Trailways uses six bus berths and ticket selling space. Taxicabs are a popular connecting mode, especially for rail commuters. AMTRAK provides a charter bus connection for its San Joaquin service in Bakersfield. Dash System.

- Good parking is provided by Union Station — almost 800 spaces, mostly at-grade, open 24 hours per day at rates which compare favorably with downtown parking. The Post Office site has over 1,000 spaces, 900 of them in a 20-year-old parking structure, now fully utilized by employees of the sorting operations.

TRANSPORTATION BASELINE

For this report the transportation baseline is defined to include existing, committed, and planned facilities (Table S-1).

Transit improvements include: the busway extension (under construction); Metro Rail's depot and first 4.4 miles (construction ~~just started~~ to start mid '87; a planned Metro Rail-interface bus station at the LAUPT site; and assumed light rail lines to Pasadena, and via

TABLE S-1

ASSUMED TRANSPORTATION BASELINE

HIGHWAY BASELINE (Year)

1. Existing System (1986)
2. Busway and added lane along U.S. 101 (1988)
3. Alameda Street Improvements (1987)
4. Vignes Street Improvement (1990)
5. Vignes/Ramirez/Center/Santa Fe Streets Arterial (2001)

TRANSIT BASELINE

1. Existing Local Bus Service (1986)
2. Busway Extension, Alameda Street Bus Station (1988)
3. Privatization of most Busway Express Routes (1988)
4. MOS-1 of Metro Rail (1992)
5. Metro Rail Bus Terminal and Busway Ramps (1992)
6. Long Beach-Los Angeles LRT (1993)
7. Metro Rail Extensions west of MacArthur Park (1997) and to San Fernando Valley (2002)
8. Light Rail Line to Pasadena (1995)
9. Light Rail Line (via Burbank Branch) to Canoga Park (1997)

PARKING BASELINE

1. Existing Facilities including USPS Structure (1986)
2. County Structures (1990)
3. Underground Parking, LAUPT Forecourt (1990)
4. Underground Parking, Metro Rail (1992)

Glendale and Burbank to the San Fernando Valley (Figure S-1) at or adjacent to the project site.

Highway improvements include an auxiliary lane on U.S. 101 east of Alameda Street, widening and repairing of Alameda Street, and improving Vignes Street intersections with Macy and with Ramirez Streets (Figure S-2).

Parking improvements include CRA and Los Angeles County structures west of El Pueblo State Park, an expanded County motor pool garage, and 300-500 parking spaces for the first segment of Metro Rail (Figure S-3).

REQUIRED IMPROVEMENTS

After evaluation of several alternative development plans and transportation complements, a transportation/parking plan has been developed to support a feasible long-range plan for site development (see Table S-2).

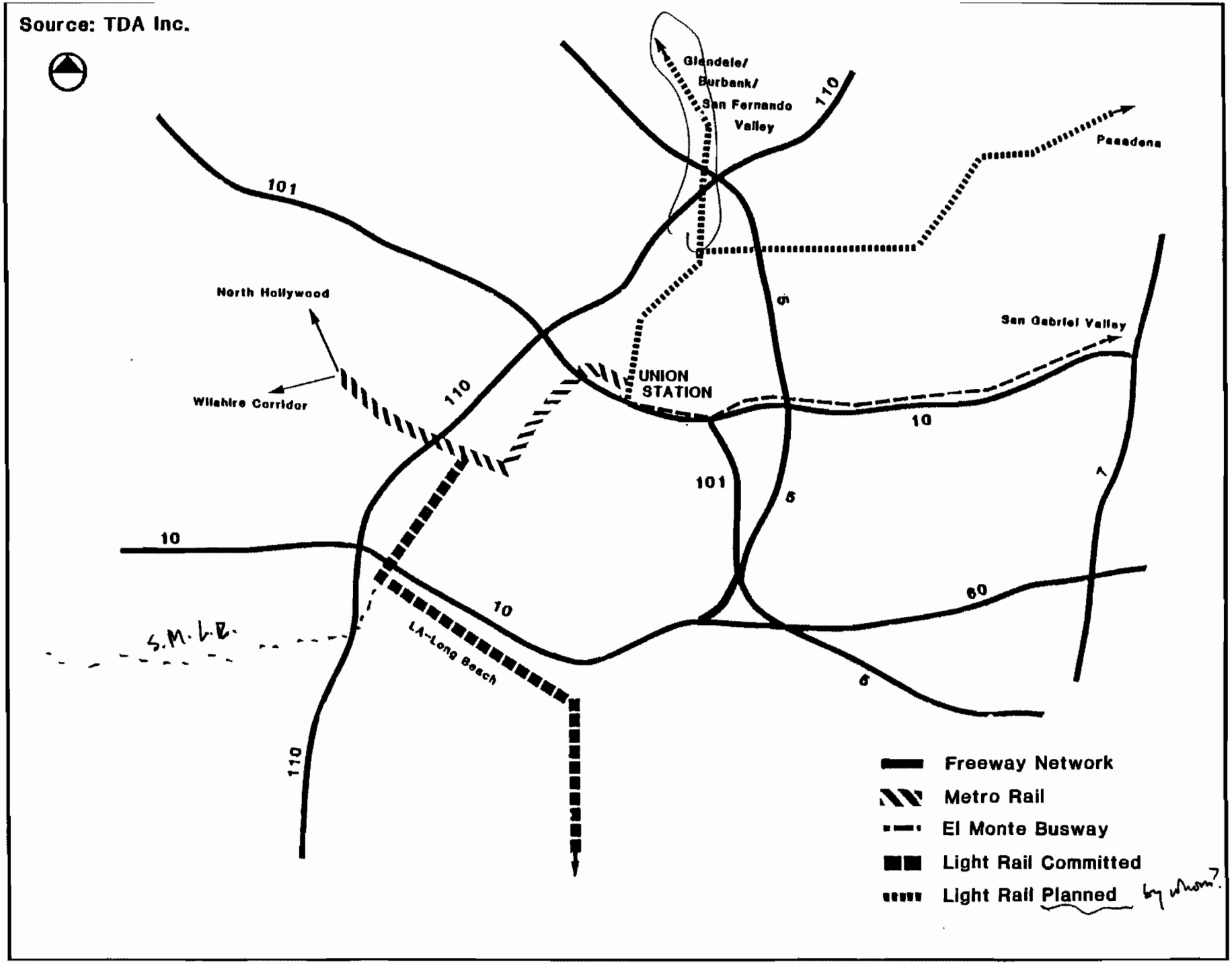
Assumptions

In addition to the light rail facilities assumed to be in the baseline, the program assumes that Metro Rail will be extended to the Fairfax District and to North Hollywood (Chandler/Lankershim).

Freeway widening by replacing median shoulders and other within-right-of-way measures is assumed to continue wherever possible (this is viewed as not feasible in the U.S. 101 "slot" area west of the site).

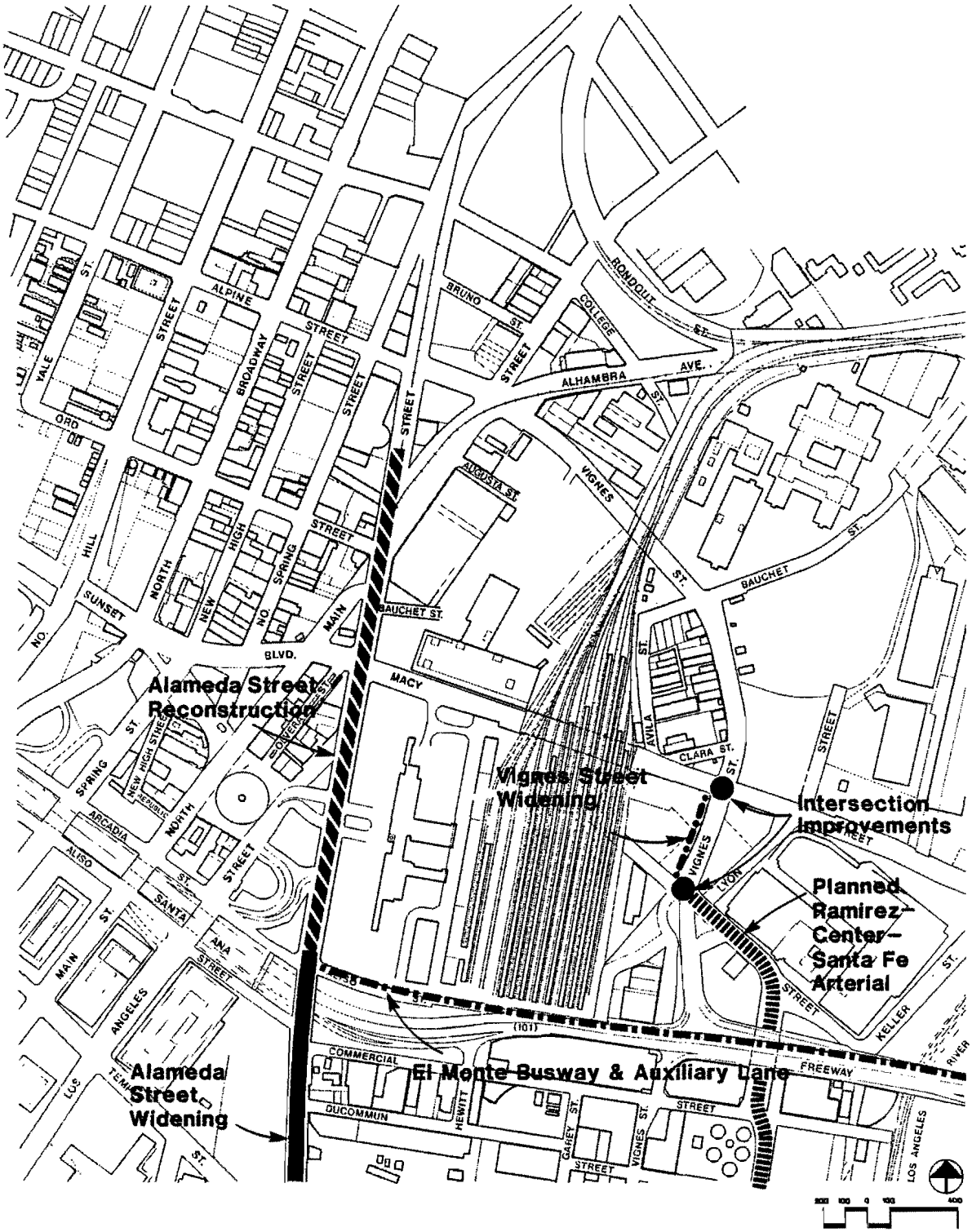
Further, it is assumed that a very strong transit/ridesharing incentive program can be established and enforced by a combination of CRA and developer efforts.

Described below are the transportation and parking improvements recommended to occupancy each increment of development. Also given is the approximate (order-of-magnitude) cost for implementing those improvement in 1986 dollars, excluding land acquisition costs.

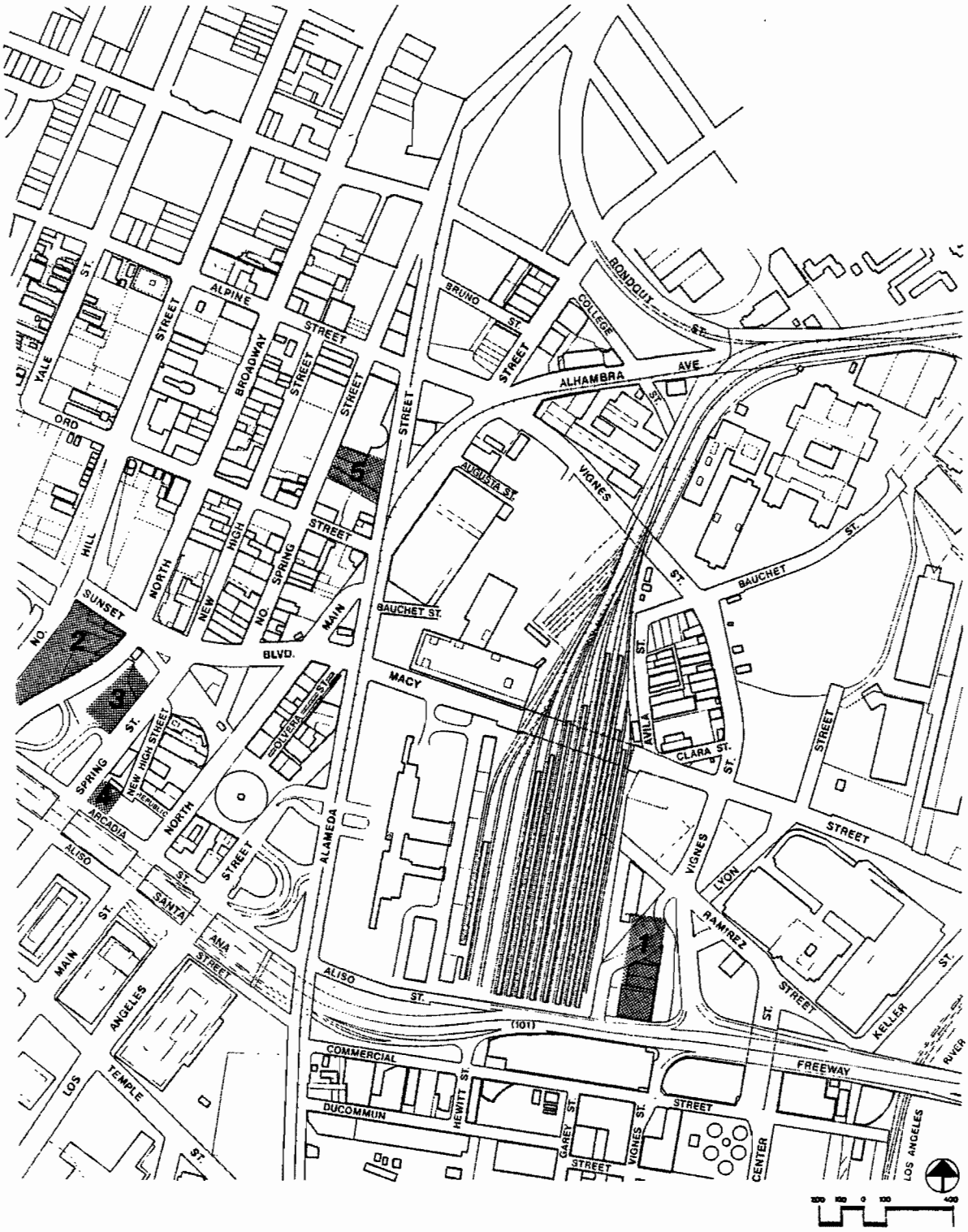


BASELINE TRANSIT FACILITIES

Figure S-1



Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	BASELINE IMPROVEMENTS (STREETS AND HIGHWAYS)	S-2



1 Metro Rail Parking, 500 Spaces
2 County Parking Structure ,1450-2000 Spaces (Open to Public)
3 Hotel Basement Parking , 300 Spaces (Guests Only)
4 County Parking Structure,300-500 Spaces
5 County Parking Expansion (County Vehicles Only)

Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	PARKING BASELINE	S-3

TABLE S-2

TRANSPORTATION IMPROVEMENTS FOR
PREFERRED DEVELOPMENT ALTERNATIVES

Phase	Site	Land Use (units)	Amount	Streets and Highways	Public Transportation	Parking (spaces)
Existing Baseline	USPS	Sorting Office to be phased out).	300 ksf	Realign Alameda/N. Main	Relocate bus layovers to central maintenance.	Structure (900). Surface (100+/-).
	LAUPT	AMTRAK, Trailways Metro Rail station construction	50 ksf	Add auxiliary lane, US 101. Widen Alameda to 6 lanes. Vignes Street intersection improvements at Macy and Ramirez.	Busway extension to Alameda Street. Metro Rail MOS-1. Bus interface station. Rerouting of buses and privatization. Light Rail lines to Pasadena and perhaps San Fernando Valley.	Subterranean parking: - along Alameda (1,000). - under bus interface station (1,000) Deck over bus interface station (unfinished).
Phase I	USPS (1990)	Branch Post Office Childrens' Museum Offices	50 ksf 100 ksf 150 ksf	No change.	Establish ridersharing/ demand management organization.	Retain existing structure (900) and short-time parking (66).
	LAUPT (1992-3)	Specialty Retail Hotel Offices	200 ksf 400 rooms 750 ksf	Add left turn lane on Vignes EB at N. Main. Restripe N. Main at Alameda and widen USPS exit.	Estabish personalized carpool placement program.	Add Structure "B" (600). Add first increment of east ("C") parking structure (1,000).
Phase II	USPS (1997)	Offices	700 ksf	No change	Initiate direct to site express buses in non-rail corridors.	Redevelop surface parking (300). Build first increment of structure (2,400). Demolish existing structure (-900).

TABLE S-2 (Continued)

TRANSPORTATION IMPROVEMENTS FOR
PREFERRED DEVELOPMENT ALTERNATIVES

Phase	Site	Land Use (units)	Amount	Streets and Highways	Public Transportation	Parking (spaces)
	LAUPT (2000)	Rail Museum Offices	50 ksf 1.05 msf	Build multilane exit to east ("C") parking structure at Ramirez. Widen US 101 off-ramp at Vignes/Ramirez for left turn pocket.	Assume Metro Rail extended to Fairfax District and Hollywood.	Build second increment of east ("C") parking structure (2,000), and build Bauchet access bridge.
Phase III	USPS (2003)	Offices Cultural Attraction	1.0 msf 50 ksf	Add WB right turn lane on Vignes at N. Main. Add EB thru lane from N. Main to USPS entrance drive at Alameda.	Reinforce ridesharing/ demand management program with financial incentives.	Build subterranean parking along Alameda (1,200). Build second increment of structure (1,800).
	LAUPT	Offices Retail	3.1 msf 50 ksf	Rebuild Alameda and N. Spring Streets to connect with I-5. Add SB left turn pocket on Alameda at Macy. Add NB and SB left turn pockets on Vignes at Macy.	Assume Metro Rail extended eastward with park-and-ride lots at stations.	Reallocate Metro Rail parking (1,000). Rely on P.O. site for commuter parking.

Phase I-USPS

Phase I of the Post Office site development, to be opened about 1990, will include rehabilitation of the existing building for a museum (100,000 square feet), office space (150,000 square feet), and a branch post office (50,000 square feet). Its transportation needs can be met by the existing and planned facilities, once the El Monte Busway extension and associated street improvements are completed. The existing parking structure should be retained along with the 66-space lot at Macy and Alameda Streets.

Phase I-LAUPT

Phase I of the Union Station development will include AMTRAK (existing), Metro Rail's eastern terminus, Specialty Retail (200,000 square feet), a hotel (400 rooms), and offices (750,000 square feet). It will require:

1. Completion of MOS-1 of Metro Rail from Union Station to MacArthur Park along with the associated bus terminal and parking under the terminal for 1,000 cars;

2. Construction of two levels of below-grade parking under the existing lot along Alameda Street and replacement of the existing lot (for a total of 1,000 spaces); before opening of retail space (approximate cost, $18.0 million);

3. Improvement of Alameda/N. Main, Macy/Vignes, N. Main/Vignes, and Ramirez/Vignes intersections as described in Table S-2 (approximate cost, $0.7 million);

4. Relocation of Los Angeles Street approximately 100 feet to the south (in order to allow for better pedestrian access between El Pueblo State Park and the Los angeles Civic Center) (approximate cost, $0.6 million); and

5. Construction of first 1,000-space increment of east parking structure (approximate cost, $8.0 million).

Phase II - USPS

Phase II of the USPS development will add 700,000 square feet of office space. It will require:

- For increment A (200,000 square feet)

    1. Build first 1,400-space increment of new garage on USPS property, and demolish existing structure (approximate cost, $11.2 million);

    2. Replace Alameda Street from Alpine Street north to Elmira Street (near Spring Street yard) to smooth it out and make it more attractive, so as toe relieve the traffic pressure on Chinatown (approximate cost, $0.2 million);

    3. Widen and restripe the Alameda/North Main/USPS driveway intersection (approximate cost, $0.1 million);

- For increment B (500,000 square feet)

    4. Close North Main Street from Alameda Street to Vignes Street (approximate cost, $0.3 million); and

    5. Construction subsurface parking along Alameda Street for future office building (approximate cost, $18.0 million).

Phase II - LAUPT

Phase II of LAUPT will add a cultural attraction (50,000 square feet) and 1.05 million square feet of office space in three increments. It will require:

- For increments A and B (345,000 square feet each)

    1. Further improvements to the Ramirez/Vignes/U.S. 101 Freeway Ramp intersection (approximate cost, $0.5 million);

2. Second 1,000-space increment of east parking structure (approximate cost, $8.0 million);

3. Bauchet Street connector (approximate cost, $1.51 million);

4. Light rail service to Glendale or Pasadena (approximate cost, $300 million but not a project responsibility;

- For increment C (360,000 square feet)

5. Final 1,000-space increment of east parking structure (approximate cost, $8.0 million); and

6. Balance of planned Burbank/Pasadena LRT (approximate cost, $300 million but not a project responsibility).

Phase III - USPS

Phase III of the USPS development will expand on-site cultural attractions by 50,000 sq. ft. and will add 1.0 million square of office space. It will require:

1. Completion of 18-mile Metro Rail "Starter Line" as presently planned (or equivalent);

2. Widening of North Spring Street on the northwest side from Elmira Street across the Los Angeles River bridge to North Broadway (approximate cost, $10.0 million);

3. An additional by in the Metro Rail bus transfer terminal (approximate cost, $0.5 million); and

4. Build second increment of 1,400 parking spaces in USPS structure (approximate cost, $11.2 million).

Phase III - LAUPT

Phase III of the Union Station property development is expected to be relatively far into the future. Based on current projections of mode choice and trip generation, it would require:

1. Further widening of North Main/Vignes, Alameda/North Main, Macy/Vignes, and Alameda/Macy intersections (approximate cost, $0.7 million);

2. Further expansion of Metro Rail bus transfer station (approximate cost, $0.5 million);

3. The final 1,400-space increment of the parking structure on the USPS property (approximate cost, $11.2 million); and

4. Either relocation of 1,000 Metro Rail parking spaces to outlying park-and-ride stations or an additional 1,000 spaces on USPS property to provide for project demands (cost range 0 to $8 million, depending on outcome of negotiations).

PRINCIPAL CONCLUSIONS

Based on best available projections of trip generation, transit use, and ridesharing, about 3.3 million square feet of development can be accommodated on the combined LAUPT/USPS site with:

- Completion of all planned street improvements;

- Additional street widening and intersection improvements adjacent to the site;

- Planned Metro Rail transit construction;

- Assumed Light Rail feeder lines;

- An active, covenant-supported program for encouraging transit use and ridesharing; and

- Additional SCRTD or charter bus service.

Up to 7.6 million square feet of development can be accommodated on the combined LAUPT/USPS site with:

- Continuing freeway operations improvements and TSM measures;

- Off-site access improvements including widening along Alameda - North Spring - North Broadway between the site and I-5;

- Further intersection improvements at Ramirez/Vignes, Alameda/Macy, Alameda/North Main and North Main/Vignes Streets.

- Metro Rail or LRT extensions to the west, east, and/or southeast;

- Additional bus and/or rail service, possibly including express charter buses directly to the site; and

- A strong transit/ridesharing incentive policy by the owner/developer.

A ridesharing management program with strong research and marketing capabilities should be established, to determine whether the initial forecasts will remain valid and whether "trigger" levels for improvements should be revised.

This program will lay the ground work for modifying transportation development strategy in the light of experience. If transit use and ridesharing are consistently higher than anticipated, the specifications for street improvements and parking should be changed to a performance standard, based on the observed number of trips per employee or per 1,000 square feet. Conversely, if transit and ridesharing fail to meet assumed levels, then either the scale of development must be cut back or new transportation improvements must be programmed.

PART I

EXISTING CONDITIONS

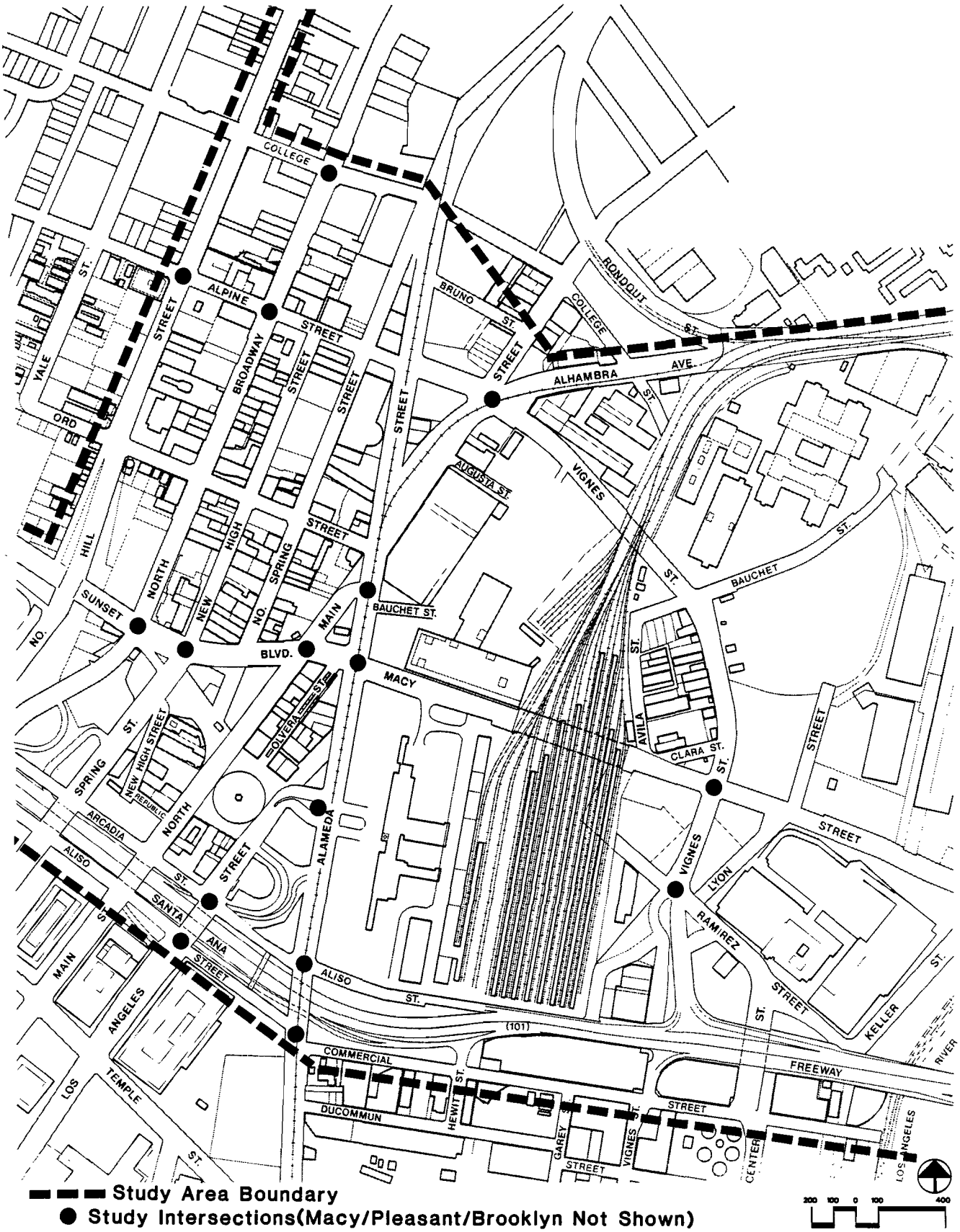
This section of the report summarizes the existing traffic conditions within the study area for the Union Station Area Master Plan Transportation. It includes a description of the existing street and highway system, an evaluation of existing traffic volumes and level of service, and an assessment of existing opportunities and constraints related to traffic flow within the study area. Part I of the report describes the existing transportation network serving Union Station and Terminal Annex. This part is divided into five sections: (A) Highways and Traffic; (B) Public Transportation; (C) Pedestrian Conditions; (D) Parking Conditions; and (E) Conceptual Transportation Baseline.

The site (Figure 1) is close to the center of Southern California's freeway system and has direct bus service to the north and east. AMTRAK and Trailways provide good but infrequent intercity train and bus service. Downtown bus connections are frequent but slow due to stop frequency and traffic delays.

Peak congestion affects both freeways and arterials and tends to detract from the site's strategic location. From one "rush hour" in each direction per day the congestion period has expanded to three hours or more in each direction. Both directions on U.S. 101 at the site are congested for four hours or more.

Bus service quality is affected by traffic congestion and by bus operating costs which motivate SCRTD to maximize bus occupancy. Thus 70% of the peak hour passengers on the El Monte busway may be standees. There are strong pedestrian linkages to the Civic Center of Los Angeles and to the El Pueblo State Park.

Parking is one of the site's strong points, but land developments and Metro Rail will increase parking demand further.



Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE 1
	STUDY AREA BOUNDARY AND LOCATIONS OF STUDY INTERSECTIONS	

HIGHWAYS AND TRAFFIC

Street System in the Study Area

Figure 2 illustrates the existing street system within the Union Station study area, and indicates the major through traffic corridors. Primary regional access to the study area is provided by the Santa Ana Freeway (U.S. 101), which runs generally east-west along the southern edge of the study area, the Pasadena Freeway (S.R. 110) north of the study area and the San Bernardino Freeway (I-10) east of the study area. Major north-south streets include North Hill Street, North Broadway, North Spring Street (south of Sunset Boulevard), North Main Street and Alameda Street. Sunset Boulevard and Macy street provide primary east-west access through the study area, while Ord Street, Alpine Street/Vignes Street and College Street provide secondary east-west access.

Access to the Santa Ana Freeway is provided by on-ramps from Broadway and from Los Angeles, Alameda, Vignes and Commercial Streets, while off-ramps are located at Broadway/Aliso Street, Spring Street, Alameda Street/Aliso Street, Vignes Street and Commercial Street. Access to the Pasadena Freeway north of the study area is obtained via North Hill Street, while access to and from the San Bernardino Freeway and the Santa Ana Freeway east of the study area can be obtained via Macy Street. Travel patterns on surface streets within the study area are greatly influenced by the proximity of these freeways to the study area.

Freeway Geometrics

In the study area, the Santa Ana Freeways passes through a deep cut with retaining walls, known locally as the "slot". The freeway provides four lanes in each direction, with minimal shoulders through the "slot". East of the "slot" from Mission Road across the Los Angeles River to Vignes Street, there are five lanes in each direction. West of the "slot" is the famous four-level interchange where the Santa Ana Freeway meets the Harbor, Hollywood, and Pasadena Freeways.

East of Mission Road, there are four lanes in each direction on the Santa Ana Freeway, and these are fed by a total of six lanes on the converging Santa Ana and San Bernardino Freeways. A lane diverges from the inbound direction on each of these

Freeway

Major Highway

Secondary Highway

Collector Street

Local Street

Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	CENTRAL CITY NORTH COMMUNITY PLAN STREET CLASSIFICATIONS	2

freeways to a pair of ramps connecting to an added lane in the outbound direction of the other freeway.

The interchange of I-5 (Golden State Freeway) with I-10 (San Bernardino Freeway) has no ramps connecting the west leg with either the north or south legs of I-5. Southbound traffic on I-5 must use either the Pasadena Freeway or North Broadway/ North Spring Street to approach the site. Northbound traffic on I-5 must use U.S. 101 to approach the site.

Street Geometrics

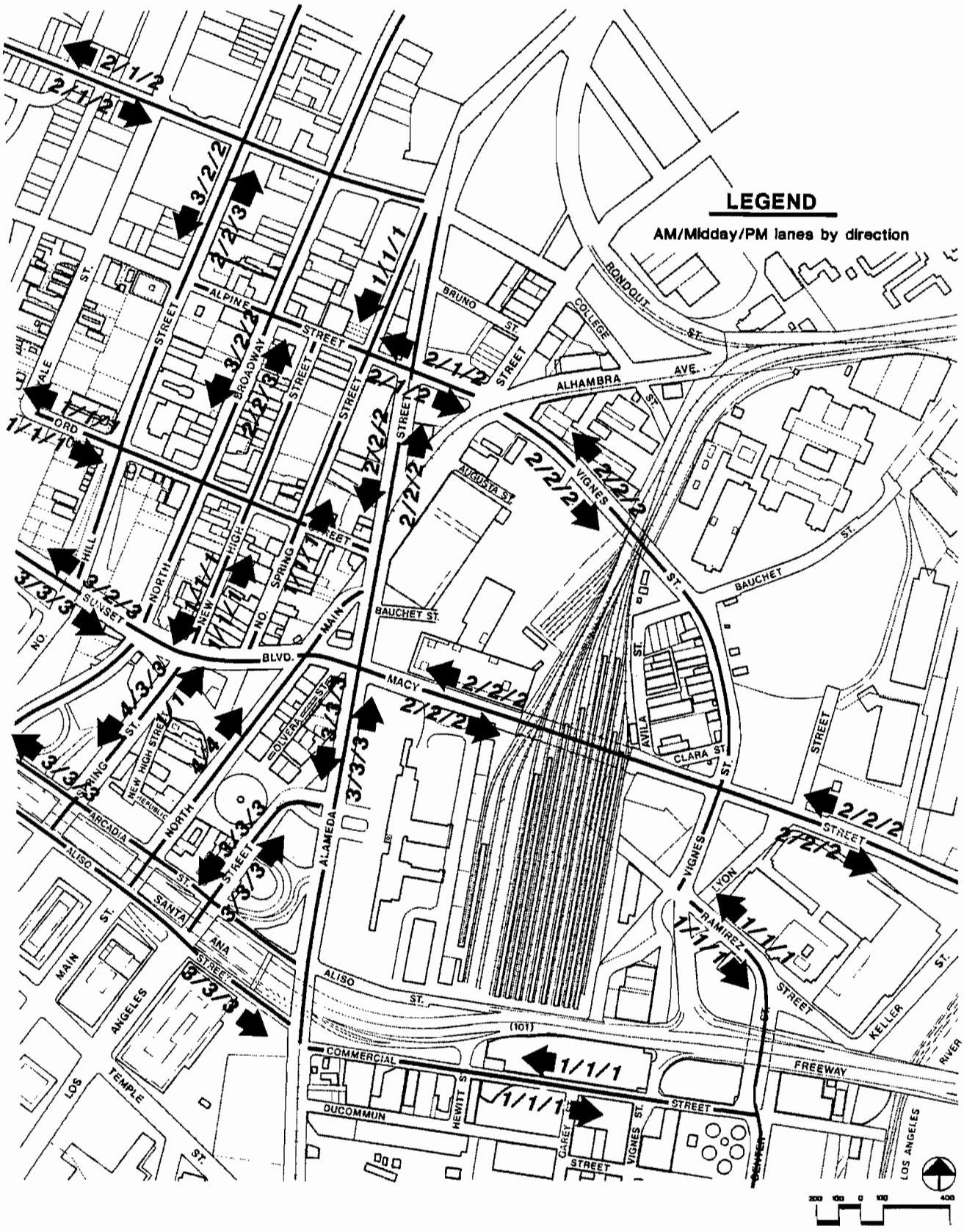
Figure 3 illustrates the number of midblock traffic lanes provided on the streets within the study area. Additional turning lanes at intersections are not indicated on the figure. As indicated on the figure, peak period parking prohibitions are used along many of the streets to provided additional travel lanes during one or both peak periods, including portions of North Hill Street, North Broadway, College Street, Alpine Street, Ord Street, Sunset Boulevard and Macy Street. Field observations indicate that the prohibitions are enforced, with towing of illegally parked vehicles.

Traffic Controls

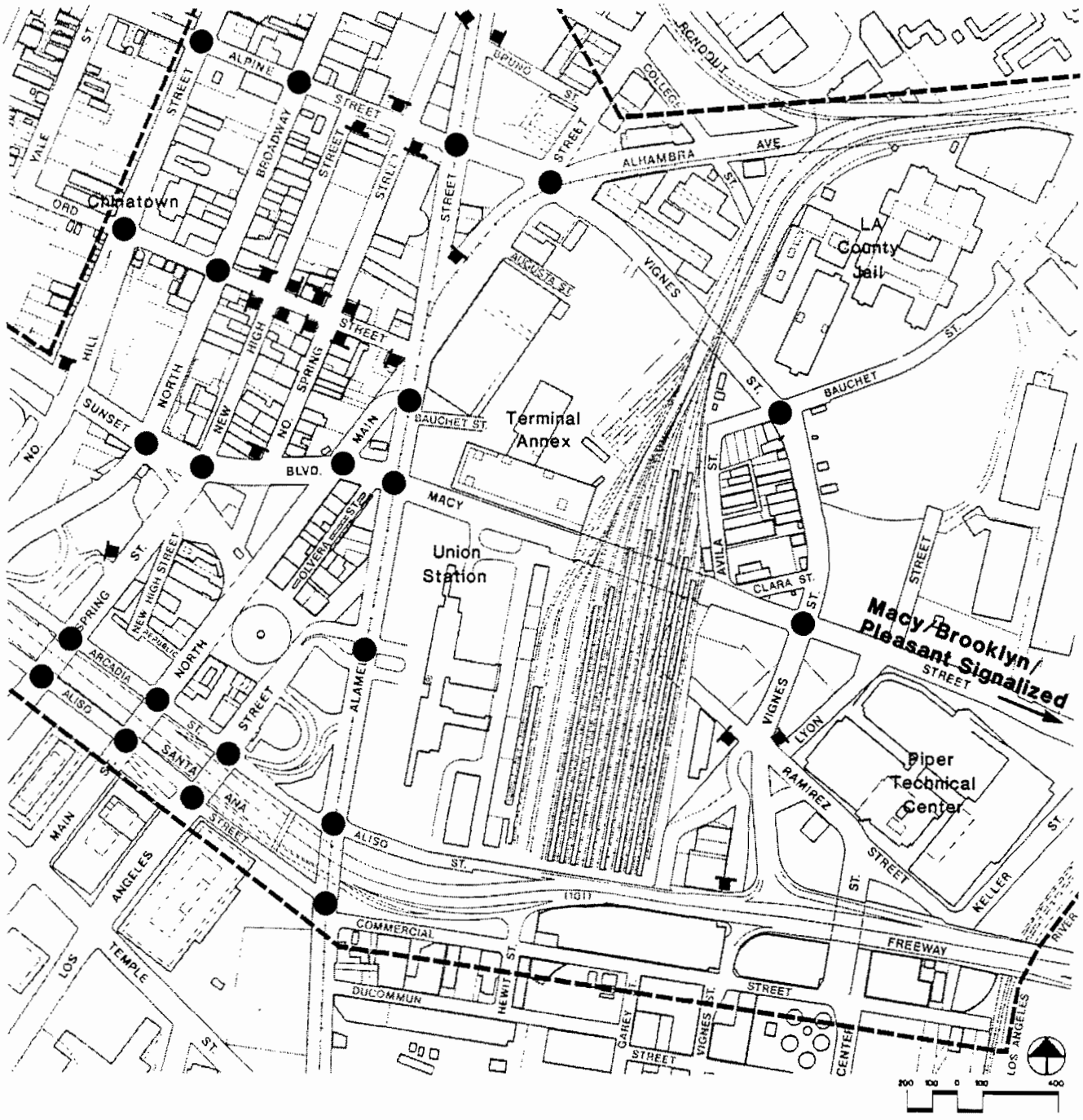
Existing traffic controls are illustrated in Figure 4. As can be seen, most of the intersections within the study area are signalized. In addition, at the intersections of North Hill Street with College Street and Alpine Street and of North Broadway with College Street and Alpine Street, left-turning movements are prohibited in the peak direction during peak hours.

Brief descriptions of the principal streets serving the study area and their traffic controls follow:

- North Hill Street - North Hill Street is a four-lane north-south facility providing access from the downtown area through the study area to the Pasadena Freeway to the north. North Hill Street is also a major commercial street within Chinatown (north of Ord Street). Within Chinatown, on-street metered parking is prohibited between 7:00 AM and 9:00 AM in the southbound direction and between 4:00 PM and 6 PM in the



Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	MIDBLOCK THROUGH LANES	**3**



● **Traffic Signal Locations**

Stop Sign Locations

Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	EXISTING TRAFFIC CONTROLS	4

northbound direction, in order to provide a third through lane in the peak direction. Left-turn lanes are not provided along North Hill, which results in congested conditions as left-turning vehicles block through lanes while waiting to turn. For this reason, left-turns are prohibited in the peak direction during peak hours. All intersections along North Hill Street within the study area are signalized.

- North Broadway - North Broadway is a four-lane north-south facility providing access from the downtown area through the study area to the Pasadena Freeway to the north. North Broadway is also a major commercial street within Chinatown. Within Chinatown, on-street metered parking is prohibited between 7:00 AM and 9:00 AM in the southbound direction and between 4:00 PM and 6:00 PM in the northbound direction, in order to provide a third through lane in the peak direction. Left-turn lanes are not provided along North Broadway, which results in congested conditions as left-turning vehicles block through lanes while waiting to turn. For this reason, left-turns are prohibited in the peak direction during peak hours. All intersections along North Broadway within the study area are signalized. Access to the Santa Ana Freeway (U.S. 101) is obtained via a westbound on-ramp south of Sunset Boulevard.

- North Main Street - North Main Street is a one-way northbound four-lane north-south facility south of Macy Street narrowing to three lanes to Alameda Street. North of Alameda Street, North Main Street is a two-way two-lane facility. On-street parking is prohibited south of Alameda Street. All intersections along North Main Street within the study area are signalized.

- Alameda Street - Alameda Street is a four-lane north-south facility widening to six lanes south of North Main Street. On-street parking is prohibited south of North Main Street. Within the study area, Alameda Street has poor pavement conditions, inadequate lane striping and signage. All intersections along Alameda Street within the study area are signalized. The westbound Santa Ana Freeway off-ramp is located at the east leg at the intersection Arcadia Street.

- Los Angeles Street - Los Angeles Street is a four-lane north-south facility ending at Alameda Street. Within the study area, on-street parking is prohibited and all intersections along Los Angeles Street are signalized. Access to and from the Santa Ana Freeway (U.S. 101) is obtained via a westbound on-ramp and eastbound off-ramp.

- Sunset Boulevard/Macy Street - This is a four-lane east-west facility providing access from the Hollywood area through the study area to East Los Angeles. this facility is identified as Sunset Boulevard west of New High Street and Macy Street east of New High Street. Within the study area, on-street metered parking is prohibited between 7:00 AM and 9:00 AM and between 4:00 PM and 6:00 PM in both directions, west of North Broadway in order to provide a third through lane. All major intersections along Sunset Boulevard Macy Street are signalized within the study area.

- College Street - College Street is a two-lane east-west facility. Within Chinatown, on-street metered parking is prohibited between 7:00 AM and 9:00 AM and between 4:00 PM and 6:00 PM in both directions, in order to provide a second through lane in each direction. All intersections along College Street are signalized within the study area.

- Alpine Street - Alpine Street is a two-lane east-west facility. Within Chinatown, on-street metered parking is prohibited between 7:00 AM and 9:00 AM and between 4:00 PM and 6:00 PM in both directions. Within the study area, signalized intersections are present at North Hill Street, North Broadway and Alameda Street.

- Vignes Street - Vignes Street is a four-lane street with signalized intersections at all major intersections within the study area. On-street parking is permitted north of Macy Street.

- Arcadia Street - Within the study area, Arcadia Street is a one-way westbound three-lane frontage road beginning at Alameda Street and dead-ending at North Broadway. At Alameda Street, the east leg of the intersection is the westbound Santa Ana Freeway off-ramp. On-street

parking is prohibited. All intersection along Arcadia Street are signalized within the study area.

- Aliso Street - Within the study area, Aliso Street is a one-way eastbound three-lane frontage road beginning at North Broadway and ending at Alameda Street. The Santa Ana Freeway eastbound off-ramp is at the west leg of the intersection at North Broadway and the frontage road is renamed to Commercial Street east of Alameda Street. On-street parking is prohibited. All intersections along Aliso Street are signalized within the study area.

TRAFFIC VOLUMES

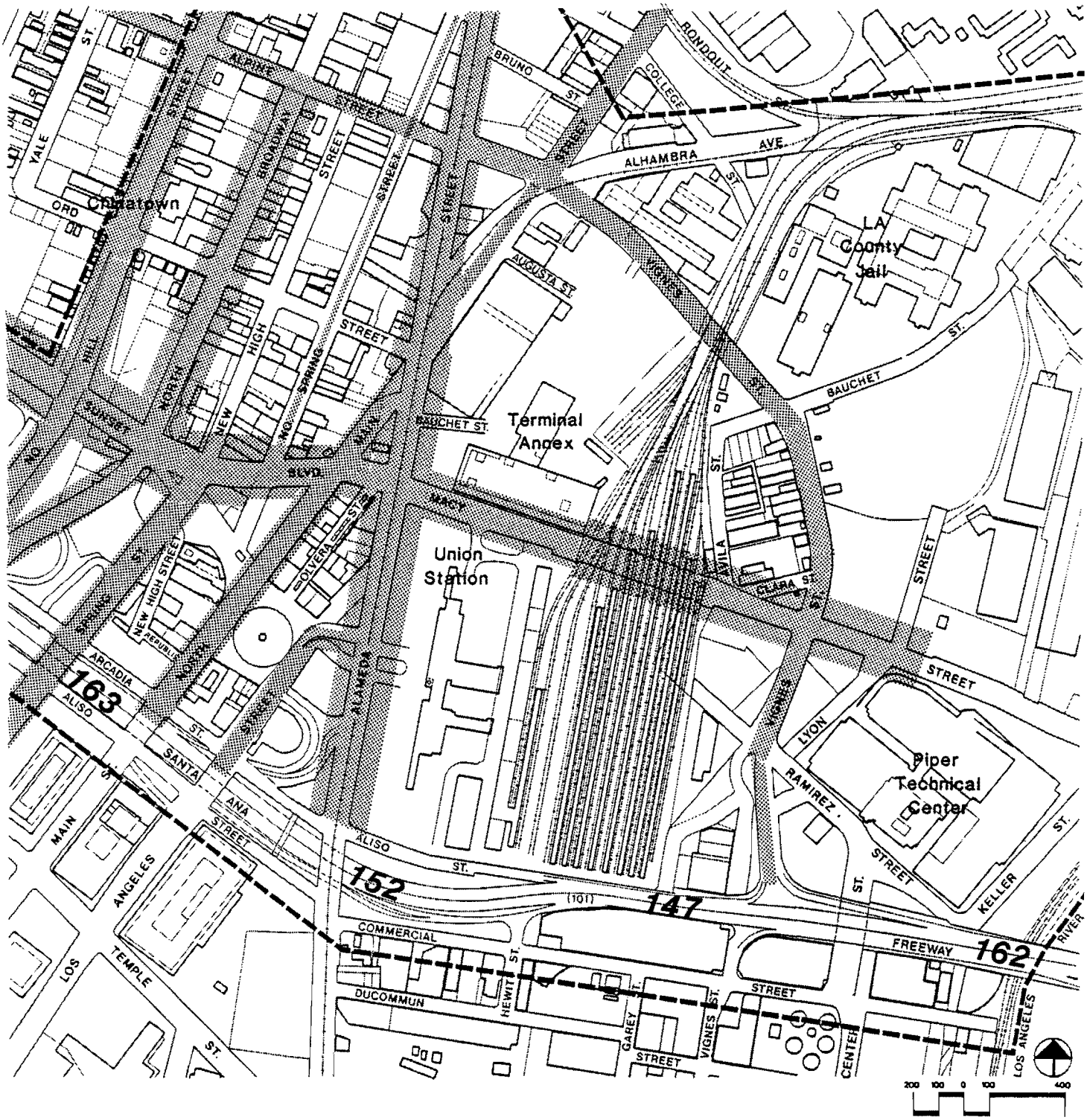
Daily Traffic Flows

Existing daily traffic volumes on city streets within the study area were obtained from PRC Engineering, Chinatown Redevelopment Project Parking and Circulation Analysis (June 1984), while 1984 volumes on the Santa Ana Freeway were obtained from Caltrans. These volumes are displayed in Figure 5.

Figure 5 indicates that, not surprisingly, the Santa Ana Freeway carries the highest traffic volumes in the study area, ranging from 147,000 vehicle per day (VPD) east of Alameda Street to 163,000 VPD west of Los Angeles Street. West of Hill Street (to the north of the study area), 192,000 VPD are carried.

East of the site, the Santa Ana Freeway carries 162,000 passengers per day on the ten-lane segment from Mission Road to Vignes Street. South of the Santa Ana/San Bernardino Freeway interchange, the Santa Ana carries 117,000 VPD on six lanes (which converge to four through the interchange). East of this interchange, the San Bernardino carries 90,000 VPD on six lanes (of which four run through to the Santa Ana).

Sunset Boulevard/Macy Street is the most heavily travelled surface street within the study area, with 24,300 VPD west to Hill Street, a high of 28,000 VPD at Spring Street/New High Street and 21,300 VPD east of Alameda Street at Union Station.



Fwy. x 1000

20,000
10,000
5,000

Parsons Brinckerhoff KAKU ASSOC TDA INC. DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	EXISTING DAILY TRAFFIC VOLUMES	**5**

Total surface street traffic volumes are heaviest in the north-south direction. However, since the major north-south streets (North Hill Street, North Broadway, and North Spring Street/Main Street one-way couplet and Alameda Street) carry approximately 18,000 to 26,000 VPD each.

Peak Hour Volumes

The volumes illustrated in Figure 5 were supplemented with morning and evening peak hour turning movement counts at each of the seventeen intersections which were analyzed in detail. These peak hour traffic counts, illustrated in Figure 6 in summary format, were obtained from the LADOT and were used as the basis for an intersection capacity analysis at each location. Details of the turning movement counts for the seventeen locations are provided in Appendix A.

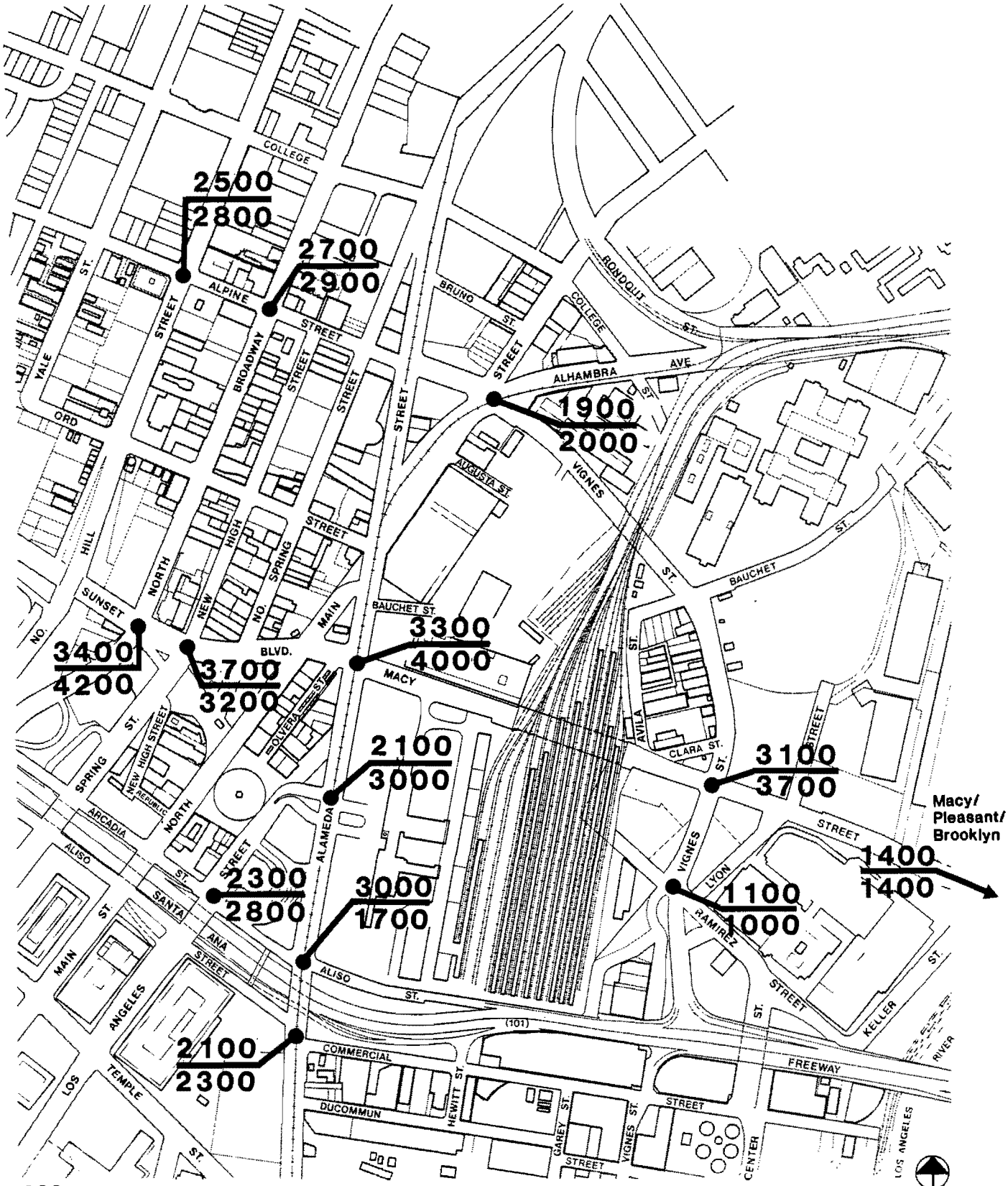
INTERSECTION LEVELS OF SERVICE

Level of Service (LOS) is a measure used to describe the conditions of traffic flow, ranging from excellent conditions at LOS A to overload conditions at LOS F. LOS C is the level of operation typically used as a design standard, while LOS D is typically considered to be acceptable for urban street system. Intersection LOS definitions are included in Table 1.

In urbanized areas such as the Union Station study area, intersections are generally the limiting factor regarding the capacity of a given street. Traffic conditions at intersection tend to control the level of service experienced by traffic along the route.

Traffic service levels were investigated for 17 intersections in the study area (Table 2). For 16 of these recent traffic counts could be obtained from the City of Los Angeles Department of Transportation. These counts are included in Appendix A of this report. Counts made in 1985 or 1986 were used whenever and wherever available. At intersections where 1985 or later counts could not be obtained, 1980 counts were projected to 1986.

At the signalized intersection, the "Intersection Capacity Utilization" method of intersection capacity analysis was utilized to determine the volume/capacity (V/C)



000 A.M. Peak Hour
000 P.M. Peak Hour

Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study SUMMARY OF EXISTING PEAK HOUR INTERSECTION TRAFFIC VOLUMES	FIGURE 6

TABLE 1

INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Volume/Capacity Ratio	Definition
A	0.00 - 0.60	EXCELLENT. No vehicle waits longer than one red light and no approach phase is fully used.
B	0.61 - 0.70	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.71 - 0.80	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.81 - 0.90	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur at permit clearing of developing lines, preventing excessive backups.
E	0.91 - 1.00	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	Greater Than 100	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.

TABLE 2

LEVEL OF SERVICE ANALYSIS
EXISTING CONDITIONS

Intersection	AM Peak Hour V/C	AM Peak Hour LOS	PM Peak Hour V/C	PM Peak Hour LOS	Year Of Count
North Hill and Apline Streets	0.64	B	0.70	B/C	1986
North Broadway and College Street	0.62	B	0.63	B	1985
North Broadway and Apline Street	0.63	B	0.66	B	1986
Broadway and Sunset Boulevard	0.49	A	0.63	B	1985
New High/Spring and Sunset Boulevard	0.49	A	0.41	A	1986
North Main and Vignes Streets	0.44	A	0.49	A	1986
North Main and Alameda Streets	0.55	A	0.59	A/B	1980[1]
North Main and Sunset Boulevard	0.49	A	0.62	B	1986
Alameda, Macy Streets and Sunset Boulevard	0.48	A	0.61	B	1986
Alameda and Los Angeles Streets	0.34	A	0.41	A	1985
Alameda and Aliso/Arcadia Streets	0.69	B	0.31	A	1980[2]
Alameda and Commercial Streets	0.38	A	0.70	B/C	1985
Los Angeles and Aliso Streets	0.28	A	0.51	A	1986
Los Angeles and Arcadia Streets	0.45	A	0.35	A	--[1]
Vignes and Macy Streets	0.70	B/C	0.77	C	1982[2]
Vignes and Ramirez Freeway Ramps[2]	+173	D	+27	E	1985[3]
Macy and Pleasant/Brooklyn Streets	0.34	A	0.32	A	1985

[1] Scheduled for re-count in October 1986.

[2] Construction area; traffic projected at 1% per year.

[3] Based on Highway Capacity Manual methodology for unsignalized intersections. Field observations in August, 1986 indicated LOS F in at least part of peak hour.

ratio and corresponding LOS for the existing turning movements and intersection characteristics. At the unsignalized intersection of Vignes Street and Ramirez Street, a signal was assumed. In addition, the "Unsignalized Intersection" methodology from Transportation Research Board, Highway Capacity Manual (1985), was used to determine the available reserve capacity and corresponding LOS for the most constrained movement at the intersection.

Table 2 and Figure 7 summarize the existing V/C ratio and corresponding LOS at each of the analyzed intersections for both the AM and PM weekday peak hours. All of the indicated intersections, with two exceptions, are currently operating at good to excellent conditions (LOS C or better) during both peak periods. The intersections of North Hill Street at Alpine Street and Vignes Street at Macy Street operate at fair levels of service (LOS D) during the evening peak hour, while the intersection of North Broadway at Alpine Street operates at LOS D during the morning peak hour. The unsignalized intersection of Vignes Street and Ramirez Street operates at a poor LOS E or F during the evening peak hour.

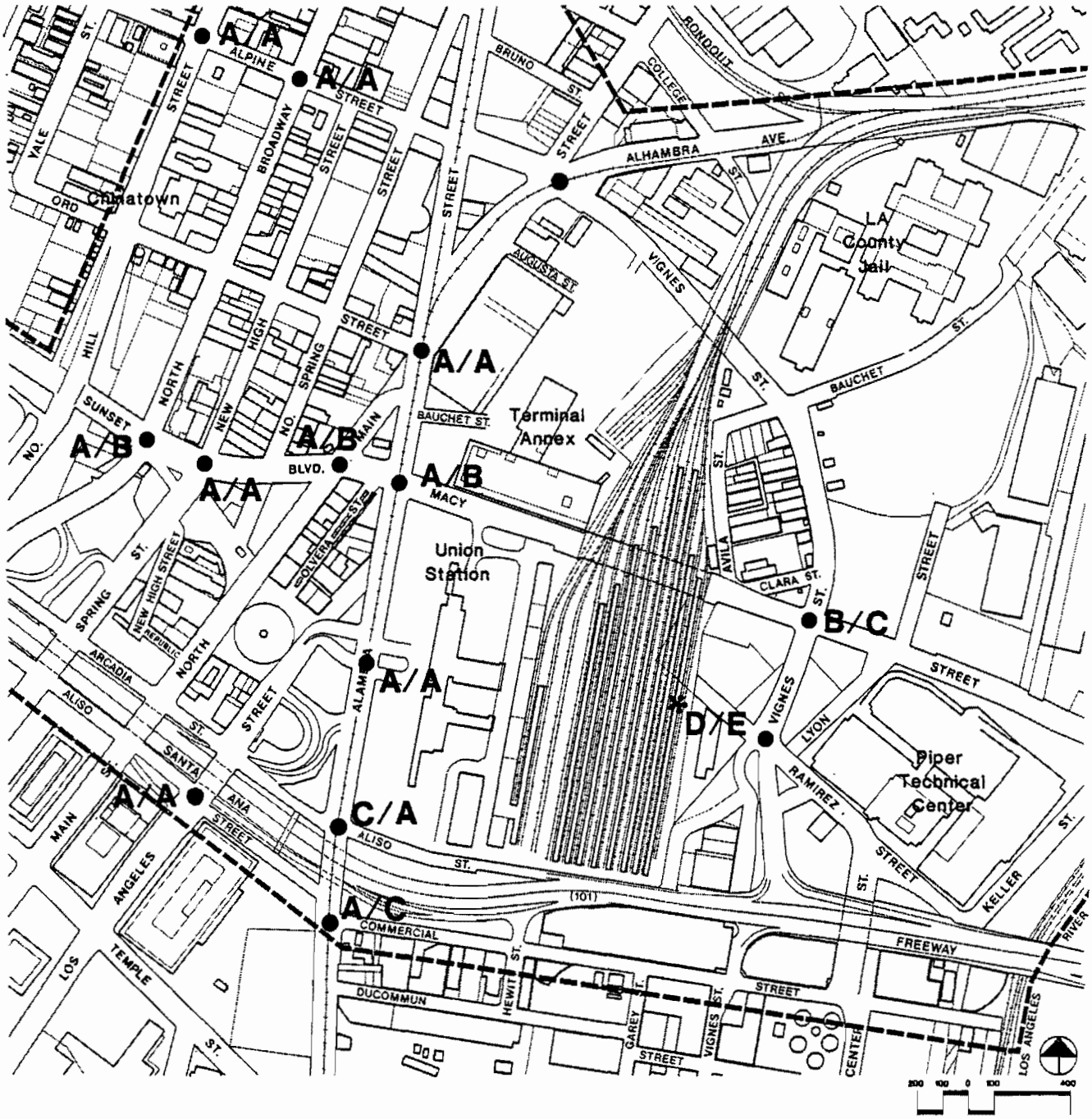
Constraints

Observations of traffic conditions within the study area indicate that a number of conditions constraint smooth traffic flow within the study area. These constraints fall into one of the following categories: physical constraints, including substandard freeway ramps, poor pavement condition, awkward geometry or confusing intersections; conflicts with pedestrians, buses, turning vehicles or parking maneuvers; and high accident locations.

Physical Constraints

Figure 8 illustrates a number of physical constraints on traffic flow within the study area. These constraints include the following.

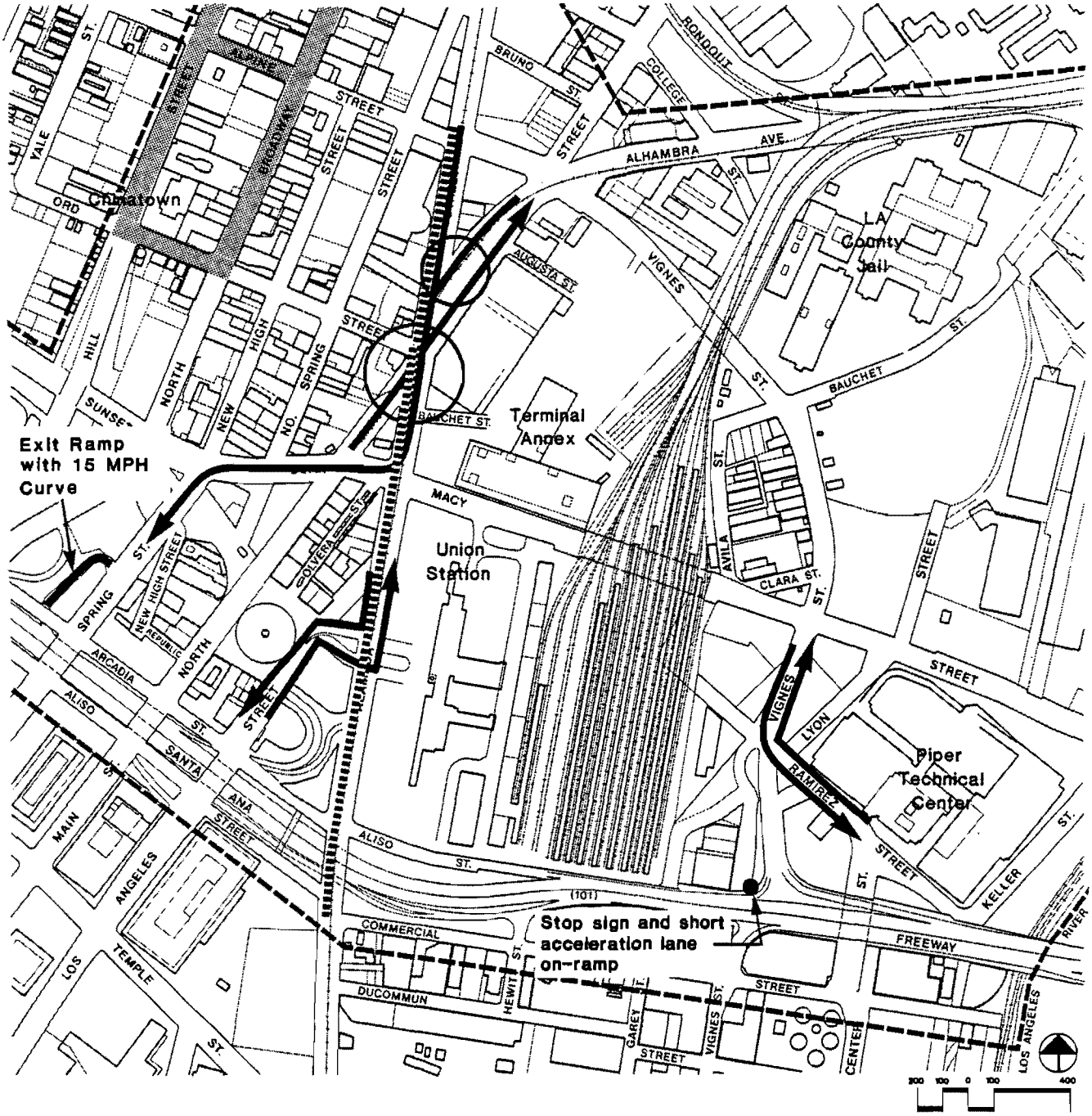
- Alameda Street - The existing pavement along Alameda Avenue throughout the study area is in very poor condition. Coupled with the presence of railroad tracks along the middle of the street and inadequate lane striping, the potential capacity of Alameda Street is reduced significantly.



X/Y = AM/PM Peak Hour Level of Service

*** Without Signal; A/A** Assuming Signal

Parsons Brinckerhoff KAKU ASSOC TDA INC. DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	EXISTING INTERSECTION LEVELS OF SERVICE	7



Poor Pavement Condition, Inadequate Lane Striping and Signage

Congested Street Segments

Confusing Intersections

Dog-Leg

Parsons Brinckerhoff KAKU ASSOC TDA INC. DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	PHYSICAL CONSTRAINTS	8

- Confusing Intersections - At the intersections of Alameda Street with College Street/North Spring Street, North Main Street east of Alameda Street and Ord Street/North Main Street west of Alameda Street, the angle of intersecting streets, poor pavement condition on Alameda to create confusion for motorists, with resultant decreases in capacity.

- Spring Street Dog-Leg - Southbound traffic on North Spring Street entering the study area and wishing to travel through the study area on Spring Street into the downtown area has two choices: (1) follow Alameda Street to Macy Street, make a right-turn onto Macy Street, and a left-turn onto Spring Street at New High Street, or (2) proceed southward on North Spring between College Street and Macy Street, make a right-turn on Macy Street, and a left-turn onto Spring Street. Under the first alternative, the motorist is subjected to the poor condition of the pavement along Alameda Street, while under the second alternative, the motorist faces delays at the stop-signs along Spring Street at Alpine, Ord and Macy Streets.

- Main Street Dog-Leg - Vehicles travelling through the study area on North Main Street in the southbound direction must turn left onto Alameda Street, turn right onto Macy Street and again turn left onto Spring Street to continue southward. In the northbound direction vehicles must turn left onto northbound Alameda, followed almost immediately by a right to continue on northbound North Main.

- Vignes Street/Ramirez Street/Center Street - Center Street provides the only crossing of the Santa Ana Freeway in the eastern portion of the study area. In order to obtain access to Center Street, vehicles must turn from Vignes Street to Ramirez Street, which then curves to the south at the Piper Technical Center and becomes Center Street. The route is round-about, and hence not heavily utilized.

- Vignes Street On-Ramp - The geometrics of the Vignes Street on-ramp to the westbound Santa Ana Freeway are substandard, with a sharp turn just before entering the freeway, a stop-sign controlling the ramp, and a very short acceleration lane beyond the stop-sign.

- Spring Street Off-Ramp - West of the site, the Spring Street off-ramp also has poor geometrics. With a 15-mile per hour limit, this ramp creates turbulence in the already congested westbound traffic flow through the "slot".

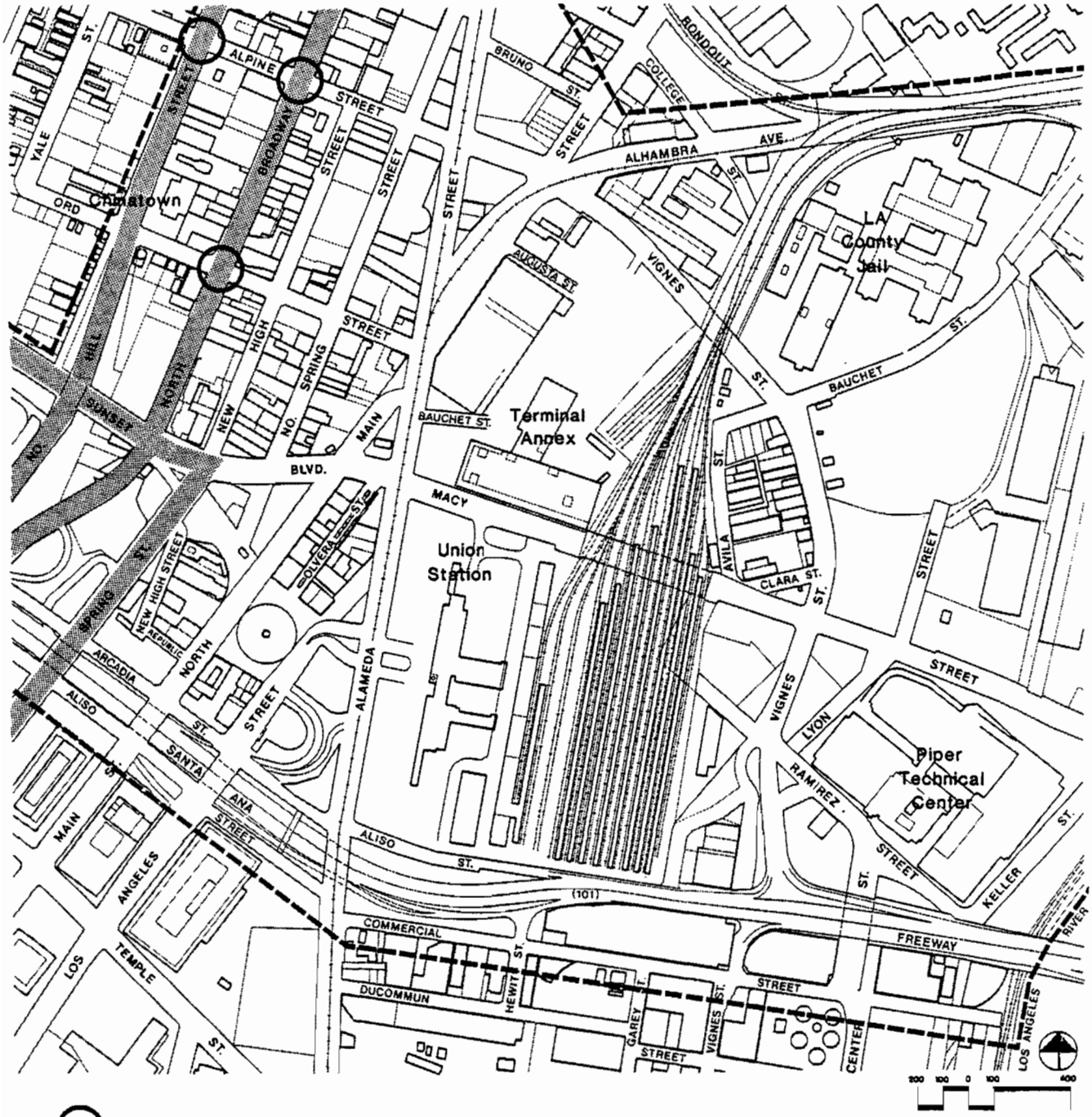
Conflicts

Figure 9 illustrates the locations of major conflict points between vehicular and pedestrian traffic, and between automobile traffic and buses. As can be seen, these conflict points are generally located within the Chinatown portion of the study area, due to the high concentration of vehicular, bus and pedestrian traffic in that area. The areas both immediately surrounding and to the east of Union Station, although serviced by RTD bus routes, do not have the heavy levels of bus and pedestrian traffic experienced in Chinatown, and do not have the same level of conflict.

Bus Conflicts. Both North Hill Street and North Broadway have high volumes of bus traffic, with some twelve bus lines on North Hill and six lines on North Broadway within Chinatown. During non-peak periods, observations indicate that buses create congestion as they maneuver in and out of the traffic lanes at bus stops. During peak periods, when on-street parking has been prohibited in order to utilize the curb lane as an additional through lane in the peak direction, buses block the right-most travel lane when stopped at bus stops, effectively reducing the capacity of the street in the peak direction by one-third.

Pedestrian Conflicts. As indicated on Figure 9, heavy pedestrian traffic creates conflicts with vehicular traffic at most intersection within the commercial district of Chinatown, including North Hill Street at Apline Street, College Street and the pedestrian crosswalk north of College Street, and North Broadway at Ord, Alpine and College Streets. Pedestrian traffic in the vicinity of Olvera Street (south of Macy Street at Alameda Street), although moderately heavy, does not seem to create significant conflicts with vehicular traffic.

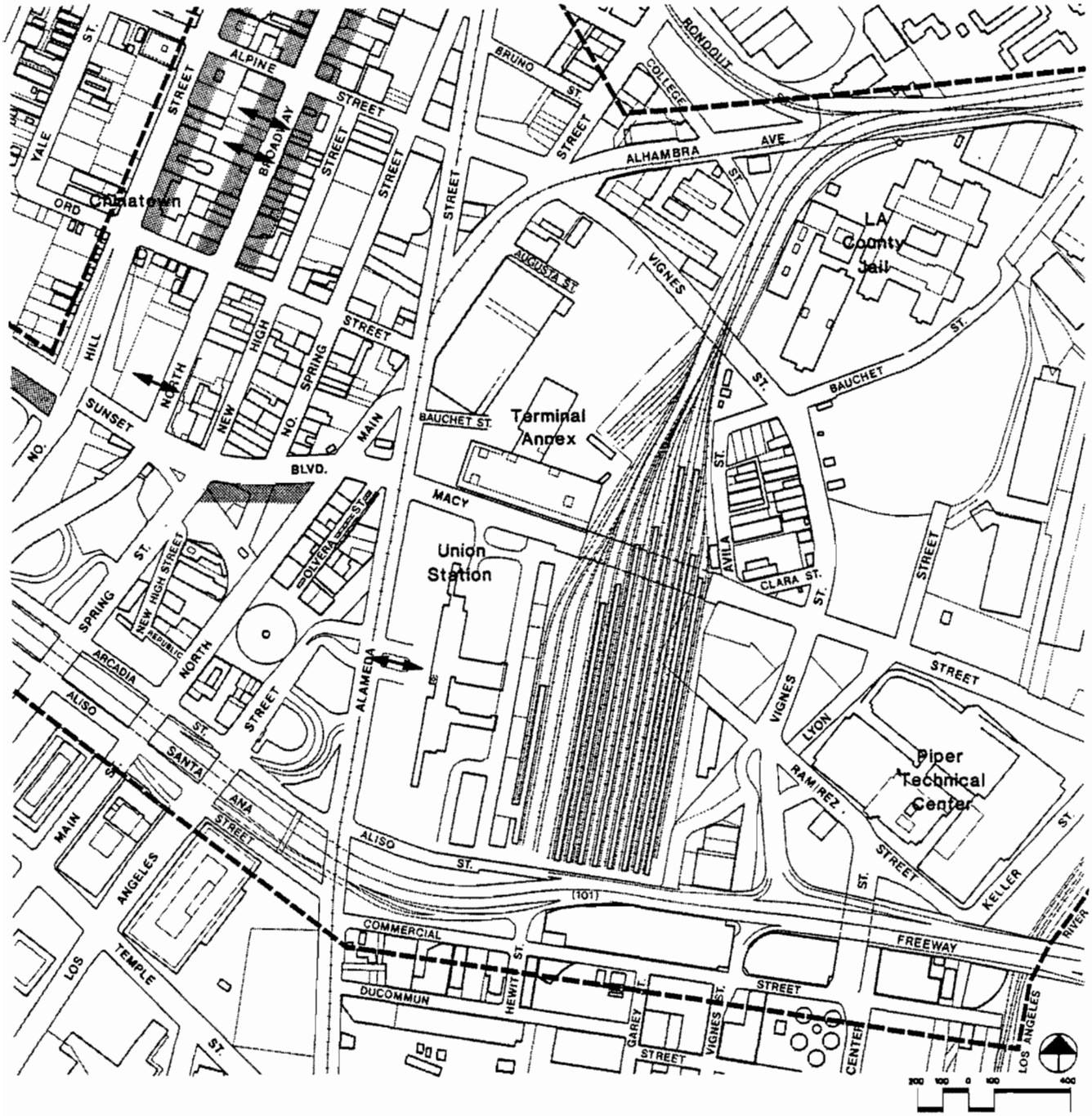
Curb Parking Conflicts. Figure 10 illustrates the locations of major conflict points between vehicular traffic and both on-street and off-street parking. The shaded areas along North Hill Street, North Broadway and Sunset Boulevard indicate locations where vehicles maneuvering into and out of on-street parking spaces often block one



Major Pedestrian-Vehicle Conflict Locations

Major Modal Conflicts

Parsons Brinckerhoff KAKU ASSOC TDA INC. DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	PEDESTRIAN AND BUS CONFLICTS	9



Conflict Locations Resulting from Vehicles Turning Into-And-Out of Parking Facilities

Locations Where Curb Parking Conflicts with Traffic Flow

Parsons Brinckerhoff KAKU ASSOC TDA INC. DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	PARKING CONFLICTS	10

of the through lanes on the street, reducing capacity and conflicting with through traffic. The resulting congestion is generally a problem during mid-day, evening and weekend periods only, since on-street parking in these areas is already prohibited during peak periods in the peak direction.

Off-Street Parking Conflicts. The arrows on Figure 10 indicate locations where large off-street parking lots create conflicts between through traffic and vehicles turning into and out of the lots. It should be noted that, although significant conflicts were observed at these locations, they represent only a small fraction of the total number of curb cuts in the Chinatown and Union Station area. As there are no left-turn lanes along North Hill Street and Broadway, through traffic within the Chinatown area is frequently delayed by vehicles waiting to turn left into off-street lots.

In the eastern portion of the study area, conflicts between through traffic and either on-street or off-street parking do not appear to create significant congestion problems, with one exception. Due to the short storage area between the street and the parking lot gates, vehicles turning into the Union Station parking lot across from Los Angeles Street form queues which occasionally extend into the curb lane on Alameda Street.

High Accident Locations

Accident data for the Year 1984 was obtained from the City of Los Angeles Department of Transportation for the streets in the immediate vicinity of Union Station. The following table summarized this information:

Intersection	Number of Accidents
North Main and Macy	6
Alameda and Macy	8
Alameda and Los Angeles	4
Alameda and Aliso	4
Alameda and Commercial	5
Vignes and Macy	13

As can be seen, the intersections of North Main and Macy, Alameda and Macy, and Vignes and Macy each experienced six or more accidents during 1984.

Opportunities

A number of streets within the study area have the potential to provide greater capacity or continuity, including the following:

- Vignes Street/Ramirez Street/Center Street - Center Street provides the only crossing of the Santa Ana Freeway in the eastern portion of the study area. As discussed previously, the existing dog-leg associated with travelling along Vignes Street to Ramirez Street and eventually to Center Street results in possible under utilization of this route to provide access between the study area and downtown. Traffic on southbound Vignes turning let onto southbound Ramirez Street also conflicts with traffic from the freeway off-ramp. Improvements to the intersection of Vignes Street, Ramirez Street and the freeway off-ramp could improve the continuity of this route under the freeway.

- Alameda Street - As discussed previously, a number of factors, including poor pavement condition, railroad tracks in the roadway, poor lane striping, confusing intersections and truck traffic, combine to reduce the effective capacity of Alameda Street. Improvements to alleviate these conditions could greatly increase the north-south street capacity immediately adjacent to Union Station and throughout the study area.

- North Hill Street/North Broadway One-Way Couplet - Previous studies within the Chinatown area have suggested the implementation of a one-way couplet, with northbound traffic on North Broadway and southbound traffic on North Hill Street. If implemented, this improvement would increase the capacities of the two streets combined, and could reduce turning movement and bus conflicts.

Opportunities to improve freeway capacity are extremely limited. Nevertheless, removing the Spring Street off-ramp and improving Arcadia Street as an alternate route, would remove a source of turbulence and a short weave in the "slot" area.

There may also be a way to allow traffic between the site and the Santa Ana and San Bernardino Freeways to bypass the congestion at their interchange east of Mission Road.

PUBLIC TRANSPORTATION

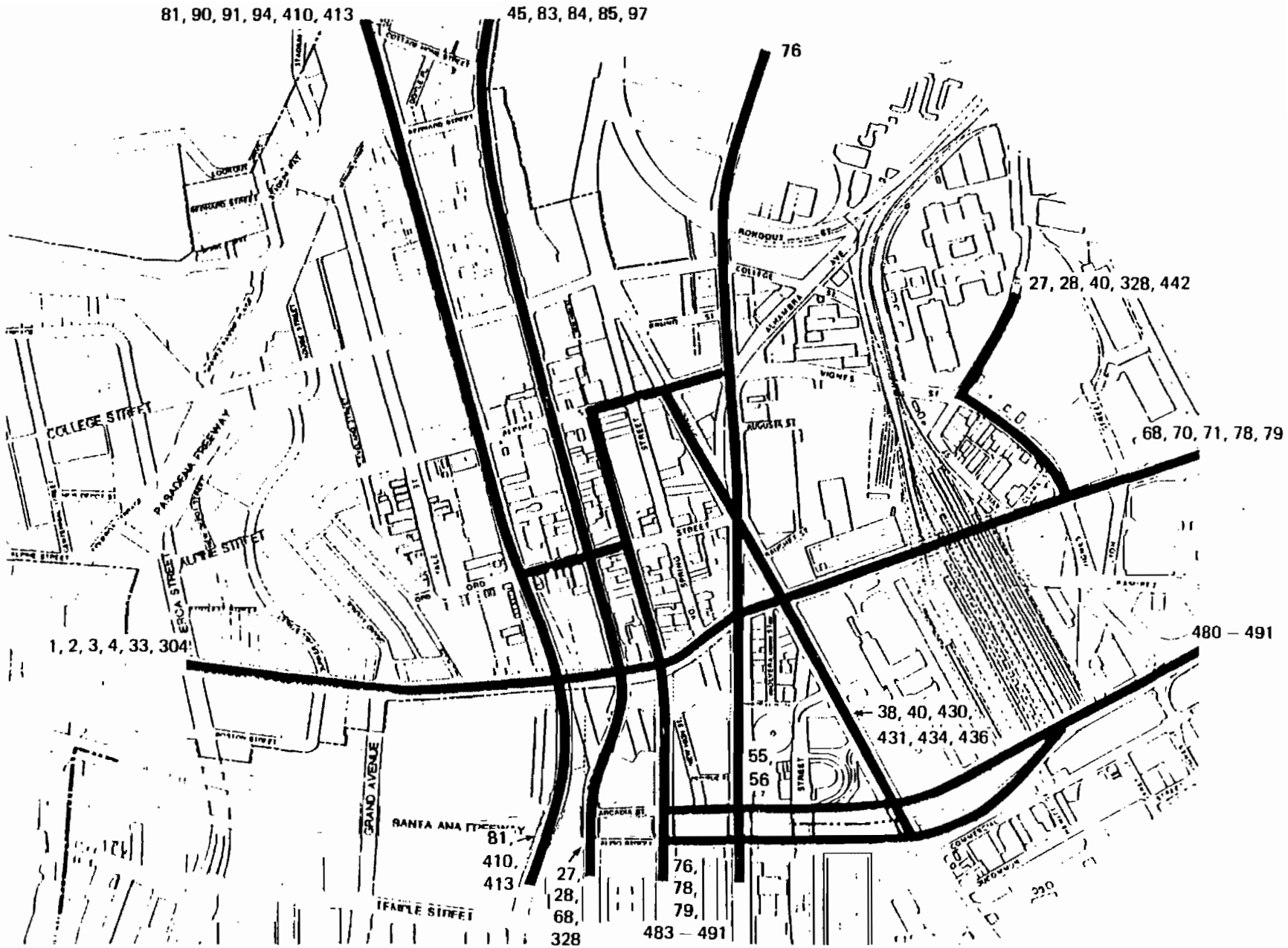
The Union Station study area is served by a number of local and intercity transportation operations including SCRTD local buses, the Dash downtown shuttle (operated by the Los Angeles Department of Transportation), Trailways intercity buses and AMTRAK trains at the Los Angeles Union Passenger Terminal (LAUPT). In addition, taxi service is available throughout the study area.

SCRTD Service

Situated on the northern periphery of the Central Business District, the study area's major streets provide transit access from downtown to the Pasadena, Golden State and Hollywood/San Bernardino Freeways. Consequently, peak hour transit service is frequent and travels to a variety of destinations to the west, north and east of the Union Station study area. Forty-seven routes pass through the study area, although 21 of those are limited to the southern boundary, generally using Aliso Street and Arcadia Street for access to the Hollywood/San Bernardino Freeways. Figure 11 shows key transit streets and routes in the study area. In the afternoon peak hour (4:30-5:30 PM) approximately 265 runs are made; most routes have average headways of 5 to 15 minutes.

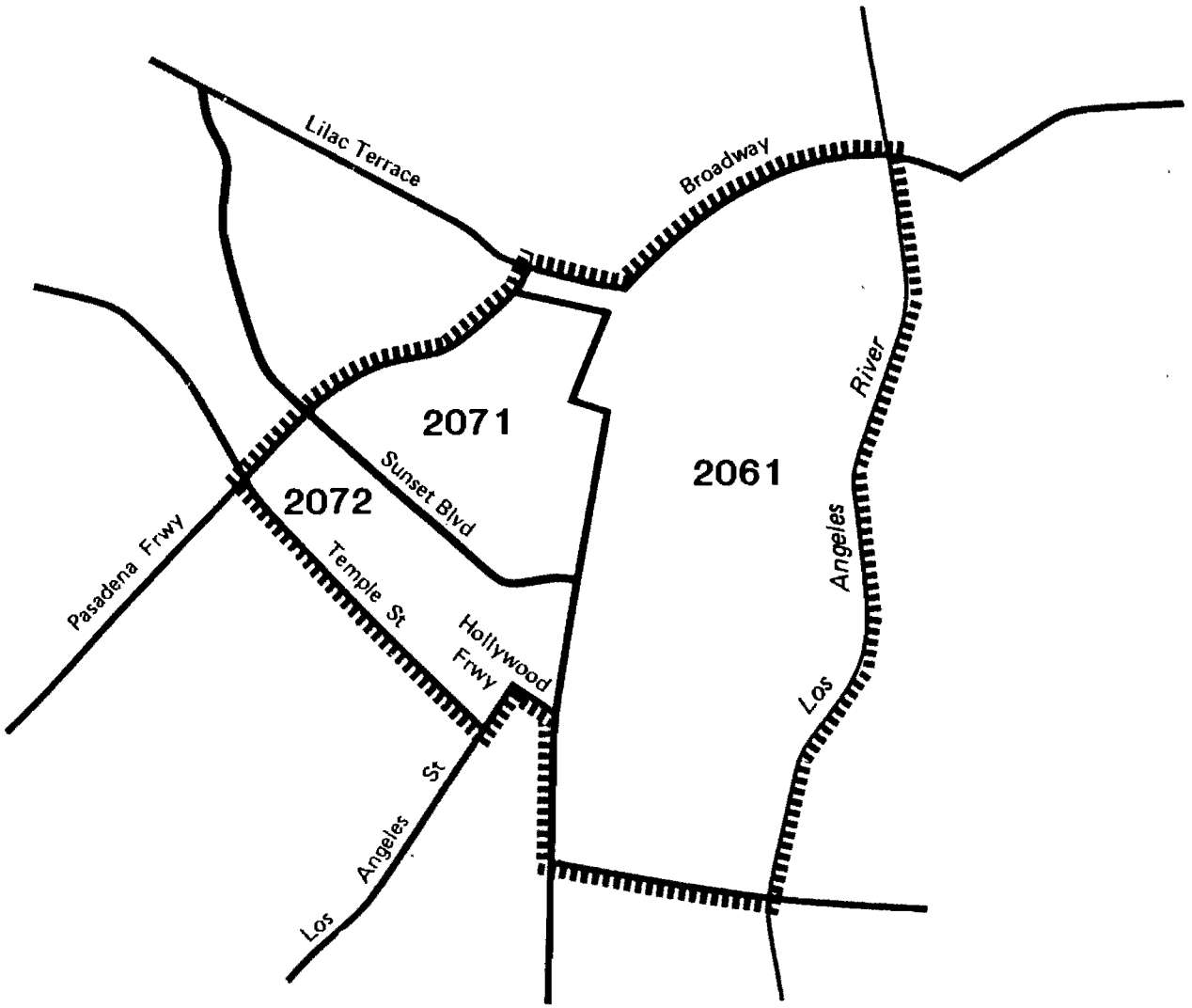
Boarding/Alightings. Total daily boardings and alightings for three census tracts which closely approximate the study area were compiled by SCRTD based on rider checks during 1985 and 1986. The three tracts cover Union Station, Chinatown and El Pueblo and are shown on Figure 12. Table 3 shows boardings and alightings by tract and includes the proportion of senior citizens/handicapped riders, students and all other riders.

The El Pueblo tract shows the highest number of boardings and alightings, but somewhat overstates the study area share since the tract-level data includes Temple Street stops (north side only) not actually within the study area. Due to its



Source: SCRTD, TDA Inc.

Figure **11**
Transit Routes



Source: US Census, 1980, TDA Inc.

Figure **12**
Census Tract Boundaries

TABLE 3

DAILY BOARDINGS AND ALIGHTINGS

	Census Tract							
	#2061 Union Station		#2071 Chinatown		#2072 El Pueblo			
	Boardings	Percent Of Tract	Boardings	Percent Of Tract	Boardings	Percent Of Tract	Total	Percent
Senior Citizens/ Handicapped	412	12.2	2,268	28.3	1,339	12.3	4,019	18.1
Student	321	9.5	2,350	29.3	2,94	21.1	4,965	22.4
All Others	2,533	78.3	3,394	42.4	7,235	66.6	13,262	59.5
	3,366	100%	8,012	100%	10,868	100%	22,246	100%
Alignments	3,397		7,521		10,002		20,920	

Source: SCRTD, TDA, Inc.

employment functions and lack of residents, the Union Station tract has a low share of elderly and handicapped riders and students. Chinatown shows the greatest diversity of users of any portion of the study area.

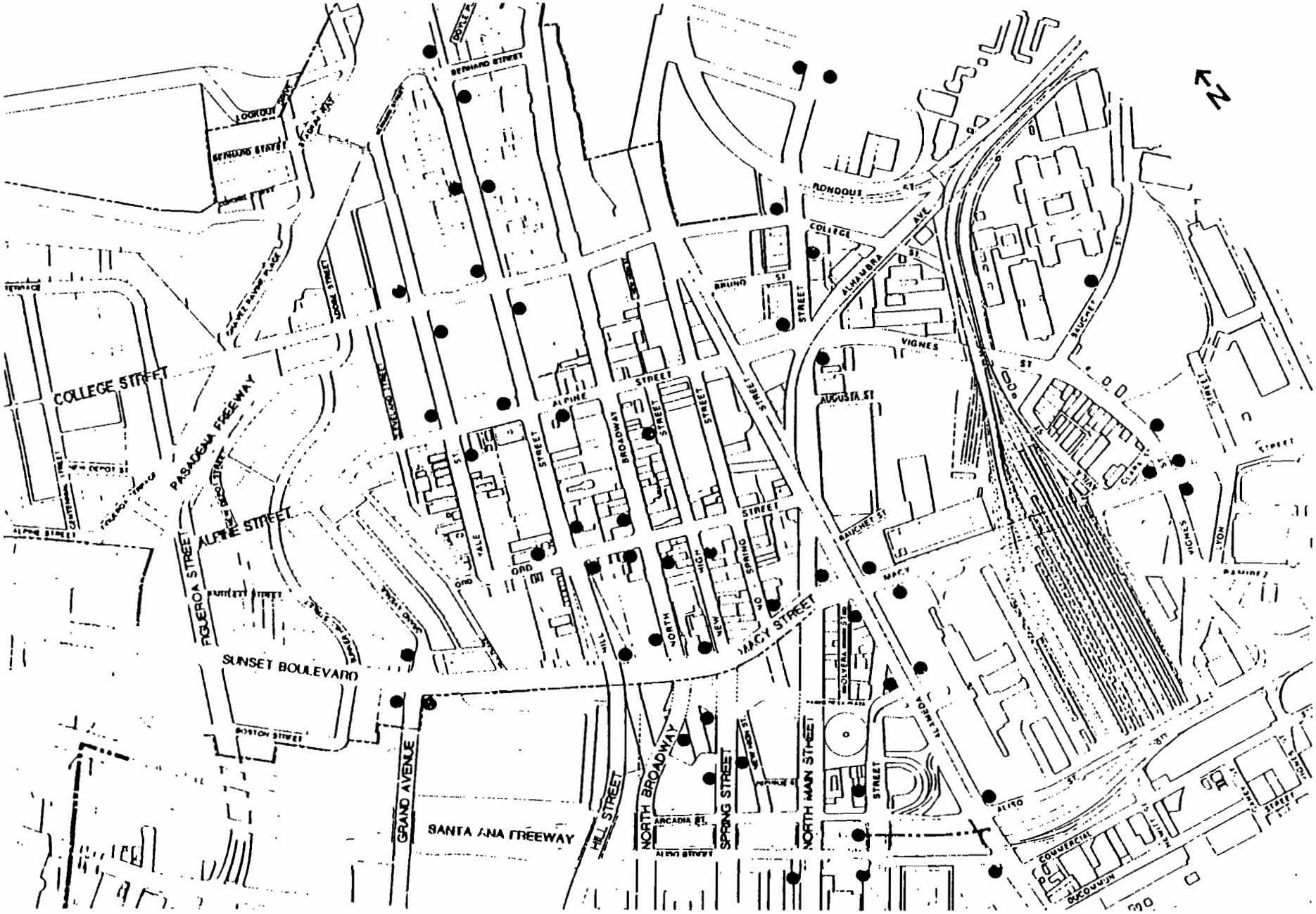
Transit-Stops and Layovers. Fifty-four transit stops are located within the study area, with the majority on N. Hill Street, N. Broadway and N. Main Street. Figure 13 shows transit stop locations. All stops are at curbside, many with shelters.

Existing layover areas are illustrated on Figure 14. The layover zone at N. Main Street and Alameda Street is a temporary site and will be abandoned when additional off-street layover space becomes available. Existing layover sites will be consolidated with the completion of SCRTD's Central Maintenance Facility in 1987 which will have approximately 35 new layover spaces. According to its Planning Division, SCRTD would then propose to abandon layover sites at North Main Street and Alameda Street, Union Station (the old street-car turnaround from Macy Street), and the Plaza on Los Angeles Street. Consolidation would eliminate uncertainties regarding temporary sites, improve access/egress for buses (which is currently very awkward for the Union Station layover due to traffic congestion on Macy Street), and return on-street parking to Los Angeles Street.

Dash Bus System

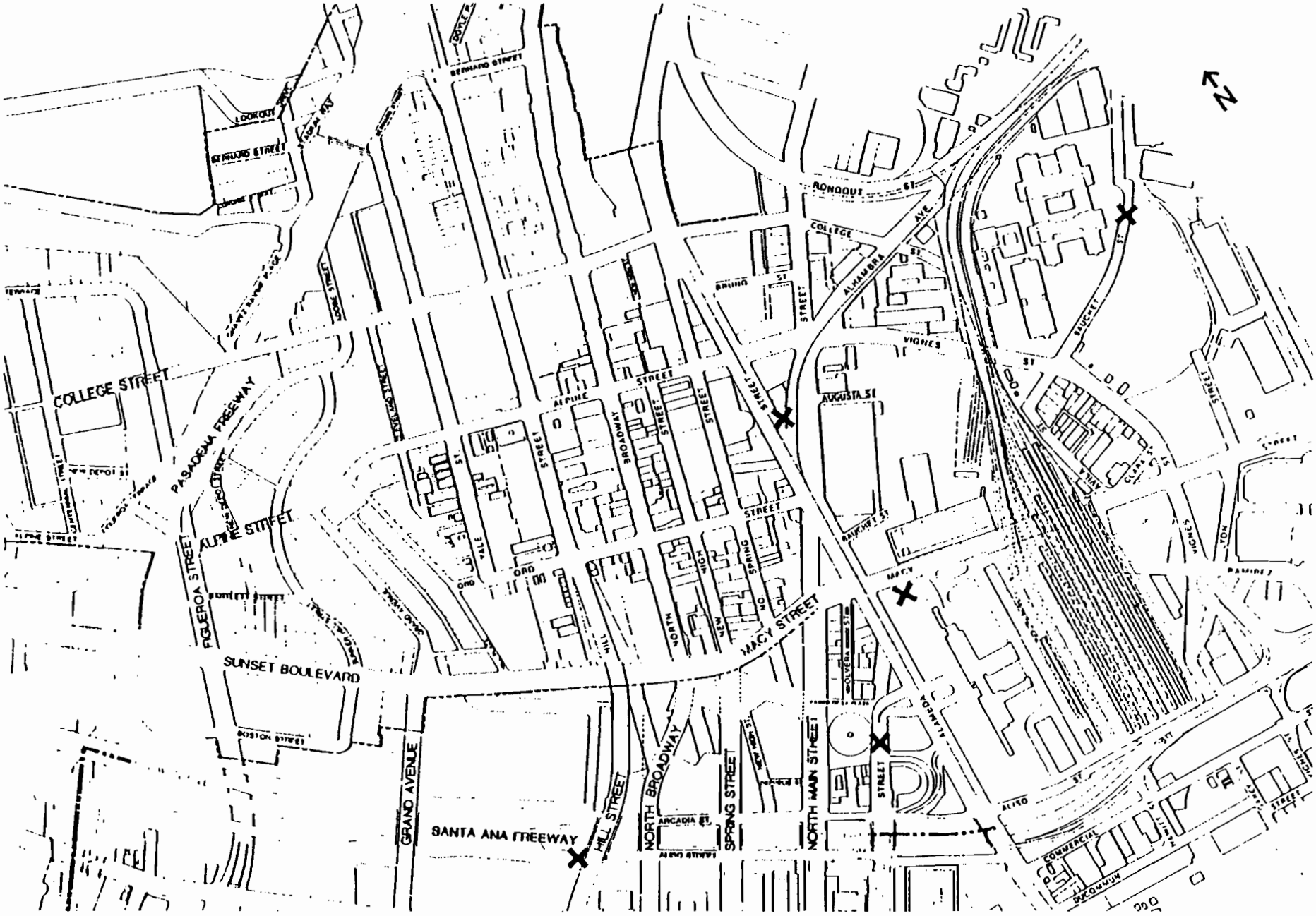
Managed by the Los Angeles Department of Transportation (LADOT) since October, 1985, after taking over from SCRTD, Dash buses shuttle between the Central Business District and Chinatown. Figure 15 is a route map for the Dash service. Near Union Station, Dash stops are located at Macy Street and Alameda Street (southbound only), and at N. Main Street at both Arcadia Street and Macy Street (northbound only). Headways range from 5 minutes at midday to 10 minutes during early morning and late afternoon hours. The shuttle, with 24 seats and room for 10 standees, operates between 7:00 AM and 6:00 PM weekdays, and 9:00 AM and 4:00 PM on Saturdays. There is no service on Sundays or holidays. Fare is 25 cents.

Ridership shows strong seasonal trends with patronage highest in summer and lowest in winter, indicating its popularity with tourists and other visitors. Average weekday ridership in May, 1986 was approximately 4,300 passengers. Over the year, daily



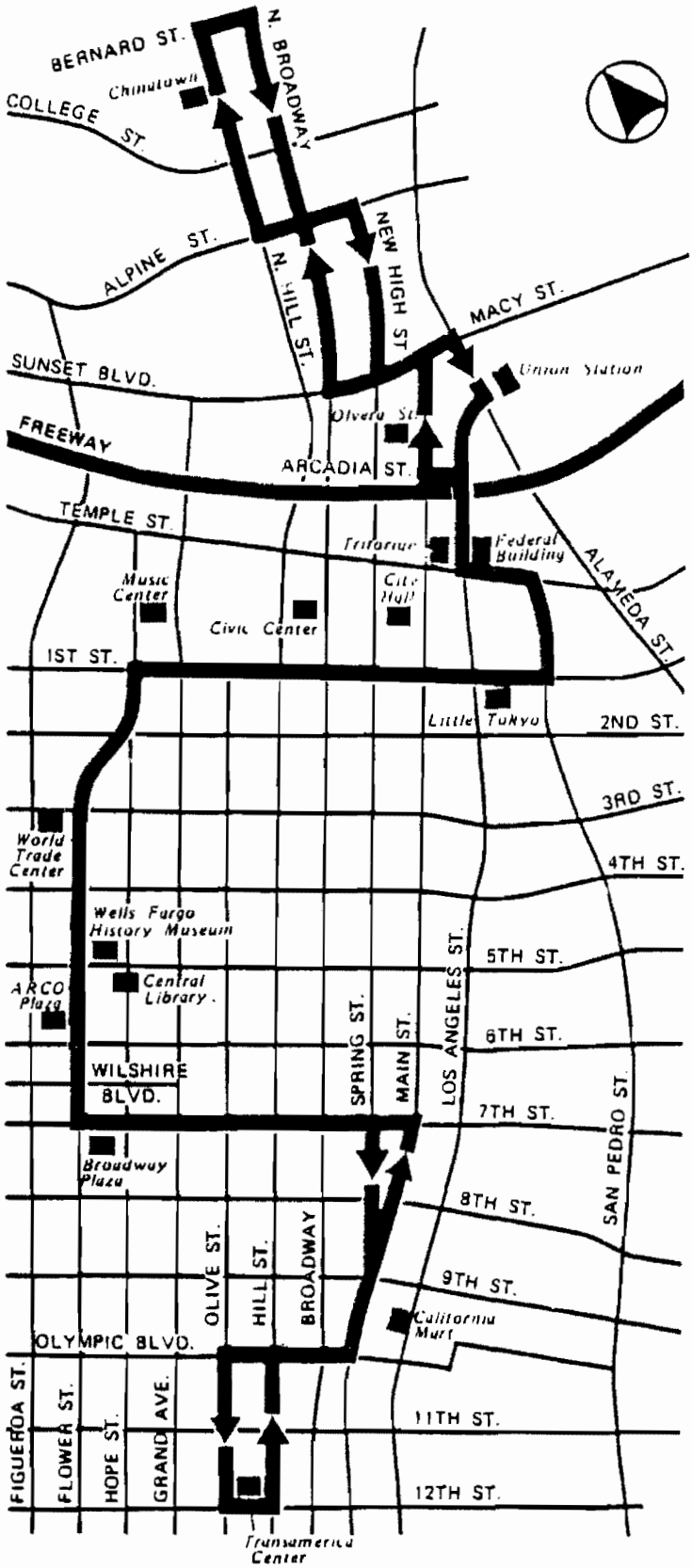
Source: SCRTD, TDA Inc.

Figure **13**
Transit Stop Locations



Source: SCRTD, TDA Inc.

Figure **14**
Transit Layover Stations



Source: LADOT, TDA Inc.

Figure **15**
DASH Bus Route

ridership varies from about 3,700 in winter to 4,900 persons in summer. Saturday volumes in May, 1986 averaged 700 riders.

Other than minor alterations to routing and stop locations, no significant service changes for Dash are planned according to LADOT. The minor changes will focus mainly on eliminating stops at low ridership points and attempting to avoid traffic congestion by slight deviations in the route.

Private Mini-bus Service

According to the LADOT Transportation Regulation Division, no private mini-buses operate in the study area. The only exceptions would be hotel or corporate courtesy vans under license by the California Public Utilities Commission, and a Los Angeles "Times" van which meets certain commuter trains at Union Station.

AMTRAK

AMTRAK provides service from Union Station to San Diego (7 round-trips daily), New Orleans, Chicago, Salt Lake City, San Francisco, and Seattle with a total of 12 trains per day. Presently, 8 tracks and platforms (platforms 5-13) are used by AMTRAK. Departures and arrivals are concentrated between 7:00 AM and 11:00 PM with no more than 3 trains in station at one time. Table 4 shows the current train schedule.

TABLE 4

AMTRAK SCHEDULE AT LAUPT

Arrivals	Departures
2:00 AM*	3:00 AM*
7:35	8:00
7:45	9:55
7:55#	
9:30	12:45 PM
10:40*	1:05*
12:45 PM	2:45
3:35	4:45
4:05*	5:45#
5:25	6:40+
7:10	8:45
10:25	10:55

*Bus connection for Bakersfield
#Weekdays only
+Saturday/Sunday only

Twice daily, AMTRAK operates buses to provide connecting train service between Los Angeles and Bakersfield. These buses use Trailways' bays and loading areas at LAUPT (see Trailways section).

Ridership

Daily ridership statistics are kept only for the San Diego trains, but monthly and yearly totals are recorded by AMTRAK for all trains. Table 5 shows total ridership at LAUPT by quarter for 1985.

TABLE 5

AMTRAK RIDERSHIP BY QUARTER - 1985

Fiscal Year 1985 Quarter	Revenue Passengers	Percent Of Total
1st - October - December	251,354	
2nd - January - March	256,427	21%
3rd - April - June	352,695	28
4th - July - September	387,771	31
Total	1,248,247	100%

Source: AMTRAK, LAUPT

According to AMTRAK, August is the highest month for ridership while February is the lowest. A seven month patronage summary (October-April, Fiscal 1986) indicates that the San Diegans account for 61% of all passengers boarding and alighting at LAUPT. Table 6 shows average weekday and weekend ridership based on August, 1985 and February, 1986 reports. Weekend patronage exceeds weekday levels year-round.

TABLE 6

AVERAGE DAILY AMTRAK RIDERSHIP

	Riders	
	Weekday	Weekend
San Diegans:		
August	4,695	5,458
February	3,160	3,888
Estimated Annual Average	3,928	4,673
Estimated Total LAUPT AMTRAK Riders*	6,439	7,661

*Based on San Diegan ridership at 61% total.
SOURCE: AMTRAK, TDA, Inc.

No specific information regarding user characteristics has been compiled by AMTRAK, but AMTRAK's Public Relations Department noted that a diverse section of the public rides the trains to and from Los Angeles with business people, students and vacationers taking advantage of rail services, especially on weekends and in the summer. Ridership data tends to support that assessment.

Trailways

Intercity bus service for Los Angeles is provided by Trailways at LAUPT. Located at the drive-up circle adjacent to the terminal's south patio, Trailways has 7 bus bays plus approximately 4,900 square feet in the south arcade for baggage handling and passenger loading. Nationwide travel is available from LAUPT via connecting routes but service is oriented primarily to San Francisco, Denver, Dallas, and Houston. Current schedules show 12 daily departures and 14 daily arrivals. No buses are scheduled between midnight and 6:00 AM.

Table 7 provides average daily ridership on Trailways buses based on 1985 data.

TABLE 7

TRAILWAYS AVERAGE DAILY RIDERSHIP 1984

	Departures	Arrivals	Total	Of Which Transfer
September - May	406	476	882	452
June - August	589	595	1,184	678

SOURCE: Trailways

To accommodate the higher summer demand 5 additional runs are added. This frequently involves running "doubles"; i.e., running two coaches on one route at the same time. Due to this doubling practice, Trailways states that it requires a minimum of 6 bus bays to avoid congestion at LAUPT.

No service changes are planned other than minor schedule adjustments. Trailways does not produce profiles of bus users at LAUPT.

Taxi Service

Taxi service in Los Angeles is regulated by the Los Angeles Department of Transportation. Cab companies are assigned to one or more of 5 designated service areas in the City. Four taxi companies (operating a total of 886 cabs) are authorized to serve Union Station which falls in the service area covering Hollywood and the Central Business District. Altogether, according to LADOT, about 1,100 cabs are licensed to operate in the City of Los Angeles, so the majority are available for duty at Union Station. Fleet size is based on public necessity and satisfying service standards for prompt response.

At any time during the day, 3 to 5 cabs are for hire at LAUPT. Queue space for 10 cabs is marked adjacent to the main portal. On weekday mornings at approximately 7:30 AM, as many as 25 cabs wait for passengers arriving on AMTRAK's Southwest Chief and the early San Diegan. At 4:00 PM on a weekday, just prior to the arrival of an AMTRAK train from San Diego, 10 cabs were observed at the taxi stand. Taxis and buses share an exclusive entrance and exit driveway from Alameda Street opposite Los Angeles Street. Information regarding the number of fares per day is not yet available.

PEDESTRIAN CONDITIONS

Existing pedestrian circulation patterns and facilities were inventoried and an assessment made of pedestrian linkages based on the character of surrounding activities including the civic center area, El Pueblo, Chinatown, and Little Tokyo. This section provides quantitative and qualitative descriptions of existing pedestrian linkages, issues, opportunities and potential problem areas relative to pedestrian activity. This section is divided into the following sub-sections: circulation paths, peak hour volumes, street crossings and intersections and qualitative assessment.

In summary, the findings of this section show that improvements in the condition of sidewalk and roadway pavement, crosswalks, signalization, orientational signage and identity elements, and public space maintenance and management programs are necessary to insure adequate linkages and a high quality pedestrian environment. The necessary pedestrian improvements will be identified and described in a later section of this report.

Circulation Paths

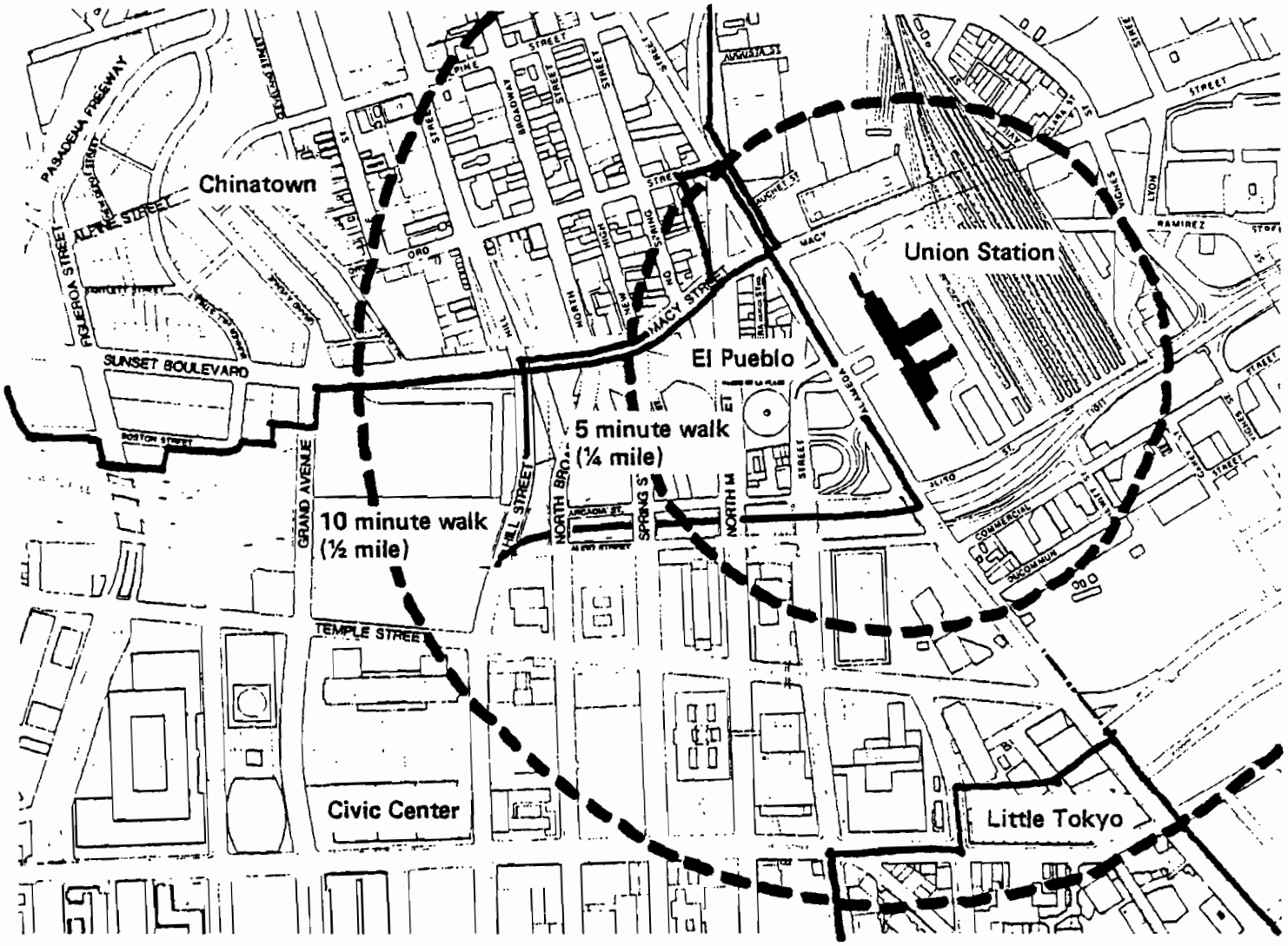
Potential pedestrian links exist between the Union Station and USPS sites and other generators and attractors of pedestrian activity. Existing pedestrian generators include the civic center, El Pueblo, Chinatown and Little Tokyo.

Although Little Tokyo is within a 10 minute walk of Union Station (see Figure 16), it seems unlikely that a significant number of these trips will be made. Little Tokyo is inwardly focused and destination-oriented by vehicle or transit. Walking trips to Little Tokyo seem more likely to occur on Los Angeles Street than on Alameda Street as traffic is heavy on Alameda Street and abutting land uses are not pedestrian-oriented.

From field observations on weekdays and Saturday, a number of findings were made, as follows:

- The major north/south pedestrian routes in the area are N. Broadway, Spring Street, N. Main Street, Los Angeles Street and Alameda Street (see Figure 17). On weekdays the greatest volumes are on Spring Street, N. Main Street and Los Angeles Street during the AM and PM peaks and at midday. On Saturdays pedestrian trips related primarily to parking and transit access to El Pueblo, Chinatown and Union Station activating Broadway, Spring Street, N. Main Street and Alameda Street. Additionally, Olvera Street functions as a destination and a circulation path.

- The major east/west pedestrian routes in the area are Aliso Street, Paseo de la Plaza/Los Angeles Street, the diagonal connection through the State Historic Park lot at Sunset Boulevard and N. Main, and Sunset Boulevard/ Macy Street. Aliso Street is used primarily on weekdays for peak hour access to parking by civic center employees. Sunset Boulevard/Macy Street. Aliso Street is used primarily on weekdays for peak hour access to parking by civic center employees. Sunset Boulevard is an active circulation path on both weekdays and weekends due to transit access and its linkage function to connect discontinuous streets where the street grid shifts.



Source: DMA/PPS

Figure **16**
Walking Distances

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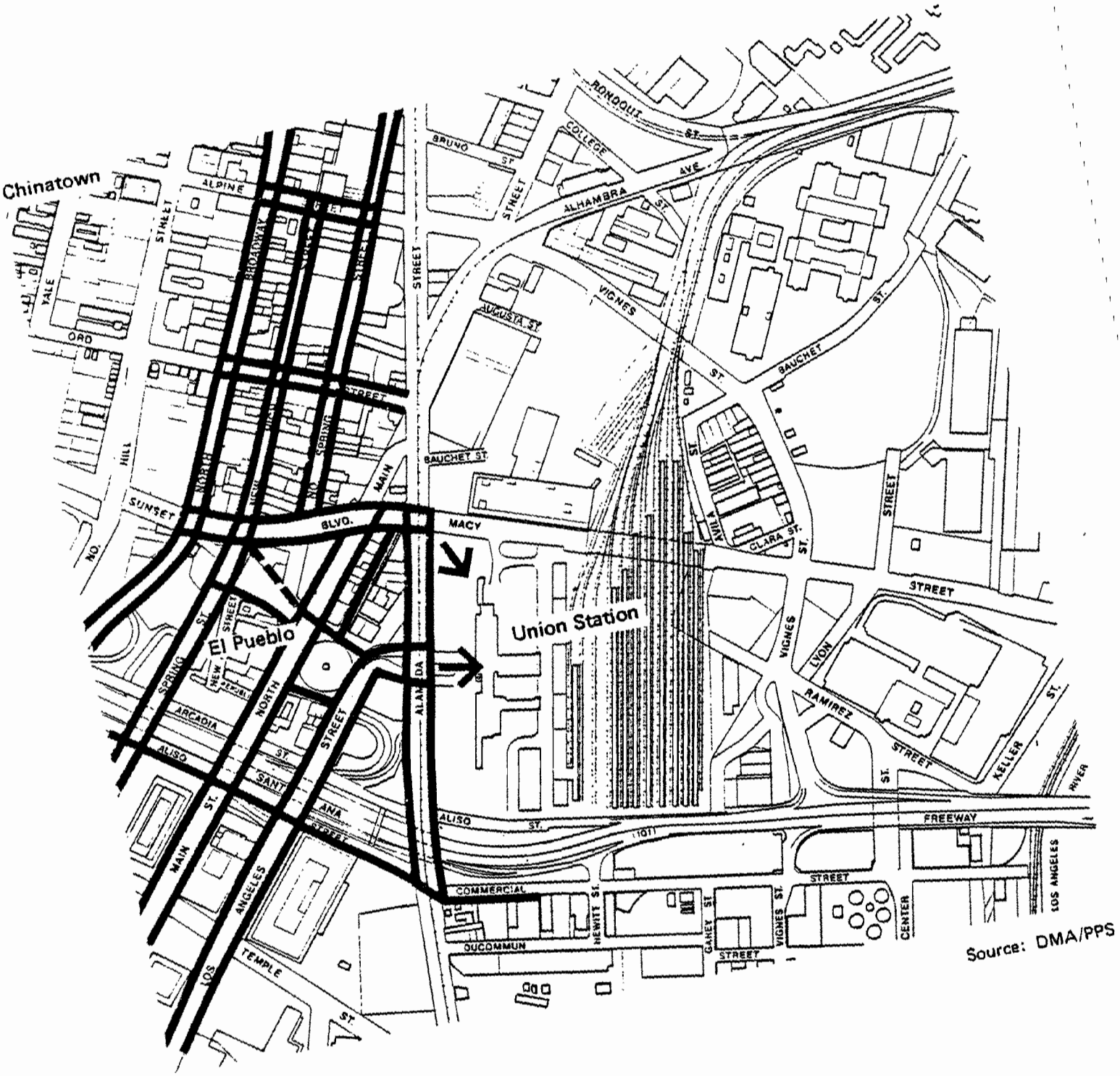


Figure **17**
Circulation Paths

- A close connection now exists between the northern Union Station parking lot on Alameda Street and El Pueblo. More use of the crossing at Macy Street and Alameda Street was observed than at Los Angeles Street and Alameda Street for parking access to/from Olvera Street.

- The pedestrian activity in Chinatown and Little Tokyo is primarily inwardly focused. This pattern reflects the role of these areas as a center for ethnic culture. El Pueblo has a lesser, but similar, pattern as the center of Hispanic culture. There are more visitors and tourists in El Pueblo due to its historic origins as the birthplace of Los Angeles.

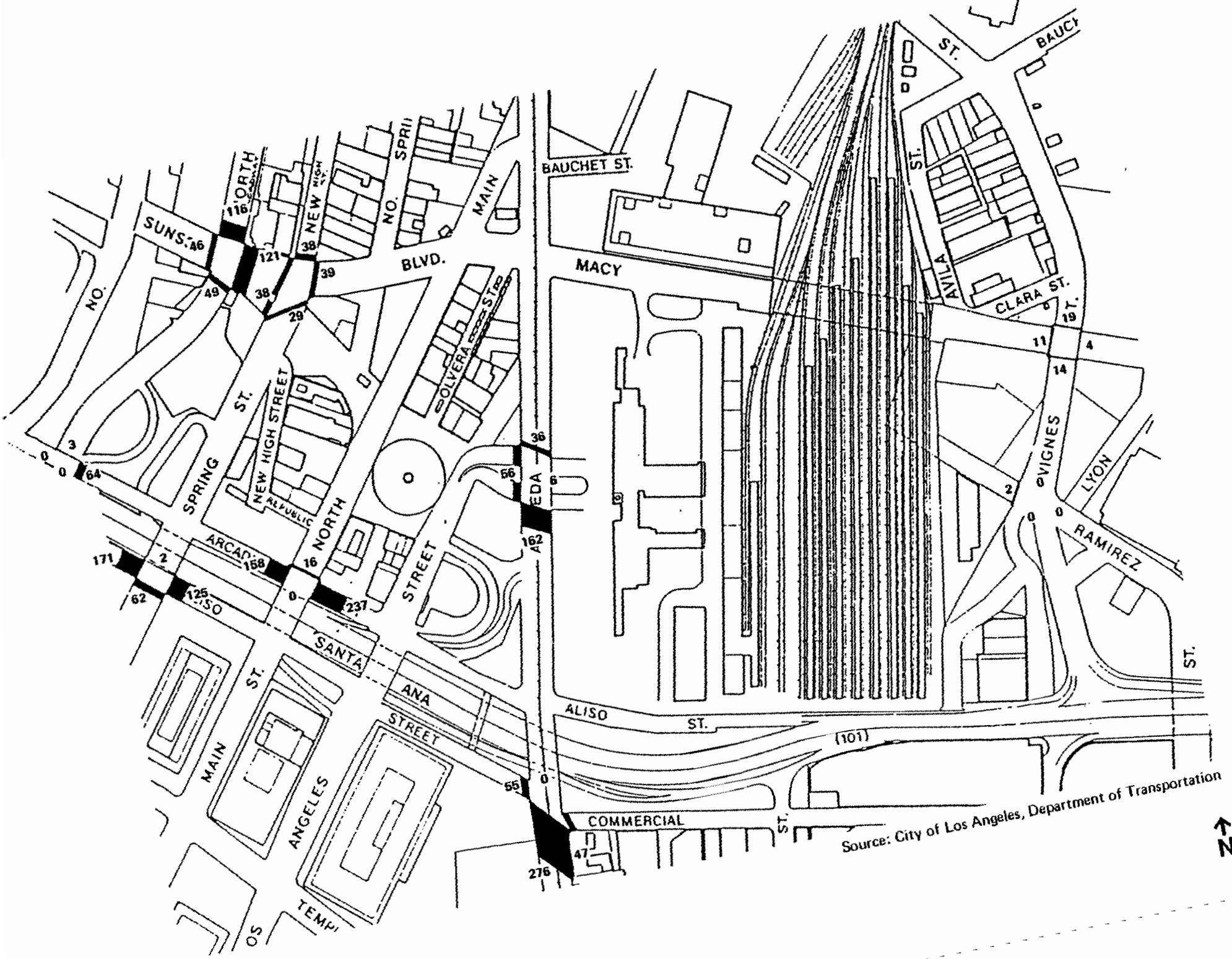
- Pedestrians were observed passing to and from the Chinatown, Little Tokyo and El Pueblo districts to make bus connections, or to access parking.

- Pedestrian trips from the civic center to lunch spots in Chinatown were observed on weekdays. These were trips primarily on Spring Street and N. Main Street, as these streets provide direct connections.

Peak Hour Pedestrian Volumes

Currently there are few pedestrian counts available for the Union Station Study area. Existing data is available during the 7:00-10:00 AM and 3:00-6:00 PM peak periods at the following intersections:

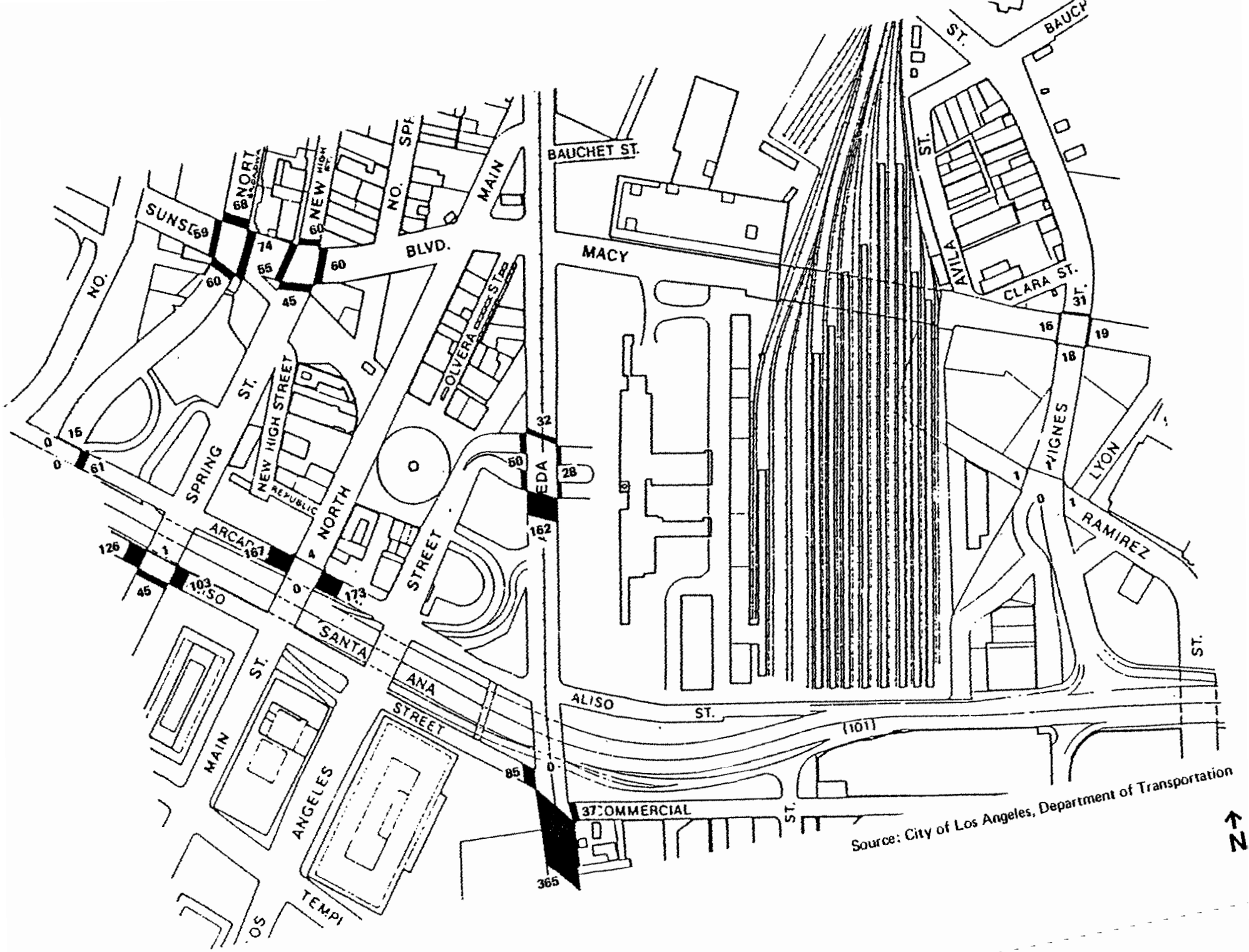
Spring and Aliso Streets
Alameda and Commercial Streets
N. Main and Arcadia Streets
Broadway and Los Angeles Streets
Alameda and Los Angeles Streets
Vignes and Ramirez Streets
Vignes and Macy Streets
N. Broadway Street and Sunset Boulevard
New High Street and Sunset Boulevard



Source: City of Los Angeles, Department of Transportation

DMA/PPS

(8 9am)



Source: City of Los Angeles, Department of Transportation

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DMA/PPS

(4-5pm)

For analysis and mapping purposes, 8:00-9:00 AM has been selected to represent the AM peak hour and 4:00-5:00 PM has been selected to represent the PM peak hour for pedestrian counts.

The intersections with the highest AM and PM peak volumes are Alameda at Commercial Street and Alameda at Los Angeles Street. Other intersections with moderately high volumes at the AM and PM peaks are N. Main at Arcadia Street and Spring at Aliso Street. The lowest volumes for both peaks were noted at those intersections east of the Union Station site. (See Figures 18 and 19.)

The crosswalk with the highest AM and PM peak is located on the south side of the Alameda/Commercial Street intersection, probably due to civic center employees accessing the parking facilities east of Alameda Street.

The crosswalk with the next highest AM and PM peak is located on the south side of the Alameda/Los Angeles Street intersection, also due to civic center employees using parking facilities north of Los Angeles Street.

Additional counts are being conducted for the Alameda at Los Angeles and Alameda at Macy intersections for both a weekday and Saturday between 11:00 AM to 2:00 PM and 3:00-6:00 PM. Also, weekday counts will be taken between 7:00-10:00 AM. CRA may also conduct counts from 11:00 AM to 2:00 PM and 3:00-6:00 PM at the following locations: Arcadia and Los Angeles Streets, Arcadia and N. Main Streets, Arcadia and Spring Streets, N. Main Street and Paseo de la Plaza. These counts will be included in a later draft of this document.

Additionally, field observations were made on weekdays and Saturday and these findings are as follows:

- Although vehicular counts drop dramatically on Saturdays, pedestrian counts increase. Peak pedestrian counts on most streets appeared to be at approximately 2:00 PM on Saturday.

- Based upon field observations on weekdays and Saturday, N. Broadway had the highest volumes in Chinatown, and Olvera Street had the highest volumes in El Pueblo. In Little Tokyo, east/west streets (First, Second and

Third Streets) seemed to have higher volumes. Major pedestrian concentrations in Little Tokyo seemed to center on commercial destinations and parking linkages.

- On weekdays during AM and PM peak periods, pedestrian volumes are light to moderate on Olvera Street and in El Pueblo, Chinatown and Little Tokyo.

- At Midday on weekdays, activity on Olvera Street is moderate. Restaurants are moderately busy. The majority of uses of Olvera Street are Hispanics and/or downtown employees at lunch. Tourists represent a small percentage (15-20%). Pedestrian volumes in Chinatown and Little Tokyo are also moderate.

- On Saturdays during AM and PM peak periods, pedestrian volumes are moderate in El Pueblo, Chinatown and Little Tokyo.

- At midday on Saturdays, pedestrian volumes are very high within El Pueblo and Chinatown. Peak volumes occur at approximately 2:00 PM. The increase in pedestrian volumes is primarily the result of heavy use of Chinatown and El Pueblo by their respective ethnic groups (Chinese and Hispanic) and more visitors.

Street Crossings and Intersections

The lack of adequate crosswalks at key locations and high traffic volumes at peak hour make certain crossings in the area difficult.

Inadequate crossings occur at the following locations:

N. Spring Street, north of Sunset Boulevard (no crosswalk at Sunset Boulevard)

N. Main Street and Sunset Boulevard (no second crosswalk at Sunset Boulevard)

N. Main Street and Paseo de la Plaza (poor crosswalk alignment with pedestrian flows)

N. Main Street and south side of the Plaza (no crosswalks)

Los Angeles Street and the Plaza (no crosswalks for crossing Los Angeles Street).

Weekday PM peak hour high vehicular volumes on Sunset Boulevard/Macy Street and Alameda Street make crossings more difficult. PM peak hour crossings are particularly difficult at Macy and Alameda Streets. Higher vehicular volumes and speeds on Macy Street and frequent turning movements together with short pedestrian green times contribute to potential vehicular/pedestrian conflicts. The railroad tracks and poor pavement on Alameda Street make crossings more difficult, particularly for the elderly and handicapped and for people with strollers.

There is a significant increase on vehicles exiting the Alameda and Los Angeles Street parking exit, heading southbound to freeway entrances during the PM weekday peak hour. This corresponds to peak use of the southern crosswalk.

Qualitative Assessment

Deficiencies exist in the overall pedestrian network and public spaces which link the LAUPT/USPS sites to each other and to surrounding activities. These negative qualities may discourage pedestrian trips and if possible improvements should be made in phase with the Union Station redevelopment project.

Two types of deficiencies have been identified: physical and management, and are described below.

Physical Deficiencies

- Inadequate sidewalk widths, paving, or continuity

  - The west side of Alameda Street between Los Angeles and Macy Streets has inadequate sidewalk width and continuity to allow easy north/south pedestrian circulation.

  - Diagonal pedestrian crossings occur through the State Historic Park parking lot and no sidewalks are provided. It should be noted that

historically, Marchessault Street extended through the current parking lot, connecting Spring Street with Alameda Street (see Figures 20 and 21). This connection is an important link between Chinatown, El Pueblo and Union Station.

- Poor sidewalk paving (former roadway paving) exists on the north and south sides of the Plaza, and the roadway on Alameda Street is in poor condition.

- Inadequate open space is available at historic sites on Olvera Street making orientation by visitors difficult.

- Pedestrian crossings at Sunset Boulevard, Macy Street, Los Angeles Street and Alameda Street, if improved, would facilitate connections (see Pedestrian Crossings and Intersections).

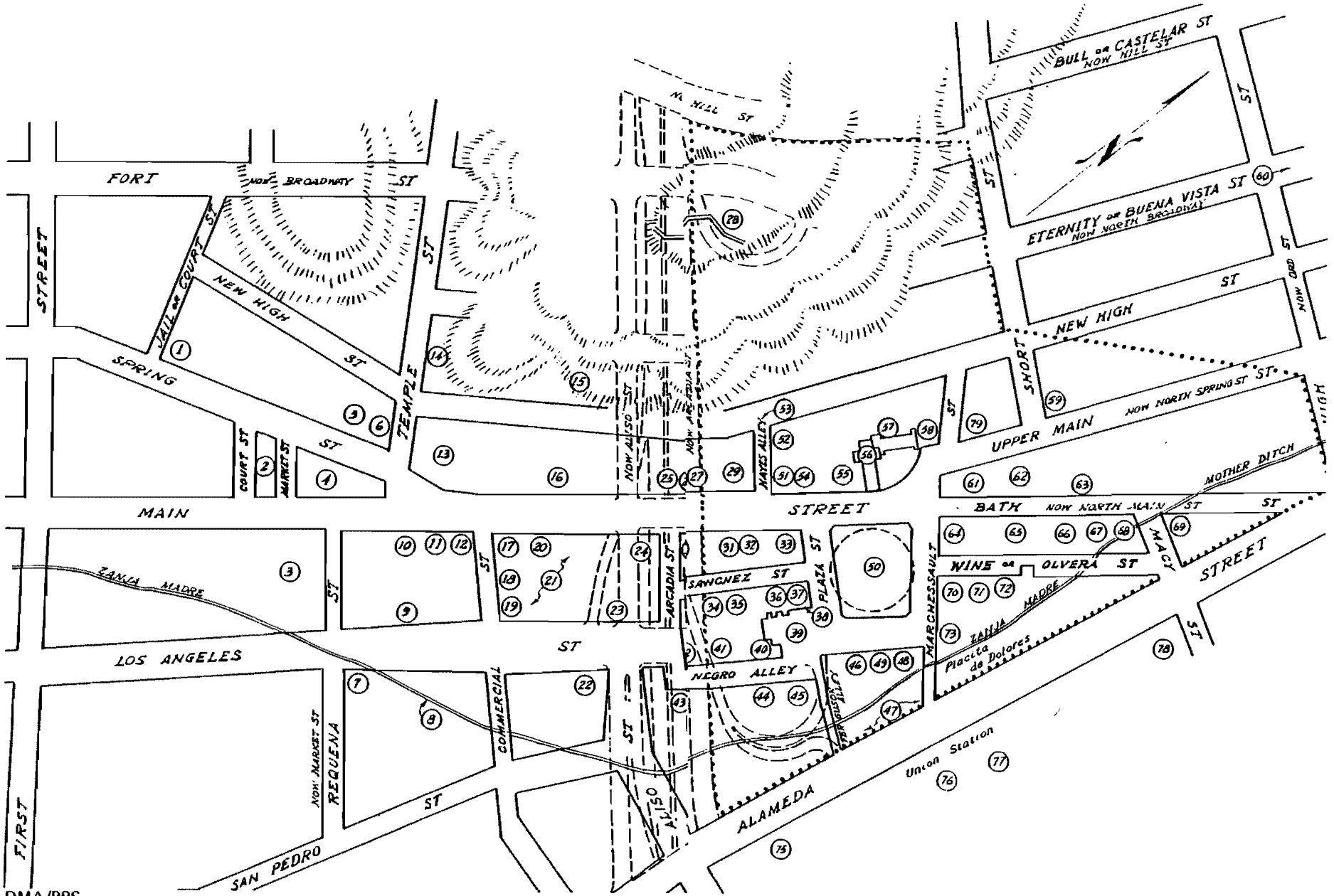
- A strong sense of sidewalk continuity (Boulevard and Plaza landscaping treatment) on Alameda Street and special crosswalk treatments on Macy Street will facilitate linking the LAUPT and USPS sites. Extension of the LAUPT arcade weather protection would be desirable.

- Parking access to the State Historic Parking lot at N. Main Street and Sunset Boulevard conflicts with pedestrian flows.

- Signage should be improved. Street signs are missing in some locations (Olvera Street, New High Street, south of Sunset Boulevard, etc.)

- Directional signage to districts should be placed at key locations and visual gateway features at the entrances to districts are lacking.

- Bus shelters are sometimes placed where they block pedestrian flow (N. Broadway and Sunset Boulevard).



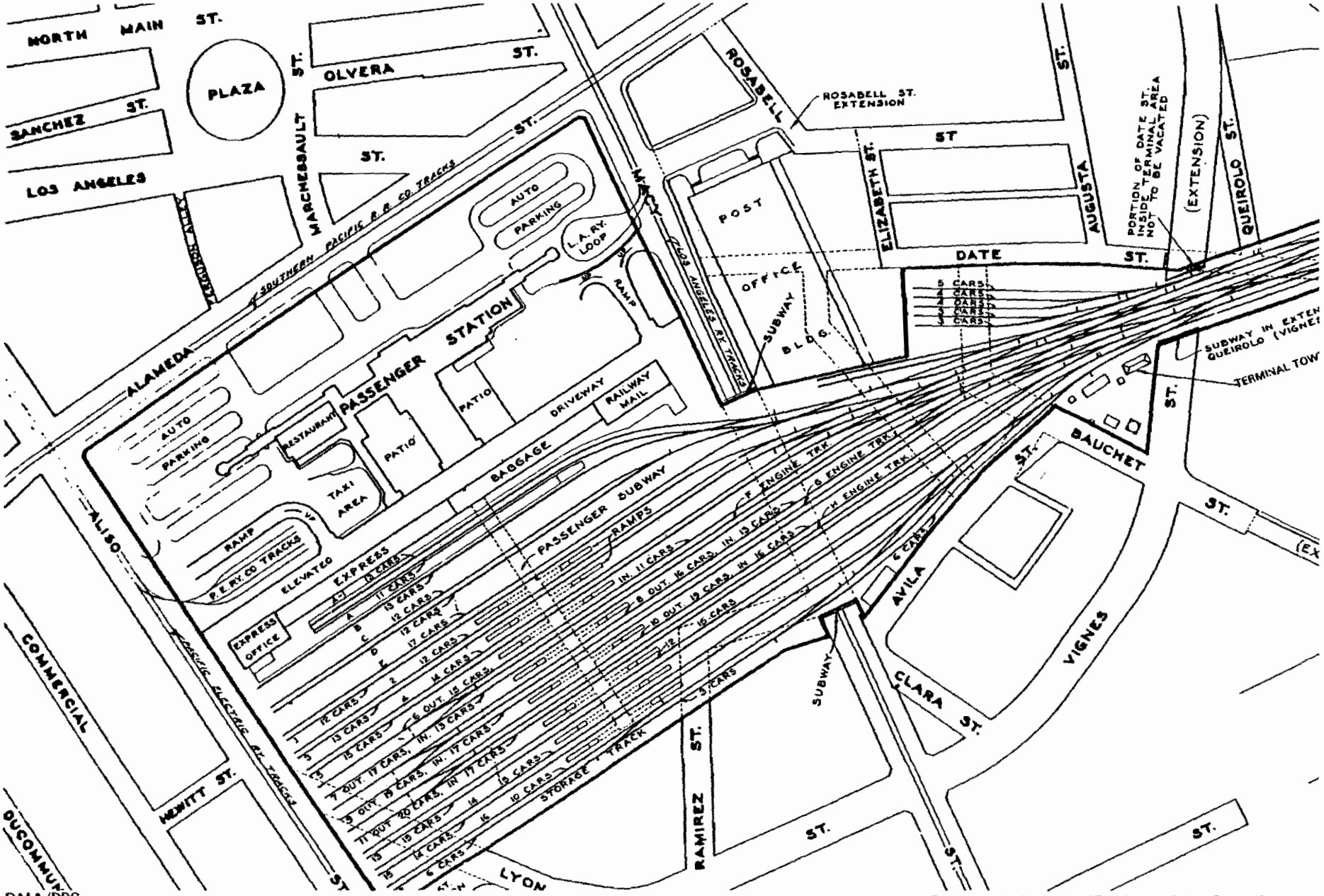
DMA/PPS

Source: W.W. Robinson, Los Angeles from the Days of the Pueblo

Figure **20**

El Pueblo Historic Street Configuration (c. 1870)

N



DMA/PPS

Source: B. Bradley, The Last of the Great Stations

Figure **21**

Union Station Historic Street Configuration (c. 1937)

N

Management Deficiencies. A number of public space management problems were observed which negatively affect the potential for pedestrian linkages to activities surrounding the LAUPT/USPS site. (See Figure 22.)

- Tour and school bus parking around the plaza block visual access to Union Station and the Plaza. A total of 18 school buses were observed on a Wednesday parked on the west side of N. Main Street.

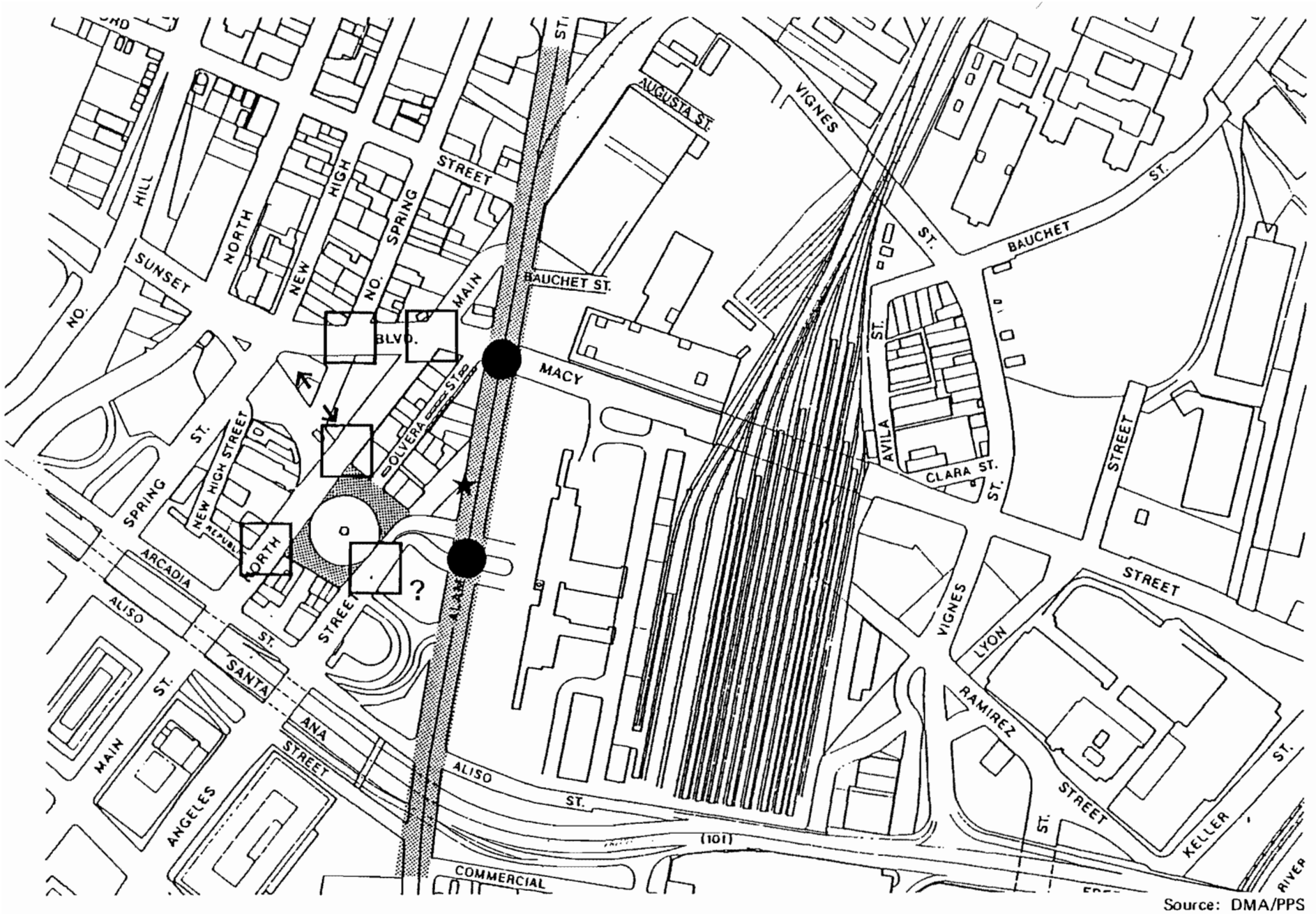
- Tourist attractions in El Pueblo are poorly signed, making them hard to find. Relocating some of the street stalls on Olvera Street to other locations around the plaza would help orientation and would attract people to the landmark building south of the plaza.

- On Saturday Olvera Street is active with high pedestrian flows, reaching peak volumes about 2:00 PM. The pedestrians on Olvera Street and in the El Pueblo district are approximately 50% Hispanic and 50% visitors and tourists.

- The Plaza Catholic Church is a social center for Hispanics. The pedestrian passage on the north side functions as a courtyard. Photographers are there to photograph weddings and other events, and there are sidewalk vendors. Hispanics gather to talk near the eastern and western entrances of the church. However, the lack of direct crossings to the Plaza make access to the church difficult.

- Heavy use of the plaza parking lot on Main Street by persons with business in the civic center area, particularly at the courthouses. These persons were leaving this lot by 5:00 PM. The all-day maximum for the lot is $2.00 which is $1.00-$1.50 lower than surrounding lots. This use clearly does not benefit the El Pueblo visitors for whom the parking lot was intended.

- During weekdays and Saturday the plaza is extremely active. Native American dancers (Mexican Indian) entertain in the plaza during midday. A constantly revolving crowd of about 150-250 persons watch the entertainment.



Source: DMA/PPS

Figure **22**
Pedestrian Problem Areas

- Pedestrian/vehicular conflict points
- Inadequate crosswalks
- Inadequate paving
- Needed linkages
- Insufficient sidewalk width
- ? Poor public space management

N

- Generally the Placita de Dolares (the small brick-paved plaza space at Los Angeles and Alameda Streets) is lightly used (8-12 persons). Peak use was observed on Saturday. Increased programming and easier access from Los Angeles Street would encourage use and a better tie to Union Station.

- Homeless adult males use the Father Serra Park at Alameda and Los Angeles Streets as a home. Constant use of the park by 12-15 persons was observed. These individuals litter the park with cardboard, plastic and paper bags and newspapers. Most of the people are on the grass alone under blankets at most times. Some persons move from the park to access the public restrooms in the plaza or to panhandle at the entrances to Olvera Street. Interviews with park maintenance workers indicate that 80% of the users are Mexicans, aged 15 to 30, who are on a temporary visa and looking for work. They arrive on Trailways and need ready access to the Mexican Consulate at the Plaza, and the Immigration Building at Los Angeles and Temple Streets. Many of these persons do not find employment and camp out at Father Serra Park for several weeks. The other 20% of the homeless are alcohol dependent (primarily Black Americans) and use the park for a few days at a time. Use of the park for the above activities discourages pedestrian trips between Union Station and El Pueblo because of the perceived threat to personal safety. Replacement of these activities with the extension of the Plaza activity would benefit the area.

- In general, it may enhance walking trips to identify El Pueblo as a district, the birthplace of Los Angeles, rather than as a State Historic Park which has misleading implications. Greater use of a district theme with special paving and historic lighting fixtures would create a stronger tie between Union Station and El Pueblo.

- Street trees are lacking on sidewalks in the area and would delineate the pedestrian zones.

- Greater sidewalk oriented retail frontages or cultural attractions in El Pueblo would encourage pedestrian connections. There are many blank or vacant frontages on Alameda, Los Angeles, N. Main, and Arcadia Streets and on Sunset Boulevard.

- Union Station lot at Macy and Alameda Streets is actively used for access to Olvera Street (a sign in the lot says "Park convenient to Olvera Street"). More pedestrian crossings to this lot were observed at Alameda and Macy Streets than at Alameda and Los Angeles Streets. Regular visitors to Olvera Street seemed to recognize that the Macy Street connection is a shorter walk. The small parking lot abutting Olvera Street on Alameda Street is full by 1:30 PM. Twenty merchants once validated this parking, now only five do.

- Lack of street retail (for example at the Cathay elderly housing on Broadway) discourages connections to Chinatown. The intersecting, shifting street grid pattern and changing street names also contribute to the poor linkages to Chinatown and to pedestrian disorientation in the area.

Recommended improvements to correct the above deficiencies will be identified and described in the next study task.

PARKING CONDITIONS

This portion of the working paper presents information on parking availability and parking practices on the Union Station and Terminal Annex sites and in the adjacent study area. Most of the information on parking to the west of Alameda Street, has been extracted from the Wilbur Smith and Associates report, **Central City Parking Study,** and from the PRC Voorhees report, **Chinatown Redevelopment Project — Parking and Circulation Analysis.** For the LAUPT property itself, in and out counts were made from 7:00 AM to 4:00 PM on a typical weekday, and drivers leaving the parking lot were surveyed to determine their local origin and their total parking time. Brief field checks were made of the Olvera Street Plaza area and of the southeasterly

TABLE 8

INVENTORY AND UTILIZATION OF PARKING FACILITIES
LOS ANGELES UNION PASSENGER TERMINAL AND ENVIRONS
(Typical Weekday in June, 1986)

Facility and Location	Number of Spaces Available	Used	Percent Used	Rate Structure Initial Init. Time	Day Rate	Closing Time	Remarks
Union Station, forecourt south	215	155	72	0.75 20 minutes	$3.50	none	
Union Station, forecourt north	225	210	93	0.75 20 minutes	3.50	none	
Union Station, north courtyard	127	125	98	0.75 20 minutes	3.50	none	
Union Station, employees only	34	11	32	0.75 20 minutes	3.50	none	
Union Station, underground	66	46	70	40.00 month	N/A	none	
Subtotal Union Station	667	547	82				
Post Office forecourt	66	63	95	no charge but 20 minutes limit		none	Employees use - 10 p.m. - 7 a.m.
Post Office structure	900	500	56	postal service employees only			none
Other Post Office parking	100	100	100	postal service employees only		none	Fills only at 10 p.m.
SW croner Sunset/N. Broadway	200	200	100	N/A N/A	N/A	N/A	
SW corner Sunset/Spring	34	0	N/A	N/A N/A	N/A	N/A	Locked
Spring S. of Sunset	256	251	98	N/A N/A	N/A	N/A	
Main S. of Sunset, Plaza	250	240	96	0.75 30 minutes	2.50	10 p.m.	
Alameda S. of Sunset, Plaza	37	36	97	1.00 30 minutes	3.00	10 p.m.	Attendant parking
W. side Mian, opposite Plaza	50	41	82	county parking only			
NE corner Main/Arcadia	22	14	64	private, gated			
NW corner Main/Arcadia	92	90	98	1.00 30 minutes	3.00	6 p.m.	Attendant parking
NE corner Spring/Arcadia	88	88	100	3.00 day	3.00	5:30 p.m	Attendant parking
Subtotal Plaza Area	1,029	960	93				
Los Angeles Street interchange	43	36	84	city employees only			
NE corner Alameda/Arcadia	40	36	90	city employees only			
NW corner Alameda/Sunset	20	0	0	Chevron Gas Sta. no rates			Graveyard post office employees use?
NW corner Main/Sunset	50	35	70	0.75 20 minutes	3.00	1 a.m.	
S. side Ord. W. of Alameda	80	50	63	Phillippe's customer only			
N. side Ord W of Alameda	35	35	100	Phillippe's customer only			
E. side Spring N. of Ord.	60	60	100	1.00 30 minutes	3.00		
E. side Spring S. of Ord.	24	33	92	0.75 20 minutes	3.00	9 p.m.	
NE corner Sunset/New High	17	17	100	Cathay Plaza customers			
W. side Spring N. of Sunset	35	30	86	Supermarket customers only			
NW corner Sunset/N. Broadway	350	330	94				
Subtotal part Chinatown	671	579	86				Full at lunchtime
GRAND TOTAL	3,516	2,821	80				

SOURCE: PBQD Field Checks

portion of Chinatown near the site to verify and update data on parking within easy walking distance of the station and post office.

Facilities

On the Union Station property are approximately 730 parking spaces, all but 66 of which are surface parking (Table 8). Those 66 are in an underground garage under the north courtyard and part of the station. Previously there were more surface spaces and a structure at the south end of the property, but these have been demolished or rendered inaccessible by Caltrans Busway construction. Of these spaces, 8 are reserved for AMTRAK-owned autos, 20 for Caltrans consultants, and 32 for station employees. The parking is managed for the Los Angeles Union Passenger Terminal company by Allright Parking.

Parking Rates

The Union Station parking rates are typical of the area, beginning with 75 cents for 20 minutes and increasing to $3.50 for a full 24 hours. The facility is unique in the area in that it is open 24 hours. The latest near by lot in Chinatown (opposite the Post Office) closes at 1:00 AM, and another at 10:00 PM. However most are closed by 6:00 PM, and car owners arriving after that time may be faced with a walk through a vagrant-frequented part of the city to another lot to recover their keys.

An underground garage at the north end of the station has lower rates, $40.00 per month. Union Station employees also have monthly parking, but have to use the less desirable rear areas.

Space Utilization

The existing parking facilities, including those of Union Station and the Terminal Annex Post Office, are fully utilized (Table 9). Approximately 85% of the 670 spaces on the Union Passenger Terminal property were occupied at lunch time on a typical Friday. Generally, because of the search time needed to find the last few spaces in a large parking lot or structure, 85% utilization is considered to be its practical capacity.

TABLE 9

SUMMARY OF PARKING FACILITIES AND USE
UNION STATION MASTER PLAN AREA AND ENVIRONS

Area Description	Curb Parking			Off-Street Parking				All Spaces		
	Total Spaces	Observed Use[a]	Percent	Total Spaces	Total Unres.	Observed Use[a]	Percent	Available Space	Observed Use[a]	Percent
Union Station Property	0	0	-	727	667	564	85	667	564	85
Post Office Property	0	0	-	1,066	66	63	95	66	63	95
Olvera Street/Plaza Ara	62	59	95	1,122	723	705	98	785	764	97
Board of Education Property	12	7	58	1,088	12	-	-	24	7	29
Chinatown (part)	380	393	103	2,162	1,884	1,413	75	2,264	1,806	80
Total	454	459	101	6,165	3,352	2,745	82	3,806	3,204	84

[a] At noon in Chinatown and Union Station areas, later in Plaza area.

SOURCE: Wilubr Smith and Assoicates, Central City Parking Study, 1981
PRC Voorhees, Chinatown Redevelopment Project - Parking and Circulation Analysis, 1983
Field checks by Parsons Brinckerhoff staff.

The short-time customer parking in the front courtyard of Terminal Annex is fully taken up by patrons of the post office. Some customers also park to the left of the main entrance while dropping off larger parcels. Although not full at the noon peak time, the employee parking lot and structure are fully utilized at about 10:00 PM, when the swing and graveyard "tours" overlap. There is then an overflow from the Post Office on-site parking to nearby parking on-street and within Chinatown. Over 60 post office employees on the 7:00 AM - 3:00 PM tour were found to use the Union Station parking across the street in preference to the remote employee surface lot at the north end of the property off Vignes Street (Table 10).

TABLE 10

ORIGINS OF VEHICLE LEAVING STATION PARKING
(7:00 AM to 4:00 PM - June 12, 1986)

Origin	Vehicles	Percent
Federal Building	59	4.75%
Insurance	19	1.52%
Mexican Consulate	34	2.75%
Olvera Street	149	12.14%
Post Office	67	5.40%
Station	889	72.24%
Other	15	1.20%
Total	1,231	100.00%

The curb parking within Chinatown is completely saturated at noon time, while the off-street parking is not, suggesting a combination of underpriced curb parking, ineffective enforcement, and inconvenient off-street spaces. Both on-street and off-street parking spaces in and around the Plaza regularly fill up, and the Union Station Parking is used by about 150 weekday parkers. As both the Plaza and Chinatown are strong generators of social weekend trips, there is an overflow onto the Union Station property from these areas on weekends as well.

About 60 of the parkers at Union Station were people who had been to the Federal Office Building across the freeway. Because there is an underground facility under the Bowron Plaza shopping center south of the freeway which is closer and less costly than the Union Station lot, this use suggests a fear of underground parking or ignorance of its existence on the part of these users.

Turnover

Figure 23 illustrates the accumulation of parkers on the Union Station property during the period 7:00 AM - 4:00 PM. About 1600 vehicles entered the Union Station parking areas and over 1,400 left, giving a turnover of 2.8 vehicles per space for the 564 spaces utilized. The 323 spaces used by people who entered during that time had a turnover factor of over 6. Only about 60 of the 340 cars parked on the property at 7:00 AM had left by 4:00 PM. The parking is thus used by two radically different sets of users. One (over 70% of those exiting during the interview day) is composed of Station visitors (passenger pickup/dropoff, ticket purchase, and parcels pickup/delivery). In addition there are short time parkers for the Plaza, Mexican Consulate, and other nearby buildings. The other population is apparently composed of extremely long-term parkers, which are surmised to include:

AMTRAK employees who are based in Los Angeles and regularly are out of town for three or four days at a time;

Railroad and AMTRAK employees on the San Diego run who work normal hours but have a split shift;

Tourists taking long distance trains who park at Union Station and do not return for anywhere from 2 days to a week or more.

Turnover in adjacent areas was inferred from other studies and posted regulations. The highest was at the Post Office's public parking where stops of 15 minutes or less were typical. Curb parking in the Plaza and Chinatown areas, mostly metered, had a typical parking time of 60 to 90 minutes, related to meals or shopping purposes. The surface lot parking in these areas was dominated by commuter parking of 7 hours or more.

Overview

Union Station - has a large and flexible supply of surface parking attractive to both long-term and short term users. Most of these users have either work or business at Union Station, but the surface lot also provides for people destined to the Plaza and the Civic Center who either cannot find a space or dislike underground or structure

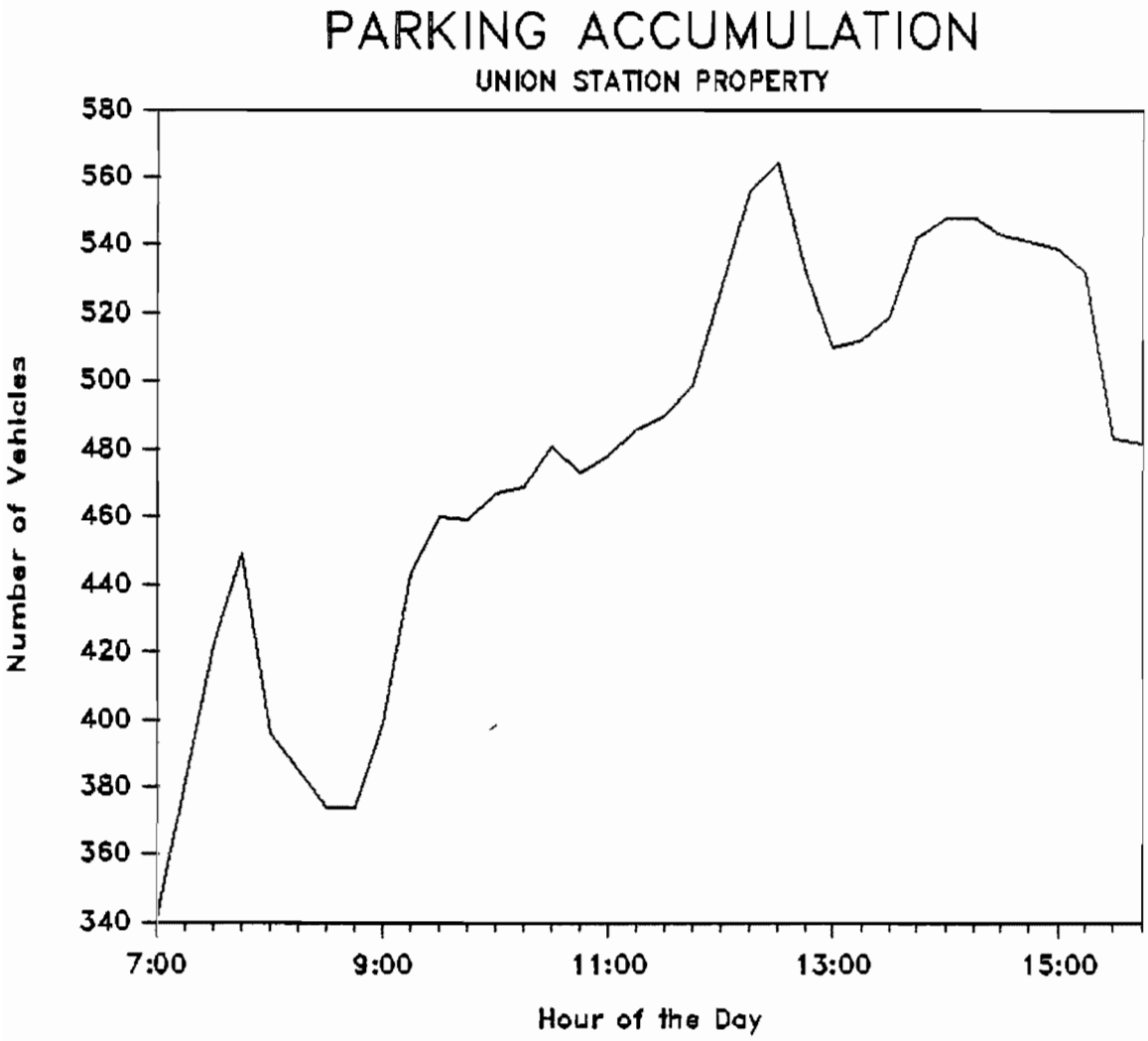

PARKING ACCUMULATION
UNION STATION PROPERTY
Number of Vehicles
580
560
540
520
500
480
460
440
420
400
380
360
340
7:00
9:00
11:00
13:00
15:00
Hour of the Day

Figure **23**

parking. Though the site is operating at its practical capacity, near the possible capacity in the northwest corner near the Plaza, it nevertheless does not completely fill and people who come to it find a space in a reasonable period of time.

Security is good, rates are reasonable for the area, and the facility is open all 24 hours. These are assets not found elsewhere in the area, and which users would doubtless like to see retained over time as development occurs.

Terminal Annex - has an adequate amount of parking. Though there is some overflow during the overlap of the swing and graveyard tours around 10:00 PM. This situation will change when the sorting office is relocated by USPS.

El Pueblo/Olvera Street Plaza - parking is filled to possible capacity in early afternoon, with some illegal parking noted. Its parking deficiencies is met in part by Union Station parking spaces, especially those in the northwest corner of the property. Some of the El Pueblo parking deficiency appears to be generated by Civic Center employees parking north of the freeway.

Chinatown - has a severe curb parking deficiency in respect to lunch hour parking convenient to restaurants. In the absence of such off-street parking, the curb parking is fully used and there is some illegal parking. However, this Chinatown parking problem does not at present appear to be affecting Union Station parking demands.

CONCEPTUAL TRANSPORTATION BASELINE

The transportation baseline is made up of those existing and committed facilities which will serve the site, and in addition includes desirable but uncommitted facilities for which will serve the site.

Union Station serves currently as a transportation hub accommodating AMTRAK, Trailways, local and regional bus transit services and parking both for activities on-site as well as those in the adjacent Civic Center and El Pueblo areas. In recent years, many additional transportation facilities have been proposed for the site, including conceptual development of the LAUPT as a transportation terminal. While later Task II work will provide greater detail on the implications of each transportation element,

this chapter defines two conceptual baselines as early input to the urban design and development analyses. It is anticipated that these transportation concepts will be refined and significantly modified as the study progresses.

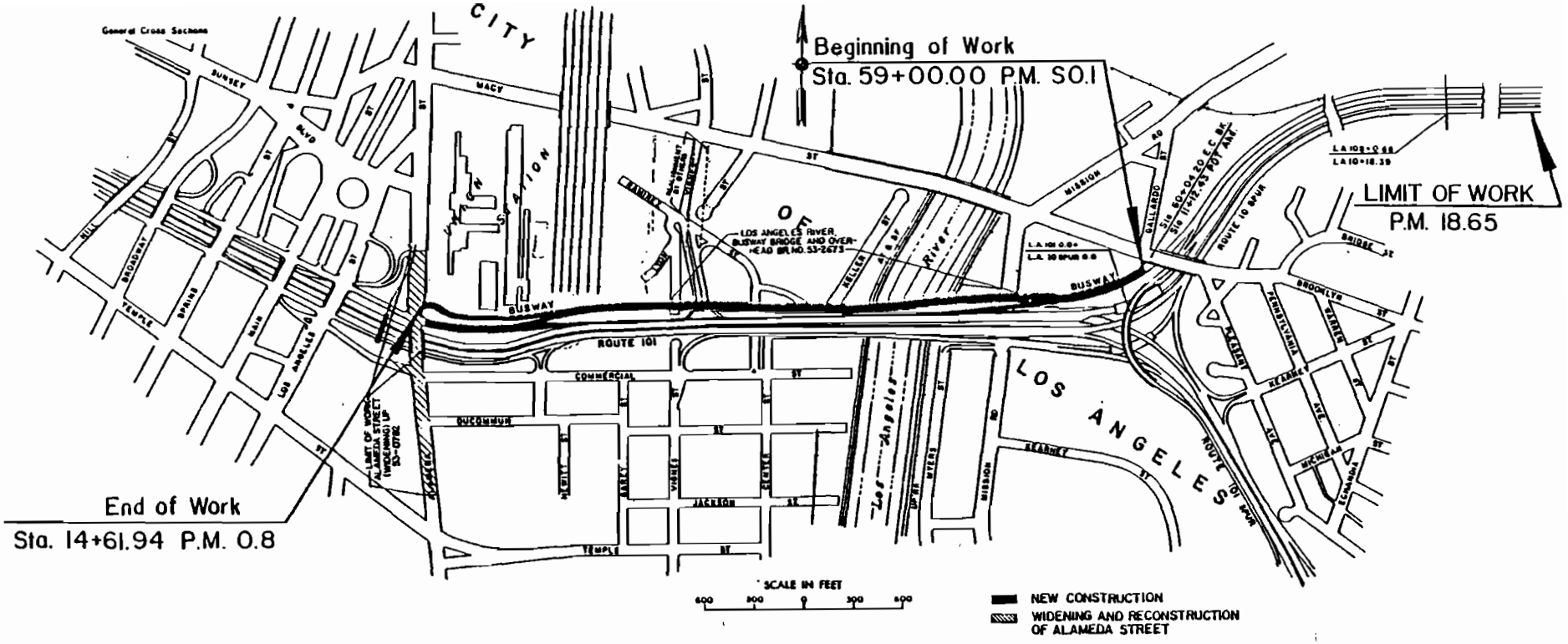
Existing and Committed Facilities

The following transportation facilities are either exist or are financially committed to construction in the LAUPT site area:

1. SCRTD Surface Bus -- surface bus operations will continue adjacent to the site along Alameda Street, Macy Street, and Vignes Street. A bus terminal is a probable and desirable element of the Metro Rail project, and some surface bus operations would likely be diverted to the bus terminal to facilitate transfers to Metro Rail. (See later bus terminal discussion.) In addition, according to SCRTD's Planning Department, with the completion of the central maintenance facility, the need for the existing layover space on LAUPT property near Macy and Alameda Streets will be eliminated.

2. El Monte Busway Extension -- the extension of the existing San Bernardino Freeway Busway from Mission Road along U.S. 101 to Alameda Street is assumed to be completed as planned by Caltrans. This extension requires use of a small strip of land along the southern boundary of the LAUPT site (Figure 24). Caltrans has completed acquisition of the required land and construction has recently been started. When complete, buses operating on the El Monte busway will have direct, grade separated access to Alameda Street at Arcadia Street. Once a bus terminal is developed, this extension could provide direct access for both surface operations on Alameda Street as well as the busway express services. (See later bus terminal discussion.)

3. AMTRAK -- both rail and connecting bus operations as described earlier are likely to remain on the LAUPT site. Although Federal funding uncertainties may result in reduced service for longer distance interstate rail services, shorter distance, the California Transportation has committed funds for additional State-subsidized services on the San Diego line and for a train to and from Santa Barbara. While AMTRAK has available 8 tracks and platforms, at present no more than 3 trains ever load or unload in the station at any given time.



Source: Caltrans, TDA Inc.

Figure 24
El Monte Busway Extension

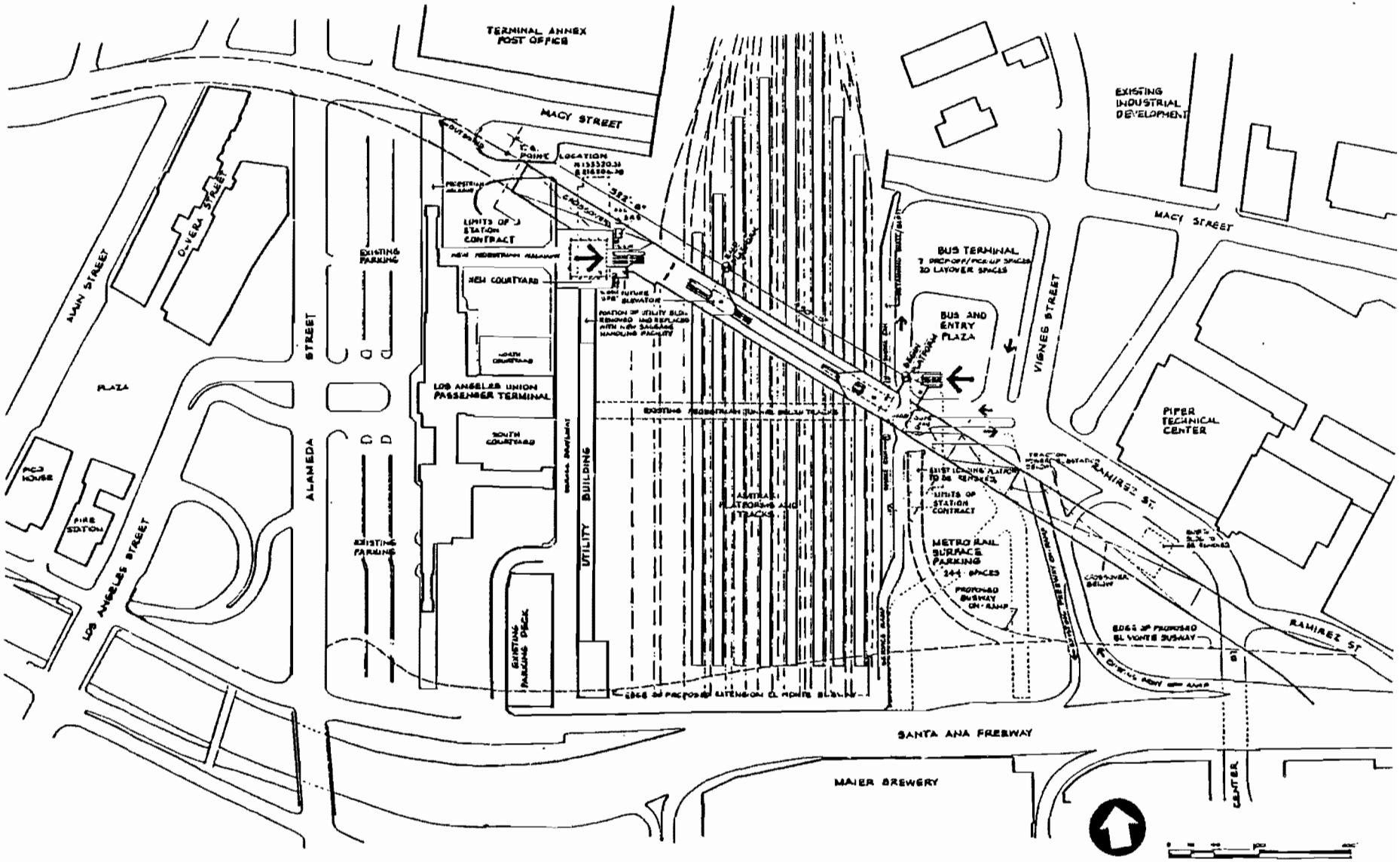
Therefore, it is possible that track usage could be reduced if alternate train storage and assembly areas could be found.

4. Trailways -- use of the site by Trailways is likely to continue, but activities could be combined with AMTRAK contract bus and SCRTD bus operations in a consolidated bus terminal. (See later bus terminal discussion.)

5. Metro Rail -- the proposed four-mile Minimum Operating Segment (MOS-1) would include a terminal station running below grade on a diagonal alignment across the site (Figure 25). In addition, Union Station would be the site of construction staging and mucking operations for tunnel work elsewhere in the CBD. SCRTD's current schedule calls for construction to begin this year pending resolution of a funding agreement with the Federal government. Much uncertainty remains, however, over the timing of extension and ultimate question of whether Metro Rail will be built as currently planned. Given the potential impacts, to both the LAUPT and Post Office properties, resolution of the future of Metro Rail is critical to determination of the two sites' development potential. When Metro Rail is constructed, both sites will become extremely accessible to the rest of downtown as well as the Wilshire Corridor. SCRTD studies project that over 13,000 riders a day will board the rail system at Union Station by the Year 2000[1]. (On the negative side, construction will be disruptive to the site and the currently planned station, bus terminal and layover area, and parking facilities will consume significant land and place constraints on future development of the site.)

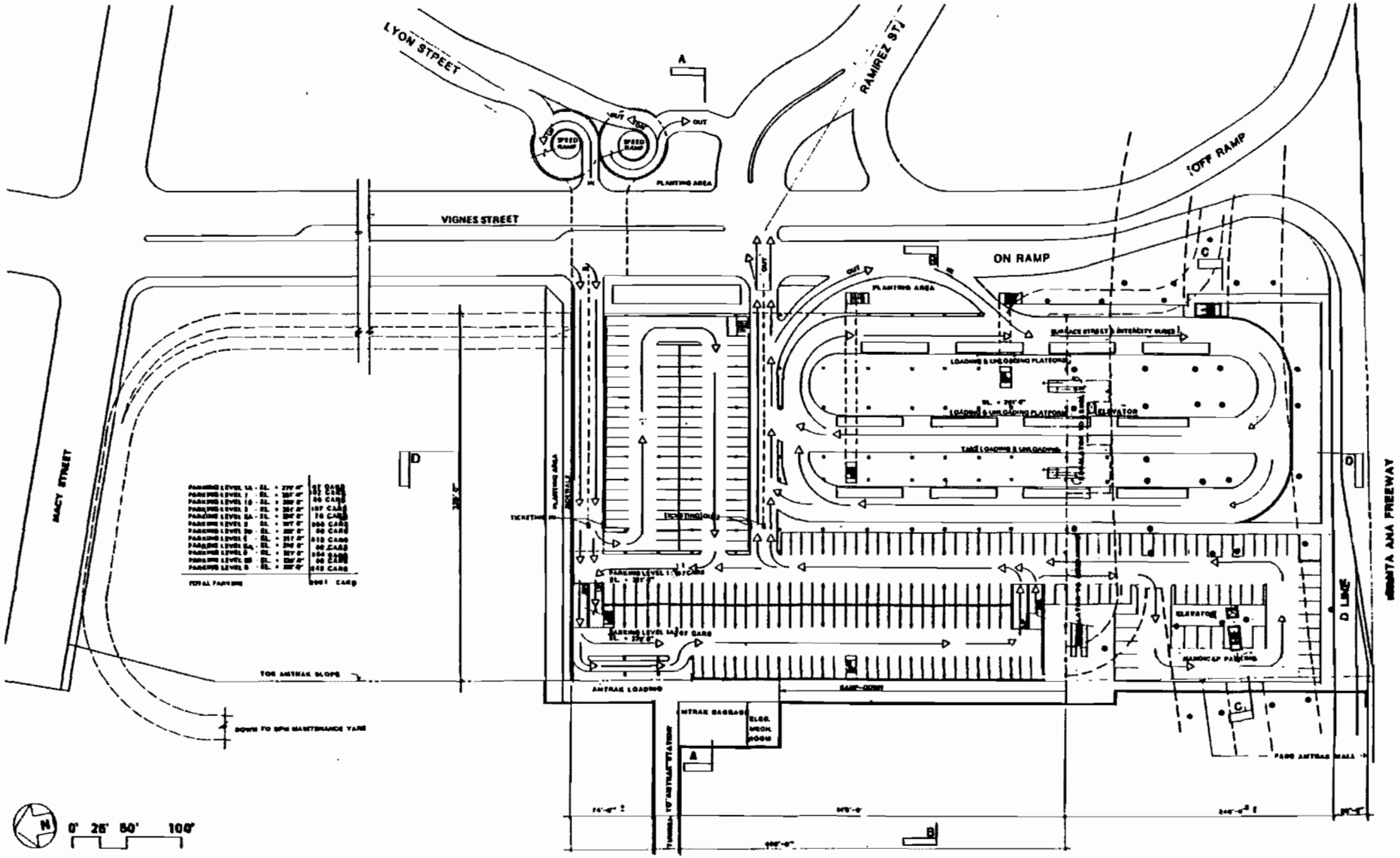
6. Bus Terminal -- development of a bus terminal at the LAUPT is a desirable and logical element of any plan to develop a transportation transfer facility at the site. Bus terminals have been proposed as part of both the Metro Rail MOS-1 project and the earlier Downtown People Mover (DPM) (Figure 26). In both cases, the bus facility was proposed for the area directly east of the existing operating rail tracks. The DPM bus terminal was proposed for the southeast corner of the site and was to have been incorporated in a larger parking facility. In the case of the Metro Rail MOS-1, the terminal is proposed for the northeast

(1) "Environmental Assessment for Los Angeles Rail Rapid Transit Project Union Station to Wilshire/Alvarado", RTD, August, 1984.



Source: RTD, TDA Inc.

Figure 25
RTD Metro Rail



Source: CRA, TDA Inc.

Figure 26
Los Angeles Downtown People Mover Union Station Intercept

corner of the site at Vignes and Macy Streets (Figure 25). Finally, as part of preliminary planning work undertaken by the LAUPT, a linear terminal option was proposed to be incorporated in the busway extension parallel to U.S. 101 along the southern boundary of the LAUPT site (Figure 27). With the development of any one of these facilities, it is assumed that all the site's bus activities (including Trailways and AMTRAK buses) would be consolidated in the terminal.

Privatization studies currently underway by LACTC could impact bus terminal needs. Presently adopted plans of SCRTD call for "trunklining" the busway with high-capacity (presumably articulated) buses looping through downtown and connecting with feeder buses at El Monte Station. Those buses from Altadena, Arcadia, and Sierra Madre which do not stop at El Monte, would feed Metro Rail

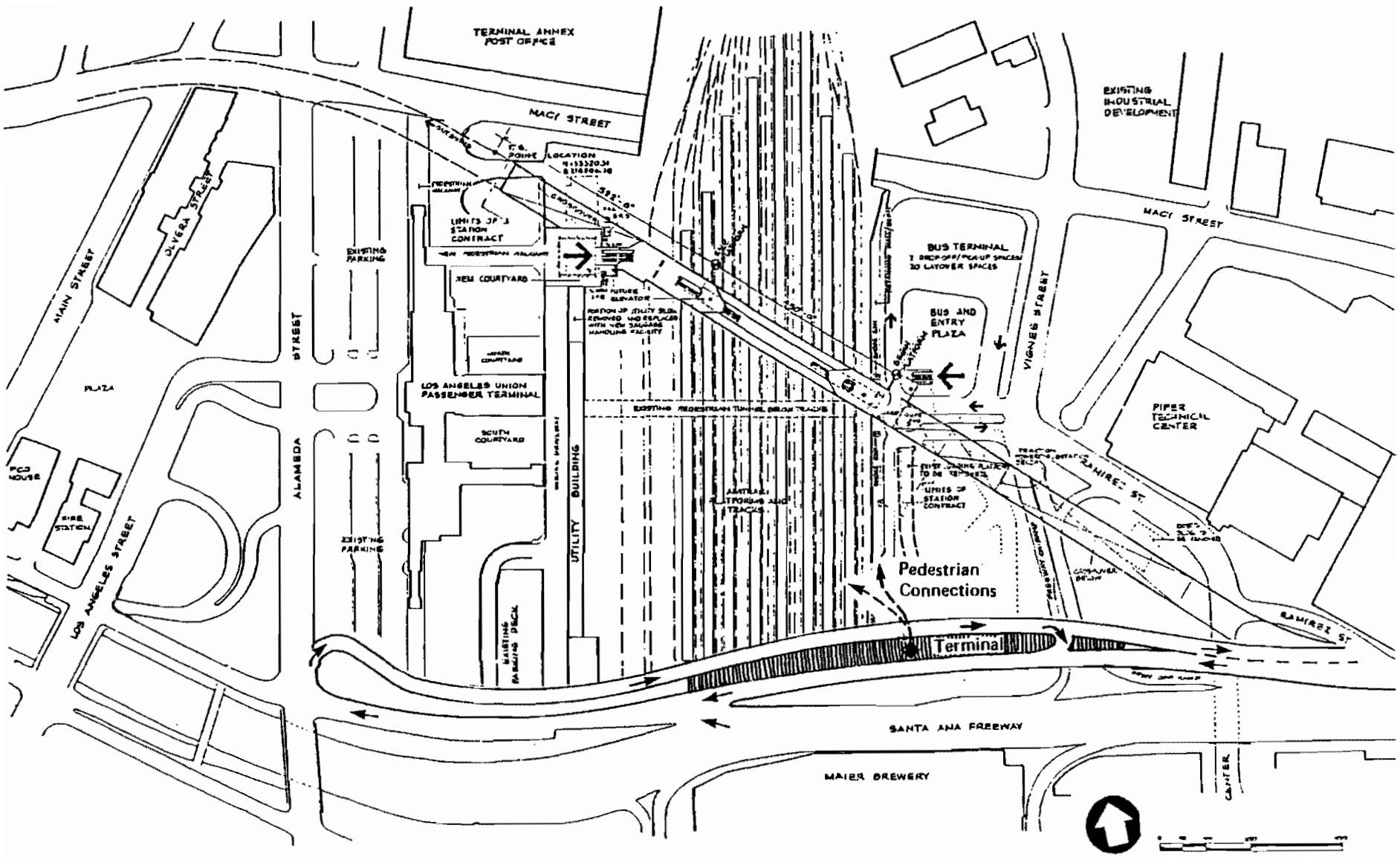
at Union Station. If the busway buses are contracted to private carriers, the need for interchange at Union Station may change.

7. Downtown Circulator/Shuttle -- the existing service in its current or a modified form is likely to continue under any scenario. Service to the LAUPT would most likely continue on-street, although inclusion in a bus terminal is possible.

8. Peripheral Parking -- the LAUPT has been proposed as a site for peripheral parking to serve the CBD as part of the previous DPM program, Metro Rail MOS-1 and most recently CRA's current Downtown Peripheral Parking Program. In the case of both Metro Rail and the DPM, parking would be located to the east of the existing tracks. The latest studies by CRA indicate the potential need for 400 spaces in 1989, growing to 1,800 spaces by 1995; Metro Rail has identified a need for 2,000 spaces by Year 2000. For perspective, 2,000 spaces in a 5 story garage would require about 3 acres.

Candidate Facilities

In addition to the existing and committed public transportation facilities, there are other projects which have been given serious consideration in the past or which could significantly improve site accessibility.



Source: SCRTD, TDA Inc.

Figure 27
LAUPT Linear Terminal Option

1. People Mover Connection -- the previously proposed Los Angeles Downtown People Mover (DPM) was to have been an approximately 3 mile, double track, automated transit system connecting Union Station to the Convention Center with 13 stations. As part of the DPM project, the LAUPT site was to have been developed with a major parking structure and bus intercept/terminal facility. In 1981, Federal support was withdrawn from the DPM program and further development work on the Los Angeles project was halted. However, the Community Redevelopment Agency (CRA) has continued a policy of preserving the right-of-way and option of future development of a people mover connection through Bunker Hill. Near-term development of a Revised People Mover (RPM) is likely only if a decision is made not to build Metro Rail MOS-1. Even under this scenario, development of the people mover is likely to connect only the Civic Center and Bunker Hill areas to Union Station.

2. Light Rail/Commuter Rail Lines -- a number of rail lines, using mostly existing rail corridors could someday serve the LAUPT and require station/terminal facilities at the site. Possible light rail transit (LRT) candidates include:

   - Long Beach-Los Angeles LRT Extension -- the Los Angeles County Transportation Commission (LACTC) has just begun construction of this line, which would terminate at 7th and Flower in Downtown Los Angeles. Passengers bound for other CBD destinations could transfer at 7th and Flower to Metro Rail or surface bus. The LACTC has examined both aerial and subway connections between 7th and Flower and Union Station, but has not subjected them to EIS/EIR studies. It is assumed for this paper that this connection would be provided by either transfer to Metro Rail or by either LRT or a people mover system if Metro Rail is not built because these projects have passed the EIS/EIR hurtle.

   - Pasadena LRT -- the LACTC has done preliminary planning for a rail line running from Union Station to Pasadena. At this time no schedule has been established for further development of this proposal, but it is recommended as a serious long-term possibility.

   - Burbank Branch LRT -- the Santa Fe Pacific Corporation has done preliminary planning for the operation of commuter service between the

LAUPT and Chatsworth in the San Fernando Valley via Glendale, Burbank, Chandler Boulevard, Tarzana and Canoga Park. While no implementation schedule has been established, this again appears to be a promising opportunity that should be planned for on the site.

- Santa Monica Branch LRT -- the Santa Fe Pacific Corporation has also explored potential service from the LAUPT to Santa Monica via Alameda Street, the San Pedro Branch, and Exposition Boulevard. While not as promising as the Burbank Branch, service on this line might one day be implemented, particularly if Metro Rail is not built.

- West Santa Ana Branch LRT -- rail service here might connect Orange County to Downtown Los Angeles via this Southern Pacific right-of-way, the Century Freeway and the Long Beach-LA LRT line. However, as with the Long Beach service, it is most likely that the West Santa Ana Branch service would terminate at 7th and Flower and not continue on to Union Station.

- El Monte LRT -- the El Monte busway was planned by SCRTD for eventual conversion of this bus facility and its planned extension to Alameda Street for rail use. However, because buses share the facility with carpools, it does not have a high priority with LACTC or Caltrans. SCRTD has plans to utilize large articulated buses on a frequent schedule to simulate LRT operations until conversion can be accomplished.

3. High Speed Intercity Rail Services -- such service has been discussed from Los Angeles to both San Diego and Las Vegas. The San Diego proposal has been dropped and current thinking for a Las Vegas service contemplates termination at Ontario in San Bernardino County. Therefore, planning for inclusion of high speed rail on the LAUPT site is not recommended.

Scenarios

Because Metro Rail has such a large impact on the future of the LAUPT/Postal Annex site and because the future of Metro Rail was until recently uncertain, it was initially recommended that two transportation baseline scenarios be considered at this time.

Details of the two scenarios are described in Table 11 and the physical elements illustrated on the accompanying conceptual sketches.

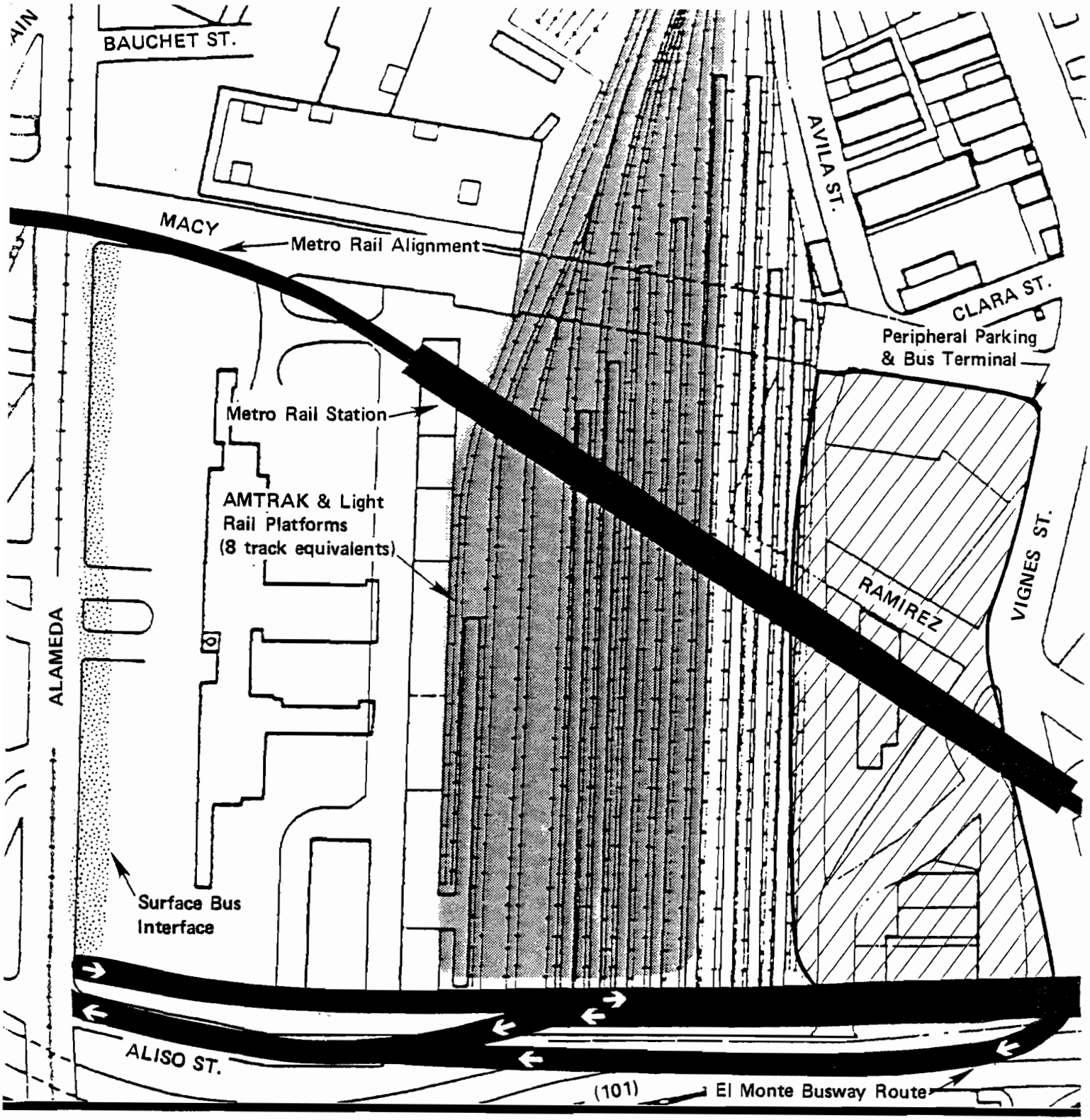
The first scenario (Figure 28) assumed the development of Metro Rail, the associated bus terminal and bus layover area, a major parking structure and the accommodation of light rail operations to Burbank and Pasadena on the existing trackage. As can be seen, most of the site east of the existing station structure would be utilized by these facilities.

The second scenario (Figure 29) assumed that Metro Rail is not built, but that a people mover connection to Bunker Hill is built. It concentrated transit facilities along the southern boundary of the site. The bus terminal would be developed as a linear platform along the route of the El Monte extension now under construction by Caltrans. The three light rail lines would operate through much shorter platforms developed at the existing track level. The people mover station would be constructed above and off-set from the light rail platforms. Peripheral parking would be developed on the southeast corner of the site.

TABLE 11

UNION STATION CONCEPTUAL TRANSPORTATION BASELINE

	Element	Scenario A	Scenario B
1.	Metro Rail	Constructed as per RTD plans for MOS-1.	Not built.
2.	People Mover Connection	Not built.	Build based on modified earlier DPM concept.
3.	AMTRAK	Remains on-site with some increased activity using approximately five tracks.	
4.	Bus Terminal	Developed on-site consolidating RTD express services, Trailways and AMTRAK contract service.	
5.	El Monte Busway Extension	Built as per current Caltrans' plans.	
6.	Light Rail Services	Two lines ultimately operate from the LAUPT including Burbank and Pasadena.	Three lines ultimately operate from the LAUPT including Burbank, Pasadena and Santa Monica.
7.	Peripheral Parking	Included on-site at a scale to be determined.	
8.	Trailways	Remains on-site consolidated in bus terminal.	
9.	RTD Express Bus	Operated through bus terminal on-site.	
10.	RTD local Bus	Continued interface on surface streets surrounding site, possible integration of some lines in bus terminal.	
11.	Downtown Shuttle/ Circulator	Continued interface on surface streets, possible integration in bus terminal depending on location of the latter.	

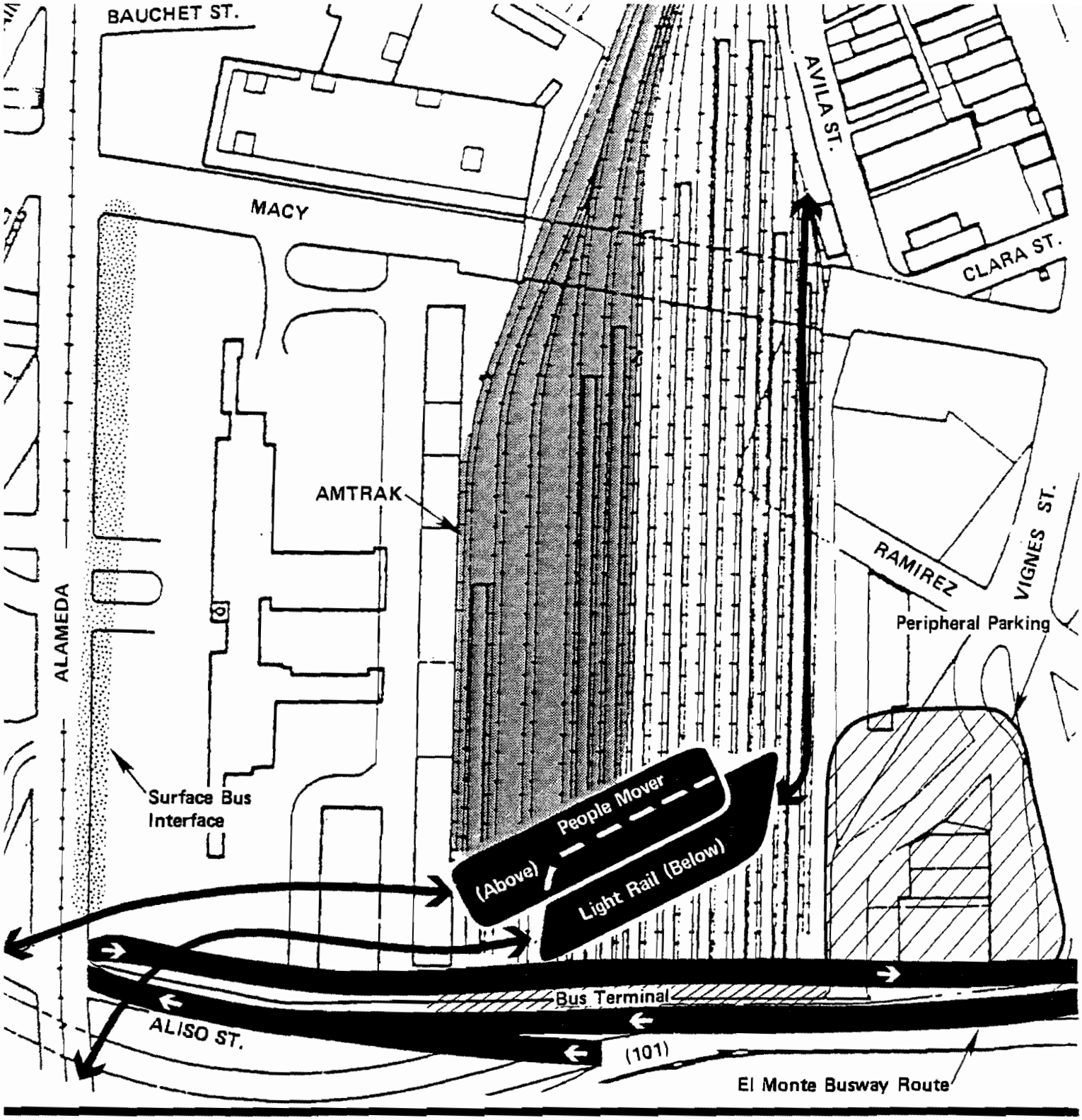


UNION STATION CONCEPTUAL TRANSPORTATION BASELINE
SCENARIO A: CURRENT PLANS WITH METRO RAIL

N

Figure 28

TDA INC.



UNION STATION CONCEPTUAL TRANSPORTATION BASELINE
SCENARIO B: DOWNTOWN PEOPLE MOVER
WITHOUT METRO RAIL

Figure 29

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PART II

TRANSPORTATION SYSTEMS AND EVALUATION METHODOLOGY

INTRODUCTION

The second part of the Union Station Area Transportation Study presents:

- An overview of presently planned transportation improvements:
- An outline of further improvements for evaluation and possible inclusion in the Union Station/Terminal Annex Master Plan;
- Recommendations for system integration among the various transportation modes planned to serve the site area;
- A discussion of alternative transportation strategies to complement site development plans;
- A recommended evaluation procedure for use in comparing alternative strategies; and,
- A baseline scenario assuming implementation of likely projects with which the alternative development concepts can be compared.

The Union Station Area Master Plan will need to incorporate a variety of transportation system improvements, ranging in scope from minor street widenings to the $3 billion Metro Rail line (Table 12). Time frames range from those projects currently under construction (e.g. Busway extension, Alameda Street widening) to beyond the expected opening of the first segment of Metro Rail in the mid-1990's.

TABLE 12

PLANNED TRANSPORTATION IMPROVEMENTS

UNION STATION MASTER PLAN STUDY AREA

Entity	Project	Description	Cost ($millions)	Funding	Timing	Capacity or Projected Patronage	Impact
Caltrans	Busway Extension to Alameda	Two lane divided busway, left hand option	19.0	gas tax (Federal & State)	Under Construction	Over 50,000 rides/day	Remove south 130 ft. from Union Station property
	Auxiliary Lane Vignes to Alameda	Weaving Lane	Incl. above	gas tax (Federal & State)	Under Construction	1,800 vph	Improves access to "front" (Alameda) entrance to site
Los Angeles City DOT	Alameda St., Arcadia to Temple	Widen to six lanes (70 to 80 ft.) with left turn pockets	1.8	gas tax (City share)	Under Construction	1,980 vph (up from 1,380 vph)	Improves access to Little Tokoyo from study area
	Alameda St. reconst. & N. Main realignment	Reconstruct Alameda and realign N. Main to correct confusion	2.3	gas tax (City share)	FY'88 & 89	1,825 vph (up from 1,615)	Smoother traffic flow, easier for pedestrians to cross
	Vignes St. and Ramirez St.	Realign Ramirez to 90° and signalize	N/A	SCRTD (MetroRail Project)	When MetroRail station is built	N/A	Alleviate present congestion and accident hazards
	Vignes St. and Macy St.	ADD eastbound right turn lane on Macy St.	N/A	SCRTD (MetroRail Project)	When MetroRail station is built	400 vph	Better access to eastside of of Union Station property
	Vignes St., Macy to Ramirez	Widen on westside to 40 ft. half width	N/A	SCRTD (MetroRail Project)	When MetroRail station is built	N/A	Allow extra left turn lane to Ramirez and better access to eastside of Union Station property
	Vignes/Ramirez/ Center/Santa Fe Streets	Widen to 100 ft. right-of-way, 80 ft. roadway	N/A	Developers	As adjacent devel. is conditioned	N/A	Good surface street connection from site to garment district, Santa Monica Fwy.
	Alameda/No. Spring Streets	Widen to 100 ft. right-of way, 80 ft. roadway	N/A	Developers	As adjacent devel. is conditioned	N/A	Good surface street connection from site to North Broadway, Golden State Fwy.
Los Angeles County	Hotel parking	Basement parking for hotel	N/A	Hotel	N/A	300 rooms	Not noticeable
	Broadway/Hill Structure	County employees parking structure-also open to public	N/A	County	N/A	2,000 spaces	Relieves overload from El Pueblo

TABLE 12 (Continued)

PLANNED TRANSPORTATION IMPROVEMENTS

UNION STATION MASTER PLAN STUDY AREA

Entity	Project	Description	Cost ($millions)	Funding	Timing	Capacity or Projected Patronage	Impact
Los Angeles County	Arcadia/Spring Structure	County employees parking structure	N/A	County	N/A	300-350 spaces	Relieves overload from El Pueblo
	Chinatown parking garage	Expand existing County parking facility	N/A	County	Indefinite	Uncertain	Marginal
CRA	Peripheral parking	Off-site parking for downtown buildings	$10 (PBQD est.)	Developers	Mid-1990's	1,850 spaces	Requires land or air rights on-site
SCRTD	MetroRail	High capacity rail rapid transit line	$1,250 (first increment)	UMTA, Prop. A, State, Spec. Tax	Completion of first segment in 1992	24,480 to 41,580 passenger/hour	Station excavation diagonally across station property; temporary storage of excavated material
	Bus Terminal	Transfer station for MetroRail at LAUPT	N/A	Part of MetroRail	Completion 1991-1992	Ultimately 28,000 passengers per day	Requires land on site and busway access ramps, 6 to 8 bay terminal, access to busway
LACTC	LRT lines	Light rail line at-grade with downtown subway	600	Prop. A	EIR approved final design	AWD 50,000	Not significant
AMTRAK	San Joaquin	Los Angeles-Oakland via Bakersfield	Uncertain	State ("403-b") Federal	Discussion only	1,250,000 per yr; over 1,900,000 by year 2000	Needs another track for loading[a]
Caltrans	San Diego commuter trains	Additional peak hour trains to and from San Diego	Uncertain	State ("403-b")	TC authorized expected 1987	N/A	Additional track need seems likely[a]
		Santa Barbara train	Uncertain	State ("403-b")	TC authorized expected 1987	N/A	No added track-extends existing San Diego train[a]

(a) Total passenger train requirements, 6-8 tracks
2-3 tracks @ 1,575 feet for long distance trains (1-2 platforms)
4-6 tracks @ 950 feet for other distance trains (2-3 platforms)

PLANNED IMPROVEMENTS

Roadway Improvements

The following is a summary of the planned traffic and circulation systems and improvements by the California State of Department of Transportation (Caltrans) and the City of Los Angeles Department of Transportation (LADOT) which would have some impact on the Union Station redevelopment project area.

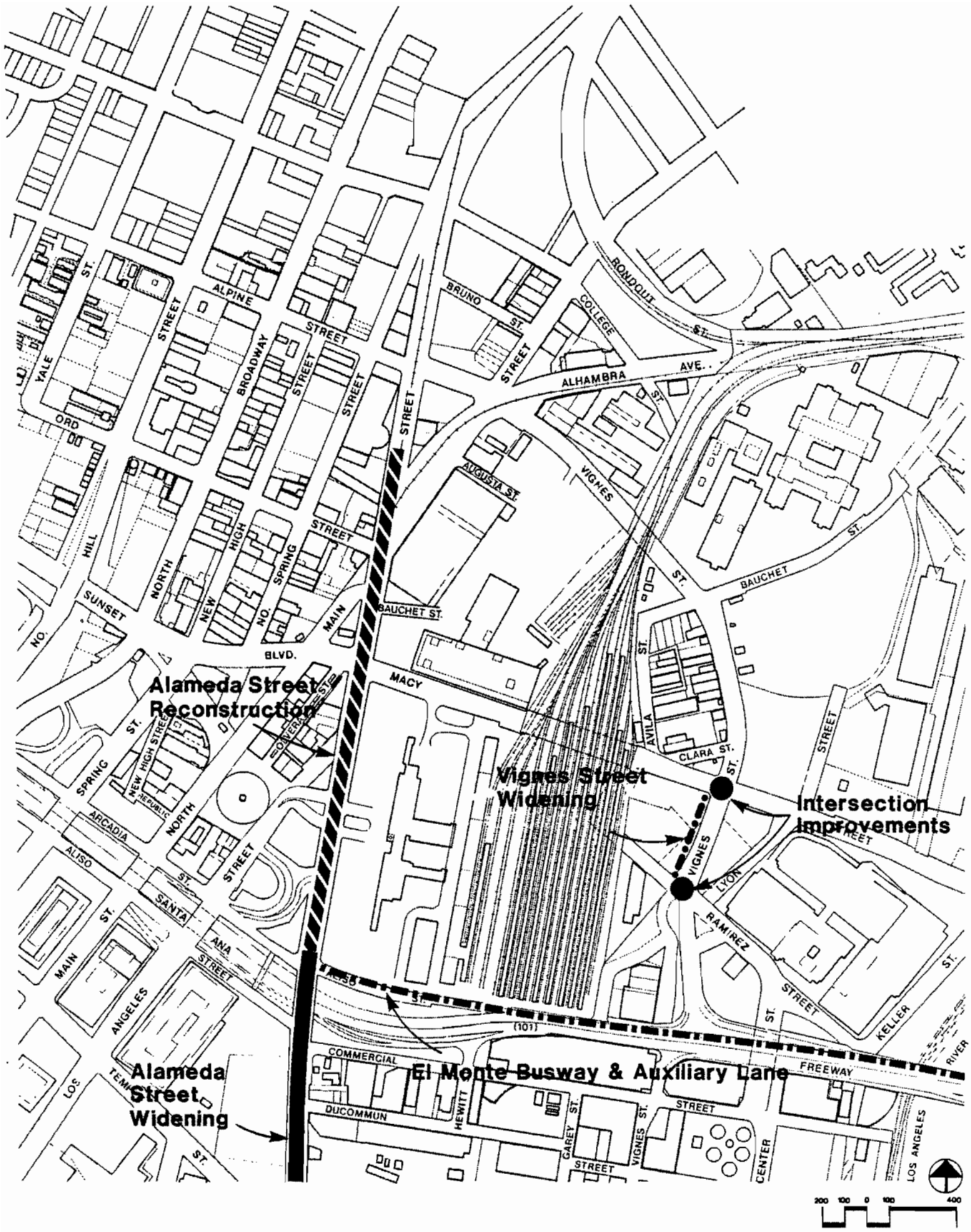
Caltrans Projects

Busway Extension. Caltrans improvement plans in the vicinity of the Union Station project relate to the El Monte Busway Extension on the north side of the Santa Ana Freeway. Land for the busway extension has been acquired, and the project is under construction. Completion of the busway was originally planned for April, 1988. However, the project may be delayed because of a deposit of hazardous materials was unexpectedly discovered in the construction area. These materials must be disposed of in an environmentally acceptable way before the project can proceed.

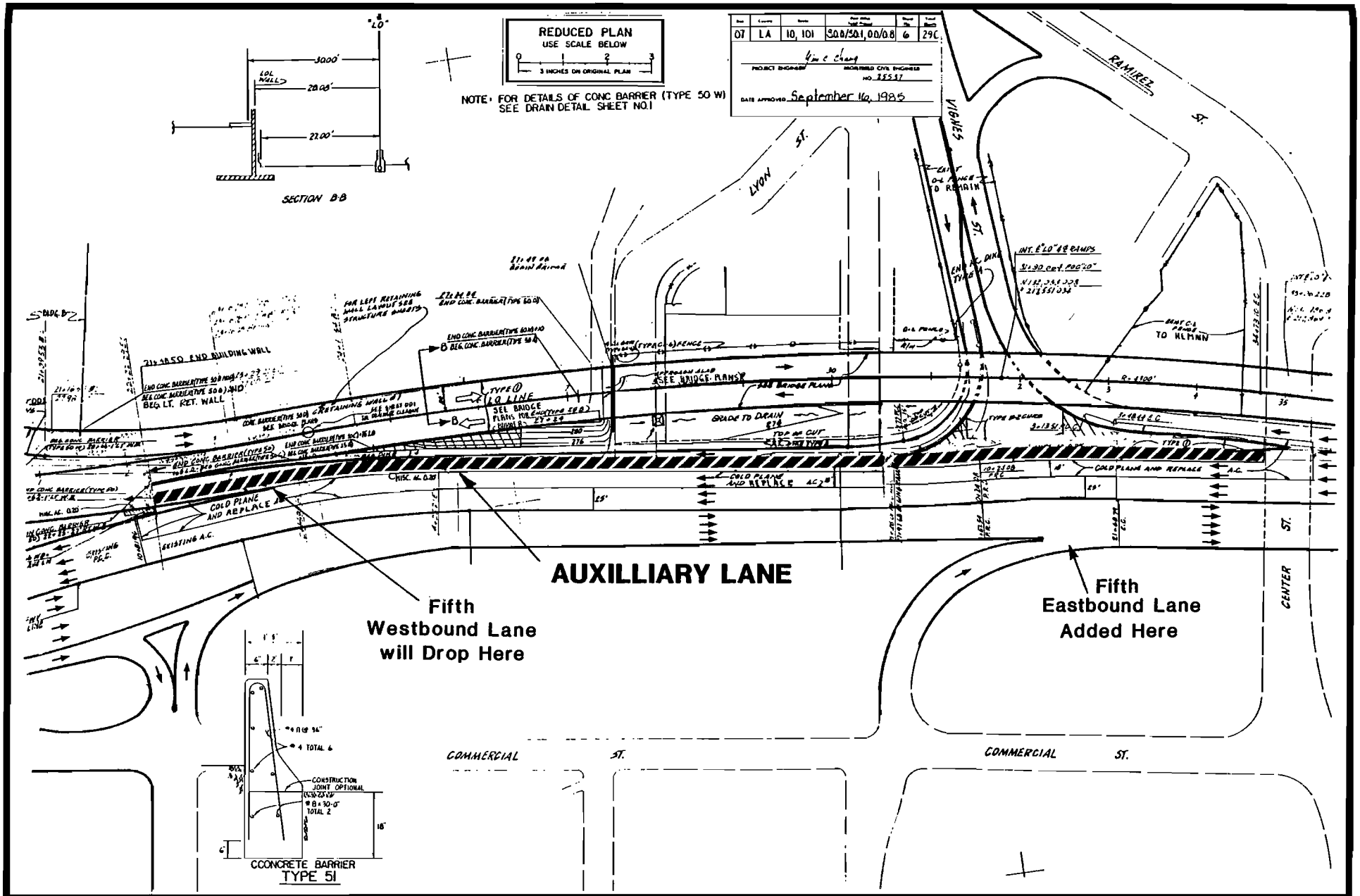
The busway bus lines presently carry over 50,000 riders per day, in addition to thousands more in vanpools and carpools of 3 or more car occupants. Extension will likely further increase this volume.

Plans call for the addition of an auxiliary lane to the Santa Ana Freeway between Vignes Street and Alameda Street. The location of the proposed lane is shown in Figures 30 and 31. The lane will improve circulation through the freeway "slot" and on the south side of the Union Station site, and will allow better access to the "front" (Alameda) side of Union Station. It will relocate the lane drop on northbound U.S. 101 from Vignes Street to Alameda Street.

Other Caltrans Projects. Other than the addition of this auxiliary lane, Caltrans has no plans for purchasing new right-of-way or constructing new facilities on the Santa Ana, Pasadena, or Golden State Freeways that would directly affect circulation to and from Union Station.



Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	PLANNED IMPROVEMENTS (STREETS AND HIGHWAYS)	30



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TDA INC.
KAKU ASSOC
DON MILES ASSOC

Union Station Area Transportation Study

PROPOSED BUSWAY EXTENSION

FIGURE 31

In the future, some operational improvements may be made. Northeast of the site, Caltrans is in the process of adding a fifth lane on the Golden State Freeway from the East Los Angeles interchange to Main Street in the northbound direction, and from Interstate 10 to the East Los Angeles interchange in the southbound direction. A minor acceleration lane on the Pasadena Freeway southbound at Avenue 52 is planned. A southbound auxiliary lane may be added on the Hollywood Freeway from Alvarado Street to the four-level interchange at a future date. None of these improvements will significantly affect traffic and circulation at the Union Station site.

City of Los Angeles Department of Transportation Projects

The roadway improvements planned by LADOT fall into four major categories:

- Alameda Street Improvements
- Vignes Street Improvements
- Long-Range Major Street Plan
- One-Way Street Plans

Alameda Street Improvements

Two improvement projects on Alameda Street near Union Station are scheduled for completion by the Year 1989. The first project, already under construction, is the widening and reconstruction of Alameda Street from 400 feet north of Arcadia Street to Temple Street. Alameda Street will be widened from its present 60-72 feet (four lanes) to 70-80 feet (six lanes) with left turn pockets provided at each intersection and curb parking restricted. As part of this project, the Southern Pacific Transportation Company may replace the existing two railroad tracks with a single track at the centerline of the roadway. The $1,782,000 needed for this project has been fully financed in the City's 1985-86 capital improvements budget. The widening will increase the practical peak hour capacity from 1,380 vehicles per hour to 1,980 vehicles per hour (vph). The new capacity will exceed the 20-year projected peak hour traffic volume of 1,585 vehicles.

The second project is the City's Alameda Street and North Main Street reconstruction. This project will not widen Alameda Street over its current six lanes, but will reconstruct severely warped pavement from north of Arcadia Street to College Street.

North Main Street will be realigned at Alameda Street to correct a confusing traffic pattern caused by a traffic island. The Southern Pacific Transportation company may also, as part of this project, consolidate the existing double tracks into a single track at the roadway centerline. The estimated cost of this project is $2,302,700, with most of the financing scheduled for the 1987-88 and 1988-89 fiscal years. The project will increase the practical peak hour capacity from 1,615 vph to 1,825 vph. The 20-year projected peak hour traffic volume of 1,830 vph slightly exceeds the new capacity.

In addition to these projects, as a mitigation measure for the Metro Rail project, SCRTD will provide left turn channelization, three through lanes in each direction, and a northbound right turn lane on Alameda at its Macy Street/Sunset intersection.

Redesign of the Los Angeles Street/Alameda Street intersection, directly in front of Union Station, is currently under consideration by LADOT.

Vignes Street Improvements

The LADOT will require the Southern California Rapid Transit District (SCRTD) to improve the intersection of Vignes Street and Ramirez Street when the SCRTD constructs a new bus terminal on the property located west of Vignes Street between Macy Street and Ramirez Street. The proposed design for the intersection includes a new traffic island and realigns Ramirez Street to a 90-degree angle with Vignes Street at the intersection. The intersection would also be signalized. This intersection improvement would reduce confusion and increase capacity, and would directly improve circulation and access to the Union Station site.

SCRTD will also provide northbound, westbound and eastbound right-turn lanes at Macy Street and Vignes Street when the new bus terminal is built. This improvement will add capacity to the intersection and improve access to the freeway from the Union Station project area.

In conjunction with these two intersection improvements, SCRTD will also widen the west side of Vignes Street between Macy Street and Ramirez Street to a 40-foot half-width.

Long Range Major Street Plans

The Central City North Community Plan, which includes the Union Station study area, describes circulation goals which will affect the future transportation system. These include:

1. Modified street alignments that eliminate or connect discontinuous streets.

2. Improve the north-south access for trucks to the industrial areas of the Central City North Community. The corridor would connect the Golden State Freeway to the north of the community with the Santa Monica Freeway to the south.

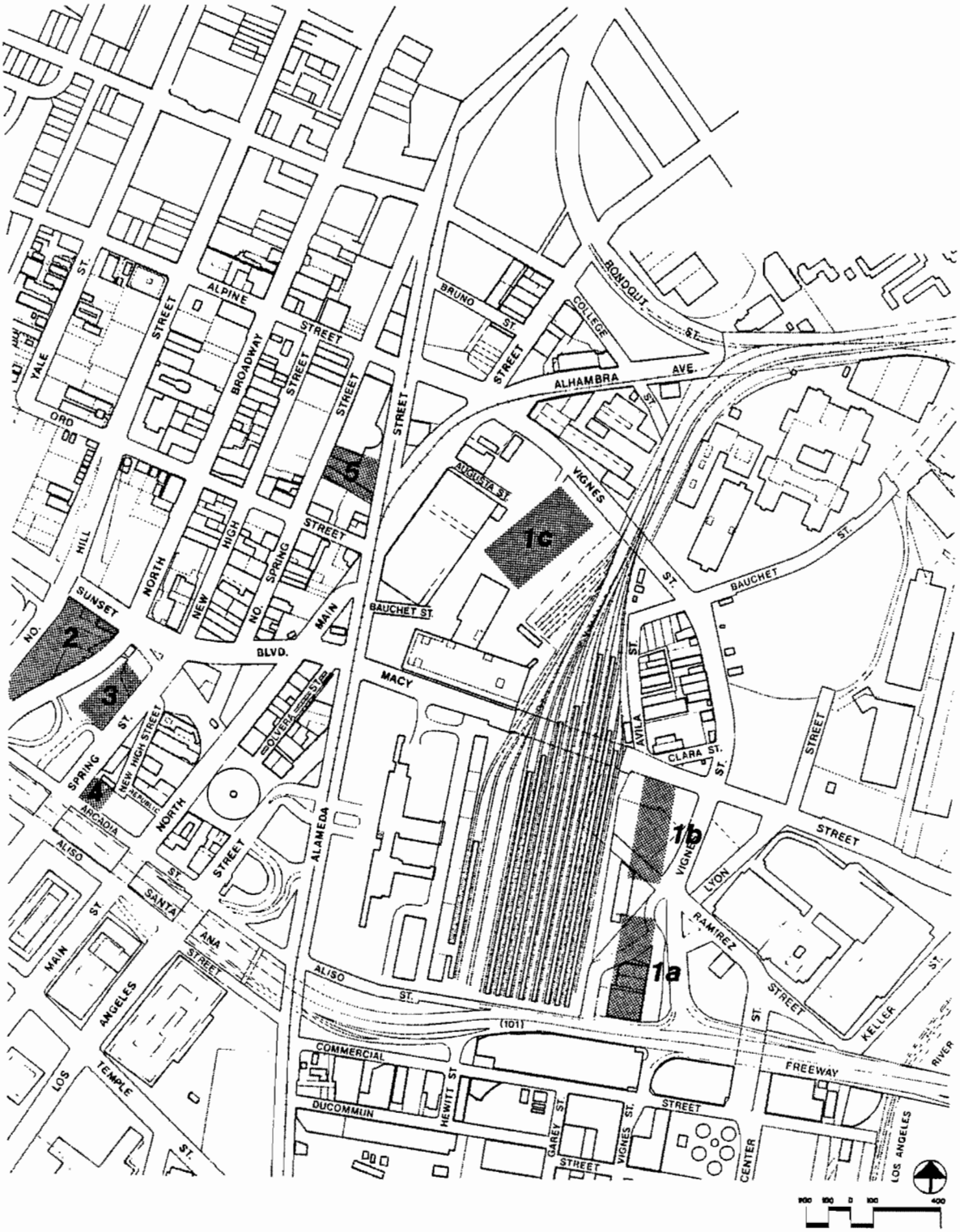
3. Increased ridesharing to reduce vehicle trips by private automobile.

Conceptually, the Central City North Community Plan street classifications (see Figure 2) shows Vignes Street/Center Street/Santa Fe Avenue and Alameda Street/North Spring Street improved to "major highway" standards (i.e., 80-foot roadway and 100-foot right-of-way). Within this configuration, the street can support three peak hour travel lanes and channelized left turns.

Either of these routes might be considered for the industrial transportation corridor to improve truck access between the Golden State and Santa Monica Freeways. The timing of these upgrades is indefinite because improvements can be made only when adjacent new development is conditioned to do the construction. Because of their uncertain timing the potential effects on access and circulation in the Union Station area of these upgrades are not established in this working paper. However there is a need to provide right of way for them on the periphery of the Union Station and Post Office sites.

One Way Street Plans

Plans for a Broadway-North Hill Street one-way couplet have been finalized. The couplet will occur south of Temple Street, to the southwest of the Union Station study area. Hill Street will operate in the southbound direction and Broadway in the northbound direction. This couplet will have a small influence on Union Station



1a 1b 1c **Peripheral Parking , Alternative Locations (1850 Spaces)**

2 **County Parking Structure ,1450-2000 Spaces (Open to Public)**

3 **Hotel Basement Parking , 300 Spaces (Guests Only)**

4 **County Parking Structure,300-500 Spaces**

5 **County Parking Expansion**

Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	PLANNED PARKING IMPROVEMENTS	32

related traffic and on the study intersections of Hill/Alpine, Broadway/Alpine, and Broadway/College. The effect will be a redistribution of existing travel patterns. This effect was recognized in the distribution and assignment of project-related and cumulative traffic for the analyses of future conditions. Another one-way pair, that of Figueroa Street and Flower Street, which was successfully implemented on an interim basis during the 1984 Summer Olympics in Los Angeles, is scheduled for permanent operation beginning in November, 1986. This couplet will increase the capacities of both streets combined and reduce turning movement and bus conflicts. This couplet will be operating south from the downtown area, which is out of the immediate Union Station area and is unlikely to have an observable effect on project circulation.

A third one-way couplet on Grand Avenue and Olive Street is currently under design. There is no projected date of implementation of this couplet, although implementation probably depends on the continued success of the Figueroa/Flower Streets couplet. This possible couplet is also located to the southwest of the Union Station site, and would have only limited effects on circulation for the Union Station project.

PARKING IMPROVEMENT PLANS

Two agencies are active in developing new parking facilities in the study area, the Community Redevelopment Agency of the City of Los Angeles and Los Angeles County.

Community Redevelopment Agency

The Community Redevelopment Agency has been studying the concept of peripheral parking since the late 1960's in an effort to minimize traffic impacts at new development and to reduce the automobile's portion of downtown land use.

Current plans have a target level of 25% of the code-required parking for new developments in the Los Angeles Central Business District (CBD) being peripheral as opposed to on-site parking. The program is planned to grow from 400 peripheral spaces in 1990 to 5,600 spaces by 1995, depending on project phasing. Of three planned sites (California Hospital/Convention Center, Temple-Beverly-Glendale Boule-

vard, and Union Station), a Union Station would be expected to provide 33% or 1,850 spaces by 1995.

Three possible sites within the master plan area appear worth a preliminary evaluation and are located diagrammatically in Figure 32. One of these (1A in the figure) is in the location originally planned by CRA for peripheral parking in conjunction with the Downtown Peoplemover. The second (1B in the diagram) would be above the planned SCRTD bus station, and third (1C in the diagram) would be on the Terminal Annex Post Office property north of Macy Street.

Metro Rail Rapid Transit

Ultimate development of a rapid transit system extending westward from LAUPT through downtown Los Angeles and the Wilshire Corridor to a terminus in North Hollywood has been planned by the Southern California Rapid Transit District (SCRTD). While alternative alignments for the outer portion of this 18.6 mile system are now under study, UMTA and SCRTD recently reached agreement on the funding of the initial 4.4 mile segment (MOS-1). Construction of this initial segment could begin as early as the fall of 1986 with passenger service beginning in 1992. This segment would provide service from LAUPT to Alvarado and Wilshire with three intermediate stations in downtown Los Angeles.

Ultimately, the 18-mile system is projected by SCRTD to carry 346,000 passengers per day, including transfers from bus and light rail transit. The Metro Rail stop at Union Station is projected to have 46,045 daily boardings and alightings for the 18-mile system. Of these 28,022 would represent transfers to or from bus lines using the planned SCRTD bus terminal at Union Station. Local matching funds for Metro Rail project will come from local benefit assessment districts near stations, Proposition A sales tax funds, and state TDA (sales tax) and Proposition 5 (gas tax) funds.

Los Angeles County Parking Facility Expansion Plans

Figure 32 also illustrates Los Angeles County plans to increase the supply of parking west of the El Pueblo State Park. The existing 190-space County parking lot between North Broadway and Hill south of Sunset (facility No. 2 in Figure 32) will be replaced by a structure with 800-1,300 publicly available spaces. These spaces will be in

addition to 550 spaces to be used by county staff, and 100-150 spaces to be used by employees in a planned hotel nearby.

The hotel is planned to have 300 rooms with basement parking for 300 guests, and will replace the 256-space County parking lot between Spring Street and North Broadway south of Sunset Boulevard (facility No. 3 in Figure 32).

East of Spring Street, the County plans to replace the existing 88-space attendant parking lot with a 300-350 space structure for county facilities nearby which include the juvenile court (Facility No. 4 in Figure 32). There are no current plans for the 92-space attendant parking lot at Main and Arcadia (adjacent to the 88-space lot). The 92-space lot is state-owned, as is the 250-space lot north of the Plaza Church. State plans are linked to historic park development and are not presently known to County staff.

In the light of these plans, it would appear that the present parking shortage in the Olvera Street Plaza area will be relieved somewhat. It is likely that some people destined to Olvera Street will continue to park in the Union Station lot, but they will do so as a matter of choice because of its convenience to the north end of Olvera Street rather than necessity.

It may be reasonable to assume that these parkers can be attracted to the shops proposed for the Union Station property and need not therefore be counted against that portion of site parking requirements.

In the Chinatown area, the County is considering three alternatives for expanding their parking in the vicinity of their existing garage on Alameda south of Alpine. Although the new spaces would be be open to the public, they would take some pressure from the all-day parking demand in Chinatown, and would reduce the perceived need to provide Chinatown parking on the post office site.

PLANNED TRANSIT IMPROVEMENTS

Both public and private proponents of transit projects recognize opportunities for creating an integrated regional transportation system at LAUPT. The transit projects

planned for the site are described in this section with a summary of their key features. Since planning information for these projects ranges from preliminary engineering studies to conceptual evaluations only, the level of detail for each project varies. Figure 33 illustrates the planned and possible regional transit services to Union Station.

Bus Transfer Terminal

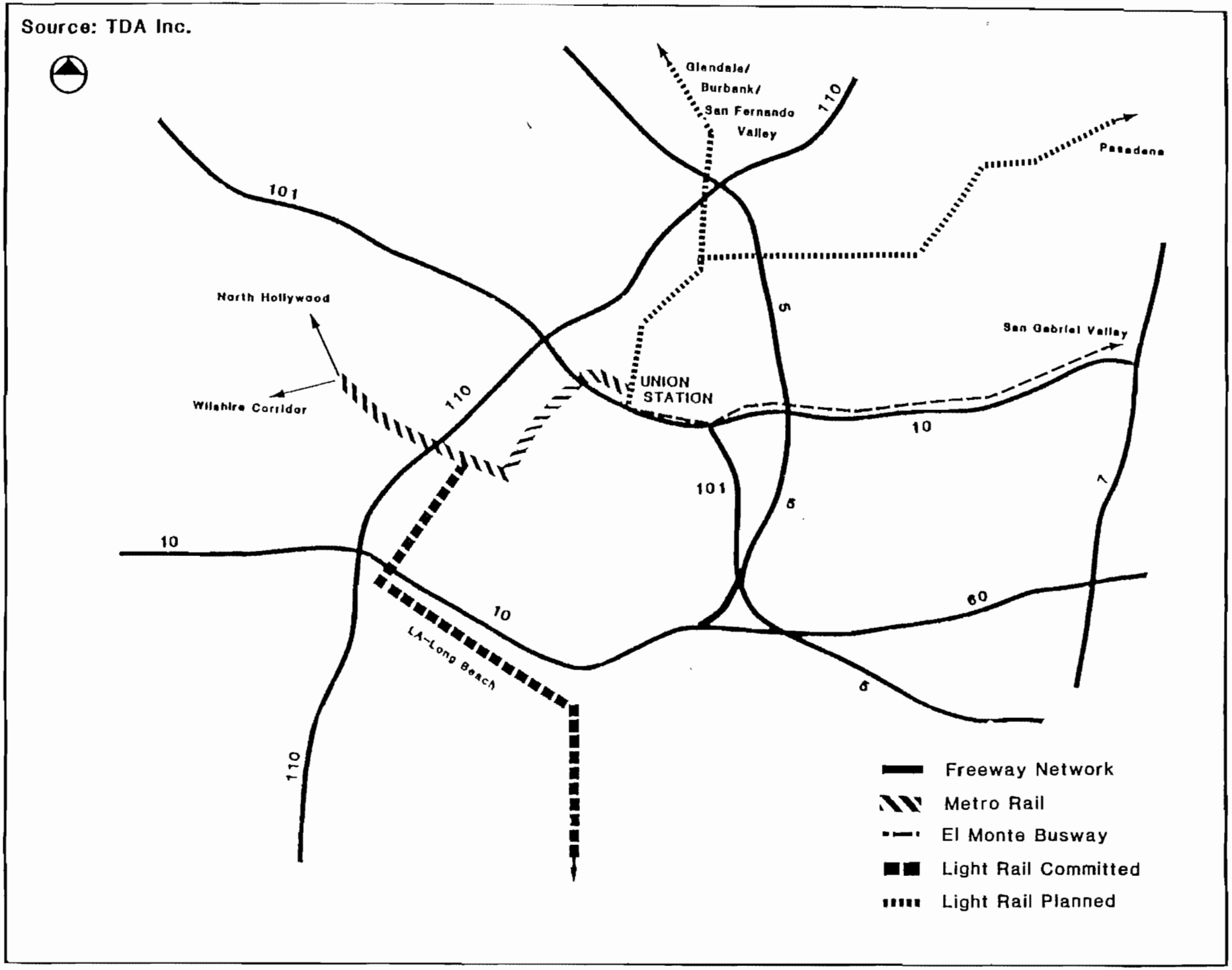
SCRTD plans a bus terminal at Union Station to facilitate transfers between feeder bus service and Metro Rail. The transfer provides the primary source of Metro Rail ridership a LAUPT. Most buses connecting to Metro Rail will use the El Monte Busway. Express bus lines 487 and 489, which use the intermediate ramps to the busway at New Street, and the lines 483 and 485, which come in from Altadena via State Route 7, will be terminated at Union Station. The other busway lines would be "trunklined" at El Monte in order to assure a more even distribution of passengers among high-capacity buses. These buses would run through to downtown in order to avoid subjecting passengers to a second transfer at Union Station. A total of about 15,000 riders per day use these bus lines. Direct access from the busway to the Union Station bus transfer terminal will be needed -- presumably via the carpool exit ramp and Vignes Street. Terminal construction would be concurrent with Metro Rail construction.

Los Angeles-Long Beach Light Rail

A conventional light rail line extending from downtown Los Angeles to downtown Long Beach is currently under construction by LACTC. Potentially, an extension could be made to LAUPT, although this would require an elevated guideway over the Santa Ana Freeway, for access into Union Station. Construction of the main line should be finished in 1989. Any extension to Union Station would probably occur after that time and would depend on the status of Metro Rail and other alternative Downtown Transit Connectors.

AMTRAK

AMTRAK provides inter-city rail passenger service to and from Los Angeles via the Santa Fe, Southern Pacific, and Union Pacific Railroad, with funds from Caltrans



COMMITTED AND PLANNED TRANSIT FACILITIES – UNION STATION AREA

Figure 33

(403-b intrastate service) and the Federal Government. Continuation of long distance national service is dependent on Federal policy decisions. Service to San Diego is expected to enjoy annual gains in ridership due to greater total travel and increased congestion in the Los Angeles-San Diego corridor. Increases in frequency will be governed by ridership, railroad operating needs and equipment availability. Additional service from Santa Barbara through the San Fernando Valley to Union Station and on to San Diego has recently been funded by Caltrans and should begin by 1987.

AMTRAK does not make long-range forecasts of patronage because its service level and fares depend on annual appropriations by Congress. Recently growth has averaged 5% per year. If the 5% growth rate continues for another 5 years and then drops to 2% for the following 9 years, then LAUPT would be handling almost two million passengers per year by the Year 2000.

PROPOSED TRANSPORTATION ALTERNATIVES

This portion of the working paper presents transportation system improvements in addition to those presently programmed which may be helpful in supporting site development strategies. They include various highway and transit improvements, including revisions in bus routes and schedules, ridersharing, and parking management measures as well as capital requirements.

Highway Alternatives

Highway alternatives are limited by physical and economic constraints. Intersection improvements adjacent to the site will be relatively easy to accomplish, especially if right-of-way can be provided by dedication from the site. Also, the relation between site traffic generation and the need for improvements to adjacent streets can be established. As distance from the site increases, the relation between traffic growth and site development becomes less clear cut, and the feasibility of off-site land dedication decreases as well.

The following alternatives would improve access between the site and the Golden State (I-5), San Bernardino (I-10), and Santa Ana (U.S. 101) freeways. They would serve travelers based in the San Fernando Valley, the San Gabriel Valley, the Norwalk-

Downey Area, Orange County, and Long Beach. Highway improvements to and from the west (Hollywood, Santa Monica, Beverly Hills, etc.) do not appear to be financially or politically feasible.

North Spring Street Improvement - Presently Alameda Street leads into North Spring Street north of the site. The right of way at that point widens, and railroad tracks from the Santa Fe freight yard cross the street--at-grade-- at a narrow angle. The general effect is confusing to drivers and the poor quality of the pavement around the tracks discourages drivers from using North Spring Street. North of the track area, North Spring narrows down to four lanes with no left turn pockets. It widens again to six lanes north of the viaduct which crosses over both the Los Angeles River and the railroad tracks on each side of the river.

If one or two yard tracks can be given up, and the angle at which the yard tracks cross North Spring can be improved, it would be feasible to widen North Spring Street to six lanes (or four lanes plus left turn lanes) for a better connection to North Broadway and the Golden State Freeway.

Santa Ana Freeway Connections - It is presently possible for motorists northbound on U.S. 101 to reach the site by exiting the Santa Ana Freeway at First Street and using First and Alameda to reach the Union Station. This path avoids the queues which form at the San Bernardino/Santa Ana Freeway interchange.

The east side of the station (as well as SCRTD and County facilities) can be reached via a ramp leading to Kearny Street (signed for Macy Street), Pleasant Street, and Macy Street. The return movement to southbound U.S. 101 is via Macy, Mission Road, and the Mission Road ramp which leads to an under-utilized added lane on the freeway.

Railroad Right-of-Way Connector Road to I-5 - This alternative would consist of a new grade-separated connector road along the Southern Pacific main line from Union Station to the Golden State Freeway (I-5) near Alhambra Avenue. To be successful, this facility would need Caltrans collaboration in designing and building ramp connections to I-5 and possibly I-10 (San Bernardino Freeway). For Caltrans to approve it, this facility would need to connect into City streets and serve such nearby public facilities as the County Jail, SCRTD Central Maintenance, and the County Sheriff's Office. (It could not be a purely private facility.)

North Main Street Closure - As part of the Union Station project, the closure of North Main Street between Alameda Street and Vignes Street has been considered. North Main Street is shown on the community plan map as a secondary highway. This means that it is expected to carry a fairly large amount of local traffic and some through (commuter) traffic. Closing this portion of North Main Street would add traffic to Alameda Street and Vignes Street around the closure, but it would also reduce turning and weaving movements on Alameda Street, thereby reducing confusion and improving safety.

The addition of traffic to Alameda and Vignes Streets can be evaluated based on existing and projected future traffic volumes at the three most affected intersections: North Main/Alameda, Alameda/Vignes, and Vignes/North Main. The greatest concern is for the addition of left-turning traffic from westbound Vignes Street to southbound Alameda Street, and right turn from northbound Alameda Street to eastbound Vignes Street. The analyses will be conducted as soon as existing traffic count data becomes available.

Other Site Area Traffic Improvements - Other improvements which will be considered for the Union Station development include the following:

- Redesign of the Alameda/Los Angeles intersection to accommodate a main access point to the Union Station site and pedestrian activity between Union Station and Olvera Street.

- Closure of North Main Street between Alameda Street and Vignes Street with addition of turn lanes and redesign of curb radii as needed.

- Acceleration/deceleration lanes on Vignes Street, Macy Street, and Alameda Street to accommodate traffic entering/exiting Union Station parking facilities.

- Redesignation of Alhambra Avenue from North Main Street to College Street as a one-way northeast-bound street to permit signalization of a parking entrance/exit with the Vignes Street/North Main Street intersection.

- Construction of an elevated employee entrance/exit to parking behind Union Station from Vignes Street at Bouchet Street to a point above Macy Street west of Vignes Street.

These additional improvements will be considered in further analysis of Union Station development traffic and circulation issues.

Transit Alternatives

Transit improvements being considered in Los Angeles which could serve Union Station involve mostly light rail lines for commuter markets. These and other potential transit improvements are summarized in Table 13. See Figure 34 for locations of planned and possible improvements in the vicinity of Union Station.

Light Rail Transit - Four light rail transit lines are currently under study by LACTC, Santa Fe Pacific Realty, or both. The perspectives of the two agencies differ slightly. LACTC considers light rail as a trunk line for intermediate-length local trips with base headways ranging from 5 to 10 minutes to 20 or possibly 30 minutes. Santa Fe Pacific appears to be thinking of light rail in the downtown-commuter context with frequent peak hour service, directed to or from specific zones, and somewhat longer (30-60 minute) base period headways. LACTC's LRT concepts would tend to feed Metro Rail (e.g. in North Hollywood) or a downtown subway, while Santa Fe Pacific's could terminate at Union Station with a bus or Metro Rail transfer at that point. Thus, a line might be satisfactory to the Santa Fe Pacific yet not attractive to LACTC.

The light rail commuter line which appears most promising to Santa Fe Pacific, would run from Union Station north along the Southern Pacific (SP) to Burbank and follow the Burbank branch of SP west through North Hollywood and Van Nuys to Canoga Park and north to Chatsworth. It is expected to attract about 20,000 weekday riders by the Year 2000 and could be constructed for about $310 million. LACTC is actively considering the part of this line west of Lankershim as an LRT feeder for Metro Rail at the outer terminal of that 18.6 mile line from the Wilshire Corridor. The commission has experienced some difficulty in gaining community acceptance for some portions of this line west of Fulton Avenue and is studying alternatives. Santa Fe Pacific is proposing that this line connect from North Hollywood through Glendale to Union Station, where it would connect with the other end of Metro Rail as well.

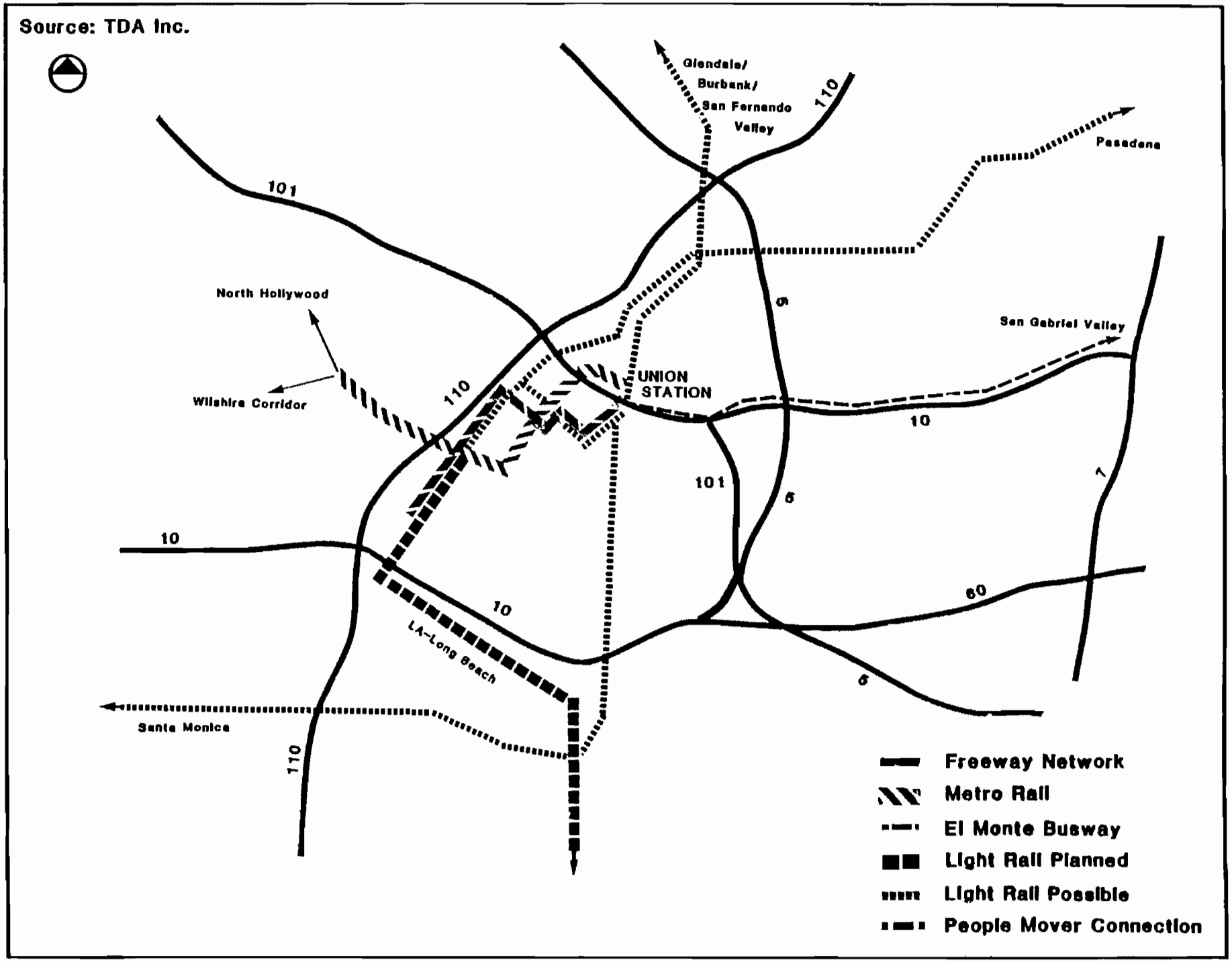
TABLE 13

PROPOSED TRANSIT ALTERNATIVES

LOS ANGELES UNION STATION AREA MASTER PLAN STUDY

Description	Technology	Facility Requirements	Capital Cost (million)	Estimates AWD Rides	Status
Burbank/San Fernando Valley/Chatsworth Commuter Rail	Light rail on existing SP Burbank branch	Station platform 300 feet minimum (may be shared)	310	20,215	Under study by Santa Fe Pacific Realty, LACTC studying LRT west of Lankershim on this line
Santa Monica LRT via USC and Jefferson Boulevard	Light rail old Pacific Electric Air Line	Station platform 300 feet minimum (may be shared)	272	16,500 to 20,000	Under study by Santa Fe Pacific Realty, LACTC studied and gave low priority
Pasadena Light Rail	Light rail in median of Huntington Drive and freeway (I-710)	Station platform 300 feet minimum (may be shared)	N/A	N/A	LACTC currently studying potential alignments
Long Beach-Los Angeles LRT Extension	Light rail subway/ elevated	Station platform 300 feet minimum (may be shared)	N/A	N/A	To be examined by LACTC
Downtown People-mover	Similar to Vancouver Skytrain, elevated/ tunnel, linear motor, automated	Aerial guideway over US 101 into Union Station property	50 to 65	N/A	EIS approved, but funding denied by UMTA in 1981. Option held by CRA for future development

Source: TDA, Inc.



PLANNED AND POSSIBLE REGIONAL TRANSIT SERVICES TO UNION STATION

Figure 34

The Pasadena Light Rail Line is presently under study by LACTC as a potential northerly extension of the Long Beach-Los Angeles Line. Current thinking is to use the median of the northerly extension of I-710 (Long Beach Freeway) to reach Pasadena, entering Downtown Los Angeles via Huntington Drive, Soto Street (old SPRR branch), and a northward extension of the Long Beach line's Flower Street Subway -- with an intermediate stop at Union Station. A routing via the El Monte Busway and the median of I-710 extension is also being considered.

The timing of this project is uncertain, depending on the I-710 freeway extension.

An alternative proposed by Santa Fe Pacific for this corridor is a commuter-type light rail line to Pasadena, feeding Metro Rail at Union Station and avoiding the Bunker Hill Tunnel with Metro Rail overloading can be foreseen.

Downtown People Mover - In 1980 an EIS/EIR for the downtown people mover was approved, but funding was denied by the Federal Urban Mass Transportation Administration. The line was to be an elevated light railway using UTDC/ALRT technology with automated cars and linear motor propulsion. The line was to run from Union Station via Little Tokyo, the Civic Center area, Bunker Hill, and Figueroa Street to the Los Angeles Convention Center, the southbound track tunneling Bunker Hill west of Hill Street. CRA was the sponsoring agency for the Downtown People Mover and still holds the option to develop it. As Metro Rail is currently committed, it will likely supplant the people mover until demand becomes more clearly established.

Surface Transit Alternatives - Other existing transit systems which may be expected to improve services are Trailways, Dash (LADOT sponsored downtown shuttle bus) and taxis. No forecasts are generated by those agencies for future ridership. Their services, however, can be expected to respond to changes in demand.

PARKING

At present the Union Station and Post Office properties between them contain almost 1,800 parking spaces. The station activity generates a demand for approximately 500 spaces -- 200 for AMTRAK employees, station staff, and train crews, and about 300

for AMTRAK patrons, baggage and parcel pickup and delivery, etc. The rest of the parking is used by nearby activities -- El Pueblo State Park, the Federal Building, and to some extent the Terminal Annex Post Office.

On the Post Office property, the postal service itself is expected to generate demand for 220 spaces -- 80 for patrons, 100 for staff and 40 loading spaces for Postal Service vehicles. Two of the latter will be for semitrailers. This will represent a substantial reduction from a present maximum of about 800 cars (at the peak overlap between swing and graveyard tours) to a total of 180, excluding 40 postal service vehicles. The reduction will be entirely in "back lot" parking demand, as the patron use of forecourt parking will continue at about 80 spaces (i.e., full utilization).

Parking Ratios

Beyond these minimums based on existing use, parking needs will depend on the development strategy. Table 14 presents a set of parking ratios used in initial planning. The ratios for office parking and for the trade center (2 spaces per 1,000 sq. ft.) were based on the requirements of the Los Angeles City Zoning Ordinance for the Central City area, in which the project site is situated. Parking demand (including the potential for reduction in demand due to shared parking) will be considered in greater detail later on, as scenarios for site development are more clearly defined.

Segmentation of the Parking Market

Present users of Union Station and Terminal Annex parking include many short-time parkers picking up or delivering mail or parcels, picking up train tickets, or picking up or dropping off passengers. Such parking users generally do not want to be involved in hunting through the levels of a large parking structure for available space. They want surface parking, visible and accessible. For parcel pickup and delivery, they desire minimal walking distances.

AMTRAK patrons (and train craws) can tolerate a longer search time and somewhat higher walking distances, as long as they are provided with a short-time loading/unloading area near the baggage handling and ticket office. To the extent that they make day trips or overnight trips away from Southern California, they seek highly

TABLE 14

PROPOSED PARKING RATIOS FOR INITIAL PLANNING

Land Use	Space Per Unit	LOS ANGELES BUILDING CODE Downtown Business District	Central City	Recommended For Initial Planning[1]
Office	1,000 sq.ft.	1	2	2
Hotel	Room	0.5 (first 20 rooms) 0.25 (rooms 21-40) 0.167 (40 rooms)	(Same as Business District)	1
Retail	1,000 sq. ft.	1	2	4
Trade Mart	1,000 sq. ft.	1	2	2
Museum	1,000 sq. ft.	1	2	None[2]

(1) Does not include possible reduction for transit accessibility and/or potential for standard use at spaces by different land use.

(2) ENO Foundation recommends three spaces per 1,000 square feet for a free-standing museum.

secure parking. All-day 24-hour access is vital to provide for rare uncertainties in train delays.

Retail parkers are similar to the short time market in their desires, in that there can be some resistance to structure parking. Time parked tends to be in the one to two hour range. Perceived security is important because of the proportion of women and children among the shopping population. Restaurant patrons are a special part of the retail population in that they may be under time pressure at lunch hour and will want short walking distances and easily found spaces.

Employees can accept somewhat longer walking distances than retail or pickup/delivery parkers, and because their trips are repetitive they can accept somewhat less visible parking than other users. Structures are acceptable as long as they are perceived to be secure -- particularly at the end of the working day.

In this context it will be logical to allocate different parking spaces to different segments of the parking market, and to encourage proper use of each type of space with pricing and directional signing.

Parking Constraints

Using initial scenarios as a frame of reference, consultants have investigated possible constraints on additional on-site parking for both the Union Station and Terminal Annex properties. The principal constraint on development appears to be intersection capacity, especially at the east entrance to the station property from Vignes Street.

A total of 4,900 to 5,700 spaces can be supported on the two sites combined, by existing street intersection capacity.* Of this, 550 to 970 spaces can be on the east side of the station, near the proposed Metro Rail and bus station. An additional 920 to 990 spaces can be serviced on the west side of the station, where the present parking is. The Post Office site can accommodate 3,400 to 3,700 spaces.

*See correspondence between Kaku Associates and ROMA, July 21, 1986.

Peripheral Parking

Center City peripheral parking would add 1,850 spaces to development demands on the Union Station property, according to present plans of the City of Los Angeles. These parkers will be downtown employees for the most part, and accept structure parking. Present thinking is that they will use either Metro Rail or another rail transit mode of travel to reach their workplace from the Union Station property.

For a good transfer to Metro Rail, the peripheral parking should logically be in a structure over the SCRTD bus station, accessible to the Metro Rail station by elevator. However the Vignes Street and Macy Street access points of this structure site are quite limited in their capacity, and the Macy/Vignes and Ramirez/Vignes intersections are even more constraining, limiting the east side parking to under 1,000 spaces -- until the Vignes Street improvements are made.

Having the peripheral parking on the Post Office site would greatly ease the access/egress problem, but would increase the walking distances for the users, frustrating the peripheral parking concept. A possible compromise might involve grade separated access roadways within the site, connecting the driveways of the Post Office site with parking at the Metro Rail station. The cost, configuration, and potentials of such a design can be investigated as this study proceeds.

Post Office Parking Structure: Re-use or Replace? - The existing three-level parking structure on the Terminal Annex property has about 900 parking spaces on its upper two levels, the ground floor level being used for postal service vehicle maintenance. The ground floor level has unusually high ceilings, sufficient to perform maintenance on trucks. Ceiling height on the second level is normal (i.e., insufficient for many vans, motor homes, and 4x4 pickups). The third level is the roof.

The existing building dates from the early 1960's and shows little promise of qualifying as an engineering monument. In the long run, it may be best to demolish it and redevelop that land for other use(s). In the short run, the existing parking could perhaps be economically used by an initial tenant or tenants in the Terminal Annex building.

The ground floor area with its high ceilings, could be used for covered parking of vanpool vans and charter buses used by downtown commuters. These vehicles are presently parked on surface lots or on-street around the edges of downtown Los Angeles. depending on the outcome of privatization studies of the SCRTD commuter express buses, this market could increase and is likely worth further investigation.

DEMAND MANAGEMENT STRATEGIES

Development of a Transportation Management Plan (TMP) for the Union Station and U.S. Post Office Terminal Annex sites would provide the redevelopment programs an effective tool to achieve efficient use of parking resources and to reduce traffic impacts on adjacent streets. The basic objectives and actions of a TMP are outlined below; its actual form and effectiveness will, of course, depend on the mix and scale of development occurring at the two sites. For employee auto trips, reductions of 15-30% could be achieved with the full combination of actions with an aggressive program.

Objectives

- Reduce parking demand generated by redevelopment.
- Reduce automobile travel generated by redevelopment.
- Satisfy employee and visitor transportation needs.
- Enhance the image of LAUPT as a transit center.

Actions

1. Establish a Transportation Services office with a Transportation Coordinator.
   - adds credibility to program.
   - makes transportation information and services readily available to employees.

2. Require paid parking.
   - discourages single occupant vehicle commuting.
   - enhances ridesharing incentives.
   - allows for preferential parking rates for carpools/vanpools.

3. Establish a Rideshare Program.
   - provides employees greater information to form carpools.

4. Provide transit pass subsidies to employees.
   - increases transit use.
   - reduces parking demand and traffic volumes.

5. Introduce flex-time and/or staggered working hours.
   - reduces peak period traffic volumes as much as 30%.
   - gives employees more opportunities to form carpools.

6. Provide vanpool subsidies.
   - reduces auto trips and parking demand.

7. Preferential parking for vanpools and carpools.
   - encourages ridesharing.

8. Marketing.
   - increases tenant and employee awareness of program opportunities.
   - may include personalized placement in carpools and vanpools

9. Lease Agreement Requirements.
   - defines objectives and performance standards for tenants.
   - increases effectiveness of program.

10. Monitoring
    - determines program effectiveness and allows program to be modified for maximum productivity.

SYSTEM INTEGRATION RECOMMENDATIONS

Objective

The objective of the system integration plan is to provide space on the site for all transportation facilities that are realistically achievable and consistent with overall

development goals for the LAUPT/USPS site. These transportation facilities could include Metro Rail, AMTRAK, light rail lines, people mover connection to downtown, and both public and private bus facilities.

DESCRIPTION OF THE PLAN

The preliminary layout of transportation facilities on the site is shown on Figure 35. This provides for:

- Metro Rail -- as in RTD's current plans.

- AMTRAK -- The six tracks described in an earlier section, with an option providing a total of eight.

- Light Rail -- This provides for up to 2 pairs of light rail tracks to and from the north and for one pair to cross the Santa Ana Freeway to downtown. (Variations in vertical profile are described later.)

- People Mover -- An elevated connection across the Santa Ana Freeway to downtown. (Later steps may consider an extension north to a major parking facility on the Postal Annex site.)

- Bus Terminals -- The space shown provides for a minimum of 8 bays for SCRTD buses and 10 bays for Trailways and AMTRAK intercity buses, along with related passenger and baggage facilities.

With the exception of RTD's Metro Rail track alignment and station box, there is some flexibility in the layout of transportation facilities.

The plan-view arrangement shown on Figure 35 places:

- AMTRAK platforms closest to their ticketing and baggage facilities.

- Light rail, buses, and the people mover in close proximity to each other to allow for convenient transfer of passengers.

Source: TDA Inc.

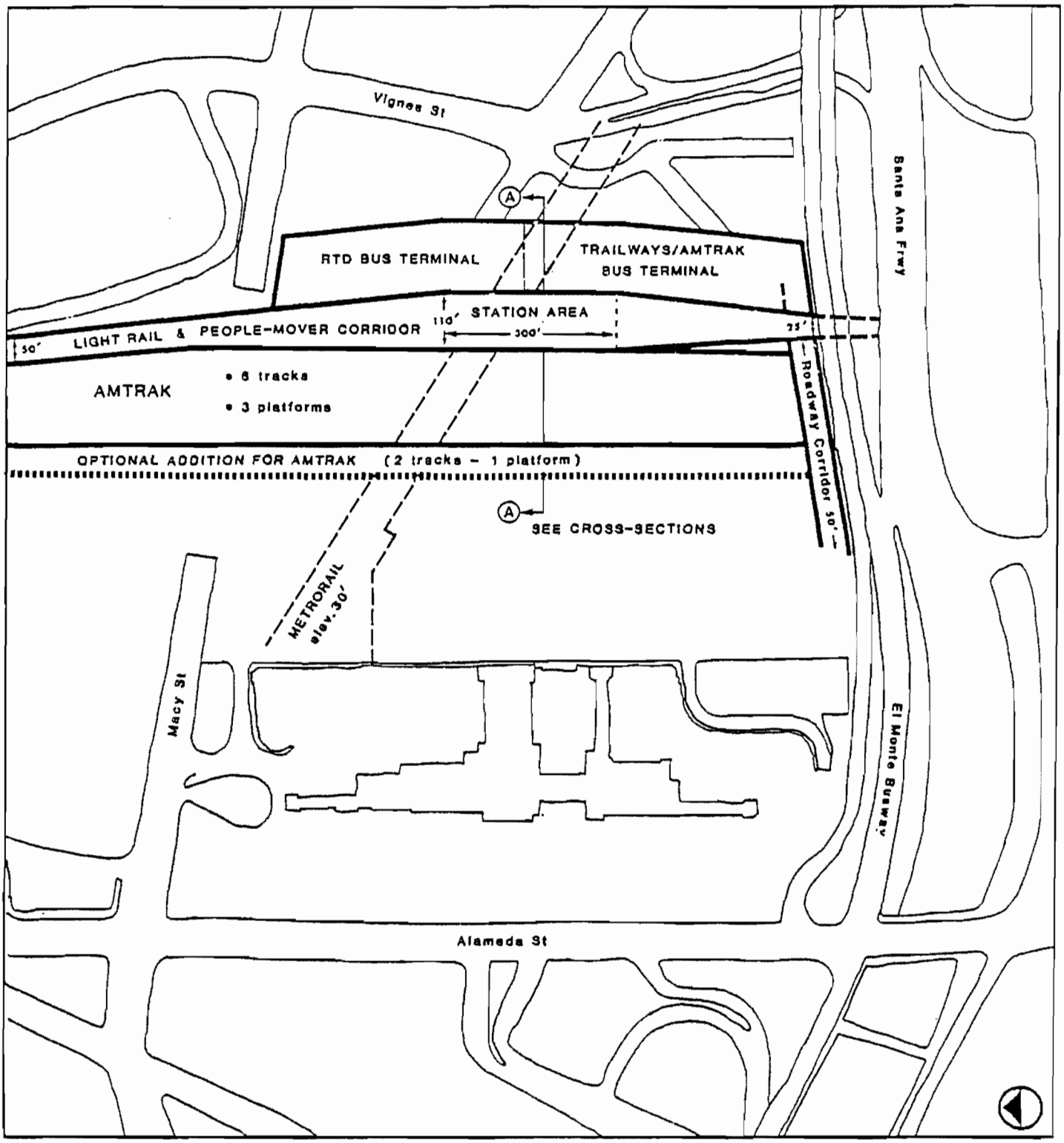


Figure 35
PRELIMINARY LAUPT TRANSIT SYSTEM INTEGRATION PLAN

Figures 36 and 37 show two alternative cross sections through the transportation facilities (for both alternatives, Metro Rail tracks will be at the -30 foot level).

Case A. This layout places the light rail tracks at the +30 foot level, allowing sufficient clearance for the light rail to cross the El Monte Busway and the Santa Ana Freeway. It was assumed that this crossing would be for the purpose of connecting through downtown to the Los Angeles/Long Beach light rail or other lines. As a result, there would be no need for the people mover in this case. In addition, this arrangement would probably apply only in the case of delay in Metro Rail construction. There would appear to be no strong need for a light rail connection through downtown, if Metro Rail provides that function on RTD's current schedule. Several alternative arrangements of platforms and tracks are possible within the "envelope' shown.

Case B. This places light rail tracks and platforms at the +15 foot level and for the people mover at the +35 foot level. Because the downtown connection would be provided by the people mover, it would not be necessary for the light rail lines to cross the Santa Ana Freeway into downtown (that is, lines to and from the north would terminate at Union Station). For both light rail and the people mover, several alternative platforms and track arrangements are possible within the envelopes shown.

The schedule of development of these transportation facilities will be discussed in the following section.

TRANSPORTATION STRATEGIES AND BASELINE SCENARIOS

Public Transportation

Both the ultimate development of and timing for the various public transportation improvements are critical to the future of the LAUPT/USPS sites. Of the elements previously discussed, the timing of the Metro Rail project is by far the most important and is critical to any development strategy for the following reasons:

- Metro Rail makes both sites very accessible to the rest of downtown with the initial completion of MOS-1. Further extension west of downtown,

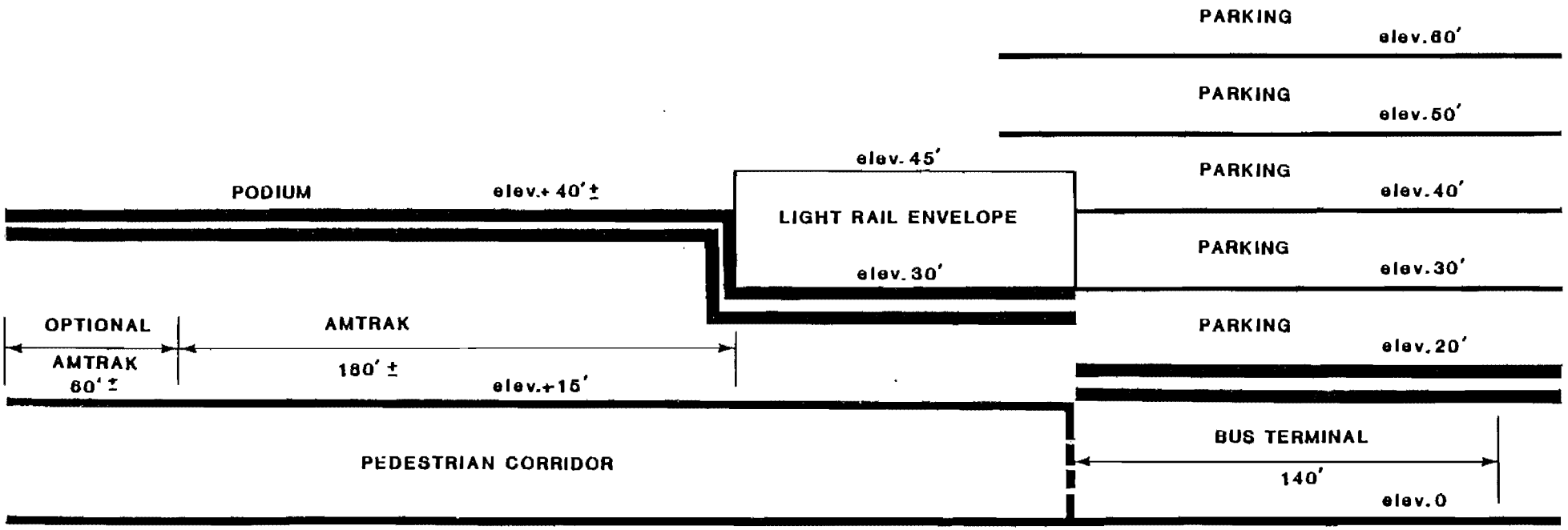


Figure 36
SECTION A–A. CASE A. LIGHT RAIL CONNECTION TO DOWNTOWN

Source: TDA Inc.

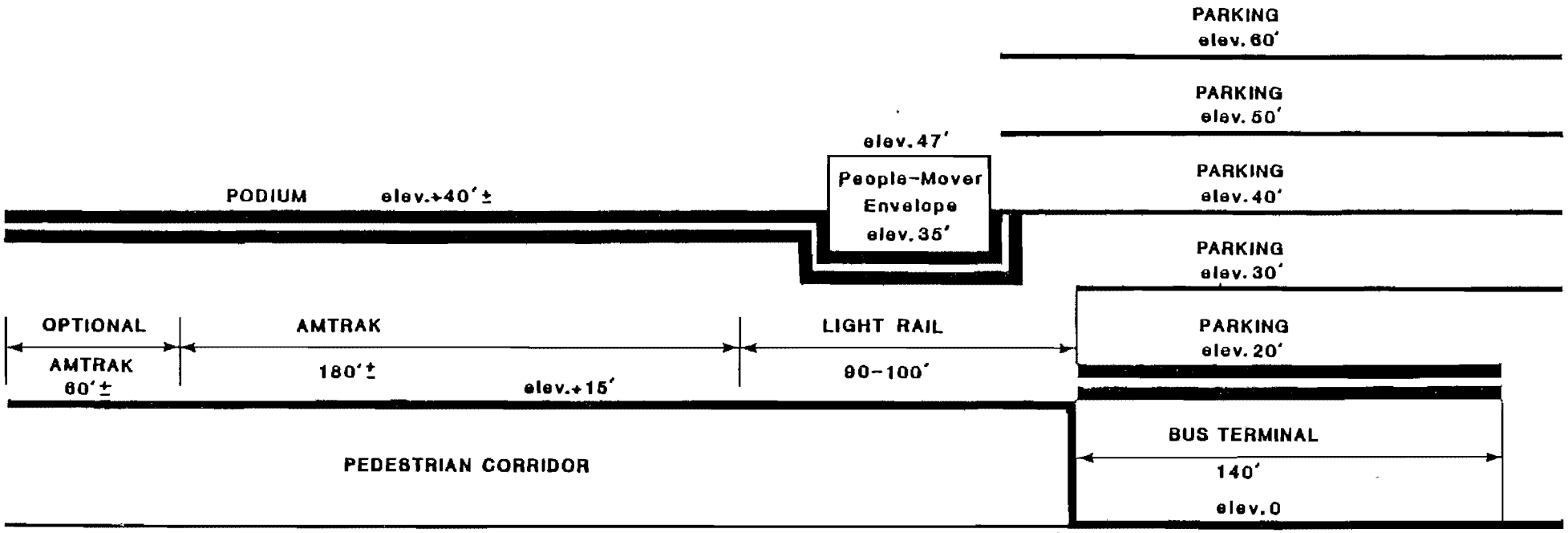


Figure 37
SECTION A-A. CASE B. PEOPLE MOVER TO DOWNTOWN

Source: TDA Inc.

generally in the Wilshire Corridor and northward to the San Fernando Valley, significantly enhances regional access to both sites.

- Metro Rail construction will be extremely disruptive to the site. The currently planned subway station and bus terminal consume significant land and place constraints on future development of the site.

Thus, development of the LAUPT/USPS sites will be impacted in the following ways:

- Metro Rail connections to downtown should increase the attractiveness of the area for those land use activities having a relationship to the downtown market, but desiring a secondary and lower cost location. Examples include secondary office space, retail activities and hotel. Completion of only MOS-1 through downtown to Alvarado Street will not have a significant impact on transit use to the LAUPT/USPS sites for journey-to-work access, however.

- Metro Rail connections to the Westside/Wilshire Corridor area and the North Hollywood/San Fernando Valley should enhance the use of transit for journey-to-work travel to the site. This should reduce parking demand and traffic impacts resulting from development of the site.

- The timing of development of both sites will be affected by the timing of Metro Rail construction. Significant delays in Metro Rail construction will require pursuit of an alternative transportation strategy if development of the sites is to proceed.

As a result, two possible transportation strategies are recommended -- one assuming that Metro Rail construction proceeds as now planned and one assuming that further delays occur, significantly postponing Metro Rail construction.

The two strategies are illustrated by the accompanying charts (Figures 38 and 39), and are summarized as follows:

1. Strategy #1 -- Under this strategy Metro Rail construction is begun in 1986, completed at LAUPT in early 1991 and the four mile MOS-1 is in

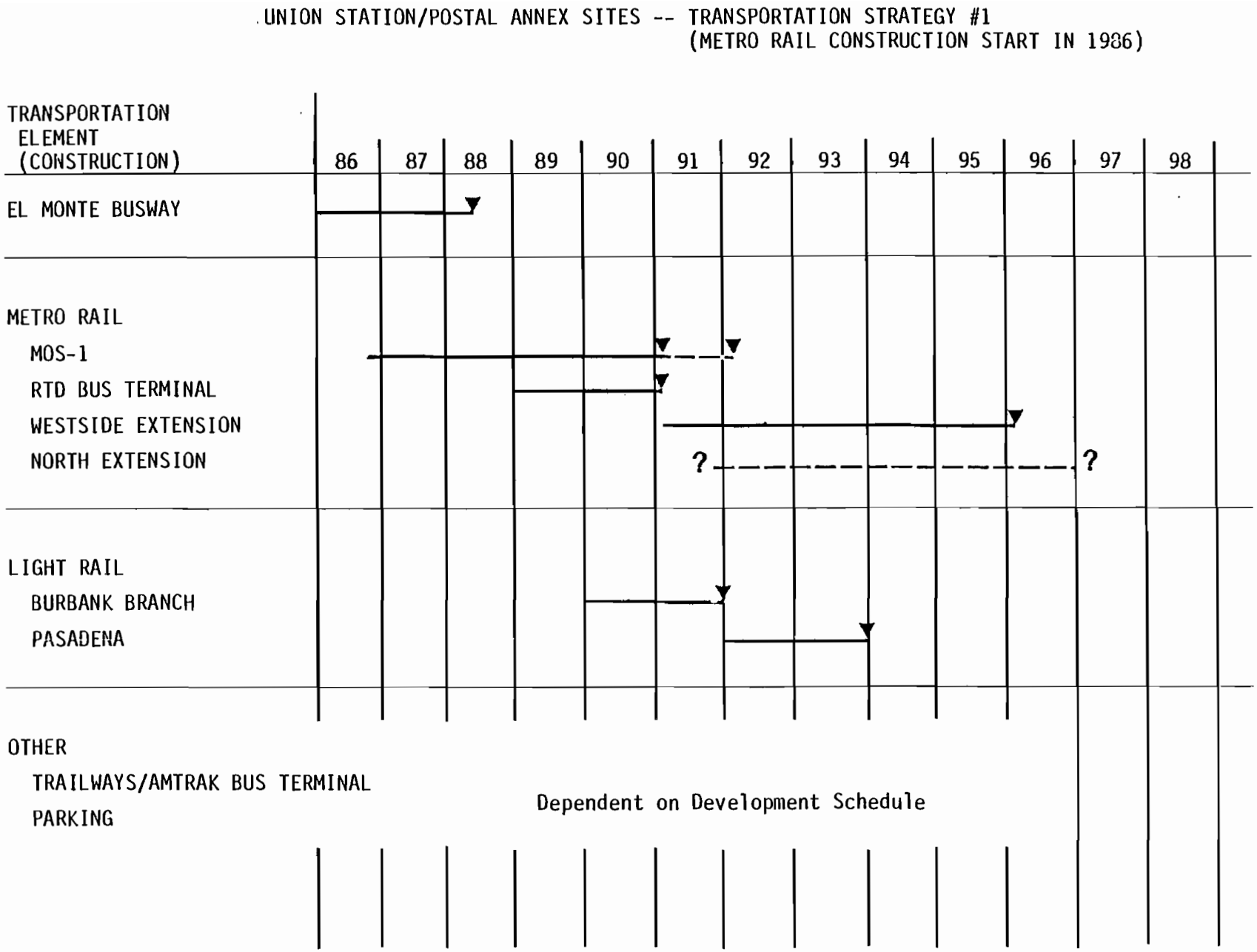

UNION STATION/POSTAL ANNEX SITES -- TRANSPORTATION STRATEGY #1
(METRO RAIL CONSTRUCTION START IN 1986)
TRANSPORTATION ELEMENT (CONSTRUCTION)
86
87
88
89
90
91
92
93
94
95
96
97
98
EL MONTE BUSWAY
METRO RAIL
MOS-1
RTD BUS TERMINAL
WESTSIDE EXTENSION
NORTH EXTENSION
?
?
LIGHT RAIL
BURBANK BRANCH
PASADENA
OTHER
TRAILWAYS/AMTRAK BUS TERMINAL
PARKING
Dependent on Development Schedule

Figure 38

UNION STATION/POSTAL ANNEX SITES -- TRANSPORTATION STRATEGY #2
(METRO RAIL DELAYED)

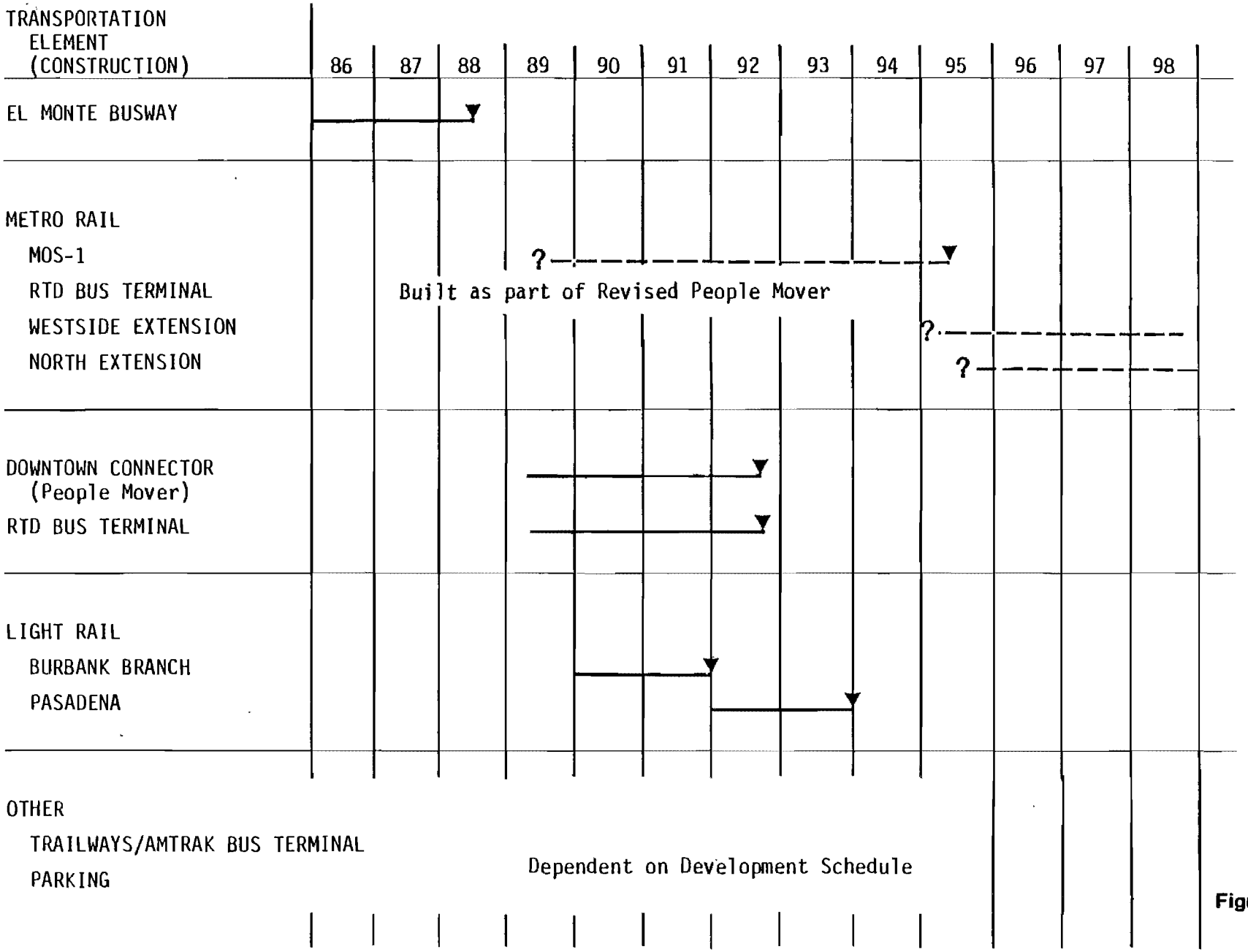


Figure 39

operation by 1992. Included as part of the MOS-1, development at LAUPT is the bus terminal for RTD operations. Metro Rail extensions west of downtown and northward to the San Fernando Valley follow in the 1990's. At roughly the time MOS-1 becomes operational light rail service to Glendale, Burbank and the San Fernando Valley would start, followed by light rail service to Pasadena in the mid-1990's. Both of these light rail lines would terminate at Union Station with passengers transferring to Metro Rail to reach final destinations in downtown or the Wilshire area. In addition, the light rail lines could utilize the eastern-most passenger platforms at the existing AMTRAK level (+15 feet). At this location and elevation, little or no disruption to other site activities would occur as a result of light rail implementation. Ultimate relocation of Trailways and AMTRAK bus operations and parking development would be dependent on the overall development schedule for the site.

2. Strategy #2 -- Under this strategy, it is assumed that Metro Rail incurs additional delay and that other transportation facilities are developed first, although the option for eventual Metro Rail construction is preserved. Here it is assumed that the light rail line to the Glendale/Burbank/San Fernando Valley area and the Pasadena line are constructed first. To provide collection and distribution of downtown passengers, a revised people mover and associated bus terminal are assumed to be developed in the same time frame as Burbank Branch light rail service. Alternatively, downtown collection and distribution might be provided by extension of the Long Beach-Los Angeles light rail line from its planned termination at Seventh and Flower Streets to Union Station where it would connect with Burbank Branch and Pasadena services. Under this strategy, ultimate relocation of Trailways and AMTRAK bus operations and parking development would be dependent on the overall development schedule for the LAUPT/USPS sites.

In view of the recent financial commitments to Metro Rail by UMTA, the City of Los Angeles, LACTC, and the State, Strategy #1 appears the more probable.

PROPOSED PEDESTRIAN IMPROVEMENTS

In response to the analysis of existing conditions and the preliminary urban design study and development scenarios, this section provides physical and operational recommendations to encourage increased pedestrian access to the site from surrounding pedestrian activity areas. The activity areas include the Civic Center area, El Pueblo, Chinatown and Little Tokyo. This section is divided into the following subsections: Alameda Street, including intersections at Los Angeles, Macy Street/Sunset Boulevard, and Ord Street; and preferred routes to downtown including North Main Street and Los Angeles Street. The pedestrian improvements recommended in this section are necessary to insure adequate linkages and a high quality pedestrian environment.

ALAMEDA STREET

Alameda Street Right-of-Way

Alameda Street is viewed as the key street in providing the identity, orientation and organization of the project's pedestrian environment. The ceremonial "front doors' of the development face Alameda Street and the landscaped setback provides a high quality and visually unified setting. Alameda Street, together with the landscaped setback, functions as a pedestrian collector/distributor, linking the development to crossing points which may be used to access surrounding activity areas. As there are no major attractions north or south, it is unnecessary to extend the Alameda pedestrian improvements beyond the site frontage at this time. It is assumed connections to Little Tokyo will be made on Los Angeles Street.

In order for Alameda Street and the landscaped setback to function successfully as a key pedestrian element, the following improvements are recommended:

- Major pedestrian connections should be provided from the project site across Alameda Street with crosswalks at the intersections of Aliso/Arcadia, Los Angeles, Macy/Sunset Boulevard, Ord and Vignes/Alpine Streets. Midblock crossings should be avoided. Crosswalks should be aligned with sidewalks and of the same width as a minimum.

- Sidewalk widths should be widened on Alameda Street where possible to accommodate increased pedestrian flows to a minimum width of 12 feet. Sidewalks on the east side of Alameda Street, adjacent to the project site, should contain a 4 foot minimum zone planted with trees to separate the pedestrian from the street. A buffer should also be provided along parking areas on the project site.

- Bicycle circulation on Alameda Street should be accommodated by providing a 14 foot curb lane.

- Assuming a 96 foot right-of-way, the street geometry should include two 12 foot sidewalks, two 14 foot curb lanes, and four 11 foot lanes. The effective width of the eastern sidewalk on Alameda Street fronting the site should be increased to 15 feet by incorporating a 3 foot street level setback. (See Figure 40.)

- Alameda Street should be resurfaced and as many railroad rails should be removed as is feasible to improve the pedestrian walking surface at crosswalks.

- Street and directional signing should be improved for the pedestrian.

LANDSCAPED SETBACK AREA

- Pedestrian connections from main entries to the sidewalk should be provided through parking lots. Pedestrian connections should be wide enough for trees and pedestrians.

- Three major landscaped areas should be accommodated to facilitate direct pedestrian connections from building entries to street crossings:

  -- Connecting to the intersection at Macy and Alameda Streets from Union Station and the Terminal Annex Building

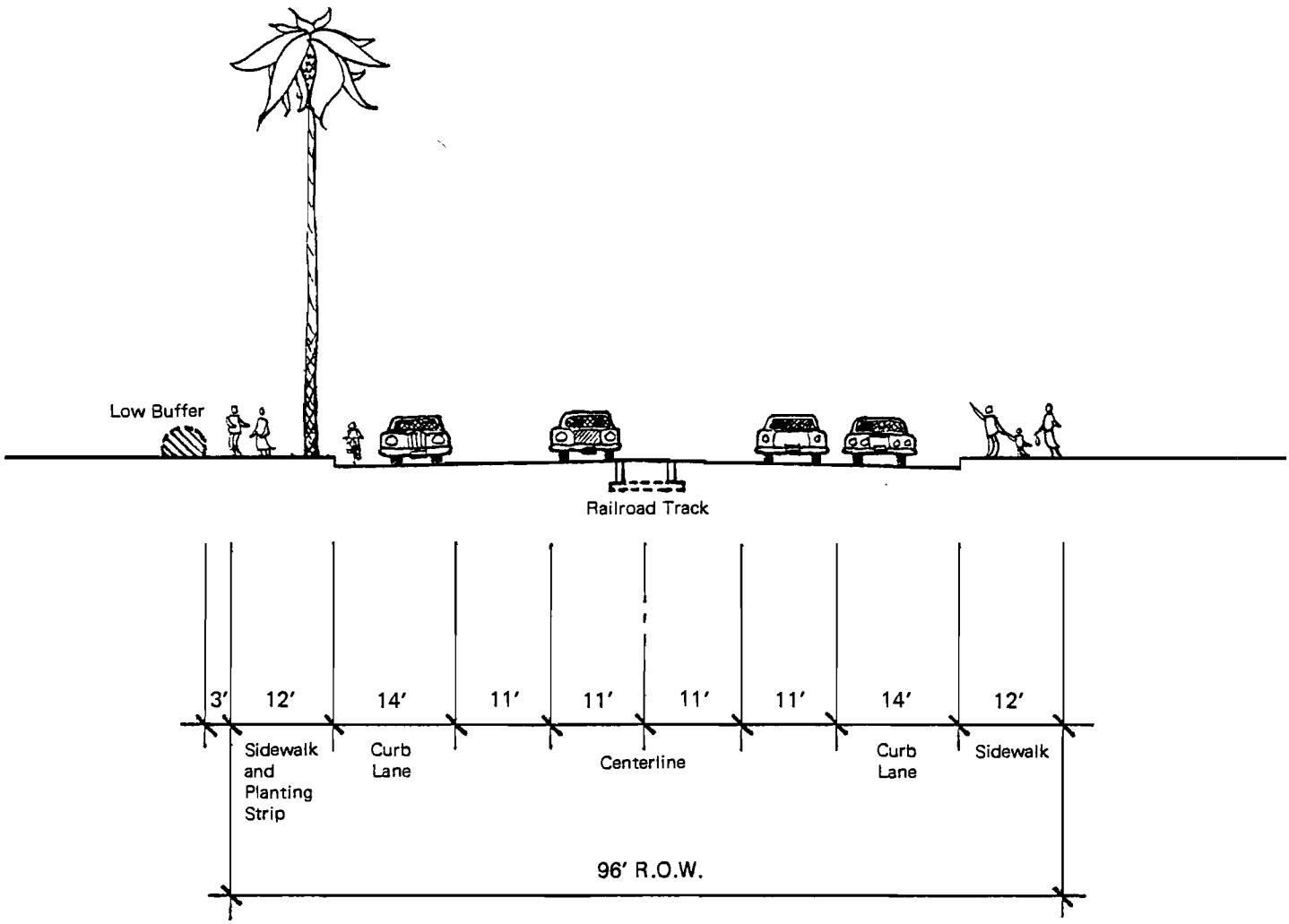


Figure **40**
Alameda Street Cross Section Looking South

Source: DMA/PPS

-- Connecting to the intersection at Los Angeles and Alameda Streets, preserving existing pedestrian entry feature

-- Connecting to Alameda Street sidewalk to cross Aliso Street and the freeway from Union Station

- The historic character and intentions of the Union Station site should be reinforced.

  -- Extension of the Civic Center with "ceremonial mall" on Alameda Street

  -- Architectural expression of Spanish heritage, local climate and gateway to the city

- The visibility of the facade and tower of Union Station and the facade of the Terminal Annex Building should be maintained.

- Bicycle parking should be provided as part of the parking areas fronting Alameda Street. It is recommended that bicycle parking be provided in the ratio of 5-10% of the automobile parking.

- Circulation on the access drive in front of Union Station and through the parking lots should be designed to minimize vehicular speeds through the use of special paving and signage to improve pedestrian safety.

- Pedestrian connections should be made within the landscaped setback to bus stops.

- The extension of the formal landscape treatment of the southern patio of Union Station should be considered within the landscaped setback. This treatment will maintain views of the building and pedestrian areas, add color and visual interest and reduce the glare from parked vehicles. Small reflecting pools, channels or fountains should also be considered.

- Planting palms in the landscaped setback should be considered as a technique for extending the presence of Union Station and channeling pedestrian movement.

- Special landscape treatment should be considered at major pedestrian and vehicular entry points to the project site.

- Large expanses of parking should be broken with landscaped walkways and islands.

- If retail pavilions are used, they should be placed along major pedestrian routes.

Los Angeles and Alameda Streets

The front door of Union Station, and the connection to the west at Los Angeles Street, is the most important pedestrian access point on the site. (See Figure 41.) The significance of this connection is due to its direct linkage to El Pueblo, the Plaza, the Civic Center to the south and the desire to reinforce the historic character and prominence of Union Station as the gateway to the development.

In order to enhance and reinforce this connection the following improvements should be implemented:

- The Los Angeles Street intersection should be moved to a point south of the present location in order to facilitate pedestrian crossings and align crossings with the historic pedestrian entrance paving. This will provide greater convenience for crossing the intersection at the northern crosswalk leg which is supported by current pedestrian volumes showing the northern leg with significantly higher volumes. (See Figures 42 and 43.)

- Sidewalks should be provided on both sides of Los Angeles Street and both north and south crosswalk legs should be provided at Alameda Street to provide convenient crossings.

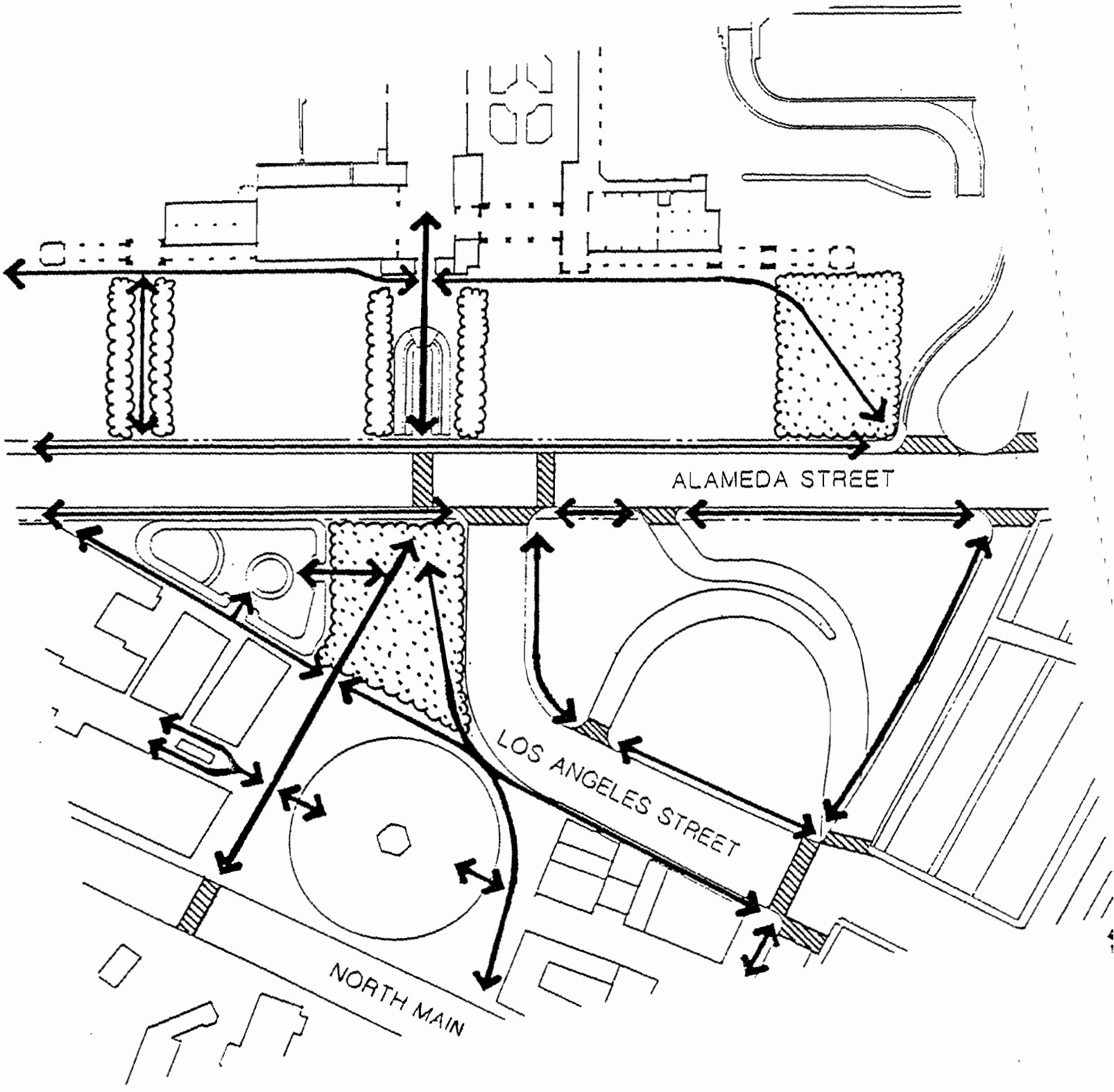
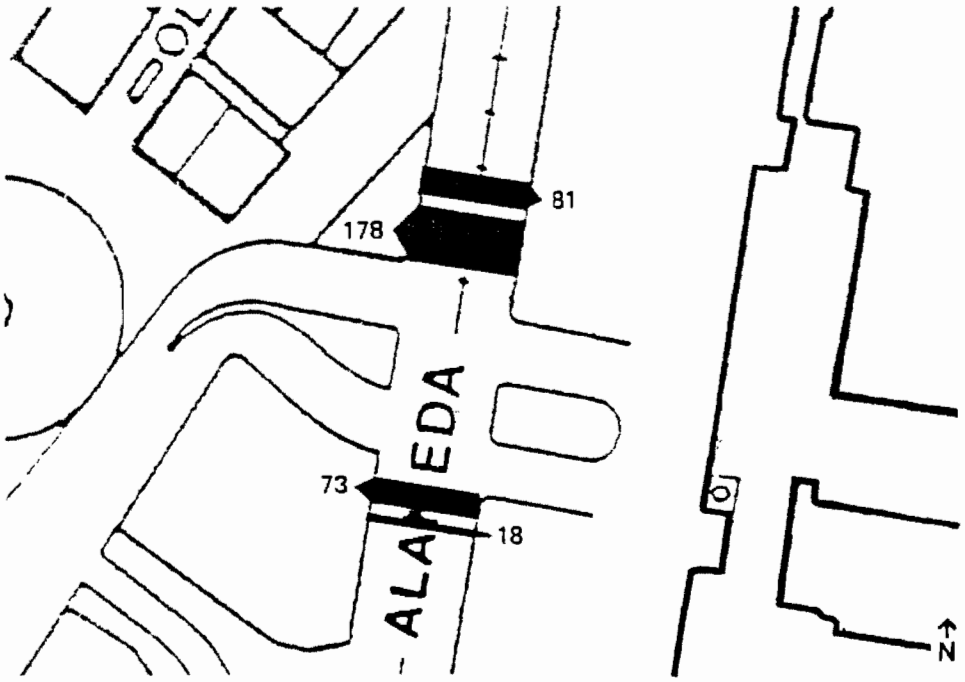


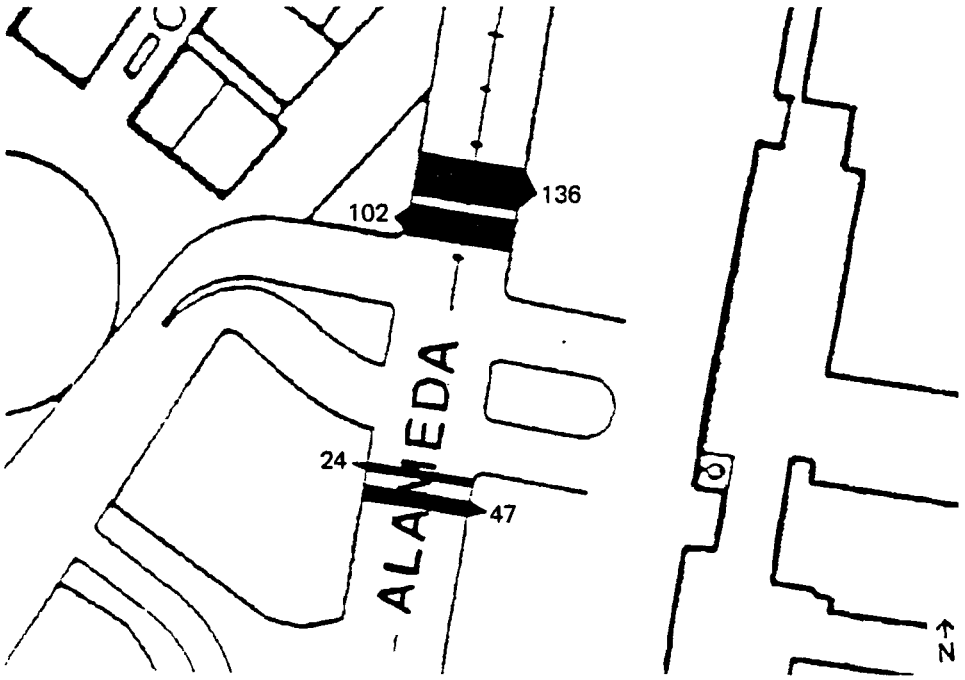
Figure 41
Alameda Street at Los Angeles Street

Source: DMA/PPS



Source: Kaku Associates

Figure **42**
Weekday AM Peak Hour Pedestrian Volumes for Alameda/Los Angeles Street Intersection (8-9am)



Source: Kaku Associates

Figure **43**

Weekday Midday Peak Hour Pedestrian Volumes for Alameda/Los Angeles Street Intersection (11:30-12:30)

- Two schematic alternatives were identified for the treatment of the pedestrian pavement west of Alameda Street in the former Los Angeles Street alignment. Alternative 1 involves restoring the historic Marchessault Street alignment as a pedestrian street while also providing sidewalks along Los Angeles Street (see Figure 44). Alternative 2 calls for the creation of a plaza which reflects the character of the historic entrance paving at Union Station (see Figure 45). Alternative 1 is preferred as a pedestrian street solution which effectively accommodates pedestrian flows while linking three established plaza spaces: the Plaza, the Union Station entrance paving, and the Placita de Dolares. Alternative 2 implies that there is an axial relationship and direct pedestrian access points between the front door of Union Station and the Plaza which do not exist. Alternative 1 seems more respectful of the historic development of the Plaza as the central focus of the historic city surrounded by streets and public ways. Alternative 1 includes a visual focal point (e.g. a fountain, kiosk, sculpture, etc.) directly west of Alameda Street on axis with the main entrance to Union Station, providing visual reference for pedestrians.

- Pedestrian paving directly north and south of the Plaza should be improved to be consistent with the historic character of the area and to provide a better walking surface.

- The view west from Union Station's southern patio of the realigned Los Angeles Street and the parking entrance should be screened with landscaping. Views from the patio to the city skyline should be maintained.

- Management should be improved to allow Father Serra Park to make a positive contribution to the area's vitality and amenity.

Macy Street/Sunset Boulevard and Alameda Street

The Macy Street/Sunset Boulevard and Alameda Street intersection provides an important pedestrian linkage. (See Figure 46.) Olvera Street is closer to the site at this point, a major bus stop is located on Macy Street and Sunset Boulevard is a major connection to Chinatown.

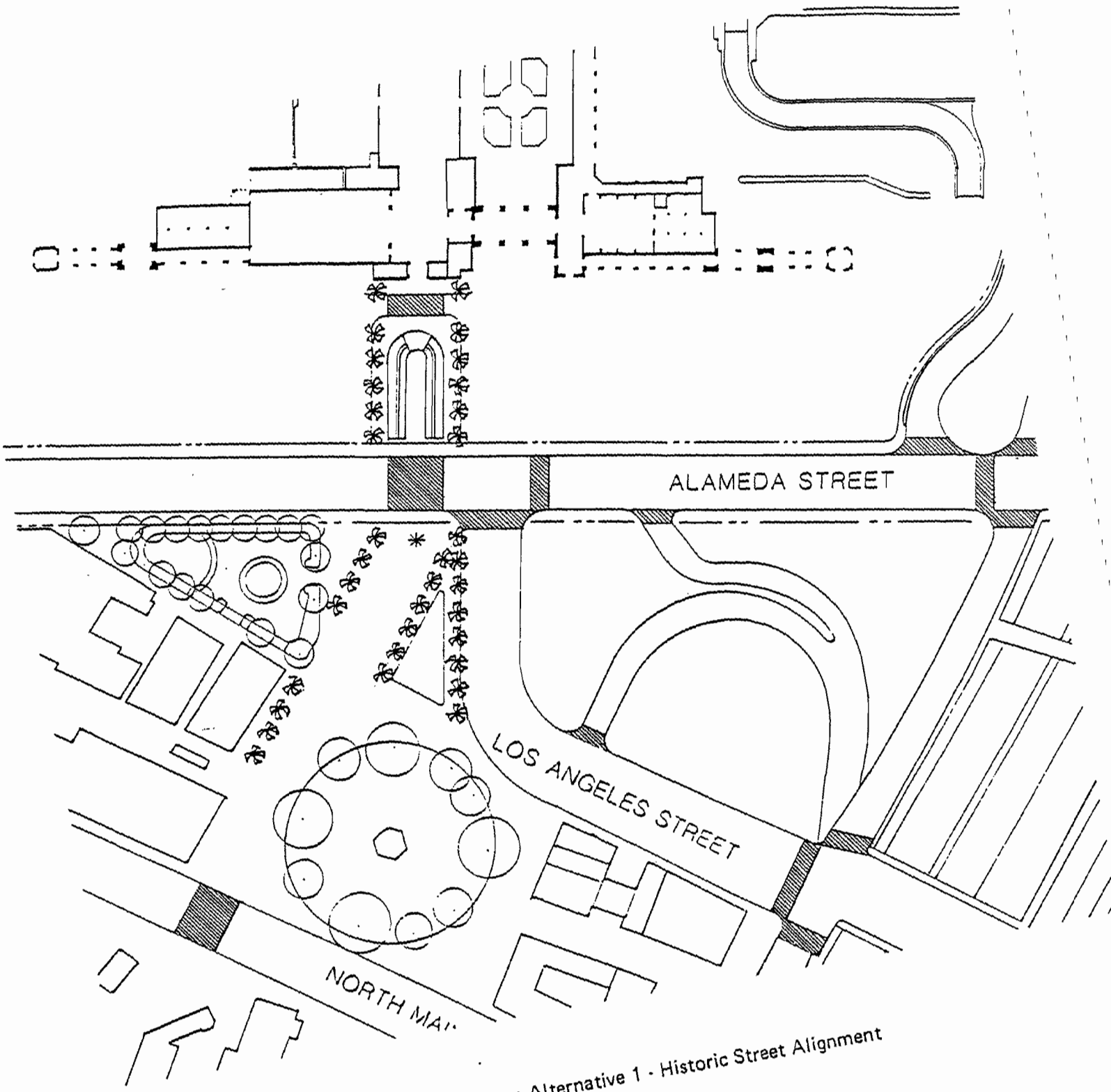


Figure 44
Alameda Street/Los Angeles Street Crossing: Alternative 1 - Historic Street Alignment

Source: DMA/PPS

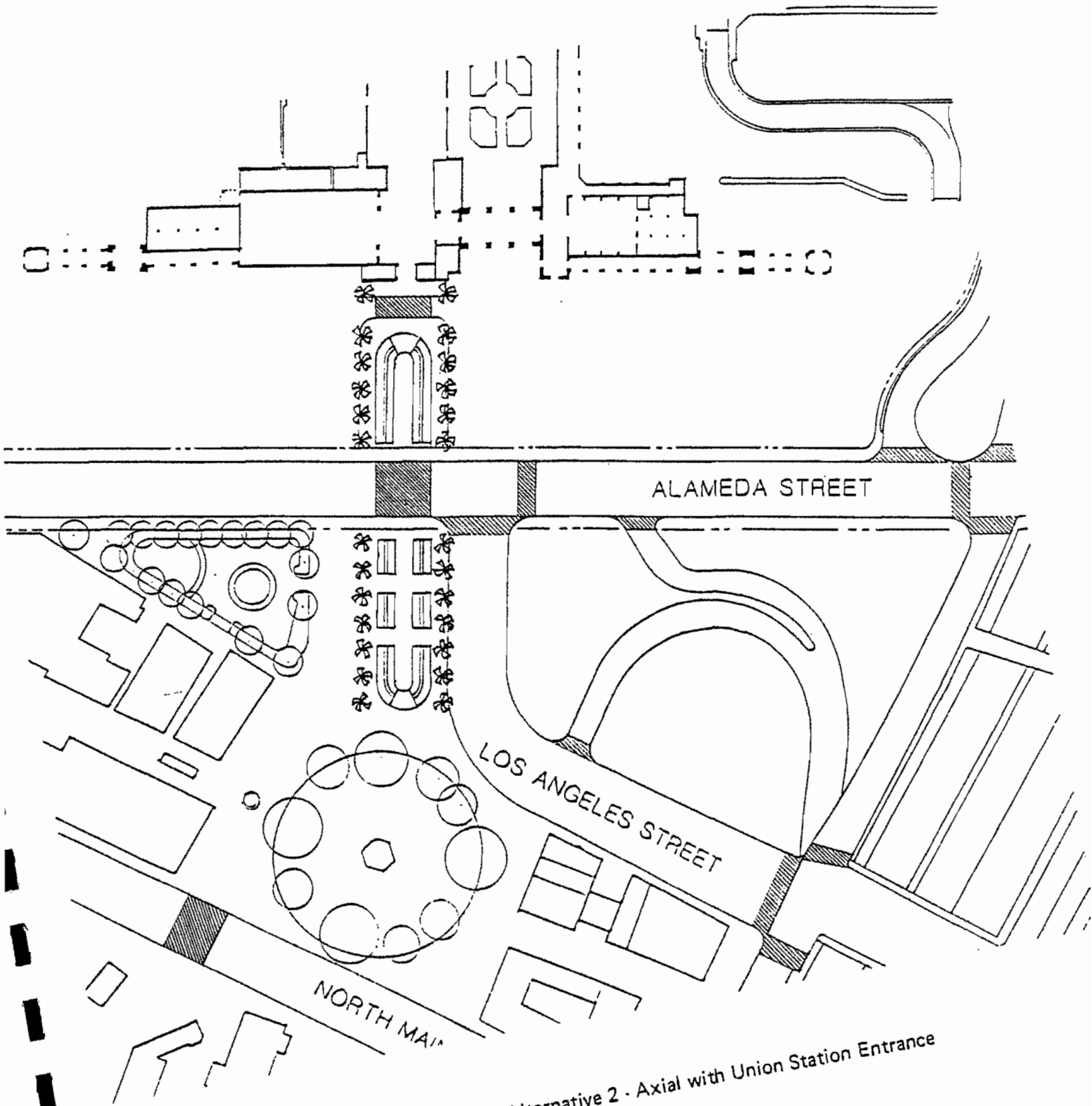


Figure 45
Alameda Street/Los Angeles Street Crossing: Alternative 2 - Axial with Union Station Entrance

Source: DMA/PPS

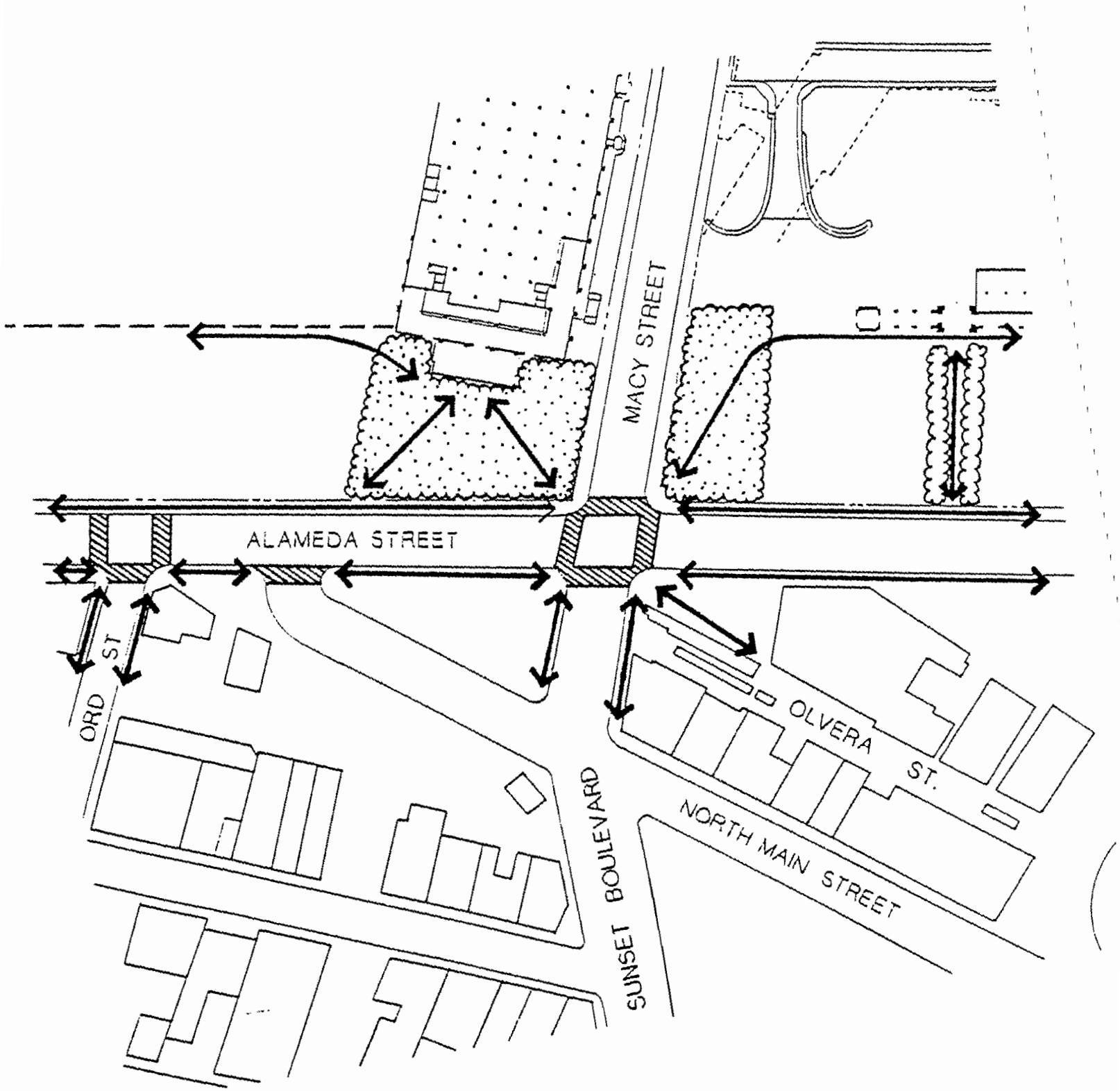


Figure 46
Alameda Street at Macy Street

Source: DMA/PPS

The following pedestrian improvements are recommended at this intersection:

- Crosswalks should be provided on the north, south, east and west legs of the intersection.

- Landscape spaces should be provided in front of the Terminal Annex and at the west end of Union Station to allow diagonal access from the intersection. These spaces should be designed to reflect the historic character of the buildings and to maintain visibility of the building facades.

- Vehicular access should occur outside of the special landscaped spaces. Short term, post office related parking may be provided immediately north of the special landscaped plaza in front of the Terminal Annex. Where feasible, long term parking should not be accessed through the landscaped setback area.

Ord and Alameda Streets

Ord Street provides the potential for a major new connection to Chinatown from the project site north of Macy Street. (See Figure 47.) Ord Street also provides the opportunity to create a pedestrian focal point in the form of a landscaped area which provides visual organization and orientation at the northern end of the development site.

The following recommendations are made for improvements:

- Entries to the building should be aligned with landscaped connections through parking areas to Alameda Street.

- Vehicular drop-off areas should be provided near the building entrances.

- Crosswalks should be provided at Alameda and Ord Streets on all sides of the intersection.

- Development should be set to the 200 foot setback line and include pedestrian weather protection north of the Terminal Annex Building.

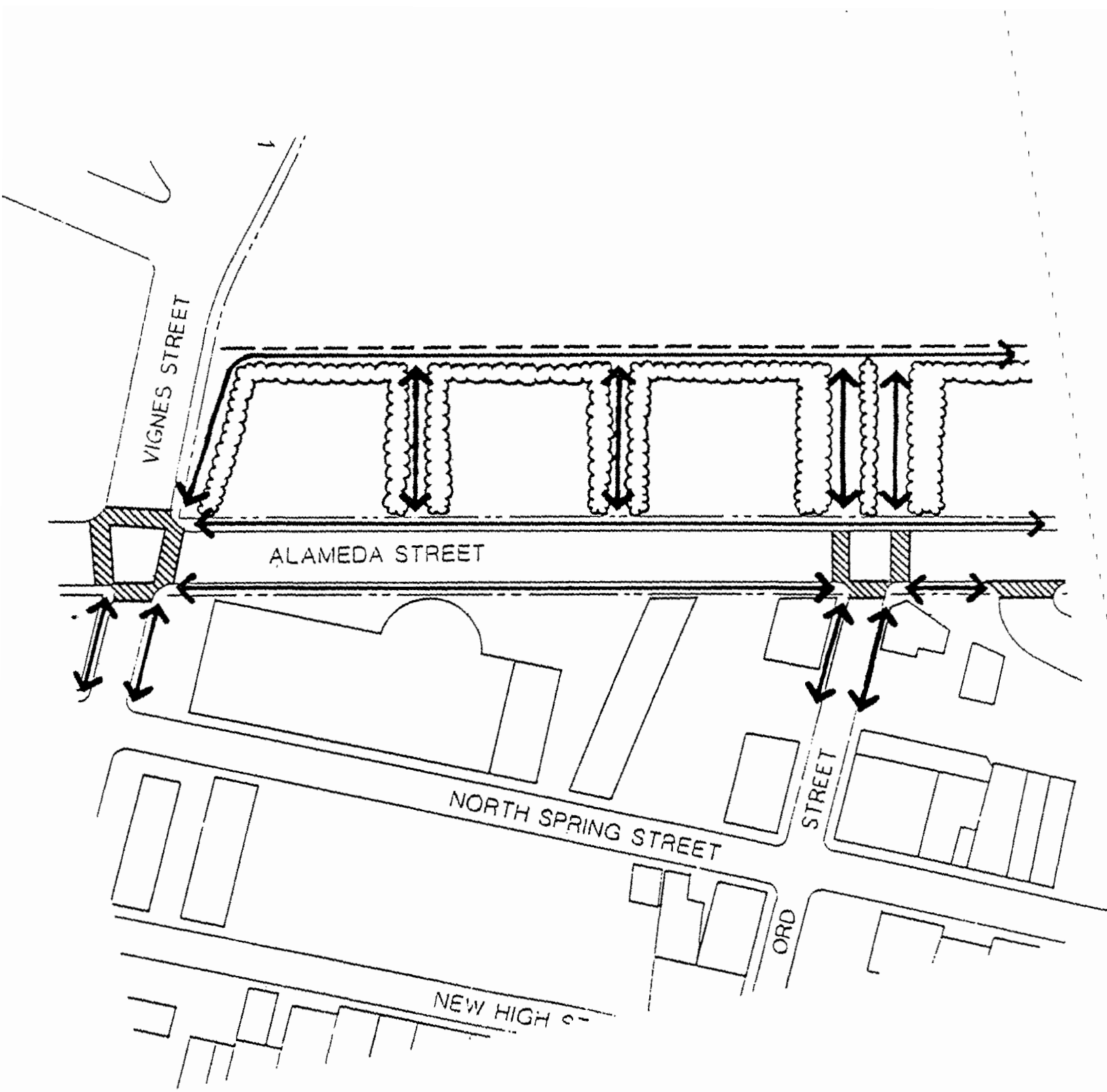


Figure 47
Alameda Street at Ord and Vignes Streets

Source: DMA/PPS

PREFERRED ROUTES TO DOWNTOWN

Los Angeles and North Main Streets

The following improvements should be made to North Main and Los Angeles Streets to improve linkages to the Civic Center.

It is recommended that an historic El Pueblo theme be established which would be used throughout the historic district for street furniture and landscaping.

Specific recommendations include:

- Widen sidewalks to a 12 foot minimum width.
- Provide flower beds or other special plantings at intersections with crosswalks while not interfering with pedestrian flows.
- Provide special historic lighting fixtures, litter receptacles, drinking fountains and benches to establish elements of continuity along the street. Other elements of continuity should include special paving, hanging flower baskets or banners, and street trees of the same type.

EVALUATION METHODOLOGY

The evaluation process is a decision-making tool used to guide strategy selection. Evaluation methods are used to organize information about alternative strategies so that the advantages and disadvantages of each can be identified. The evaluation methodology proposed to be used for this project will involve the following steps:

- **Define Evaluation Criteria** -- A set of transportation related evaluation criteria has been defined. These criteria cover the significant goals and objectives of transportation users, operators, and "neighbors" of the project area -- insofar as they relate to the transportation consulting team's terms of reference.

- **Develop Evaluation Matrix** -- Performance measures which reflect the extent of achievement of objectives, will be developed and an evaluation matrix used to compare the alternative strategies.

- **Identify Trade-offs Among Objectives** -- An analysis will be conducted identifying the trade-offs among the competing objectives.

Scope of Evaluation

The scope of the evaluation discussed in this working paper is focused on transportation measures which are designed to improve the accessibility of the Union Station area and to mitigate any impact that development of the Union Station and USPS properties may have on traffic service (and associated air quality) within and near the site.

The environmental impact study for the project as a whole must consider carefully such sensitive items as historic preservation and visual intrusion. The transportation study will highlight or "flag" these items to the extent that they are likely to be affected by transportation improvement proposals. The evaluation, quantitatively or otherwise, of these non-transportation impacts will need to be done by other team members -- such as the urban design consultant.

CRITERIA FOR EVALUATING ALTERNATIVE PLANS

Criteria for evaluating alternative site development strategies have been selected by a two-step process. A comprehensive list of potential evaluation criteria was prepared, and each criterion on the list was reviewed for:

- Applicability to the Union Station Master Plan Areas;
- Applicability to transportation issues;
- Significance of potential impacts; and,
- Potential to show a meaningful difference between options.

Goals and Objectives

The objective utilized in the evaluation process determine the "tests" each alternative must pass. Experience has shown that the ability of decision-makers to consider the interrelationships and trade-offs between objectives, decreases as the number and degree of precision of objectives is increased. Thus, wherever possible, one objective has been selected as representative of a group of related objectives.

In order to insure a comprehensive review of all characteristics of the strategies under consideration, the objectives were classified by group interests as follows:

- Neighborhood/Environmental;
- Community;
- User;
- Operator/Provider; and
- Owner.

This approach was derived from that recommended in the Urban Mass Transportation Administration (UMTA) publication, "New Systems Requirements Analysis Program -- Transportation System Evaluation Indicators", 1973.

This classification of objectives by interest group helps to clarify the evaluation because each of the groups has a different perspective on the alternative proposals and on how each alternative will affect them.

- The **Neighborhood/Environmental** objective reflects the concern of the individuals over the impacts of the development on the immediate environment. In the current context, conflicts with and impacts on local traffic circulation service levels represent the primary neighborhood/environmental concern.

- The **Community** objective represents an aggregate or consensus set of desires of all members of the community in relation to relatively complex qualities of the facility and its impacts. The related criteria -- in a general context -- include such items as maximizing public agency revenues (in this project especially, property tax increments and the City share

of retail sales taxes), improving regional air quality/energy conservation, implementing the city/county "Centers Plan". In the transportation context, community objectives include historic preservation, city tax base enhancement, and plan implementation.

- The **User** objective is to maximize the convenience of the traveling public. The appropriate criteria for this project include minimizing the time spent in making connections (AMTRAK/commuter rail - intercity bus, AMTRAK /commuter rail - local bus, AMTRAK/commuter rail - LRT or people mover, AMTRAK/commuter rail - Metro Rail, AMTRAK/commuter rail - taxi, auto/carpool - LRT or Metro Rail or people mover, etc.) and reducing travel times to the site and to downtown Los Angeles from the region.

- The **Operator** objective reflects the concerns of the transportation providers in relation to ease of implementation and operation of the intermodal facility. The criteria relate to AMTRAK, SCRTD, and freight railroad revenues and operating costs, and to operational characteristics of the site.

- The **Owner** objective reflects the desire of the site owner (U.S. Postal Service and the railroads which share ownership of Union Station) to maximize lease or sale revenue from the property.

Evaluation Criteria

Tentative evaluation criteria to be used for transportation strategy evaluation are listed in Table 15. For each criterion, the table indicates one or more means of measuring effectiveness or impacts, the objective of the study in relation to that means of measurement, the relative significance of the criterion, and the team member primarily responsible for its evaluation.

Neighborhood/Environmental Criteria - In this project the principal neighborhood concerns appear to be related to site traffic as it is superimposed on major streets bordering the site.

1. **Traffic Congestion** - Congestion will be measured in terms of volume capacity ratios at signalized intersections near the site. The development should not lower the existing service level on city streets. Particular concerns would be the Alameda/Macy/Sunset intersection, the Macy/Vignes intersection, and the Ramirez/Vignes freeway ramps intersection.

2. **Spillover** - Spillover will be measured by either number of vehicle trips or vehicle miles diverted from arterial to local streets, due to insufficient arterial capacity. The development should not divert new traffic onto residential streets or through commercial "environmental areas". Particular concerns would be the Chinatown and El Pueblo State Park environmental areas.

3. **Business Access** - This criterion qualitatively describes the impacts of site development on business access to customers and employees. Traffic mitigation measures may affect business access (e.g., by removal of parking, prohibiting turns, or altering curb cuts). Desirable peripheral parking and ridesharing programs may also have an impact on perceived access time for downtown and on-site employees. Although considered only moderately significant, this criterion could be critical if business proprietors were offered no alternative convenient means of access or parking.

4. **Air Quality** - Even though motor vehicles play a large role in the smog problem of the Los Angeles Basin, the air quality impact of the development strategies will fall chiefly on the immediate neighborhood. As many planned site uses would likely develop elsewhere if the site were not developed, the total regional vehicle miles traveled (VMT) and trips by motor vehicle would be similar for all alternatives. Local traffic conditions therefore provide the best indicator of air quality impacts of the several strategies. Emissions tend to be higher under congested conditions for any given level of traffic flow. Even so, there may not be a significant difference in air quality impact among alternatives.

Community Criteria

The most critical community concerns with the Union Station and Terminal Annex properties are the historic and visual aspects, which will be reflected in the alternative designs.

The transportation study affects these criteria only insofar as a desirable transportation improvement may have an impact on them. For example, if Alameda Street is widened for better access to the property, mature street trees will have to be removed. It will be necessary to work with the urban design team to find out if there is an acceptable way of mitigation this impact -- such as planting new trees in what is now the first row of parking spaces.

Other community level criteria relate to transportation system utilization, cost-effectiveness, subsidy needs, etc. These are transportation concerns and can be evaluated by TDA, PBQD, or Kaku Associates. The uncertainty of some transit improvements, such as the Downtown People Mover and the Metro Rail Subway, make flexibility for adding new access modes a concern -- complicated by the presence of rail tracks above grade, storm and sanitary sewers below grade, an elevated busway under construction, and a freeway that dips below Alameda Street before cutting into the ridge west of Los Angeles Street.

5. **Historic Preservation** - Union Station, El Pueblo de Los Angeles State Park, and the original (1939) Terminal Annex Post Office are listed in the National Register of Historic Buildings and Places, and their appearance must be either protected or fully restored to its 1939 appearance. The transportation consultants will "flag" any transportation improvements (such as a new parking structure under the site of Tracks A - E and 1 - 4) whose construction could affect the historic buildings, but the impact would need to be evaluated by the urban design consultant.

6. **Landscape Integrity** - The views of the historic buildings and their views of each other and of the Los Angeles Civic Center and Little Tokyo areas need to be preserved insofar as feasible, and new construction needs to harmonize with the styles and scales of the historic structures and urban spaces. The transportation consultants will "flag" any transportation

improvements, such as street widening or introducing an above grade rail or bus viaduct, which would cross a line of vision to or from the station or Terminal Annex, for evaluation by the urban design consultant.

7. **Tax Increments** - In a redevelopment area, the increase in land value above the baseline when the area is established, can accrue to the city redevelopment agency and be used for its operating costs and debt service. Where commercial activities are involved, the city general funds receive a portion of sales taxes. These amounts need to be estimated by the market consultant for each strategy. The transportation consultants will "flag" any desirable transportation improvement that is seen to impinge on taxable property — either on the site or on neighboring land --for evaluation by the economic consultant.

8. **Plan Consistency** - The elements of a City's General Plan are required by law to be consistent -- redevelopment with land use and circulation. Kaku Associates, which has been reviewing the capital improvement program and the circulation element of the City's General Plan, will "flag" any changes in the circulation element which may be needed to improve site access or mitigate traffic impacts.

9. **Potential for Phasing** - This criterion qualitatively describes the flexibility of alternative strategies to meet foreseeable future needs, such as Metro Rail construction, commuter rail/LRT development, street improvements in the circulation element of the City's General Plan, and any freeway system improvements which SCAG and Caltrans believe can realistically be included in the next 15 to 20 years. The transportation consultants will "flag" conflicts between potential transportation improvements and site development or among transportation proposals.

User Criteria

Transportation system users include pedestrians and both voluntary and involuntary transit passengers as well as vehicle drivers. A primary concern of users is the "disutility" of travel, a variable reflecting travel time, perceived walking and waiting time, user costs (fares, motor fuel cost, tolls, parking fees, etc.). Personal security —

at transit stops, in parking lots and structures, and in pedestrian-only passages -- has become a growing concern in recent years. Traffic safety is also a basic user concern, though individuals may be more sensitive to safety as reflected in insurance rates than to personal hazards.

10. **Pedestrian Circulation On-Site** - Transfers between modes -- and between the transportation terminal and commercial activities -- should be free of barriers to people using wheelchairs, strollers or wheeled luggage, and should be short, direct, and understandable. This criterion can be quantified in terms of walking distances for selected intermodal transfers. In addition it should be qualitatively evaluated for absence of barriers and visual quality of the environment traversed by the traveler.

11. **Pedestrian Access** - This criterion is similar to pedestrian circulation on-site but applies to off-site walks (e.g., LAUPT waiting room to midblock Olvera Street). It can be quantitatively measured in terms of time as well as distance, allowing for delay at Alameda Street traffic signals. This criterion should also reflect the impacts of such traffic engineering measures as street widening or crosswalk relocation on pedestrian access, as well as any improvements from sidewalk widening, street closures, and driveway relocation.

12. **Pedestrian Security** - Developments should be so designed that pedestrians have a sense of well-being and security -- especially in perceived high-vulnerability areas such as parking structures and intermodal transfer corridors.

13. **Traffic Study** - The number of accidents, accidents rates, and accident exposure/traffic conflicts should be minimized. Also, the access to police, fire, and medical personnel should be adequate (e.g., if there is congestion, it should not trap emergency vehicles).

14. **Regional Access** - This criterion refers to the impact of site development strategies on trips to the site and to downtown Los Angeles from the rest of the Southern California region. Site strategies are likely to affect only users of Metro Rail, AMTRAK/Caltrans commuter lines, possible light rail

lines to Pasadena or Burbank, bus lines serving the site, and site parking facilities. This criterion should be measured in terms of the travel times and disutilities for selected representative trips at peak and off-peak times, including trips generated in low income residential areas. It is expected to respond to differences in rail service availability and frequency, parking availability and pricing, and bus service hours and frequencies.

Operator Criteria

Operator concerns are primarily economic and are components of the subsidy need and cost-effectiveness calculations (Items 12 and 13 above). Attention will be focused on impacts of site-specific transportation improvements or TSM measures developed for project alternatives.

15. **Transit Operations** - This criterion describes the effect on bus and train schedules, vehicle operator hours, train operating costs, of the alternative strategies, and in addition has a qualitative component relating to bus flow improvements from preferential lanes or parking removal which may be reflected in schedule stability rather than time savings.

16. **Capital Costs** - This criterion reflects the estimated capital costs (in constant 1986 dollars) required to implement all of the transportation system improvements in each alternative, regardless of the funding source. Order-of-magnitude unit cost estimates for each types of improvements are to be obtained from available reports, adjusted for changes since the date of publication or (for traffic engineering measures) from City of Los Angeles experience. These estimated costs will include such items as street construction cost, pavement sandblasting and marking, parking structure cost, guideway cost, and bus procurement costs for any new or expanded service.

17. **Freight Operations** - Even though most high-value rail shipments now move in containers or trailers on flatcars, uncertainties in carload freight collection and delivery can severely penalize railroads in terms of loss of revenue traffic to over the road trucks. AMTRAK or Caltrans as operators

of passenger services, are responsible to the railroads for the "avoidable costs" of passenger trains, but the definition and allocation of these costs are difficult. It is easier to discuss the paths of planned passenger trains with experienced railroad operating staff and to qualitatively establish possible points of conflict for negotiation and mitigation.

Owner Criteria

The owner in this study are represented by the railroads which own shares in the terminal company, their real estate departments, and the United States Postal Service. The railroads, as previously noted, are concerned with systemwide freight operations as well as with maximizing the market value of their land.

18. **Development Delay or Disruption** - Transportation improvements which might add value to the site in the long run, nevertheless can have negative short-term effects on-site development. Metro Rail and the busway extension are good examples. Though both of these projects will likely be included in the baseline, alternative strategies may differ in parking facilities, transit service availability and frequencies, and traffic controls -- and these in turn may have land requirements and construction impacts which would delay or foreclose some development options. The transportation consultants will "flag" possible development effects of parking, transit, and traffic-related proposals for evaluation by others (e.g., by the economic consultants).

Cost Assumptions

Capital Costs - When projects are in the early stages of planning, cost estimates lack precision. As plans advance, engineers can estimate construction costs more precisely from the quantities of earthwork, steel, etc. Even well engineered projects have had cost overruns from unanticipated causes such as the energy crises of the 1970's or unknown geological or environmental conditions uncovered by construction. (A current example of the latter is the toxic waste dump recently found in the path of the busway extension.) Only when contracts are completed and records compiled are costs known with certainty.

Recognizing uncertainties in capital costs of future projects, it is proposed to use available estimates in the following order of preference:

1. Bid prices of projects under construction;

2. Budgeted costs of projects which have been designed and are in the capital budget of the owner;

3. EIS/EIR costs, adjusted to 1986 dollars for projects not yet budgeted;

4. Approximate per-mile or per-square foot figures by type of construction for other projects.

Operating Costs - Although total operating costs of existing forms of transportation are known, unit costs must usually be modeled on the basis of vehicle miles, vehicle hours, or some other variable which reflects the amount of labor and materials involved. In estimating cost savings by transit operators, the following rules are suggested:

- For SCRTD, use the "Scatchard Formula", unless SCRTD management prefer that an alternative be used.

- For other bus operators, base bus hour costs on driver labor plus fringes and supervision, and base bus mile costs on maintenance labor, insurance/ safety, and materials -- ignoring overheads such as legal and planning activities.

- For light rail and Metro Rail, use EIS/EIR projections of operating costs, adjusted to 1986 dollars.

- For personal autos, use latest FHWA or Auto Club average of fuel and maintenance costs.

- For AMTRAK, build up costs from train crew requirements, assuming that the new direct-employment work rules will apply.

- For freight trains, use estimates by the railroads in question, which will likely reflect present labor agreements.

Discounted Cash Flow - To compare capital and operating costs, it is suggested that the equivalent uniform annual cost approach be used, land that salvage values be considered negligible. This technique greatly simplifies the comparison of alternatives with differing cost structures and service lives. In this method, capital costs are annualized by means of a "capital recovery factor" which represents an annuity over the estimated service life of the facility. The annualized capital costs are then added to estimates of annual operation and maintenance costs to obtain an equivalent uniform annual cost for comparison purposes.

Annualizing capital costs in this way requires the planner to assume an interest rate or a minimum acceptable rate of return on investment. In the present context, 10% is suggested as reflecting current capital market conditions for the public sector. To establish priorities, estimate the effects of uncertainties, and test opportunities opened by a continuing fall in interest rates, sensitivity tests should be undertaken using 5% and 15% rates of return.

It is also necessary to consider the service lives of vehicles and infrastructure. For this project, unless the EIS/EIR used different numbers, the following are recommended:

- For transit buses, 12 years;
- For rail equipment, 20 years;
- For highways, except major structures, 25 years;
- For parking structures, 25 years;
- For all other infrastructure, 50 years; and
- For intercity and charter buses, 7 years.

Measurement of Effectiveness

For each of the criteria recommended to be used in this study, an approach to measurement of effectiveness or impact has been indicated in Table 3 and in the foregoing discussion of criteria. Where possible, currently accepted quantitative measures of effectiveness have been indicated. Certain criteria, such as historic

preservation and plan consistency are qualitative, and others can only be quantified with the aid of the urban design consultant or the economic consultant.

In such instances it is considered to be the role of the transportation consultants to "flag" the criterion and described the impact or effect in physical terms so that it can be evaluated by others.

In measuring the effectiveness of terminal rationalization on users, the interest group affected may not be using the facility at present or may be using it to an unknown extent. As mathematical models of the travel desires of these population growth could involve small numbers subject to large errors, it is recommended that typical trips be assumed without specific weighing for person-hours or for the number of trips likely to be made. An example of such a typical trip might be a student traveling from a house near Long Beach Avenue and 85th Street in south central Los Angeles to Cal State University at Los Angeles.

Further Refinement

As the study proceeds, it will likely become evident that alternatives may be found not to detectably differ in reference to some of these criteria. Other criteria may be expressed as design requirements rather than variables, and again there may be no detectable difference among alternatives. The study evaluation will focus on the remaining criteria where there are discernable differences.

TABLE 15

EVALUATION CRITERIA

LOS ANGELES UNION STATION AREA TRANSPORTATION PLAN

Primary Interest	Criterion	Measurement	Objective	Significance	Responsibility
Neighborhood/ Environmental	1. Congestion	Volume/capacity ratios at Alameda/Macy/Sunset, Alameda/Vignes, Macy/Vignes, and Ramirez/Vignes Freeway ramps	Maintain or reduce V/C ratios at three intersections	High	Kaku Associates
	2. Spillover	Added ADT or ADW flows on nearby local streets, e.g., in Chinatown	Avoid, minimize	High	Kaku Associates
	3. Business Access	Loss of curb parking, turn prohibitions, number and size of establishments	Mitigate by provision of off-street parking, provide turn pockets, underwrite relocation	Moderate	Kaku Associates
	4. Air Quality	Traffic volumes in and around site, adjusted for effects of congestion on exhaust emission (micro scale only)	Maintain or improve quality by reducing or stabilizing emissions	Moderate	Kaku Associates
Community	5. Historic Preservation	Qualitatively, alteration in exterior or interior of listed buildings and their surrounding, to the extent affected by transportation improvements.	Avoid	Critical	PBQD to "flag" for evaluation by other any historic structure changes due to transportation improvements, such as parking or elevated people mover/ LRT
	6. Landscape Integrity	Qualitatively, visual harmony of scale and patterns between new and old structures, preservation and development of site vistas	Preserve, enhance	High	PBQD to "flag" for evaluation by others any visual impact due to transportation improvements, such as loss of site trees or elevated transit structure in view of site
	7. Tax Increments	Increase in property tax and in City portion of sales tax from baseline values	Maximize	Very High	PBQD to "flag" for evaluation by others any property tax decreases due to right-of-way acquisition
	8. Plan Consistency	Qualitatively, by comparison of community plans with site transportation objectives	State law requires redevelopment plan to be consistent with other general plan elements	High	Kaku Associates

TABLE 15 (Continued)

EVALUATION CRITERIA

LOS ANGELES UNION STATION AREA TRANSPORTATION PLAN

Primary Interest		Criterion	Measurement	Objective	Significance	Responsibility
	9.	Flexibility, Potential	Qualitatively, ability to provide for uncertain alternatives or change in public policy	Preclude as few as possible	High	TDA, PBQD
Users	10.	Pedestrian Circulation, on-site	Walking distances for typical intermodal transfers and walks between activity centers and parking	Minimize or make easy; no barriers to wheelchairs. Good visual environment	High	DMA/PPS
	11.	Pedestrian Access	Walking distance between site activity center and El Pueblo Plaza, Chinatown, Little Tokoyo and Civic Center points. Delays to pedestrians, e.g., at traffic signals	Minimize or make easy; no barriers to wheelchairs. Good visual environment	High	DMA/PPS
	12.	Pedestrian Security	Visibility and "policeability" of pedestrian areas and passengers	Maximize; provide sense of security while walking	Very High	DMA/PPS
	13.	Traffic Safety	Accident rates, number of accidents, and/or accident exposure/conflicts	Minimize	High	Kaku Associates
	14.	Regional Access	Travel times and "disutilities" for typical trips between the site and major regional centers, high density residential areas, and high income residential areas	Minimize	Moderate	TDA, Inc. Kaku Associates PBQD
	15.	Transit Operations	Vehicle hours, vehicle miles, equipment need as affected by site access, egress and internal circulation	Minimize	High	TDA, Inc.
	16.	Capital Costs	Traffic and transit improvements, based on Item 14 and on TSM improvement scenarios	Control	High	TDA, Inc. Kaku Associates PBQD

TABLE 15 (Continued)

EVALUATION CRITERIA

LOS ANGELES UNION STATION AREA TRANSPORTATION PLAN

Primary Interest	Criterion	Measurement	Objective	Significance	Responsibility
	17. Freight Operations	Delay to freight trains from passenger trains or other transportation improvements	Minimize	High	TDA, Inc.
Owners	18. Development Delay	Temporary or permanent interference with site development as a result of transportation improvements or TSM measures	Avoid, minimize	High	TDA, Inc., Kaku Associates and PBQD to "flag" possible impacts of transit, parking, and traffic improvements, for evaluation by others (e.g., by economic consultant)

PART III

EVALUATION OF PROPOSED DEVELOPMENT PROGRAMS

The selection of the recommended development plan for the two properties involved a comprehensive process which considered a variety of issues including the market opportunities and constraints, physical limitations of the two properties, the preservation of historically significant structures, and the ability of the transportation system to support the proposed development. This section of the report documents the results of the evaluation of alternative land use concepts, as well as phasing options, in terms of the potential impacts on the transportation system. The analysis was conducted in steps which served an evolutionary process to identify the optimum development concept if transportation impacts were to be used as the primary criterion.

The first element of the analysis involved the evaluation of each of three alternative land uses schemes developed for each of the two property sites. The second involved an assessment of the development potential of each alternative given specific improvement scenarios for the highway network. The final step was the identification of the preferred alternative. The various steps include estimates of future traffic expected to be generated by various land use schemes, an assessment of the potential impact each scheme would have on the street system within the study area, the identification of measures required to mitigate the impacts, and the development of the preferred land use alternative.

DESCRIPTION OF ALTERNATIVES

Land use features of the build-out stage of the three alternatives development schemes for the Union Station and Postal Services are summarized in Table 16.

For the initial analysis, the following assumptions were made about the alternatives:

1. Three alternatives were analysed by combining the three separate alternatives for each site. For instance, Alternative 1 in this analysis is the combination of the proposed development for Alternative 1 for the LAUPT

TABLE 16

ALTERNATIVE DEVELOPMENT SCENARIOS

Alternative	Land Use	Development by Site (ksf)		
		Union Station	Post Office	Total
1	Offices	3,000	1,250	4,250
	Hotel	245*	300*	545
	Retail	225	50	275
	Culture	50	0	50
	Transportation	50	0	50
	TOTAL	3,570	1,600	5,170
2	Offices	3,730	1,750	5,480
	Hotel	315*	0	315
	Retail	225	50	275
	Culture	250	0	250
	Transportation	50	0	50
	Trade/Conference Center	0	300	300
	TOTAL	4,570	2,100	6,670
3	Offices	5,300	3,450	8,750
	Hotel	280*	0	280
	Retail	270	50	320
	Culture	100	0	100
	Transportation	50	0	50
	TOTAL	6,000	3,500	9,500

*700 square feet per guest room (not including conference or banquet facilities).

site and the proposed development for Alternative 1 for the Post Office site. Alternatives 2 and 3 in this analysis are similarly defined.

2. Only the total proposed "build-out" development for each of the alternatives as described above was analyzed. No assessment was made at this stage of the separate impacts of each of the proposed phases of each alternative. An analysis of the proposed development phasing for the selected alternative is discussed below.

3. The rehabilitation of the existing Terminal Annex on the Post Office site was assumed to be entirely office use. This was done to present a "worst case" analysis, since the office use will generate the greatest peak hour traffic impact of all the possible uses listed.

4. When the subalternative options (e.g., "signature office building or 400-room hotel and office") were indicated, office development was assumed for the same reason.

It can be seen by the information of Table 16 that the three alternatives represent increasingly greater densities of development for the two sites with a total of 5.2 million square feet in Alternative 1, 6.7 million square feet in Alternative 2, and 9.5 million square feet in Alternative 3.

The alternatives differed primarily in regard to the square footage of office space planned on the two parts of the site. In addition, Alternatives 2 and 3 featured a 100,000-square foot museum on the Union Station Property; and Alternative 2 also would locate a trade center exhibition and conference center on the USPS property.

EVALUATION APPROACH

At this stage of evaluation, transportation impact analyses focused on the following key criteria:

1. Traffic congestion impacts;
2. Parking demands;

3. Transit use; and
4. Car Occupancy (ridesharing)

Other evaluation factors were considered as design requirements, as potential project costs, as constraints on mitigation measures or as "side effects" of mitigation. A tabulation of criteria not evaluated (mainly because there were no perceivable differences among alternatives) can be found in Appendix C.

The principal questions explored in this evaluation were:

1. What kind of improvements will be necessary to deal with the sites' traffic impacts?

2. Can parking demand be satisfied on-site, and if so how?

3. How much of the traffic demand can reasonably be allocated to transit and ridesharing?

Traffic mitigation measures were designed to maintain Service Level E or better at all intersections near the site. Parking measures took the form of on-site parking and incentives for different types of users to use different parking facilities within the site. Transit mitigation measures featured additional bus services.

Capital costs were projected for the traffic mitigation measures.

TRANSPORTATION BASELINE

The transportation baseline consists of the existing, committed, and assumed projects, which are listed in Table 17.

Highway Baseline

Items 2 through 4 of the Highway Baseline are committed as part of the busway extension and Metro Rail MOS-1 projects. Their acceptability and funding appear

TABLE 17

ASSUMED TRANSPORTATION BASELINE

HIGHWAY BASELINE (Year)

1. Existing System (1986)
2. Busway and added lane along U.S. 101 (1988)
3. Alameda Street Improvements (1987)
4. Vignes Street Improvement (1990)
5. Vignes/Ramirez/Center/Santa Fe Streets Arterial (2001)

TRANSIT BASELINE

1. Existing Local Bus Service (1986)
2. Busway Extension, Alameda Street Bus Station (1988)
3. Privatization of most Busway Express Routes (1988)
4. MOS-1 of Metro Rail (1992)
5. Metro Rail Bus Terminal and Busway Ramps (1992)
6. Long Beach-Los Angeles LRT (1993)
7. Metro Rail Extensions west of MacArthur Park (1997) and to San Fernando Valley (2002)
8. Light Rail Line to Pasadena (1995)
9. Light Rail Line (via Burbank Branch) to Canoga Park (1997)

PARKING BASELINE

1. Existing Facilities including USPS Structure (1986)
2. County Structures (1990)
3. Underground Parking, LAUPT Forecourt (1990)
4. Underground Parking, Metro Rail (1992)

assured. The Vignes/Ramirez/Center/Santa Fe Streets Arterial appear likely to be implemented by the City over the next 15 years.

Transit Baseline

Items 1, 2, 4, 5 and 6 of the Transit Baseline represent projects which have cleared environmental impact hurdles and currently have had funding committed for their construction and operation. Item 8 has been the subject of a route refinement study -- though present LACTC plans assume that the line will connect into a northerly extension of the programmed Flower Street Subway. A Union Station terminus for the line, feeding Metro Rail, has been assumed in this study for the purpose of defining transit needs within the Union Station property.

Item 9, the Los Angeles - Canoga Park (Burbank branch) LRT, is not fully committed. LACTC is conducting route refinement studies on the segment from Chandler/Lankershim Metro Rail Station to Canoga Park along the right-of-way of the Burbank Branch. A rail transit line from Los Angeles to Glendale is included in the map endorsed by public opinion in the 1980 Proposition A referendum. Santa Fe Pacific studies indicate that a light rail line in the Glendale-Burbank corridor, with a stop or terminal at Union Station, will be feasible, and relatively low in capacity cost. The San Diego and Portland experience has shown that light rail has public appeal, and that it can be implemented in less than 10 years from initial planning studies. The Burbank branch has, therefore, been assumed in planning for on-site transit facilities and in projecting future mode choices of site employees. The effect of not building these light rail lines or Metro Rail extensions, is discussed in Part IV of this report under the heading of "Contingency Analysis".

Parking Baseline

The parking baseline includes existing facilities and the planned parking structures in the Los Angeles County "pipeline", off-site. On the Union Station site, the west side subsurface and surface parking (1,000 spaces) and the subsurface parking on the east side of Union Station (1,000 spaces) are expected to be completed during Metro Rail construction. There will also be so that additional levels of parking can be added without interfering with bus operations.

On the Post Office property, the existing surface lots and structure totaling 966 spaces are assumed to continue. Between the two sites, baseline parking would amount to about 3,000 spaces as of 1992, including parking available for Metro Rail users.

TRAFFIC AND PARKING ANALYSES

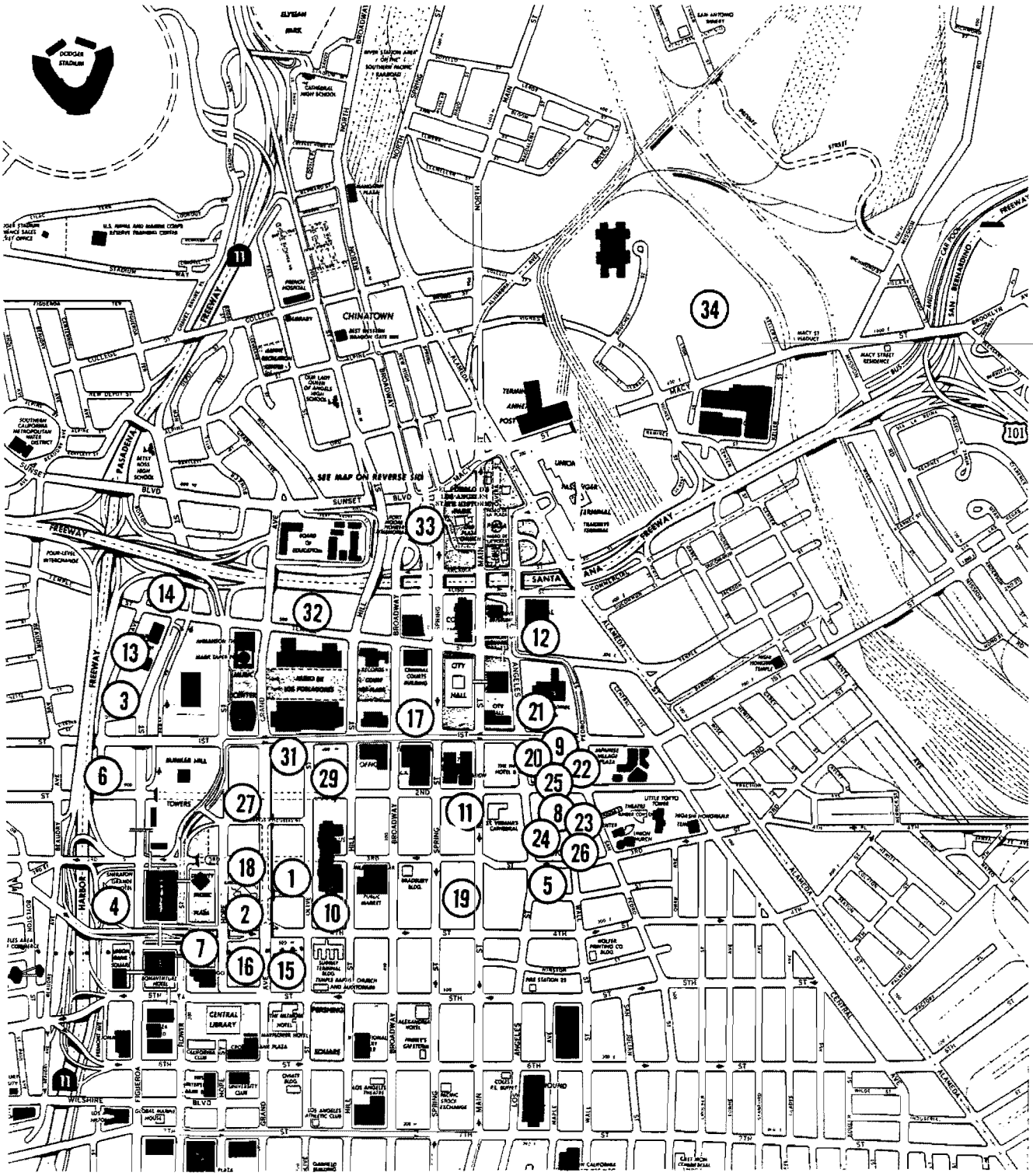
This section summarizes the evaluation process used in the evaluation of the three alternatives described above. It is directed at the identification of roadway improvements which would be required if any of the three concepts were to be implemented, while maintaining an acceptable level of service at all intersections within the study area.

Background Traffic Conditions

Seventeen intersections were identified by CRA to be analyzed in the Union Station Area Master Plan Transportation Study. As indicated in Table 2 - Part I, the availability of base-year data for these intersections varied and in some cases older traffic counts were projected to estimate 1986 conditions. (A 1% annual growth rate was assumed after consultation with LADOT and CRA staff, for these projections.)

Other Projects and Their Effects on Traffic. In order to assess the impacts of the Union Station development scenarios on future traffic conditions, further traffic generated by other projects which would influence the study area had to be estimated. CRA provided a list of developments "in the pipeline" -- i.e. currently being planned or considered in the downtown, Chinatown, and El Pueblo areas, as well as the area to the east of Union Station. The consultant team, CRA and LADOT determined that these areas would serve as an appropriate area of influence for this project. Figure 48 illustrates the location of these planned developments within the area of influence. Table 18 provides a summary of the size and type of each of the projects shown in Figure 48.

The information from Table 18 was used to estimate the traffic expected to be generated by each of these projects. Table 19 lists the traffic generation-rates which



Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study LOCATION OF PLANNED DEVELOPMENTS	FIGURE 48

TABLE 18

LIST OF PLANNED DEVELOPMENTS
LOS ANGELES UNION STATION MASTER PLAN AREA AND VICINITY

No.	Project	Land Use	Size	
1	California Plaza I	Office	880,000	SF
		Retail	30,000	SF
		Other	100,000	SF
2	Crocker II	Office	1,000,000	SF
		Retail	20,000	SF
3	Figueroa Plaza I	Office	307,000	SF
4	Sheraton Grande	Office	50,000	SF
		Retail	50,000	SF
		Hotel	553	rooms
5	Villa Condo	Residential	176	DU
6	Promenade Tower	Office	26,000	SF
		Retail	40,000	SF
		Residential	493	DU
7	YMCA	Health/Sports	70,000	SF
8	Brunswig Square	Office	120,000	SF
		Retail	30,000	SF
9	Sunshine Hotel	Hotel	178	rooms
		Retail	10,000	SF
10	California Plaza II/III	Office	2,320,000	SF
		Retail	118,000	SF
		Residential	750	DU
		Hotel	450	rooms
11	County Engineering	Office	50,000	SF
		Retail	52,000	SF
12	Federal Center	Office	400,000	SF
		Other	555,000	SF
13	Figueroa Plaza II	Office	300,000	SF
14	Gateway	Office	573,000	SF
		Retail	20,000	SF

TABLE 18 (Continued)

LIST OF PLANNED DEVELOPMENTS
LOS ANGELES UNION STATION MASTER PLAN AREA AND VICINITY

No.	Project	Land Use	Size	
16	Library Square	Office	1,250,000	SF
		Retail	50,000	SF
17	New County Mall	Office	500,000	SF
		Retail	50,000	SF
18	Promenade Grand	Office	75,000	SF
		Retail	25,000	SF
		Residential	950	DU
19	State Office Building	Office	590,000	SF
		Retail	12,000	SF
20	All Right Parking	Retail	38,000	SF
21	First Street North	Office	600,000	SF
		Retail	250,000	SF
		Residential	135	DU
22	Great Ginza	Office	150,000	SF
		Retail	100,000	SF
			400	rooms
23	Little Toyko Plaza	Office	22,000	SF
		Retail	11,000	SF
24	New Otani Expansion	Hotel	200	rooms
25	San Nana Go	Retail	30,000	SF
26	Taira Hotel	Hotel	400	rooms
27	Parcel K	Hotel	400	rooms
		Retail	100,000	SF
28	Parcel Q	Office	1,300,000	SF
		Retail	121,755	SF
29	Parcel W1	Office	250,000	SF
30	Parcel K - Parking Adjustment			

TABLE 18 (Continued)

LIST OF PLANNED DEVELOPMENTS
LOS ANGELES UNION STATION MASTER PLAN AREA AND VICINITY

No.	Project	Land Use	Size	
31	Parcel Q - Parking Adjustment			
32	Lot 2 - Additional Parking			
33	Plaza International	Hotel	294	rooms
34	SCRTD Central Maintenance Facility	Bus Garage and Maintenance Depot		

TABLE 19

TRIP GENERATION RATES FOR CUMULATIVE PROJECTS

Land Use	Unit	Daily Rate	A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total
Office	1,000 SF	8.45	1.06	0.18	1.24	0.20	1.20	1.40
Retail	1,000 SF	7.60	0.08	0.07	0.15	1.43	1.70	3.13
Hotel	Room	10.50	0.57	0.28	0.85	0.38	0.39	0.77
Condo	Dwelling Unit	6.60	0.10	0.40	0.50	0.27	0.16	0.43
YWCA	1,000 SF	15.0	0.60	0.40	1.00	0.31	0.39	0.70
Other	1,000 SF	15.0	0.60	0.40	1.00	0.31	0.39	0.70

were used for these cumulative developments. Table 20 summarizes the traffic generation estimates for the various cumulative projects.

The cumulative project traffic was assigned to the baseline future street system within the study area to determine its impact on the key intersections of interest. Estimates of the impact of the cumulative projects on each of the study intersections during the morning and evening peak hours were made. These peak hour traffic levels were then added to the existing peak hour traffic information to obtain estimates of future intersection operations without the Union Station project. The resulting future traffic levels serve as the base traffic levels for the analysis of the impacts of the Union Station project.

Levels of service at the intersections in the morning and evening peak hours for future conditions without the Union Station project were determined using the ICU method. The results of these analyses are presented in Table 21.

SITE TRAFFIC PROJECTIONS

Traffic projections for the various alternative development schemes were prepared using techniques and assumptions which are consistent with transportation planning efforts conducted throughout the downtown area of Los Angeles and Chinatown. These include trip generation rates, trip distribution patterns, traffic assignment techniques, and intersection capacity analysis standards.

Assumptions

In view of the experience of the last 10 to 15 years, projections of mode choice beyond the Year 2000 are subject to errors in estimating motor fuel availability and cost, public policy measures on air pollution control, and effectiveness of public and private entities in marketing transit and carpooling. For this analysis it was assumed that the developer would implement restrictions favoring transit and ridesharing in order to secure a maximum intensity of land use. These analyses represented an exploration of maximum feasible use of transit and ridesharing for Alternative 3, a reasonable modal split for Alternative 1, and intermediate values for Alternative 2. These assumptions imply construction of Metro Rail, LRT lines, etc. in the transit baseline. For

TABLE 20

TRIP GENERATION FOR CUMULATIVE PROJECTS

Project	Land Use	Size		Daily Trips	A.M Peak Hour In	A.M Peak Hour Out	A.M Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total
California Plaza I	Office	880,000	SF	7,436	933	158	1,091	183	1,053	1,236
	Retail	30,000	SF	228	2	2	5	43	51	94
	Other	100,000	SF	1,500	60	40	100	31	39	70
				9,164	995	200	1,196	257	1,143	1,400
Crocker II	Office	1,000,000	SF	8,450	1,060	180	1,240	208	1,196	1,404
		20,000	SF	152	2	1	3	7	8	15
				8,602	1,062	181	1,243	215	1,204	1,419
Figueroa Plaza I	Office	307,000	SF	2,594	325	56	381	64	367	431
Sheraton Grande	Office	50,000	SF	423	53	9	62	10	60	70
	Retail	50,000	SF	380	4	4	8	60	210	270
	Hotel	553	rooms	5,807	315	155	470	210	216	426
				6,609	372	168	540	280	486	766
Villa Condo	Residential	176	DU	1,162	18	70	88	48	28	76
Promenade Tower	Office	26,000	SF	220	28	5	32	5	30	35
	Retail	40,000	SF	304	3	3	6	14	16	30
	Residential	493	DU	3,254	49	197	247	133	79	212
				3,778	80	205	285	152	125	277
YMCA	Health/ Sports	70,000	SF	1,050	42	28	70	22	27	49
Brunswig Square	Office	120,000	SF	1,014	127	22	149	22	136	158
	Retail	30,000	SF	228	2	2	4	11	12	23
				1,242	129	24	153	33	148	181
Sunshine Hotel	Hotel	178	rooms	1,869	101	50	151	68	70	138
	Retail	10,000	SF	76	1	1	2	14	17	31
				1,945	102	51	153	82	87	169
California Plaza II/III	Office	2,320,000	SF	19,604	2,460	417	2,877	432	2,635	3,067
	Retail	118,000	SF	897	9	8	18	408	333	741
	Residential	750	DU	4,950	75	300	375	203	120	323
	Hotel	450	rooms	4,725	256	126	383	171	176	247
				30,176	2,800	852	3,652	1,214	3,264	4,478
County Engineering	Office	50,000	SF	4,225	530	90	620	93	448	541
	Retail	52,000	SF	395	4	4	8	19	20	39
				4,620	534	94	628	112	468	580
Federal Center	Office	400,000	SF	3,380	424	72	496	74	454	528
	Other	555,000	SF	8,325	333	222	555	178	216	394
				11,705	757	294	1,051	252	670	922
Figueroa Plaza II	Office	300,000	SF	2,535	318	54	372	56	341	397
Gateway	Office	573,000	SF	4,842	607	103	710	107	513	620
	Retail	20,000	SF	152	2	1	3	7	8	15
				4,994	609	104	713	114	521	635
Grand Place	Office	1,200,000	SF	10,140	1,272	216	1,488	223	1,075	1,298
	Retail	20,000	SF	152	2	1	3	7	8	15
				10,292	1,274	217	1,491	230	1,083	1,313
Library Square	Office	1,250,000	SF	10,563	1,325	225	1,550	233	1,420	1,653
	Retail	50,000	SF	380	4	4	8	19	20	39
				10,943	1,329	229	1,558	252	1,440	1,692

TABLE 20 (Continued)

TRIP GENERATION FOR CUMULATIVE PROJECTS

Project	Land Use	Size		Daily Trips	A.M Peak Hour In	A.M Peak Hour Out	A.M Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total
New County Mall	Office	500,000	SF	4,225	530	90	620	110	590	700
	Retail	50,000	SF	380	4	4	8	19	19	38
				4,605	534	94	628	128	610	738
Promenade Grand	Office	75,000	SF	634	80	13	93	14	85	99
	Retail	25,000	SF	190	2	2	4	10	10	20
	Residential	950	DU	6,270	95	380	475	257	152	409
				7,094	177	395	572	381	247	528
State Office Building	Office	590,000	SF	4,986	626	106	732	110	670	780
	Retail	12,000	SF	91	1	1	2	4	5	9
				5,077	627	107	734	114	675	789
All Right Parking	Retail	38,000	SF	289	3	3	6	14	15	29
First Street North	Office	600,000	SF	5,070	636	108	744	132	708	840
	Retail	250,000	SF	1,900	20	18	38	93	97	190
	Residential	135	DU	891	14	54	68	36	22	58
				7,861	669	180	849	260	828	1,088
Great Ginza	Office	150,000	SF	1,268	159	27	186	28	170	198
	Retail	100,000	SF	760	8	7	15	38	38	76
	Hotel	400	rooms	4,200	228	112	340	152	156	308
				6,228	395	146	541	218	364	582
Little Tokyo Plaza	Office	22,000	SF	186	23	4	27	4	25	29
	Retail	11,000	SF	84	1	1	2	4	4	8
				270	24	5	29	8	29	37
New Otani Expansion	Hotel	200	rooms	2,100	114	56	170	72	74	146
San Nana Go	Retail	30,000	SF	228	2	2	4	11	12	23
Taira Hotel	Hotel	400	rooms	4,200	228	112	340	144	148	292
Parcel K	Hotel	400	rooms	4,200	228	112	340	144	148	292
	Retail	100,000	SF	760	8	7	15	38	38	76
				4,960	236	119	355	182	186	368
Parcel Q	Office	1,300,000	SF	10,985	1,378	234	1,612	242	1,164	1,406
	Retail	121,755	SF	925	10	9	19	45	47	92
				11,910	1,388	243	1,631	287	1,211	1,498
Parcel W1	Office	250,000	SF	2,113	265	45	310	47	224	271
Parcel K - Parking Adjustment				502	(251)	0	(251)	0	(251)	(251)
Parcel Q - Parking Adjustment				1,636	(818)	0	(818)	0	(818)	(818)
Lot 2 - Additional Parking				2,138	1,069	0	1,069	0	1,069	1,069
Plaza International	Hotel	294	rooms	3,087	167	82	250	109	115	224
SCRTD Central Maint. Bus Depot				--	--	--	--	--	--	--
				175,706	15,577	4,413	19,990	5,214	15,992	21,206

TABLE 21

LEVEL OF SERVICE ANALYSES
FUTURE CONDITIONS WITHOUT PROJECT

Intersection	A.M. Peak Hour V/C	A.M. Peak Hour LOS	P.M. Peak Hour V/C	P.M. Peak Hour LOS
N. Hill & Alpine	0.90	D/E	0.97	E
N. Broadway & College	0.73	C	0.77	C
N. Broadway & Alpine	0.80	C/D	0.90	D/E
Broadway & Sunset	0.55	A	0.71	C
New High/Spring & Sunset	0.51	A	0.41	A
N. Main & Vignes	0.52	A	0.58	A
N. Main & Alameda	0.50	A	0.62	B
N. Main & Sunset	0.45	A	0.59	A
Alameda & Macy/Sunset	0.53	A	0.65	B
Alameda & Los Angeles	0.39	A	0.47	A
Alameda & Aliso/Arcadia*	0.77	C	0.39	A
Alameda & Commercial*	0.49	A	0.79	C
Los Angeles & Arcadia	0.41	A	0.40	A
Los Angeles & Aliso	0.35	A	0.76	C
Vignes & Macy*	0.70	B/C	0.77	C
Vignes & Ramirez/Fwy. Ramps*	0.32	A	0.44	A
Macy & Pleasant/Brooklyn	0.35	A	0.32	A

* With planned improvements.

Alternatives 2 and 3 they imply auto use disincentives -- such as requiring employees to pay for their own parking or providing employees with transit passes or commuting tickets at discount rates -- as is presently done by SCAG. If there are no environmental or energy "crises" to justify these policies, then the developer may have to provide for higher levels of auto use or accept a lower level of office development.

Transit Use

Current transit use by Union Station and Postal Service employees is low (5-10%) because their work schedules tend not to fit the supply of public transportation, because many of them travel off-peak, and because inexpensive parking is available. All the alternative plans, with their emphasis on office buildings, will create peak-hour travel demands and will need high-cost structure parking. The result will be a better market for public transportation.

Records of transit use for employees in downtown Los Angeles are available from biennial cordon counts. The new accumulation of people within downtown from 6AM to 9AM approximates downtown employment. Since 1970, the percentage of these people arriving by transit has ranged from 35 to 43%, depending primarily on motor fuel costs and employer policy on parking.

For build-out (Year 2000 or later), it was assumed that transit use would be 20% (about half of downtown levels) for Alternative 1 (4.3 million square feet of office space), 33% for Alternative 2 (5.5 million square feet of office space) and 43% for Alternative 3 (8.8 million square feet of office floor space).

Ridesharing

Ridesharing by present site employees is reported to be low (10-20%) at present, due to the reasons cited above for low transit use. Downtown Los Angeles workers arriving by auto have averaged 1.3 to 1.45 per car since 1970. Average occupancy of autos on freeways in the AM peak by contrast remained under 1.2 even during the 1973-74 and 1979 energy crises.

As with transit, higher employment densities will improve the market for ridesharing management programs. It has been assumed that auto occupancy would average 1.20

(slightly improved) for Alternative 1, 1.33 (typical of downtown at present) for Alternative 2, and 1.40 (typical of strong ridersharing programs) for Alternative 3. Over 50% of employees will have to be either using transit or otherwise ridesharing in Alternative 2 and about 70% will have to be using transit or carpools or vanpools in Alternative 3. Direct carpool ramp access from the El Monte Busway extension to the site's parking garages and convenient spaces reserved for carpools, will aid in achieving these objectives.

Trip Generation

The motor vehicle trip generation rates used in this analysis (Table 22) reflect the relatively good public transportation and ridesharing accessibility of the site. Although mode choice was not projected for individual origin-destination pairs in this particular study, mode choice forecasts by others for SCAG, SCRTD, LACTC and CRA of downtown Los Angeles travel were used in projecting auto trips for this project.

The trip generation rates for retail and office used in this analysis are lower than typical rates for these uses. The rates used here are from work done by Barton-Aschman Associates and Peat-Marwick-Mitchell specifically for large developments in the Los Angeles downtown area. These rates have been accepted by the City of Los Angeles and the CRA, and they reflect documented transit and ridesharing characteristics for downtown Los Angeles.

Trip generation estimates for each of the alternatives were developed by applying the appropriate rate to each land use. The results are shown in Tables 23 and 24.

For Alternative 1, approximately 3.700 vehicles would desire to exit the Union Station property in the P.M. peak hour, and an additional 1,600 vehicles would be seeking to exit the Post Office property, a total of about 5,300 vehicles. For Alternative 2, P.M. peak exiting volumes would total over 5,600 vehicles -- 4,000 from the Union Station property and 1,600 from the Post Office property. For Alternative 3, P.M. peak exiting volumes would exceed 8,000 vehicles, over 5,000 from Union Station property and approximately 3,000 from the Post Office property.

Trip Distribution and Assignment. The distribution of vehicular trips generated by each alternative was performed using the pattern shown in Figure 49. This pattern

TABLE 22

TRIP GENERATION RATES FOR ALTERNATIVES 1, 2, AND 3

Land Use (units)	A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total
Retail (1,000 sq. ft.)	0.08	0.07	0.15	0.37	0.39	0.76
Office (1,000 sq. ft.)						
Alternative 1	1.01	0.17	1.18	0.21	1.09	1.30
Alternatives 2 and 3	0.79	0.13	0.92	0.16	0.85	1.01
Hotel (room)	0.57	0.28	0.85	0.37	0.39	0.76
AMTRAK (1,000 sq. ft.)	1.37	0.59	1.96	0.63	1.47	2.10
Cultural/Museum (1,000 sq. ft.)	1.30	1.30	2.60	3.53	3.17	6.70
Health Club (1,000 sq. ft.)	0.28	0.19	0.47	0.63	0.42	1.05
Trade Center (1,000 sq. ft.)	0.25	0.17	0.42	0.28	0.28	0.56

TABLE 23

A.M. PEAK HOUR AUTO TRIP GENERATIONS FOR ALTERNATIVE DEVELOPMENT SCENARIOS

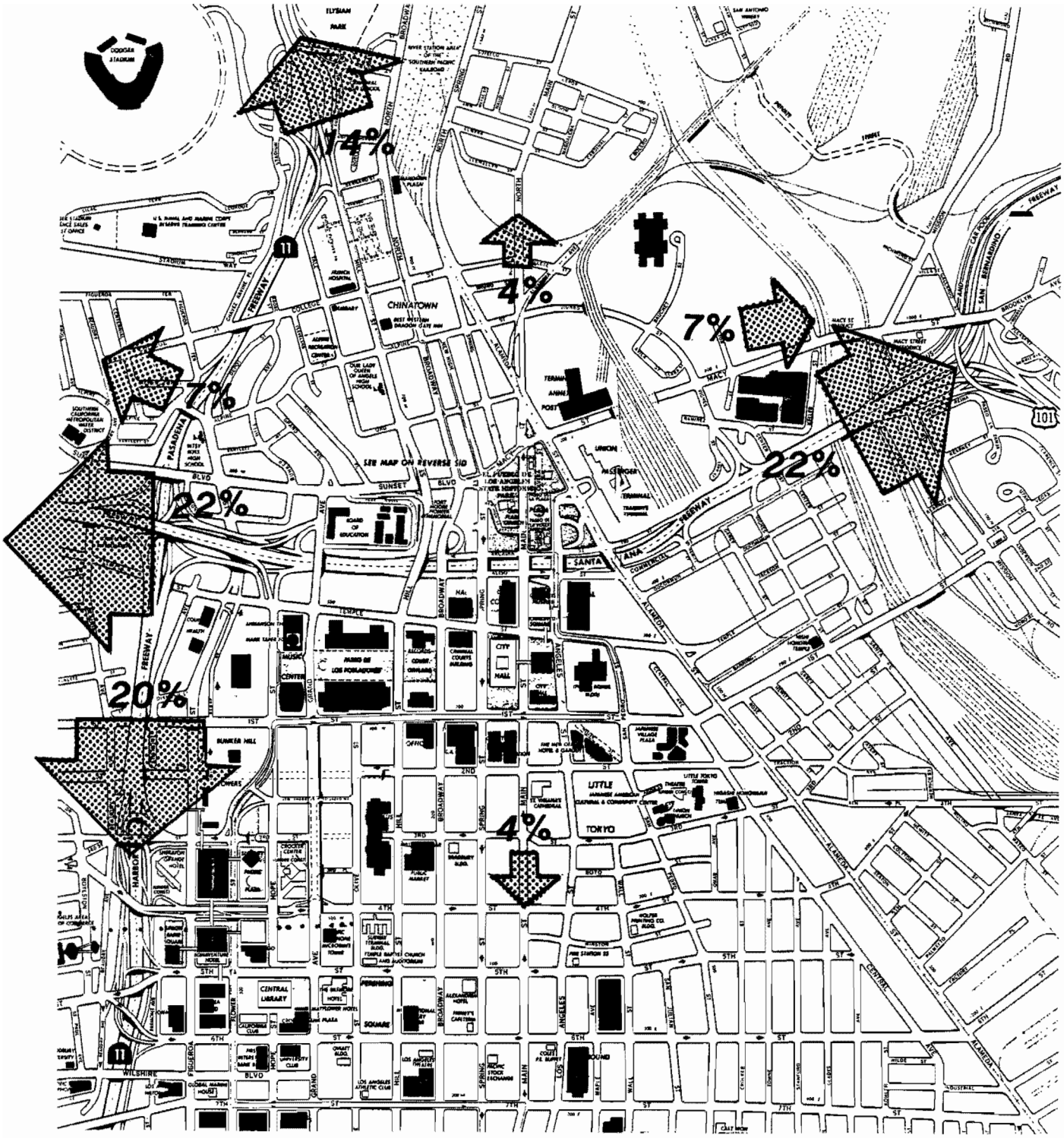
		Trip Ends by Site					
		Union Station		Post Office		Total	
Alternatives	Land Use	In	Out	In	Out	In	Out
1	Offices	3,030	510	1,263	212	4,293	722
	Hotel	200	98	257	126	457	224
	Retail	18	16	4	4	22	20
	Culture	65	65	0	0	65	65
	Transportation	69	29	0	0	69	29
	TOTAL	3,382	718	1,524	342	4,906	1,060
2	Offices	2,946	485	1,383	227	4,323	712
	Hotel	257	126	0	0	257	126
	Retail	18	16	4	4	22	20
	Culture*	223	214	0	0	223	214
	Transportation	69	29	0	0	69	29
	Trade Conference Center	0	0	75	51	75	51
	TOTAL	3,513	870	1,462	282	4,975	1,152
3	Offices	4,363	721	2,726	448	7,089	1,169
	Hotel	228	112	0	0	228	112
	Retail	22	19	4	4	26	23
	Culture	130	130	0	0	130	130
	Transportation	69	29	0	0	69	29
	TOTAL	4,812	1,011	2,730	452	7,542	1,463

*Includes health club.

TABLE 24

P.M. PEAK HOUR AUTO TRIP GENERATIONS FOR ALTERNATIVE DEVELOPMENT SCENARIOS

Alternatives	Land Use	Trip Ends by Site: Union Station In	Union Station Out	Post Office In	Post Office Out	Total In	Total Out
1	Offices	630	3,270	255	1,370	885	4,640
	Hotel	129	137	167	176	296	313
	Retail	85	88	20	20	105	108
	Culture	177	159	0	0	177	159
	Transportation	31	74	0	0	31	74
	TOTAL	1,052	3,728	442	1,566	1,494	5,294
2	Offices	597	3,171	280	1,488	877	4,659
	Hotel	167	176	0	0	167	176
	Retail	85	88	20	20	105	108
	Culture	594	519	0	0	594	519
	Transportation	31	74	0	0	31	74
	Trade/Conference Center	0	0	84	84	84	84
	TOTAL	1,474	4,028	384	1,592	1,858	5,620
3	Offices	848	4,505	552	2,933	1,400	7,438
	Hotel	148	156	0	0	148	156
	Retail	108	108	20	20	128	128
	Culture	354	318	0	0	354	318
	Transportation	31	74	0	0	31	74
	TOTAL	1,480	5,161	571	2,953	2,061	8,114



Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE 49
	DIRECTIONAL DISTRIBUTION OF SITE AREA TRIPS	

was prepared from information obtained from other previously conducted studies in the downtown area. Using the trip distribution pattern and the trip generation estimates, traffic was assigned to the street system within the study area. Figures 50, 51, and 52 illustrate the project-generated traffic for Alternatives 1, 2, and 3, respectively.

The peak hour traffic volumes from Figures 50, 51, and 52 were then added to the future base traffic levels, as previously described. The resulting future traffic volumes, which are illustrated in Figures 53, 54, and 55 represent the total future traffic expected for the study area with the implementation of Alternatives 1, 2, and 3, respectively.

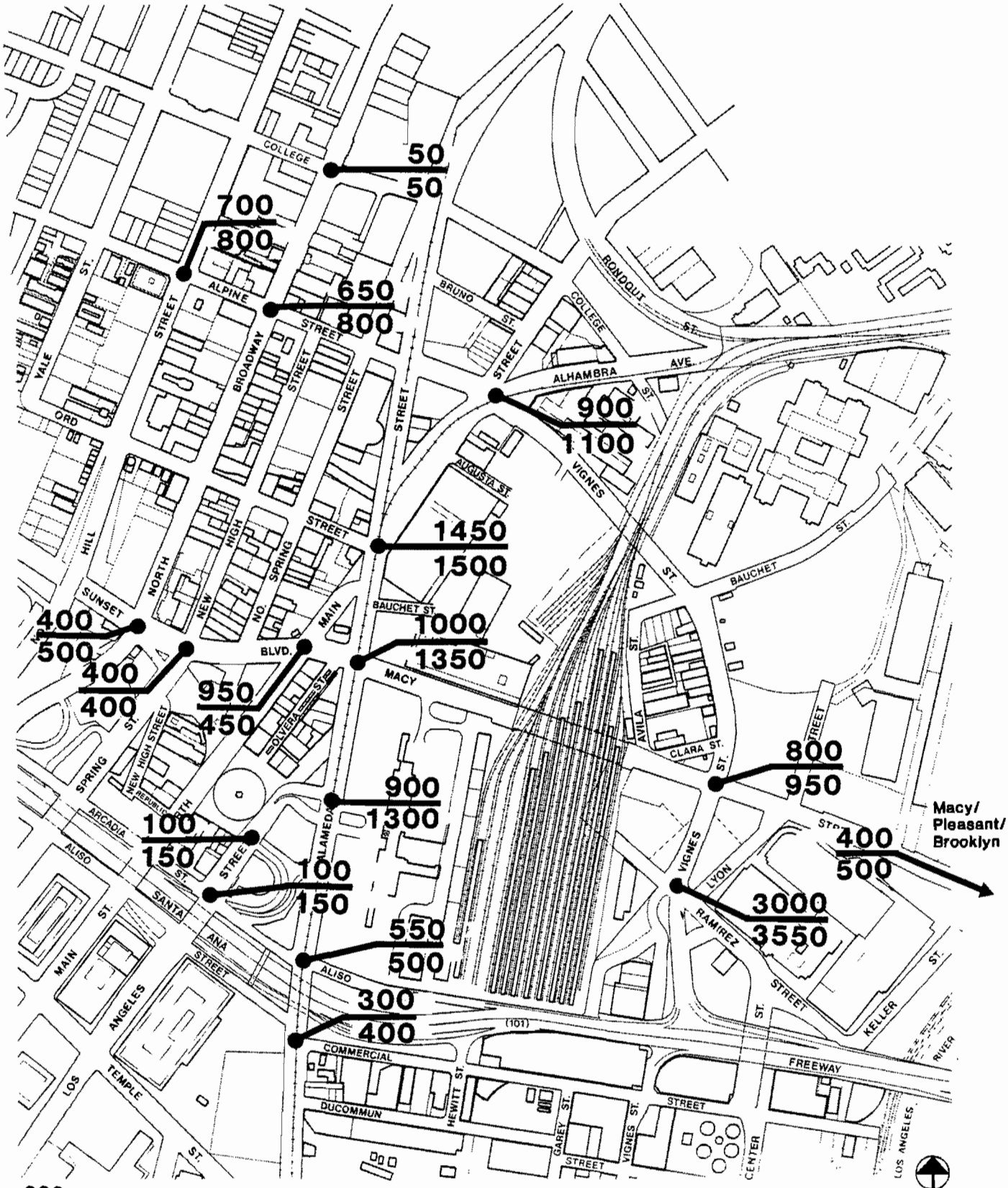
Intersection Levels of Service (LOS). The ICU method of intersection capacity analysis was used to evaluate the volume/capacity ratio and levels of service during the morning and evening peak hour conditions for each of the previously identified seventeen intersections within the study area. The results of these analyses are presented in Tables 25 and 26 for the morning and evening peak hours, respectively.

As shown in the tables, many intersection reach LOS E or F (unacceptable levels) with the addition of project traffic. The number of intersections which reach unacceptable levels increases with the increasing levels of development proposed under each alternative.

Mitigation Measures

This section of the report identifies the mitigation measures which would be required to improve operating conditions at any intersection projected to operate at LOS E or F for each of the alternative development scenarios. These mitigation measures were developed on the sole criteria of improving LOS to an acceptable level, to illustrate the level of improvements that would be needed to accommodate each alternative. It should be recognized that these mitigation measures were not analyzed to determine the ease of implementation in terms of the availability of right-of-way or other similar issues and constraints.

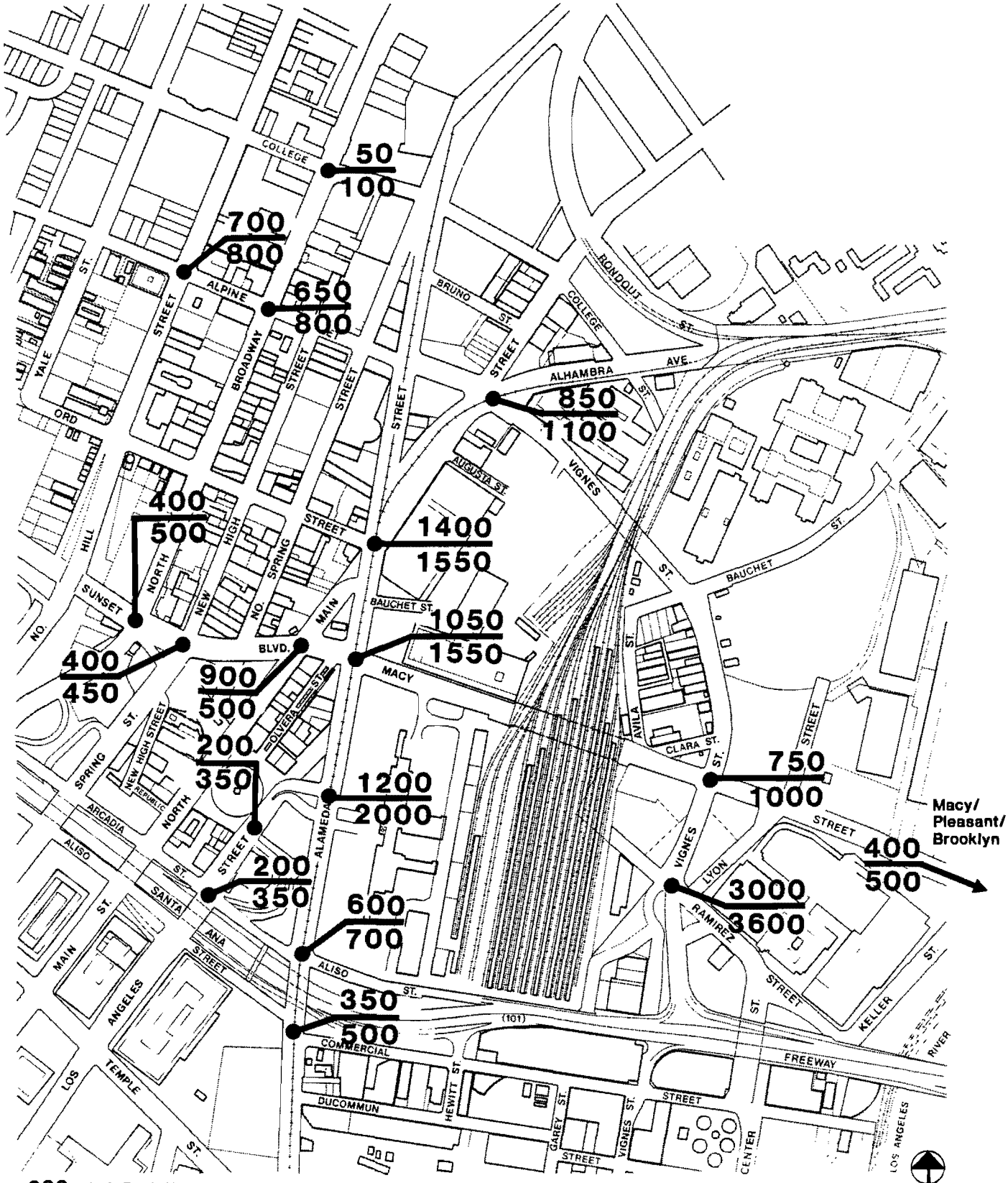
The proposed mitigation measures are cumulative: that is, mitigation for Alternative 2 includes all the mitigation for Alternative 1 plus additional measures needed due



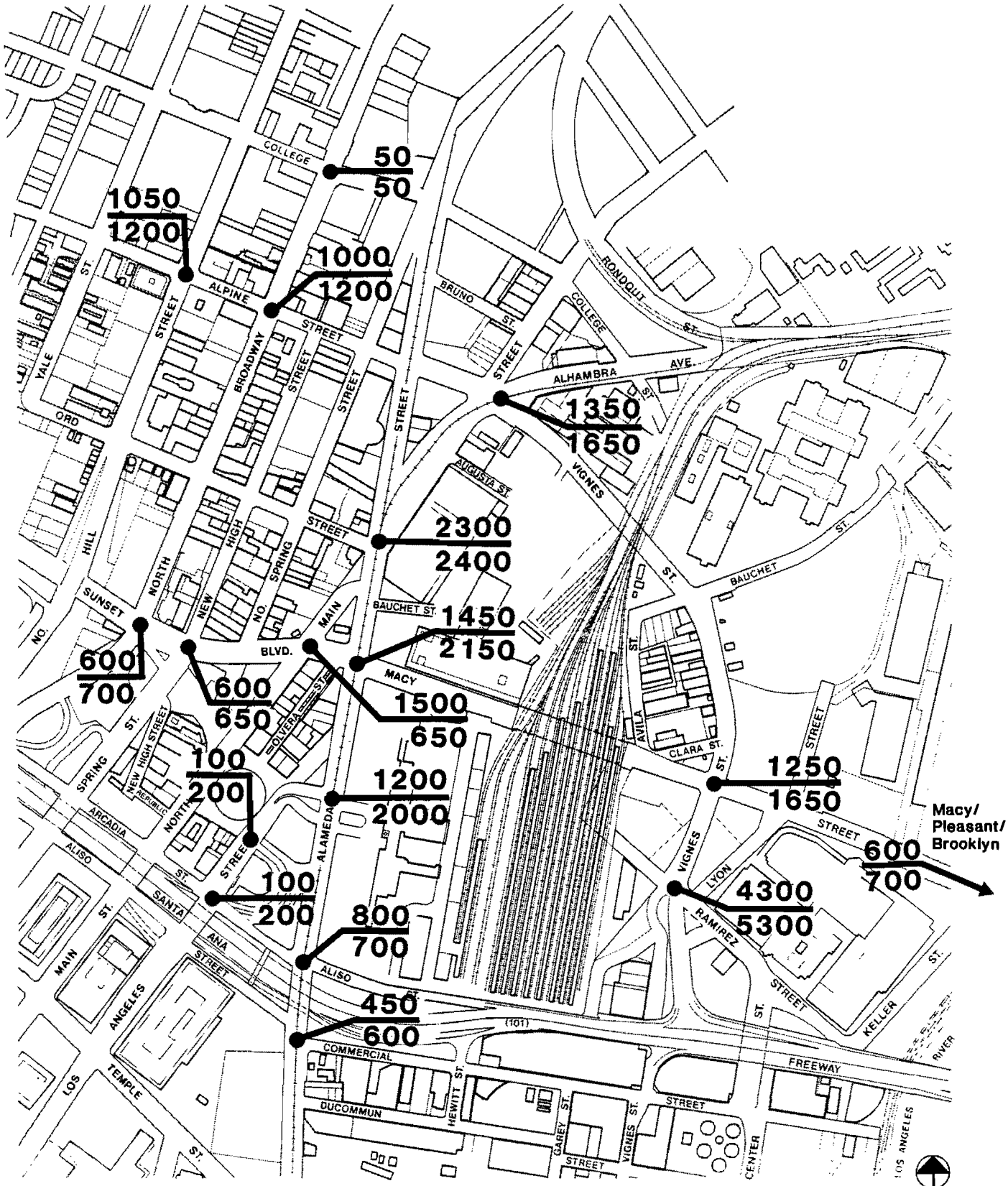
000 A.M. Peak Hour
000 P.M. Peak Hour

200 100 0 100 400

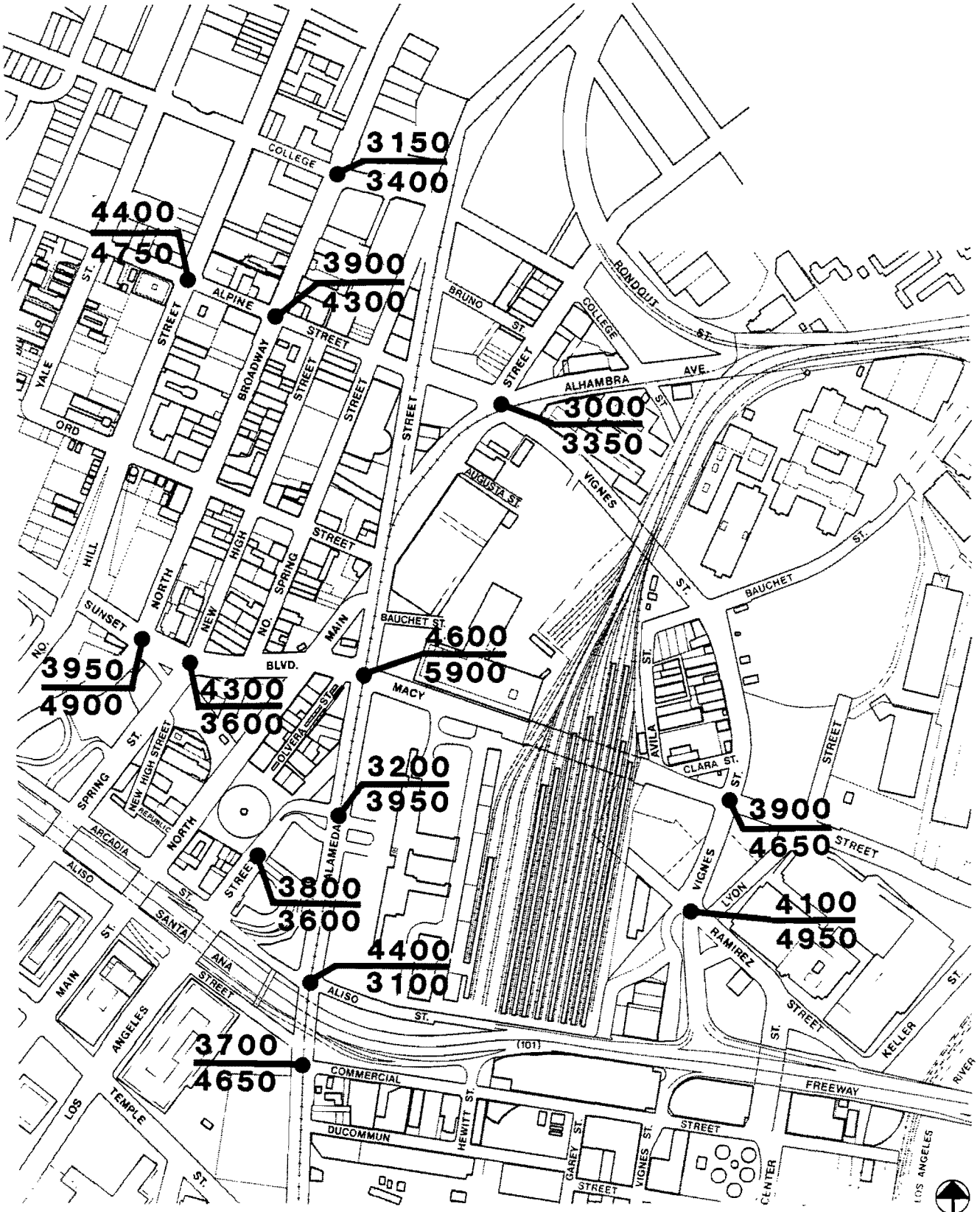
Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study PROJECTED PEAK HOUR TRAFFIC VOLUMES ALTERNATIVE #1	FIGURE 50



Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study PROJECTED PEAK HOUR TRAFFIC VOLUMES ALTERNATIVE #2	FIGURE 51

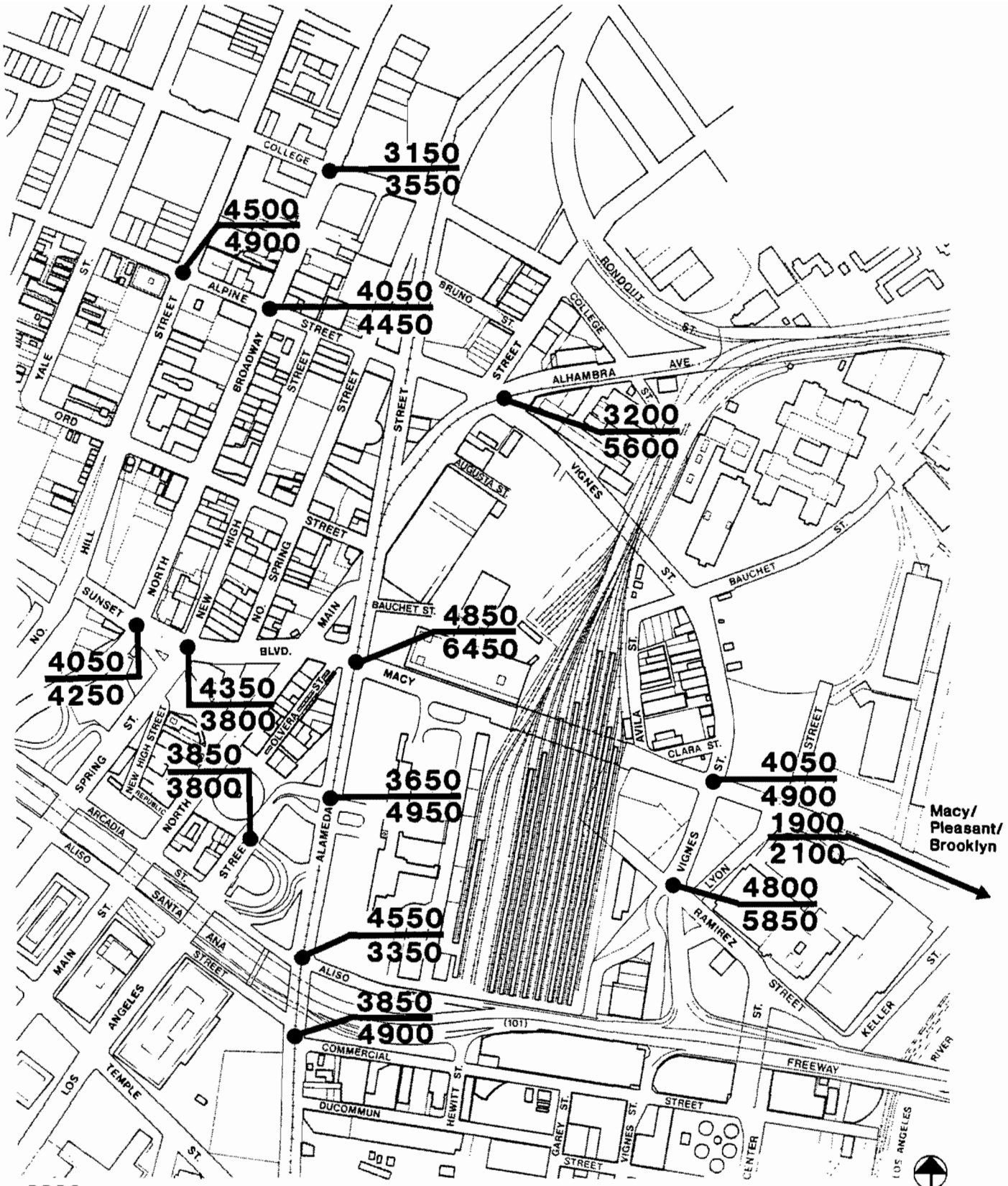


Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	PROJECTED PEAK HOUR TRAFFIC VOLUMES ALTERNATIVE #3	52



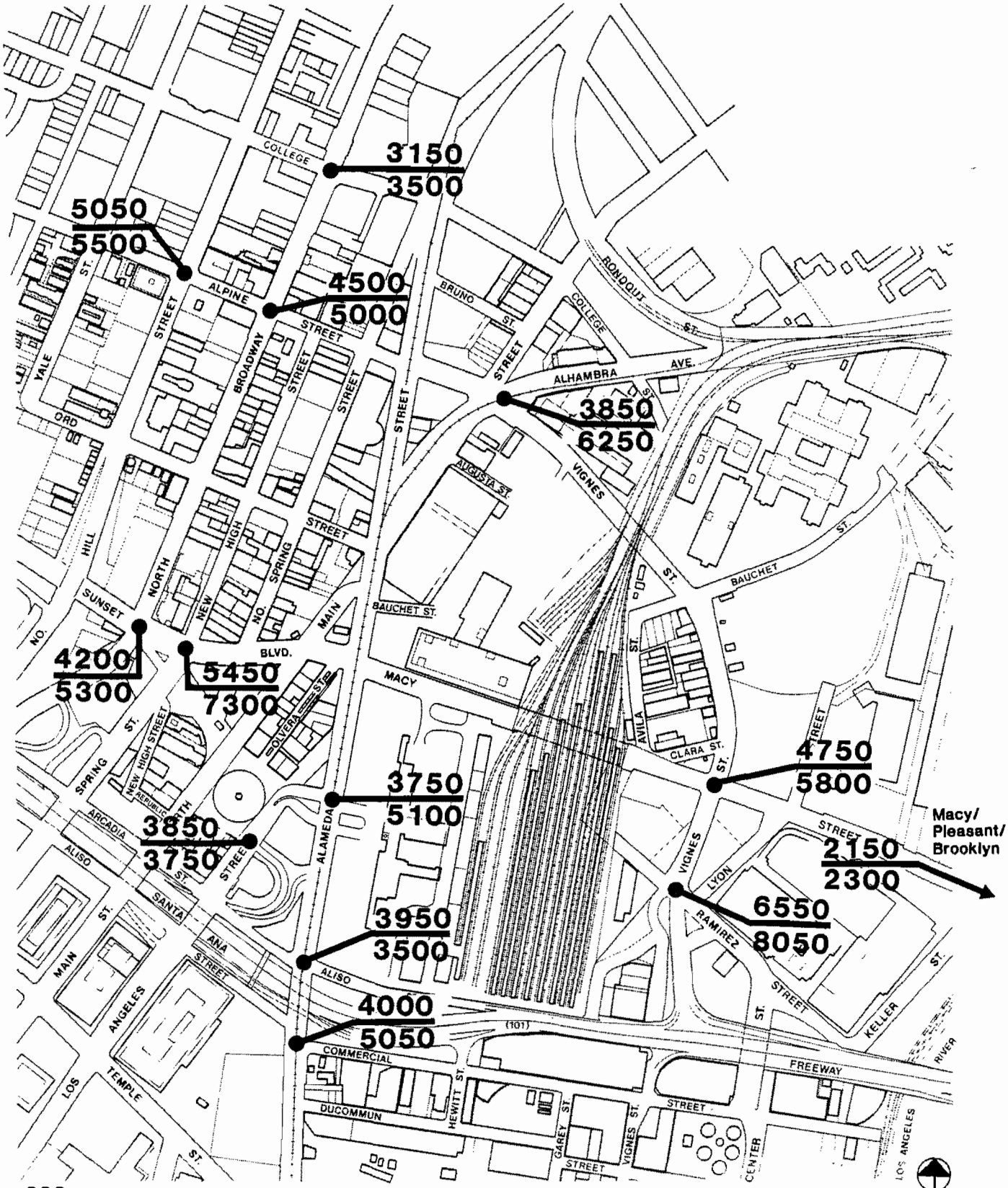
000 :A.M. Peak Hour
000 (P.M. Peak Hour)

Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	TOTAL FUTURE PEAK HOUR TRAFFIC VOLUMES WITH ALTERNATIVE #1	53



0000 A.M. Peak Hour
0000 P.M. Peak Hour

Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	TOTAL FUTURE PEAK HOUR TRAFFIC VOLUMES WITH ALTERNATIVE #2	54



Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study TOTAL FUTURE PEAK HOUR TRAFFIC VOLUMES WITH ALTERNATIVE #3	FIGURE 55

TABLE 25

LEVEL OF SERVICE ANALYSIS
FUTURE CONDITIONS WITH PROJECT
A.M. PEAK HOUR

Intersection	Alternative 1		Alternative 2		Alternative 3	
	V/C	LOS	V/C	LOS	V/C	LOS
N. Hill/Alpine	1.00	E	1.06	F	1.13	F
N. Broadway/College	0.61	B	0.63	B	0.63	B
N. Broadway/Alpine	0.75	C	0.82	D	0.83	D
Broadway/Sunset	0.59	A	0.61	B	0.62	B
New High/Spring/Sunset	0.58	A	0.60	A/B	0.61	B
N. Main/Vignes	0.63	B	0.51	A	0.52	A
Alameda/Macy/Sunset	0.72	C	0.78	C	0.79	C
Alameda/Los Angeles	0.57	A	0.72	C	0.60	A/B
Alameda/Aliso/Arcadia	1.06	F	1.07	F	1.14	F
Alameda/Commercial	1.01	F	1.04	F	1.03	F
Los Angeles/Aliso	0.55	A	0.57	A	0.55	A
Vignes/Macy	0.83	D	0.86	D	0.93	E
Vignes/Ramirez/Fwy	1.27	F	1.49	F	1.68	F
Macy/Pleasant	0.45	A	0.47	A	0.50	A

Note: Arcadia/Los Angeles Streets and North Main/Sunset Boulevard were not evaluated due to lack of traffic data. Subsequent counts indicate that these intersections were not critical.

TABLE 26

LEVEL OF SERVICE ANALYSIS
FUTURE CONDITIONS WITH PROJECT
P.M. PEAK HOUR

Intersection	Alternative 1		Alternative 2		Alternative 3	
	V/C	LOS	V/C	LOS	V/C	LOS
N. Hill/Alpine	0.97	E	1.08	F	1.10	F
N. Broadway/College	0.58	A	0.65	B	0.65	B
N. Broadway/Alpine	0.94	E	1.00	E	1.06	F
Broadway/Sunset	0.73	C	0.75	C	0.76	C
New High/Spring/Sunset	0.43	A	0.44	A	0.44	A
N. Main/Vignes	0.90	D/E	1.47	F	1.54	F
Alameda/Macy/Sunset	0.91	E	1.02	F	1.09	F
Alameda/Los Angeles	0.71	C	1.02	F	0.83	D
Alameda/Aliso/Arcadia	0.69	B	0.74	C	0.71	C
Alameda/Commercial	1.30	F	1.46	F	1.56	F
Los Angeles/Aliso	0.70	B/C	0.76	C	0.73	C
Vignes/Macy	0.99	E	1.06	F	1.30	F
Vignes/Ramirez/Fwy.	2.07	F	2.47	F	2.96	F
Macy/Pleasant	0.43	A	0.46	A	0.49	A

Note: Arcadia/Los Angeles Streets and North Main/Sunset Boulevard were not evaluated due to lack of traffic data. Subsequent counts indicate that these intersections were not critical.

to the increased level of project development. Similarly, the proposed mitigation for Alternative 3 includes these measures proposed for Alternatives 1 and 2.

Mitigation Measures Common to All Alternatives. The following measures would be required for Alternatives 1, 2, and 3.

Hill/Alpine:	Northbound	- add separate left and thru lanes
	Southbound	- add thru lane
	Eastbound	- add separate left turn lane
	Westbound	- add separate left turn lane
Broadway/Alpine:	Eastbound	- add separate left turn lane
	Westbound	- add separate left turn lane
Alameda/Macy:	Southbound	- add separate left turn lane
Alameda/Aliso/Arcadia:	Westbound	- add separate left turn lane
Alameda/Commercial:	Northbound	- add two thru lanes
	Southbound	- add separate left and thru lanes
	Eastbound	- add thru lane
Vignes/Macy:	Eastbound	- add thru lane (SCRTD to add right turn lane)
Vignes/Ramirez:	Northbound	- add thru and two separate left turn lanes
	Eastbound	- add left turn and two thru lanes
	Westbound	- add thru lane

Alternative 2 Mitigation Measures. In addition to the common mitigation measures, the following would be needed to mitigate Alternative 2 impacts.

Hill/Alpine:	Southbound	- add separate left and thru lanes
Main/Vignes:	Eastbound	- add second left turn lane
	Westbound	- add thru lane
Alameda/Macy:	Northbound	- add separate left turn lane
Alameda/Los Angeles:	Westbound	- change the lane configurations to two left turn, one optional right/thru lane, and one right turn lane
Alameda/Commercial:	Southbound	- add two separate left turn lanes and a thru lane
	Westbound	- separate right and left turn lanes by adding one lane

Alternative 3 Mitigation Measures. In addition to the mitigation measures for Alternatives 1 and 2:

Hill/Alpine:	Southbound	- add left turn lane
Broadway/Alpine:	Westbound	- add thru lane
Main/Vignes:	Westbound	- add thru lane
Alameda/Macy:	Southbound	- add thru lane
Alameda/Commercial:	Northbound	- add thru lane
	Southbound	- add left turn lane
Vignes/Macy:	Southbound	- add thru lane
	Eastbound	- add thru lane
	Westbound	- add thru lane
Vignes/Ramirez:	Northbound	- add left turn lane
	Southbound	- add left turn lane
	Eastbound	- add thru lane
	Westbound	- add thru lane

The resulting intersection levels of service for Alternatives 1, 2, and 3 are presented in Tables 27, 28, and 29, respectively.

Note that these mitigation measures apply only to seventeen intersections near the site. The exiting trips desiring to use the freeway system would likely have to be stored at ramp meters in the P.M. peak hour for delays of 5 minutes or longer.

EVALUATION OF DEVELOPMENT POTENTIAL

The next step in the planning process used to evaluate the various development schemes was to use the various types of roadway improvements as a means of determining the development potential of the two sites. The criterion used in establishing this upper limit of development was the ability of the roadway system to continue to operate at an acceptable level of service. To conduct this assessment in an orderly and manageable way, it was necessary to categorize the roadway improvement into four levels. These four levels are:

TABLE 27

LEVEL OF SERVICE ANALYSES
ALTERNATIVE 1 WITH MITIGATION

Intersection	A.M. Peak Hour V/C	A.M. Peak Hour LOS	P.M. Peak Hour V/C	P.M. Peak Hour LOS
N. Hill & Alpine	0.71	C	0.79	C
N. Broadway & Alpine	0.67	B	0.76	C
Alameda & Macy	0.72	C	0.83	D
Alameda & Aliso	0.83	D	0.61	B
Alameda & Commercial	0.60	A/B	0.83	D
Vignes & Macy	0.83	D	0.80	C/D
Vignes & Ramirez	0.66	B	0.74	C

TABLE 28

LEVEL OF SERVICE ANALYSES
ALTERNATIVE 2 WITH MITIGATION

Intersection	A.M. Peak Hour V/C	A.M. Peak Hour LOS	P.M. Peak Hour V/C	P.M. Peak Hour LOS
N. Hill & Alpine	0.69	B	0.73	C
Broadway & Alpine	0.74	C	0.81	D
Main & Vignes	0.43	A	0.87	D
Alameda & Macy	0.62	B	0.83	D
Alameda & Main/USPS	0.51	A	0.66	B
Alameda & Aliso	0.88	D	0.65	B
Alameda & Commercial	0.57	A	0.87	D
Vignes & Macy	0.86	D	0.87	D
Vignes & Ramirez	0.79	C	0.83	D

TABLE 29

LEVEL OF SERVICE ANALYSES
ALTERNATIVE 3 WITH MITIGATION

Intersection	A.M. Peak Hour V/C	A.M. Peak Hour LOS	P.M. Peak Hour V/C	P.M. Peak Hour LOS
N. Hill & Alpine	0.69	B	0.74	C
Broadway & Alpine	0.78	C	0.71	C
Main & Vignes	0.50	A	0.90	D/E
Alameda & Macy	0.64	B	0.88	D
Alameda & Main	0.45	A	0.65	B
Alameda & Aliso	0.89	D	0.63	B
Alameda & Commercial	0.57	A	0.89	D
Vignes & Macy	0.73	C	0.86	D
Vignes & Ramirez	0.89	D	0.90	D/E

- No Improvements - maintaining existing street network at an acceptable level of service.

- Improvements within existing right-of-way - identifying roadway improvements which can be implemented within existing right-of-way to maintain acceptable level of service.

- Improvements using available right-of-way - improvements which can be implemented within right-of-way which appears to be easily available to maintain acceptable levels of service.

- All potential mitigation measures.

Analysis of Level 1 - No Improvements

The existing street network would be severely constrained at several intersections if no improvements were made with the addition of traffic from the Union Station project. In particular, these intersections directly adjacent to the project boundaries would be overloaded by expected project traffic:

- Vignes/Ramirez/Freeway ramps
- Alameda/Aliso/Arcadia

Other areas intersection that were analyzed for this study have sufficient available capacity to handle project traffic, including:

- Macy/Pleasant/Brooklyn
- Broadway/College
- Broadway/Sunset

However, it is the first set of intersections, those without sufficient capacity to accommodate project traffic without improvements, which determine the development potential under existing conditions.

Based on the analysis of project traffic with exiting roadway conditions (no improvements), the level of project development could be approximately **1.03 million square**

feet, or 20% of Alternative 1. This is roughly the level of development that would be accomplished by building Phases 1 and 2A on the LAUPT site and Phase 1 on the Post Office site as identified under Alternative 1.

Analysis of Level 2 - Improvement Within Existing Right-of-Way

The City of Los Angeles is currently undertaking improvement projects on Alameda Street which will improve the surface and increase the capacity of this roadway. Capacity will be added on Alameda Street by the City's project to widen the existing four lanes to six lanes from 400 feet north of Arcadia Street to Temple Street. This will add much needed capacity to the following study intersections:

- Alameda/Aliso/Arcadia
- Alameda/Commercial

Aside from this improvement in the existing right-of-way, no other study intersections that are the constraining intersections for this project have available right-of-way for improvements (e.g., Ramirez/Vignes/Freeway Ramps). Therefore, the development potential for the site under this scenario would remain at 1.03 million square feet, or approximately 20% of Alternative 1.

Analysis of Level 3 - Improvements Within Available Right-of-Way

As previously indicated, the improvements to Alameda Street by the City of Los Angeles which were described above are expected to improve the intersections of Alameda/Aliso and Alameda/Commercial. It would be necessary to provide improvements to one additional intersection which would require the dedication of right-of-way to allow the development of Alternative 1 in its entirety (5.17 million square feet). This right-of-way can be available form the project site and qualifies as "easily available".

The intersection involved and the improvements required are:

- Vignes/Ramirez/Freeway Ramps - By dedication from the LAUPT site, add the following: two northbound separate left turn lanes; a separate

eastbound left turn lane; an eastbound through lanes; and, two eastbound right turn lanes.

The location of these improvements are shown in Figure 56.

The cost of these improvements would be about $125,000 plus land cost (if any) and would require dedication of right-of-way on the east boundary of the LAUPT site. The dedication required ranges from zero to 24 feet along Vignes Street (20,000 square feet total) from property belonging to LAUPT and SCRTD. If land must be purchased from SCRTD, the cost could be up to $400,000, bringing the total improvement cost to about $500,000.

Alternatively, 78% of Alternative 2 (5.17 million square feet) could be developed with the improvements to these intersections as listed above:

- Alameda/Aliso/Arcadia (LADOT);
- Alameda/Commercial (LADOT); and
- Vignes/Ramirez/Freeway Ramps (project dedication).

Assuming that the purchase of the triangle of land bordered by Vignes Street, North Main Street, and Alameda Street is made as has been previously considered for Alternatives 2 and 3, right-of-way can be dedicated from the site to allow an additional left turn pockets eastbound from Alpine/Vignes into North Main and westbound from Alpine/Vignes into southbound Alameda.

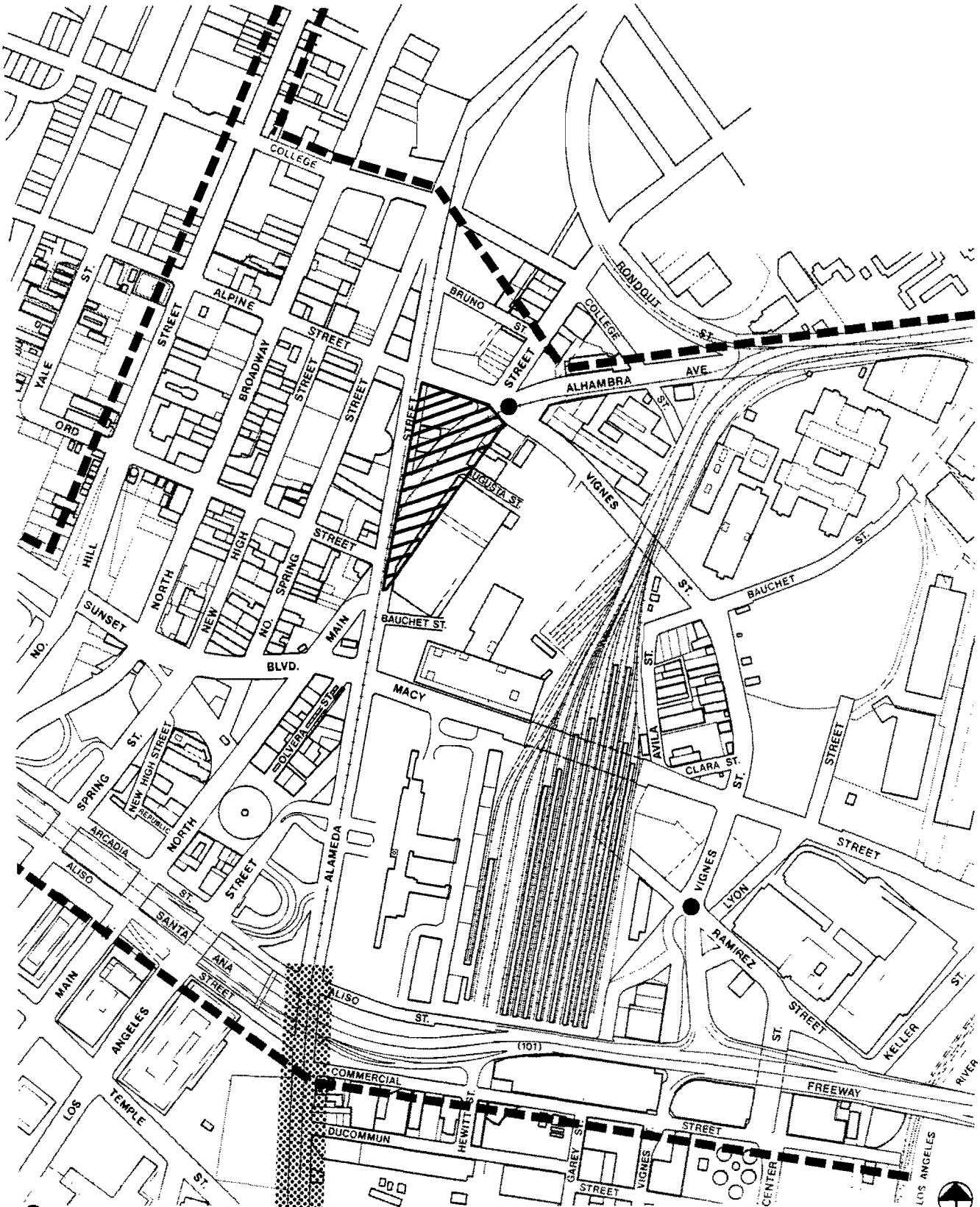
The estimated cost of the purchase of the entire triangle parcel, which is apparently owned by the City of Los Angeles, could be $1,500,000 to $2,000,000. If the entire triangle is not purchased, the turn lanes can likely be added within the existing 90-foot wide right-of-way. Either way the construction component of the cost would be about $60,000.

These improvements are summarized in Figure 57.

Analysis of Level 4 - All Potential Measures

In order to provide adequate roadway improvements to allow Alternatives 2 and 3 to be fully developed, it will be necessary to provide additional improvements either in

Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	IMPROVEMENTS WITHIN EXISTING AND PROJECT RIGHT-OF-WAY	56



○ Intersection Improvement With Project Dedication of Right-of-Way

▒ LADOT Street Widening Project ▨ Land Purchase

200 100 0 100 400

Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study	FIGURE
	IMPROVEMENTS WITHIN EXISTING RIGHT-OF-WAY AND PROJECT DEDICATIONS	57

the form of physical roadway improvements or measures designed to reduce vehicular travel demand on the roadway system. The following paragraphs summarize these potential improvements and their implications relative to right-of-way requirements, construction costs, transit ridership and rideshare participation.

Roadway Improvements in Chinatown. Intersection improvements required for Alternatives 1, 2, and 3 were listed in the previous section of this report.

The mitigation measures for full development of Alternatives 2 and 3 require more than easily obtainable property acquisition or dedication from the project. Major purchases of land with existing uses (banks, retail and commercial shops) would be required in the Chinatown area to improve intersections to acceptable levels of service. The cost of the land alone in the Chinatown area is estimated to be $100 per square foot, and this cost does not include purchase, relocation, or restructuring of existing land uses. These costs and the political considerations of acquiring property in the Chinatown area probably means that these improvements are not feasible.

Given these constraints, a list of other potential mitigation measures was developed. The costs and impacts to the project of these measures are discussed below. These costs are based on unit cost estimates available from various sources, and are used here as a means to rank improvements. The actual cost of any of these improvements will vary somewhat from these estimates, depending on specific design and construction requirements.

Railroad Right-of-Way Access to I-5. The possibility of creating a new roadway using the Southern Pacific Railroad right-of-way to run easterly to the Golden State Freeway (I-5) was considered as an option to roadway improvements in the Chinatown area. This roadway is envisioned to divert project traffic from Hill Street and Broadway to access I-5 and the Pasadena Freeway, and, therefore, eliminate the need for intersection improvements in the Chinatown area.

The roadway would need to cross the terminal throat and the tracks of the Santa Fe and Southern Pacific which run along the banks of the Los Angeles River flood control channel, and it also may need to avoid sidings on the north side of the Southern Pacific tracks east of the river. This new roadway is, therefore, assumed to be entirely on

structure from the parking garage entrance east of Union Station to a new interchange with I-5 where it crosses the Southern Pacific line to Alhambra and Colton.

Its cost would be of the order of 40 to 50 million dollars, depending on whether two lanes or four lanes are provided and whether the road could run at-grade for any distance along the north side of the Southern Pacific.

Improvements to North Spring/Alameda. As an alternative to constructing a new roadway in the railroad right-of-way, improvements to North Spring and Alameda Streets might be undertaken to improve access to freeways to the north of the project site and to divert traffic from the Chinatown area.

Sufficient right-of-way exists to widen Alameda Street to three lanes each way with a track lane in the center. If train movements can be restricted to nights or weekends, the center lane can be used for left turns.

Additional right-of-way to add a lane each way to Alameda Street can be acquired by purchasing a strip of industrial land along the east side of that street from Vignes to North Spring Streets. The cost of this improvement, including widening and reconstructing the existing freeway ramps on Broadway at I-15, is estimated to be in the 5 to 10 million dollar bracket.

This project may be feasible as a joint project with the City. It may best be done in two phases: Phase 1 would widen and "smooth out" North Spring through the railroad tracks area from College Street to Elmira Street, retaining the four-lane configuration along the railroad yard. Phase 2 would widen to six lanes from Elmira to North Broadway, including the viaduct. The second phase would account for 90% of the cost. The first phase would provide a lower-capacity but attractive alternate to traffic now filtering through Chinatown.

El Monte Busway Use By Carpools/Vanpools. Caltrans has indicated that the El Monte Busway extension may be available for carpools only and not for vanpools. This option means that project-related carpools coming to the project site from the east may be able to use the El Monte Busway to arrive at the intersection of Alameda Street and Aliso Street.

Trip distribution patterns developed for this project indicate that approximately 20% of project traffic is oriented to the east via the Santa Ana Freeway. Use of the busway may encourage additional carpooling by this portion of the project traffic, however, the busway will have not impact on project traffic oriented to the north where problems occur with increasing development levels. In other words, use of the El Monte Busway by carpoolers would benefit the project, but it will not alleviate problems in the Chinatown area that would be created by full development of Alternatives 2 and 3.

Increased Transit and Ridesharing Usage. If programs are implemented to obtain a higher mode split and increased transit use and ridesharing **above** the levels that currently occur in the downtown Los Angeles area, then a lower trip generation rate for office use could be used than was used in the above analysis of Alternatives 2 and 3. It is not feasible to consider a lower-than-downtown trip generation rates for Alternative 1 because its lower level of development could not support the increased transit and ridesharing patronage.

A trip generation rate for office use was developed assuming an increase of the modal split of 10% (from 33% to 43%), and a corresponding increase in auto occupancy for office trips from the currently observed 1.4 persons per vehicle to 1.53 persons per vehicle.

The use of this office trip generation rate and the inclusion of the improvements and land purchases listed above for Alternative 2 would allow development of Alternative 2 in its entirety (6.67 million square feet).

The use of this lower trip generation rate for Alternative 3 results in the need for a second set of mitigation measures as shown in Table 30. As shown, roadway improvements would still be required in areas where right-of-way is not easily available.

A second set of trip generation rates for offices were developed to determine what transit and ridership levels would have to be obtained to allow full development of Alternatives 2 and 3 without requiring major improvements in Chinatown or to the north and east of the project site as described above.

TABLE 30

LEVEL OF SERVICE ANALYSES
ALTERNATIVE 3 WITH HIGH TRANSIT AND RIDESHARING

Intersection[a]	A.M. Peak Hour[b] V/C	A.M. Peak Hour[b] LOS	P.M. Peak Hour[b] V/C	P.M. Peak Hour[b] LOS
N. Hill/Alpine	1.10	F[c]	1.06	F[c]
N. Broadway/Alpine	0.82	D	1.03	F[c]
N. Main/Vignes	0.51	A	1.50	F
Alameda/Macy/Sunset	0.78	C	1.05	F
Alameda/Aliso/Arcadia	1.10	F	0.71	C
Alameda/Commercial	1.02	F	1.50	F
Vignes/Macy	0.87	F	1.10	F
Vignes/Ramirez	1.57	F	2.71	F

(a) Intersections with C or better in both AM and PM, omitted.

(b) No mitigation.

(c) Mitigation requires land taking and/or parking in Chinatown.

Source: Kaku Assoicates, interpolations.

The analysis revealed that a transit split of 60% and an average auto occupancy of 1.53 persons per vehicle would be required to produce a low enough trip generation rate for office to allow full development of Alternatives 2 and 3. These results imply about 80% participation in transit and ridesharing programs by project employees -- a higher participation than any program that has ever been implemented to date in the Los Angeles area, even during the 1973 and 1979 energy crises. It is unlikely that a marketing program could be developed and implemented to produce these results under the most optimistic conditions.

PARKING DEMANDS

Parking demand forecasts were prepared concurrently with trip generation projections and were derived from similar assumptions (Table 31). Analyses focused on the third phase or ultimate build-out of each alternative. Special attention was given to office parking generation because: (1) the three alternatives differed mainly in regard to office floor area; (2) office employee demand dominated the peak parking requirement; and (3) office employee demand was judged to be the best market for employer-based transportation demand management programs.

Timesharing of Parking Spaces

In a mixed-use development it is possible to assume some timesharing of parking spaces because the parking demands of different uses peak at different times, and because people once parked can visit more than one establishment. The timesharing factors in Table 31 are based on data from the Urban Land Institute report, Shared Parking. In addition, 80% of the 11 AM retail parking demand at build-out is assumed to be generated by site employees. (Note that this situation would prevail only at build-out. Retail demand, which will peak on Saturdays, will dominate initial stages of site development.

Distribution of Parking Demand

Table 32 illustrates the projected distribution of parking demand by stage of development among the different sections of the site. The Union Station property is divided into three parts: "West", ("orchard" and depressed parking below forecourt);

TABLE 31

PARKING DEMAND ASSUMPTIONS FOR BUILDOUT OF DEVELOPMENT ALTERNATIVES

	Parking Ratios in Spaces per 1,000 sq. ft.				
Land Use	Unconstrained	Transit Use[a]	Auto Occupancy[b]	Timesharing Factor[c]	Net Ratio
Offices					
Alternative 1	3.0	20%	1.20	100%	2.0
Alternative 2	3.0	33%	1.33	100%	1.5
Alternative 3	3.0	43%	1.40	100%	1.2
Hotel[d]	1.4	NM[e]	NM[e]	40%	0.6
Retail	3.1[f]	NM[e]	NM[e]	13[g]	0.4
Culture	3.0	NM[e]	NM[e]	100%	3.0
Transportation	16.0	NM[e]	NM[e]	90%	14.4
Trade/Conference Center	30.0	NM[e]	NM[e]	100%	30.0

(a) Unconstrained ratio assumes negligible transit use.

(b) Unconstrained ratio assumes auto/occupancy to average 1.0 persons/car for office use.

(c) Percent utilized at 11 AM when office demand peaks.

(d) Assumes one space per guest room equivalent to 700 sq. ft.

(e) NM = not meaningful. These land uses have higher occupanies but are not susceptible to transit or ridesharing marketing activities.

(f) Weekday maximum; Saturday maximum is 4.0.

(g) Assumes 65% utilized at 11 AM and 80% overlap with other uses.

TABLE 32

CUMULATIVE PARKING DEMAND

Alt	Location		Space Need at End of Phase Phase 1	Phase 2	Phase 3	Projected Spaces	Recommended Spaces
1	Union Station	West	475	1,330	1,215[a]	1,100	1,300[c]
		Central	720	1,890	1,880[a]	1,300	1,300
		East[b]	400	500	4,620	5,000	5,100
	Subtotal		1,595	3,720	7,715	7,400	7,700
	Post Office	South	825	880	880	700	700
		North	0	600	2,000	2,500	2,200
	TOTAL		2,420	5,200	10,595	10,600	10,600
2	Union Station	West	675	1,370	1,140[a]	1,100	1,500[c]
		Central	720	2,300	2,050[a]	1,300	1,300
		East[b]	400	500	4,610	5,500	5,000
	Subtotal		1,795	4,170	7,800	7,900	7,800
	Post Office	South	700	1,550	1,325[a]	700	700
		North	0	0	3,500	4,000	4,100
	TOTAL		2,495	5,720	12,625	12,600	12,600
3	Union Station	West	875	2,730	2,070[a]	1,100	1,700[c]
		Central	720	2,180	1,930[a]	1,300	1,300
		East[b]	400	500	4,440	6,000	5,400
	Subtotal		1,995	5,410	8,440	8,400	8,400
	Post Office	South	650	1,400	1,100[a]	700	700
		North	0	800	3,240	4,000	4,000
	TOTAL		2,645	7,610	12,780	13,100	13,100

a. Same floor area as Phase 2, but transit and ridesharing increased.

b. Includes peripheral parking assumed at 400 spaces in Phase I and 100 additional spaces for Phases 2 and 3, respectively.

c. Retail and/or hotel demand governs.

"central" (below the former railway express building and tracks) and "East" (above the transit terminal between the tracks and Vignes Streets).

The Post Office property is conceptually divided into two parts: "South" ("orchard" and surface parking along Alameda); and "North" (structure parking accessed from Vignes and North Main Streets).

Generally, the projected 2,400 "West" and "Central" spaces on the Union Station property and the projected 700 "South" spaces on the Post Office property will be fully utilized. The rates for these facilities should be set to encourage short-term parking.

The "East" structure on the Union Station property (4,000 spaces) and the "North" parking on the USPS property (2,500-4,000 spaces), would be used by employees working on the west side of Union Station and on the south and west sides of the USPS property. The rates for these facilities should be set to encourage carpools and vanpools.

The early phases of each alternative involve specialty retail hotel and cultural uses which peak in the evening or on weekends. These activities require parking at the west ("A") side of Union Station and in the middle ("B") area. Later office building development will require parking on the east ("C") side of Union Station. Alternative 3 will likely require some Union Station site employees to use Post Office site parking.

Staging - To be sure of supplying early demand on weekends, retail parking on the west side of Union Station should be constructed first and should be designed for the peak Saturday parking ratio (4 spaces per thousand square feet) rather than the adjusted build-out ratio in Table 31. Similarly, the hotel component should be built to provide one space per room and then made use of by office visitors later on when the office buildings are constructed.

TRANSIT SENSITIVITY ANALYSIS

This section describes the implications for transit services of the three alternative development concepts. The analysis also assesses the implications of differing mode splits for providing adequate transit capacity.

Transit patronage for each system has been estimated using trip rate and mode split assumptions developed by the project team for each alternative.* These transit trips were distributed by direction on the same basis as motor vehicle traffic (Figure 49). Within these constraints, it was additionally necessary to make reasonable assumptions on the relative capture rate for transit by major direction and then to assign the transit trips to individual transit systems.

The purpose of these figures is to provide a preliminary estimate of the magnitude of transit loadings that might be expected. They are not substitutes for the more detailed patronage estimation work that should follow in later steps of development planning for the LAUPT/USPS site.

Table 33 shows the patronage projections and the vehicle capacity required to meet demand generated by site development for Year 2000. It does not include Metro Rail's own boardings (estimated to grow from 2,000 to 3,500 per hour as that system is opened and extended). The bus and Metro Rail vehicle needs are discounted because passengers traveling outbound in the A.M peak and inbound in the P.M. peak tend to balance system loading instead of reinforcing peaks.

The busway bus lines from El Monte to downtown Los Angeles have their maximum load points just east of Union Station. The site area developments would, therefore, add to the peak load on these lines. The bus lines which are planned to terminate at Union Station serve Pasadena and points east, reaching the busway via the Long Beach Freeway or the Del Mar HOV ramps. Some passengers who now use these lines, would likely divert to the Los Angeles-Pasadena light rail line -- making room for Alhambra-Temple City area commuters to the site activities.

Express and local bus lines to and from areas south and west of downtown Los Angeles will likely be accessed by Metro Rail, with a transfer at one of the downtown stations. Ultimate build-out of Alternatives 2 and 3 may require direct peak hour express buses

*3.76 office employees for every 1,000 square feet of office floor area, of whom 30% would use transit in Alternatives 1 and 2, 33% in Alternative 3. Transit generation by retail, hotel, and museum employees is also allowed for. More refined analysis were undertaken for the selected alternatives.

TABLE 33

TRANSIT DEMAND BY MODE, YEAR 2000

Development Program	Total	Transit Riders via Metro Rail	Transit Riders via Bus	Transit Riders via LRT
Alternative 1				
%	100%	34%	48%	18%
P.M. Peak Hour	3,617	1,225	1,753	640
Vehicle Equivalent[a]	--	3[b]	13[c]	6
Alternative 2				
%	100%	34%	48%	18%
P.M. Peak Hour	4,701	1,592	2,277	832
Vehicle Equivalent[a]	--	4[b]	17[c]	7
Alternative 3				
%	100%	34%	48%	17%
P.M. Peak Hour	6,833	2,3563	3,307	1,172
Vehicle Equivalent[a]	--	6[b]	24[c]	10

(a) Vehicle Capacity: Metro Rail - 170 persons/car standing load.
RTD Bus - 70 persons/car standing load.
LRT - 120 persons/car standing load.

(b) Assumes 40% of Union Station passengers are still on at the maximum load point in the peak direction.

(c) Assumes 50% of bus passengers boarding at Union Station are maximum load point passengers.

Source: Kaku Associates, TDA Inc.

to and from the site in the Hollywood Freeway (U.S. 101) and Santa Ana Freeway (I-5) corridors -- not so much to meet transit capacity needs as to combine groups of potential carpoolers. (Such services, sponsored by Atlantic Richfield, have been very effective in limiting the traffic impacts and parking needs of Arco Plaza.)

The site developments would add to patronage in the peak direction on the assumed light rail transit lines from Glendale and Pasadena, making their peaks higher.

Implications of Higher Level of Transit Usage

The assumptions made for this analysis have been as favorable as could be justified by past experience in the Los Angeles area. (Recent studies suggest that the high percentage of employees entering downtown by bus does not apply to the newer buildings in the financial district.) Nevertheless, it is possible that higher transit demand could develop 20 or 30 years hence.

If peak hour transit use were to increase to 40% (the maximum observed for downtown Los Angeles), up to 13 to 25 more buses, 5 to 10 more LRT cars, and 3 to 61 more Metro Rail cars might be needed for site traffic, based on Table 33 numbers.

If a substantial mode shift to transit were to occur before the Year 2000, then it might be possible to delay building some of the parking spaces projected for the Post Office site, and fewer spaces might be needed in the "C" structure of the east side of Union Station. The traffic impact of Alternative 3 might become manageable. However, in that event, transit capacity would have to be increased by such measures as:

- Expanding the number of berths in the on-site bus terminal.
- Adding buses on lines serving Union Station and the Terminal Annex to accommodate increases in bus ridership.
- Adding equipment for the Metro Rail and light rail lines even though they would be well within their infrastructure capacity.

Implications of a Lower Level of Transit Usage

With a lower level of transit use (e.g., 20% of peak hour passengers), there will be an increase in carpooling and solo driver commuting. In Alternative 2, for example, 1,000 to 2,000 more automobiles would have to be accommodated exiting the site in the PM peak hour, making a difficult situation hopeless, and favoring the lower density Alternative 1.

PEDESTRIAN IMPACTS

The purpose of this section is to evaluate the development alternatives from the standpoint of the quality of the pedestrian environment and ease of pedestrian circulation.

Analysis

Many pedestrian impacts are common to the alternatives. In general, pedestrian volumes would increase during weekday commuting times and at midday and throughout the afternoon on weekdays and Saturdays as the result of new retail and restaurant activity. High pedestrian volumes would occur on the east side of Alameda. High pedestrian crossing volumes would occur on Alameda at Los Angeles and Macy Street.

Pedestrian volumes will increase around the Plaza and on North Main and Los Angeles Street between Sunset Boulevard and the Civic Center.

Pedestrian volumes will increase on Macy Street/Sunset Boulevard and on Spring Street as the result of transit access and circulation to and from Chinatown and El Pueblo.

Other pedestrian impacts are unique to the design alternatives and are described below.

LAUPT Alternative 1. The ramp configuration at the northern edge of the site reduces the development intensity and pedestrian activity which might help to anchor the northern portion of the retail center.

The hotel located east of Union Station may reduce the potential of developing an east/west "public way" through the development site, as it would be disruptive to have large pedestrian flows passing through the hotel lobby.

LAUPT Alternative 2. The ramp configuration at the northern edge of the site reduces the development intensity and pedestrian activity which might help to anchor the northern portion of the retail center.

The ramp configuration also reduces the potential conflicts between pedestrians and vehicles, as pedestrians need not cross it to access buildings.

The mid-rise office development located east of Union Station provides opportunities to develop an east/west "public way" through the development site as it is divisible into two entities (e.g., an office building north and south of the east/west public way).

LAUPT Alternative 3. The comparatively high density on the site increases the number of potential internal pedestrian and transit trips relative to Alternatives 1 and 2.

The ramp configuration at the northern edge of the site increase the development intensity and pedestrian activity which may help anchor the northern portion of the retail center.

The hotel east of Union Station should be relocated (to the north or south) to allow for an east/west public pedestrian connection through the site.

USPS Alternative 1. The low density of the development relative to Alternatives 2 and 3 reduces the number of potential internal pedestrian and transit trips and the degree to which the USPS site anchors the northern end of the development.

USPS Alternative 3. The Ord Street connection to Chinatown is not reinforced by a good east/west pedestrian gateway at that location. The landscaped setback on Alameda Street provides the opportunity to create gateway landscaping at this location.

MITIGATION MEASURES

Transit

Transit mitigation measures (Table 34) would be needed on the LRT lines and possibly on busway and local bus routes. Initially at least, no mitigation would be needed on Metro Rail because site-generated trips would utilize unused capacity.

TABLE 34

TRANSIT MITIGATION MEASURES

		At 30 % Transit Mode Split	
	Metro Rail	Bus	LRT
Alternative 1	None	Add 11 buses/hour	Add 5 cars/hour
Alternative 2	None	Add 1 bay and 15 buses/hour	Add 7 cars/hour
Alternative 3	None	Add 2 bays and 20 buses/hour	Add 10 cars/hour

Source: TDA Inc.

Relative to baseline conditions, light rail services would need to be reinforced by 5, 17 and 10 cars per hour for Alternatives 1, 2, and 3, respectively. These additions could take the form of extra trains or longer trains, or a combination thereof. Planned baseline terminal/platform space for LRT appears sufficient.

Bus lines from the north and east would be impacted by the site, as there are not direct lines from the west into the area. An estimated 26% of the transit traffic would be on these buses (4% Alameda lines and 22% busway lines). So an additional 11 buses per hour would be needed for Alternative 1, 15 for Alternative 2, and 20 for Alternative 3, respectively. In Alternatives 2 and 3, it might be necessary to add one or two bays, respectively, to the Metro Rail bus station.

Pedestrian: Facility Improvements

- Realign the Los Angeles and Alameda Streets intersection south of its present location to facilitate pedestrian connections between the main entrance of Union Station and El Pueblo.

- Install special paving and markings in the crosswalk on Alameda Street at Los Angeles Street.

- Alameda Street will be retained as six lanes from 400 feet north of Arcadia Street to Vignes Street, except at Macy Street/Sunset Boulevard. The implications for pedestrian circulation of widening Alameda Street in order to provide extra lanes at Macy, are as follows:
  - More exposure to vehicular traffic for crossing pedestrians.
  - Crossing times increase, requiring longer green time for pedestrians.
  - Increasing possibility that elderly, handicapped, and persons with luggage, packages, or strollers will be inconvenienced.
  - Greater roadway width gives people the feeling that crossings are hazardous, pedestrians unwelcome, and that Union Station is "cut off" from El Pueblo.

- A median may be desirable as an intermediate destination or safety zone for pedestrians.

- Provide a continuous sidewalk (12-foot minimum) on the west side of Alameda Street between Los Angeles and Macy Streets.

- Provide crosswalks at Ord and Alameda Streets.

- Develop a pedestrian circulation framework:
  - Clarify principal entrances and routes - "Front door".
  - Establish a hierarchy of pedestrian routes based on intensity, e.g., "A", "B", "C", and "D" routes.

- Develop pedestrian design and management guidelines.

TRANSPORTATION DEMAND MANAGEMENT

Consisting of programs (including parking management) designed to reduce automobile trips, Transportation Demand Management provides a valuable tool for achieving the lower vehicle trip rates more typical of downtown Los Angeles. Reductions in vehicle

trips will reduce the scale of required street improvements and enable a greater level of spite development within the constraints of the transportation system. Specific actions to reduce vehicle trips and parking demand were outlined in Part II (see "Demand Management Strategies", page 97).

An aggressive Transportation Management Program would require an on-site transportation office and administrator to coordinate ridesharing opportunities among tenants and provide an accessible source of transit, parking and traffic information. Research and monitoring capabilities are essential so that the success of the program can be verified by the City, markets identified for specific promotions, and the "trigger" levels for improvements can be projected.

BASELINE COMPARISONS

The effectiveness of mitigation actions defined above are evaluated against the criteria developed in Part II and modified as indicated above. Table 35 presents the findings in an evaluation matrix.

The matrix displays seven key criteria which apply to various interest groups including the neighboring communities, site users and the site owners. Measurements described for the criteria provide a means of evaluating their objectives. The significance given to achieving the objective each criterion is high for all seven. Findings of the transportation study, displayed in the last column, show the performance of mitigation measures. For example, Criterion 1 - Congestion, is evaluated for intersection level of service, and for all alternatives has low ratings.

Transit Operations, Criterion 5, are evaluated for projected bus-hours and bus-miles requirements. These are based on average one-way bus trips from downtown Los Angeles.

RECOMMENDED DEVELOPMENT PLAN

Based on input on the traffic and public improvement limitations and a refined master plan/retail design, a recommended development program (preferred alternative) was

TABLE 35

BASELINE EVALUATION MATRIX

Primary Interest		Criterion	Measurements	Objective		Significance Findings
Neighborhood/ Environmental	1.	Congestion	Volume/capacity ratios at Alameda/ Macy/Sunset, Alameda/Vignes, Macy/Vignes and Ramirez/Vignes Freeway ramps	Maintain or reduce V/C ratios at three intersection	High	Alt. 1 -- 2 intersection at LOS F(1); 1 at LOS E with mitigation: all at LOS D or better Alt. 2 -- 4 intersections at LOS F with mitigation: all at LOS D or better Alt. 3 -- 4 intersections at LOS F with mitigation: 3 at LOS E; 1 at LOS C Preferred Alt. 3 --
Users	2.	Pedestrian Access	Walking distance between site activity center and El Pueblo Plaza, Chinatown, Little Tokoyo and Civic Center points. Delays to pedestrians e.g., at traffic signals	Minimize or make easy; no barrier to wheelchairs. Good visual environment	High	Alt. 1 -- Same as without project Alt. 2 -- Alameda Street/Macy intersection widening will increase Alt. 3 -- Same as Alt. 2 Preferred Alt. 3 -- Same as Alt. 2
	3.	Transit Operations	Vehicle hours, vehicle miles equipment need as affected by site access, egress and internal circulation. Qualitative impact on AMTRAK	Minimize	High	Alt. 1 -- 61 bus hours; 1,225 bus miles (2) Alt. 2 -- 80 bus hours; 1,595 bus miles Alt. 3 -- 115 bus hours, 2,315 bus miles Preferred Alt. 3 (24% mode split)-- 77 bus bus hours; 1,535 bus miles (30% mode split)--126 bus hours; 2,520 bus miles
	4.	Capital Costs	Traffic and transit improvements, based on development and TSM improvement scenarios	Control	High	Alt. 1 -- $11 million* Alt. 2 -- $14 million* Alt. 3 -- $25 million - $50 million* Preferred Alt. 3 - $20 million*
Owners	5.	Development Delay	Temporary or permanent interference with site development as a result of transportation	Avoid, minimize	High	All alternatives: Metro Rail will delay major development through 1991 Other transportation improvements would be concurrent with Metro Rail construction or site development

Notes: (1) LOS corresponds directly to V/C ratios, e.g., LOS A 0.6 V/C; LOS F - 1.0 V/C.
(2) Bus hours and bus miles are for one-way trips.

*Order of-magnitude costs, for comparison only. Does not reflect likely availability of state or federal capital grants for purchasing buses and rapid transit cars.

prepared for the LAUPT/USPS site. The program, which is summarized in Table 33, includes a mixture of office, retail, hotel and transit facilities which is designed to maximize the development on the most marketable and economical portions of both sites. The implementation program assumes the build-out of Phases I and II over a 15-year period. Phase III is scheduled for completion after 2003.

EVALUATION OF PREFERRED DEVELOPMENT ALTERNATIVE

The final step in the traffic analysis for the LAUPT/USPS site was the detailed evaluation of the preferred development alternative. The evaluation was conducted using techniques and assumptions similar to those used in the previous analyses but with minor modifications to reflect the nature of the phasing program.

SUMMARY OF PLAN

Table 36 summarizes the preferred development alternative indicating the quantities of development by land use proposed for each of the three phases.

FUTURE TRAFFIC PROJECTIONS

As indicated, estimates of future traffic projections for the various phases of development were based on techniques and assumptions similar to those used in previous analyses. The key differences were related to the methodology used in estimating the future base traffic conditions and in the trip generation rates which were applied to the project traffic.

Future Base Conditions

The procedures used to estimate future traffic conditions as part of previous traffic studies conducted in the vicinity of the study area included the use of an adjustment factor for existing traffic to reflect the potential changes which are expected as a result of increased transit usage and rideshare participation. For the downtown analyses, the existing peak hour traffic volumes were factored by a constant, 0.91,

TABLE 36

PREFERRED DEVELOPMENT ALTERNATIVE

Site	Phase	Land Use	Size	
LAUPT	1	Retail	200,000	SF
		Hotel	400	rooms
		Amtrak	50,000	SF
		Office	750,000	SF
	Subtotal		1,280,000	SF
USPS	1	Post Office	50,000	SF
		Office	150,000	SF
		Cultural	100,000	SF
	Subtotal		300,000	SF
	PHASE 1 TOTAL		**1,580,000**	**SF**
LAPUT	2	Museum	50,000	SF
		Office	1,050,000	SF
	Subtotal		1,100,000	SF
USPS	2	Office	700,000	SF
	PHASE 2 TOTAL		**1,800.000**	**SF**
Cumulative Total - Phases 1 and 2			3,380,000	SF
LAUPT	3	Office	3,100,000	SF
		Retail	50,000	SF
	Subtotal		3,150,000	SF
USPS	3	Cultural	50,000	SF
		Office	1,000,000	SF
	Subtotal		1,050,000	SF
	PHASE 3 TOTAL		**4,200,000**	**SF**
Cumulative Total - Phases 1, 2, 3			**7,580,000**	**SF**

which was estimated to be a realistic representation of the reduction in the magnitude of vehicular traffic as a result of the changes in travel characteristics. For the purposes of this study, it was estimated that the effects of these change in travel habits would be less during Phase I and II and so a factor of 0.95 was used. The 0.91 factor was used for Phase III since all of the transit improvements and the implementation of the TSM program would be complete within that long range timeframe.

Traffic Generation

As previously discussed, the trip generation rates used in the downtown traffic studies used an adjusted trip generation rate which also reflects this increase in transit usage and rideshare participation. It was estimated that for Phases I and II of this analysis, an interim trip generation rate would be more realistic reflection of conditions in the area. Although many of the transit improvements will be in place and the effects of the TSM program are expected to be reflected in traffic levels, it is estimated that the trip generation rates listed in Table 17 would be the most appropriate for these early phases of this project. The previously described rates which were used for analysis of Phase III are also shown in Table 37.

Using the rates from Table 37 for Phases I, II and III, the traffic expected to be generated by recommended development plan was estimated. These volumes are summarized in Table 38.

Trip Distribution and Assignment

The project traffic estimates were distributed and assigned to the local street system using the patterns illustrated in Figure 49. Figure 58 illustrates the morning and evening peak hour traffic expected to be generated by completion of the project through Phase III on the local street system within the study area. These volumes were added to the future base traffic projections to estimate the total future traffic expected in the area after the completion of Phase III of the project as illustrated in Figure 59. The volumes for all three phases of development are summarized in the Appendix D.

TABLE 37

PROJECT TRIP GENERATION RATES

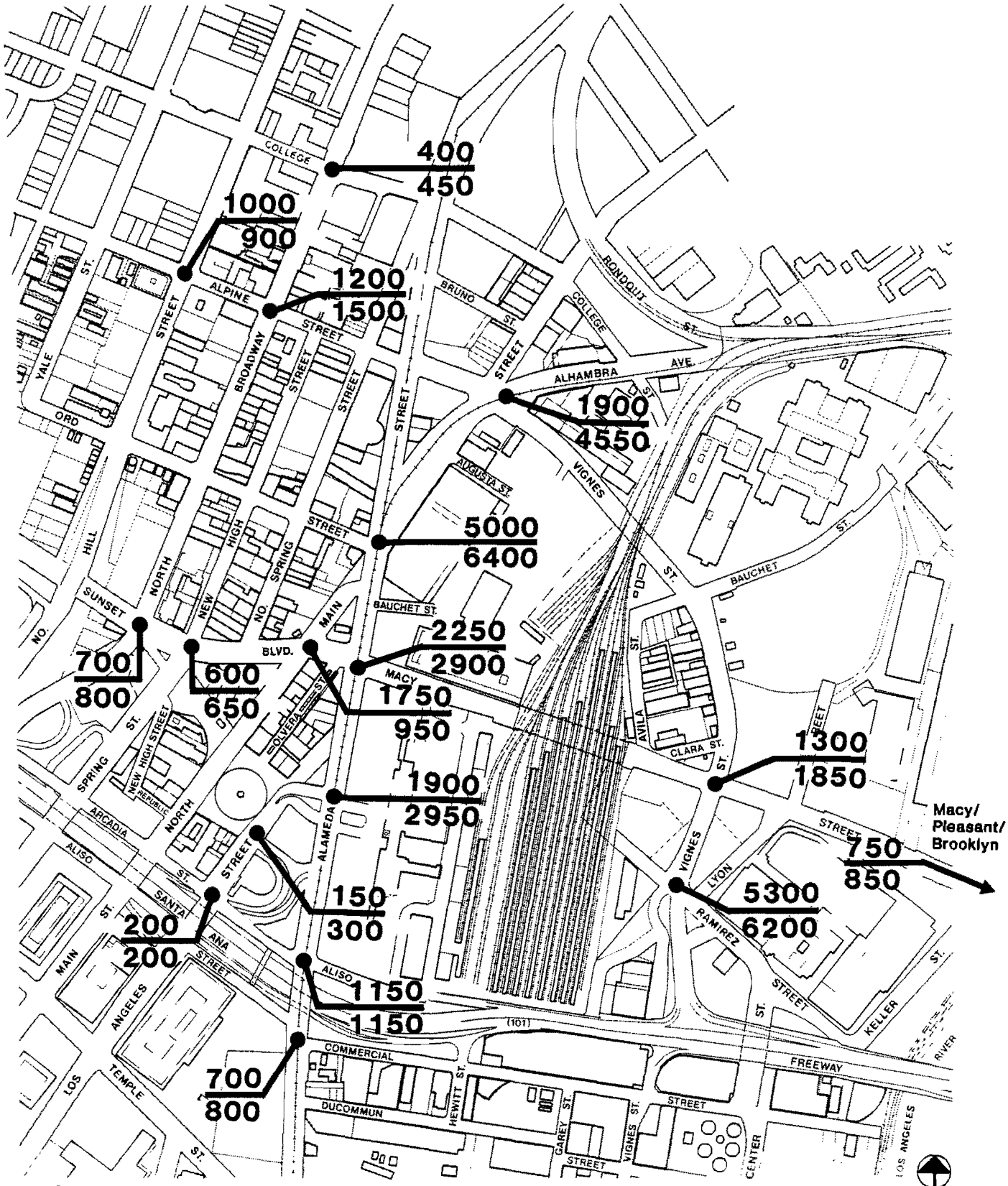
PREFERRED DEVELOPMENT ALTERNATIVE

Land Use	Unit	A.M. Peak Hour			P.M. Peak Hour		
		In	Out	Total	In	Out	Total
Retail	1000 SF	0.08	0.07	0.15	0.37	0.39	0.76
Office:							
Phases 1 & 2	1000 SF	1.38	0.23	1.61	0.26	1.50	1.76
Phase 3	1000 SF	1.01	0.17	1.18	0.21	1.09	1.30
Hotel	Room	0.57	0.28	0.85	0.37	0.39	0.76
Amtrak	1000 SF	1.37	0.59	1.96	0.63	1.47	2.10
Cultural/Museum	1000 SF	1.30	1.30	2.60	3.53	3.17	6.70
Post Office	1000 SF	12.7	12.7	25.4	12.7	12.7	25.4

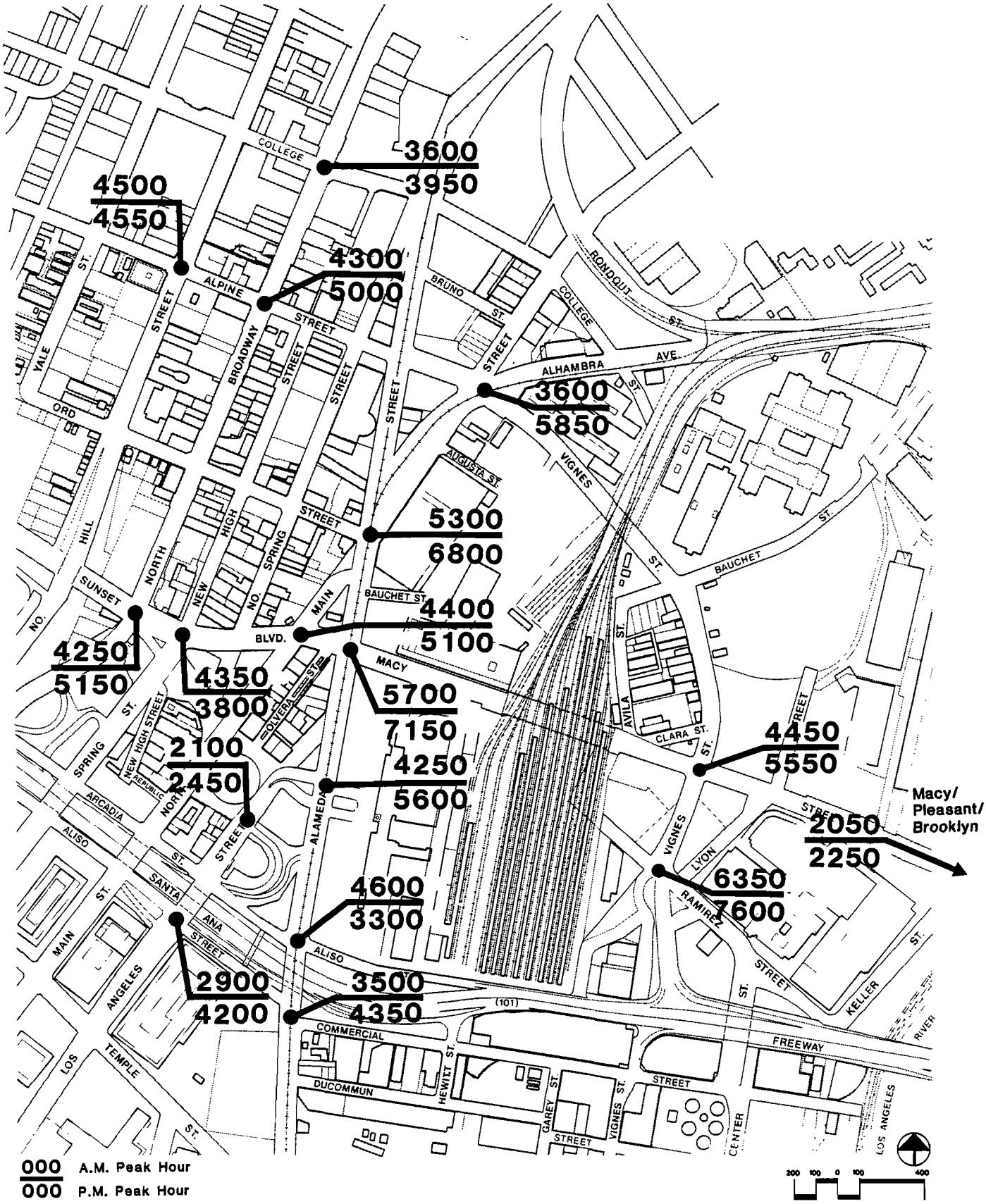
TABLE 38

TRIP GENERATION FOR PREFERRED ALTERNATIVE

Phase	Site	Land Use	Size		A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total
1	LAUPT	Retail	200,000	SF	16	14	30	74	78	152
		Hotel	400	rooms	228	112	340	148	156	304
		Amtrak	50,000	SF	68	30	98	32	74	105
		Office	750,000	SF	1,035	173	1,208	195	1,125	1,320
1	USPS	Post Office	50,000	SF	635	635	1,270	635	635	1,270
		Office	150,000	SF	207	35	242	39	225	264
		Cultural	100,000	SF	130	130	260	353	317	670
	Total Phase 1		1,580,000	SF	2,319	1,129	3,448	1,476	2,610	4,086
2	LAUPT	Museum	50,000	SF	65	65	130	177	159	336
		Office	1,050,000	SF	1,449	242	1,691	273	1,575	1,848
2	USPS	Office	700,000	SF	966	161	1,127	182	1,050	1,232
	Total Phase 2		1,800,000	SF	2,480	468	2,948	632	2,784	3,416
	Cumulative Total-Phases 1 & 2		**3,380,000**	**SF**	**4,799**	**1,597**	**6,369**	**2,108**	**5,394**	**7,502**
3	LAUPT	Office	3,100,000	SF	3,131	527	3,658	651	3,379	4,030
		Retail	50,000	SF	4	4	8	19	20	39
3	USPS	Cultural	50,000	SF	65	65	130	177	159	336
		Office	1,000,000	SF	1,380	230	1,610	260	1,500	1,760
	Total Phase 3		4,200,000	SF	4,580	826	5,406	1,107	5,058	6,165
	Cumulative Total - Phases 1, 2, & 3		**7,580,000**	**SF**	**9,379**	**2,423**	**11,802**	**3,215**	**10,452**	**13,667**



Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study TRAFFIC TO & FROM PROJECT - RECOMMENDED DEVELOPMENT PLAN	FIGURE 58



Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	Union Station Area Transportation Study TOTAL FUTURE TRAFFIC WITH RECOMMENDED PLAN	FIGURE 59

TRAFFIC IMPACT ANALYSIS

The three phases of the preferred development alternative were evaluated using the previously described ICU method of intersection capacity analysis. Each of the seventeen intersections were analyzed under morning and evening peak hour conditions.

Analysis of Phase I

The results of the volume/capacity analysis and the levels of service for Phase I of the recommended plan are summarized in Table 39 which indicates the v/c ratio and LOS at each of the seventeen intersections. The results indicate that six of the seventeen locations would operate at LOS E in one or both peak hours. It should be recognized that the LADOT has identified LOS D as the minimum acceptable level of service for these intersections. The six locations with their corresponding morning and evening LOS are as follows:

	Peak Hour LOS-Phase I	
Intersection	**Morning**	**Evening**
Hill/Alpine	E	E
Broadway/Alpine	D	E
Alameda/Main	E	D/E
Alameda/Aliso/Arcadia	E	A
Alameda/Commercial	B	E
Vignes/Ramirez/Freeway	A	E

These analyses were conducted with consideration given to the roadway improvements which were previously identified from other sources including the LADOT and SCRTD, and include those potential improvements which have been identified as part of this project. These potential improvements are discussed below.

Analysis of Phase II

As indicated in Table 40, the addition of the projects proposed for Phase II would cause four additional intersections to operate at LOS E or F during one or both of the peak hours. These additional locations are:

TABLE 39

LEVEL OF SERVICE ANALYSES
PREFERRED ALTERNATIVE - PHASE 1

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	V/C	LOS	V/C	LOS
N. Hill/Alpine	0.91	E	0.97	E
N. Broadway/College	0.78	C	0.82	D
N. Broadway/Alpine	0.88	D	1.00	E
Broadway/Sunset	0.58	A	0.74	C
New High/Sunset	0.56	A	0.43	A
N. Main/Vignes	0.42	A	0.80	C/D[1]
Alameda/N. Main	0.93	E	0.90	D/E[2]
N. Main/Sunset	0.56	A	0.67	B
Alameda/Macy/Sunset	0.72	C	0.84	D
Alameda/Los Angeles	0.65	B	0.74	C
Alameda/Aliso/Arcadia	0.94	E	0.51	A
Alameda/Commercial	0.63	B	0.92	E
Los Angeles/Arcadia	0.42	A	0.46	A
Los Angeles/Aliso	0.41	A	0.82	D
Vignes/Macy	0.75	C	0.87	D
Vignes/Ramirez	0.58	A	0.97	E
Macy/Brooklyn	0.39	A	0.37	A

---

[1] LOS with addition of second eastbound left turn lane; right-of-way available with project dedication.

[2] LOS with the following mitigation: change eastbound right turn lane to optional right turn/through lane within the existing right-of-way; add westbound left turn lane on project site; add northbound right turn lane with right-of-way from project dedication.

TABLE 40

LEVEL OF SERVICE ANALYSES
PREFERRED ALTERNATIVE - PHASES 1 AND 2

Intersection	A.M. Peak Hour V/C	A.M. Peak Hour LOS	P.M. Peak Hour V/C	P.M. Peak Hour LOS
N. Hill/Alpine	0.88	D	0.99	E
N. Broadway/College	0.78	C	0.83	D
N. Broadway/Alpine	0.96	E	0.99	E
Broadway/Sunset	0.60	A/B	0.84	C
New High/Sunset	0.56	A	0.42	A
N. Main/Vignes	0.45	A	0.91	E[1]
Alameda/N. Main	0.97	E	0.96	E
Main/Macy	0.65	B	0.68	B
Alameda/Macy/Sunset	0.76	C	0.94	E
Alameda/Los Angeles	0.76	C	0.94	E
Alameda/Aliso/Arcadia	0.95	E	0.52	A
Alameda/Commercial	0.64	B	0.97	E
Los Angeles/Arcadia	0.40	A	0.45	A
Los Angeles/Aliso	0.41	A	0.83	D
Vignes/Macy	0.80	C/D	0.98	E
Vignes/Ramirez	0.85	D	0.73	C2
Macy/Brooklyn	0.43	A	0.41	A

[1] LOS with Phase 1 mitigation.

[2] LOS with the following mitigation: add northbound separate left turn lane by purchasing available right-of-way; add three eastbound lanes to create one left turn lane, two through lanes and one right turn lane.

Intersection	Peak Hour LOS-Phase II Morning	Evening
N. Main/Vignes	A	E
Alameda/Macy	C	E
Alameda/Los Angeles	C	E
Vignes/Macy	C/D	E

Analysis of Phase III

The addition of traffic generated by projects proposed as part of Phase III of the project would not increase the number of intersections which would operate at LOS E or F. However, as indicated in Table 41, many of the more critical intersections would have significant increases in the volume/capacity ratio with projected volumes far in excess of the theoretical capacity of the intersection. These include Main/Vignes, Alameda/Main, and Vignes/Ramirez/Freeway.

POTENTIAL MITIGATION MEASURES

The mitigation measures for this project were ranked according to the previously identified categories for roadway improvements: i.e., within existing right-of-way, within available (i.e., site) right-of-way, and all other improvements. The following discussion is directed at these categories.

Improvements Within Existing ROW

No additional improvements using existing right-of-way are possible which would reduce the V/C ratio at any of the key intersections.

Improvements Within Available ROW

Various potential improvements are possible under this category which could improve traffic conditions at several key intersections. These include improvements which would be required in Phases I and II.

TABLE 41

LEVEL OF SERVICE ANALYSES
PREFERRED ALTERNATIVE - PHASES 1, 2, AND 3

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	V/C	LOS	V/C	LOS
Hill/Alpine	0.98	E	1.06	F
Broadway/College	0.81	D	0.87	D
Broadway/Alpine	1.07	F	1.11	F
Broadway/Sunset	0.64	B	0.77	C
New High/Macy	0.58	A	0.42	A
Main/Vignes	0.56	A	1.10	F[1]
Alameda/Main	0.90	D/E	1.26	F[1]
Main/Macy	0.79	C	0.74	C
Alameda/Macy	0.80	C/D	1.16	F
Alameda/Los Angeles	0.77	C	1.07	F
Alameda/Aliso	0.99	E	0.54	A
Alameda/commercial	0.56	A	1.05	F
Los Angeles/Arcadia	0.39	A	0.44	A
Los Angeles/Aliso	0.40	A	0.83	D
Vignes/Macy	0.92	E	1.21	F
Vignes/Ramirez	1.00	E	1.07	F[2]
Macy/Brooklyn	0.51	A	0.51	A

[1] LOS with Phase 1 mitigation.

[2] LOS with Phase 2 mitigation plus: addition of a second northbound left turn lane; and, addition of a third southbound through land and a separate right turn lane.

Phase I. Two improvements are possible which could increase the capacity at two intersections and thus reduce the V/C ratios at these locations during peak hours. These are:

- Widening of the eastbound approach of the intersection of Main/Vignes to provide a second eastbound left-turn lane. This would require project dedication of right-of-way.

- Making three changes to the intersection of Alameda/Main/USPS including the conversion of the eastbound approach from a right-turn plus a shared through and left-turn plus a left-turn, to a shared right-turn and through lane plus two left-turn lanes; widening of the westbound approach to provide a left-turn lane; and widening the northbound approach to add a right-turn lane. The two widening projects would require project dedication of right-of-way.

These improvements would allow Main/Vignes to operate at LOS A during the morning peak hour and LOS C/D during the evening peak hour; and the Alameda/Main/USPS intersection to operate at LOS E during both peak hours.

It is not possible to implement improvements which fall into this category to allow all of the intersections to operate at LOS D or better. Therefore, if LOS D is to be maintained within the study area, Phase I development must be reduced by 125,000 square feet of development.

Phase II. In order to provide conditions with LOS E or better at each of the intersections for the level of development proposed in Phase II, two additional improvements would be necessary. These are:

- Widen the eastbound approach of the Vignes/Ramirez/Freeway intersection to provide three additional lanes including a right-turn lane, two through lanes, and a left-turn lane.

- Widen the northbound approach of the Vignes/Ramirez/Freeway intersection to provide a northbound left-turn lane.

Both of these improvements require the dedication of right-of-way from the project site. As with Phase I, these improvements would allow all of the intersections to operate at LOS E or better. Within the context of this category of roadway improvements, it is not possible to improve operating conditions to LOS D at the critical intersections.

If LOS D is to be maintained, it would be necessary to reduce the proposed density of development by 540,000 square feet for Phase II.

Phase III. Two additional improvements are possible using available right-of-way which would improve the operating conditions further at the Vignes/Ramirez/Freeway intersection. These are:

- Widen the northbound approach to add a second left-turn lane.
- Widen the westbound approach to add a through lane and a right-turn lane.

Both improvements would require the dedication of additional project right-of-way and would improve conditions at this intersection during peak hours. However, no additional improvements could be made using available right-of-way to improve conditions for all critical intersections in Phase III. A total of nine intersections would operate at LOS F under the Phase III level of development if improvements were limited to those within available right-of-way.

All Mitigation Measures

If existing right-of-way limitations were not placed on the potential mitigation measures proposed for the project, major improvements could be made to the operating conditions within the study area. The most significant improvement would be the improvements to North Spring and Alameda Streets. The objective of this improvement would be to increase access to freeways to the north and south of the project site (primarily I-5) and to divert traffic from the Chinatown area.

Sufficient right-of-way exists to widen Alameda to three lanes each way with a track lane in the center. If train movements can be restricted to nights or weekends, the center lane can be used for left turns. Additional right-of-way to add a lane each way to Alameda can be acquired by purchasing a strip of industrial land along the east side

of that street from Vignes to North Spring Street. The cost of this improvement, including widening and reconstructing the existing freeway ramps on Broadway at I-5, is estimated to be in the 5 to 10 million dollar bracket.

The implementation of this improvement would provide sufficient additional roadway capacity to allow traffic to be diverted away from many of the roadways which are expected to operate at LOS F under Phase III conditions. With the reassignment of appropriate levels of traffic onto Alameda Street and North Spring Street, an intersection capacity analysis was conducted with the study area to assess the impact of this improvement. Table 42 summarizes the analysis for Phase III with this improvement.

It can be seen that all locations are expected to operate at LOS E or better if this improvement and the following intersection improvements were implemented:

- Main/Vignes -- Add a separate westbound right-turn lane. This improvement is possible within existing right-of-way due to the removal of the westbound left-turn lane under the assumption that North Main Street between Alameda Street and Vignes Street would be closed.

- Alameda/Main/USPS access -- Add an eastbound through lane by purchasing available right-of-way; add a westbound separate right-turn lane on the project site.

- Alameda/Macy -- Add a separate southbound left-turn lane by dedication of right-of-way from the project site.

- Vignes/Macy -- Add northbound and southbound separate left-turn lanes by purchasing available right-of-way.

TABLE 42

LEVEL OF SERVICE ANALYSES
PREFERRED ALTERNATIVE - PHASES 1, 2, AND 3
WITH IMPROVEMENTS TO NORTH SPRING/ALAMEDA

Intersection	A.M. Peak Hour V/C	A.M. Peak Hour LOS	P.M. Peak Hour V/C	P.M. Peak Hour LOS
Hill/Alpine	0.84	D	0.96	E
Broadway/College	0.78	C	0.84	D
Broadway/Alpine	0.93	E	0.97	E
Broadway/Sunset	0.63	B	0.76	C
New High/Macy	0.61	B	0.43	A
Main/Vignes	0.74	C	1.00	E[1]
Alameda/Main	0.91	E[2]	0.95	E[2]
Main/Macy	0.80	C/D	0.74	C
Alameda/Macy	0.80	C/D	0.91	E[3]
Alameda/Los Angeles	0.79	C	0.98	E
Alameda/Aliso	0.98	E	0.51	A
Alameda/Commercial	0.56	A	0.91	E
Los Angeles/Arcadia	0.39	A	0.44	A
Los Angeles/Aliso	0.40	A	0.82	D
Vignes/Macy	0.96	E	0.98	E[4]
Vignes/Ramirez	0.99	E[5]	0.99	E[5]
Macy/Brooklyn	0.54	A	0.54	A

[1] LOS with Phase 1 mitigation plus addition of separate westbound right turn lane within existing right-of-way.

[2] LOS with Phase 1 mitigation plus: addition of a second eastbound throughlane by purchasing available right-of-way; and, addition of a separate westbound right turn lane on project site.

[3] LOS with addition of separate southbound left turn lane through project dedication of right-of-way.

[4] LOS with addition of northbound and southbound separate right turn lanes with purchase of available right-of-way.

[5] LOS with Phase 3 mitigation for project without North Spring/Alameda improvements.

PART IV
TRANSPORTATION DEVELOPMENT STRATEGY

This part of the report discusses the recommended transportation development strategy for the project.

REFINED TRANSPORTATION ANALYSIS

This section describes the transit requirements of the preferred development alternative (basically, the previously described development alternative three, but with changes in scale and in the mix of land uses). It provides estimates of peak hour travel by transit mode (bus, Metro Rail and Light Rail transit). In addition, it summarizes site-related bus demand by major corridor.

Total transit patronage was estimated separately by corridor for each of three phases of development of the preferred alternative. Total person trips were estimated and distributed by direction on the same basis as motor vehicle trips (Figure 49). Then modal split factors ranging from 15 to 30% were applied, depending on the quality of transit service in each corridor. The transit mode split was assumed to increase as the rail transit system expanded and site development moved into its later stages. Specifically, the conditions assumed were:

- Phase I Development
  - Metro Rail MOS-1 (4.4 miles) complete
  - SCRTD bus terminal complete
  - El Monte Busway Complete

- Phase II Development
  - Metro Rail extended to 8.8 miles, either to the west or toward North Hollywood
  - Burbank and Pasadena Light Rail lines in operation

- Phase III Development
  - Metro Rail extended beyond 8.8 miles

As a result of these phasing assumptions, the average transit use figure for all three phases shown in Table 43, was 24%. This is more conservative than the 30% mode split used for the development alternatives. These lower percentages were assumed in order to be consistent with the work done on other major developments in the Los Angeles downtown area in regards to vehicle trip generation. The average of 30%, which was used in the evaluation of development alternatives (Part III above), would appear achievable. Moreover, recognizing that Phase III of the development would begin after the Year 2000, higher levels of transit use -- in the 35 - 40% range -- are possible -- as observed in some of the downtown Los Angeles cordon counts.

Table 43 summarizes the results for each major direction and for the various transit systems. The purpose of these figures is to provide a preliminary estimate of the magnitude of transit loadings that might be expected; they are not substitutes for the more detailed patronage estimation work that should follow in later steps of development planning for the LAUPT/USPS site.

The "vehicle equivalents" are shown to provide an idea of the magnitude of service required; they are based on:

- Metro Rail - the added number of peak hour departing rail cars required at the rate of 170 persons per added car loading at the LAUPT/USPS site (seated plus standing).

- Bus - the added number of peak hour departing buses required at the rate of 70 persons loading at the LAUPT/USPS site (SCRTD standard for full standing load).

- Light Rail (LRT) - the added number of peak hour departing rail cars required at the rate of 120 persons per added car loading at the LAUPT/USPS site (seated plus standing).

The estimates shown in Table 43 are site-generated, post-year 2000 trips and do not include transit boardings not related to the site development. The "vehicle equivalent" figures are in addition to the "background" service frequencies not related to the site development. Figure 60 illustrates the relative magnitude of site-related and non-site-related boardings for Metro Rail at Union Station.

TABLE 43

DISTRIBUTION OF PM PEAK HOUR TRANSIT BOARDINGS BY DIRECTION FOR THE PREFERRED ALTERNATIVE AT BUILD-OUT (POST-YEAR 2000)

Direction	Total Person-Trips	Total Transit Trips[a]		Allocation of Transit Trips[b] Metro Rail		Bus		LRT	
North Freeway	2,730	683	(25%)	137	(20%)	102	(15%)	444	(65%)
North Local	780	156	(20%)	0		94	(60%)	62	(40%)
East Freeway	4,290	1,073	(25%)	0		804	(75%)	268	(25%)
East Local	1,365	205	(15%)	0		205	(100%)	0	
South Freeway	3,900	858	(22%)	429	(50%)	429	(50%)	0	
South CBD	780	195	(24%)	98	(50%)	98	(50%)	0	
West Freeway	4,290	1,287	(30%)	901	(70%)	386	(30%)	0	
West Local	1,365	300	(22%)	225	(75%)	75	(25%)	0	
TOTAL	19,500	4,756	(24%)	1,790	(38%)	2,193	(46%)	744	(16%)
VEHICLE EQUIVALENT					5[c]		18[d]		7

NOTES:

(a) The percentage shown under "Total Transit Trips" are transit's share of total person trips for that direction.

(b) The percentages shown under "Allocation of Transit Trips" represent the portion of the total transit trips in the specified direction by each of the systems.

(c) Assumes that 40% of the passengers continue past the maximum load point in the peak direction.

(d) North and east lines only.

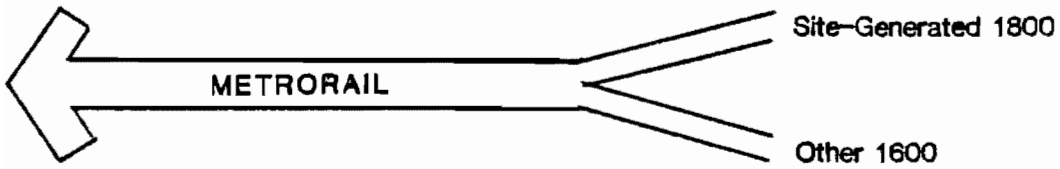


Figure 60

Metrorail Boardings by Source - Union Station

Source: Metrorail Design Directive DD-001 for non-site-related boardings (year 2000), and Table 43, above, for site-related boardings at build-out (post year 2000).

Expansion of SCRTD Bus Service

In all three alternatives, buses are a major part of the transit access, with about half of the transit riders. The rail lines will provide a high-level of service in limited corridors. However, projected rider demand from the LAUPT/USPS site is not concentrated in these corridors. Bus routes, on the other hand, provide a reasonably good level of service in all directions, and would, therefore, serve many of the expected transit riders.

The increased demand for bus service generated by site development alternatives will require expansion of bus capacity and service frequency in all major corridors radiating from Union Station. Expansion will be necessary for express routes serving the LAUPT/USPS site at the proposed SCRTD Bus Terminal and for other express and local routes with stops on streets adjacent to the site. Table 44 shows families of routes which would require expansion by cardinal direction. Those routes are also shown on Figure 61.

TABLE 44

CANDIDATE BUS ROUTES FOR FUTURE SERVICE EXPANSION WITH LAUPT/USPS DEVELOPMENT

	North		East		South		West	
	Exp	Local	Exp	Local	Exp	Local*	Exp	Local
Route	410-419	70's	480-490's	70's	440's	10's, 30's	420's	1-4
Families		80's			450's	40's, 40's	430's	10's

*This relates to routes from Chinatown through the CBD on Hill Street, Broadway, Spring Street, and Main Street.

Source: TDA Inc.

Table 45 provides potential expansion needs by major corridor for each development alternative. Total bus vehicle needs (based on LAUPT/USPS loadings of 70 passengers per bus and the transit usage shown previously in Table 43) range from 34 to 54 buses in the afternoon peak hour. For example, under Preferred Alternative Phase 3, the East Freeway bus volume would be 12 buses. That additional volume would be

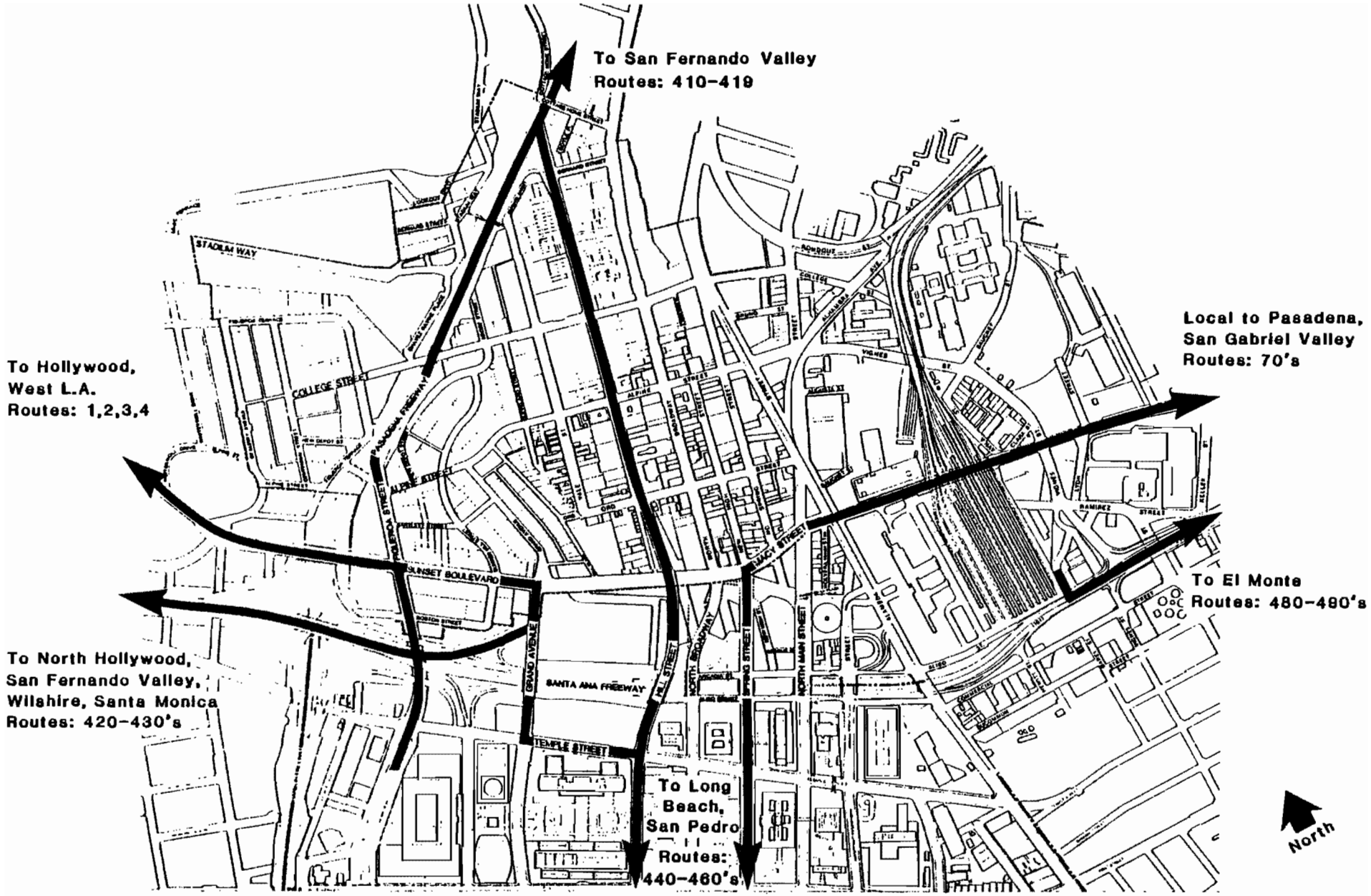


Figure: 61

Source: SCRTD, TDA, Inc.

FAMILIES OF BUS ROUTES FOR FUTURE SERVICE EXPANSION

equivalent to one additional bus every 5 minutes on the El Monte Busway. In other major corridors such as the West Freeway or South Freeway, added volumes would be about 6 peak hour buses for an average frequency of 1 bus every 10 minutes. For most express routes this would mean an increase of one or two runs in the peak hour. Express bus headways currently range from 10 to 30 minutes, so the increased service for any one route would not be expected to alter schedules significantly. Local routes on arterial streets would require extra service at average rates of one bus every 20 minutes or longer. If transit usage exceeds the 30% level, and is in the 40% ranges indicated by some downtown cordon counts, total added bus volumes would exceed 60 vehicles in the peak hour.

TABLE 45

SCRTD EQUIVALENT VEHICLE NEEDS BY DIRECTION

Direction:	Preferred Alt. 3 Mode Split = 24% Boardings	Buses	Preferred Alt. 3 Mode Split = 30% Boardings	Buses
North Freeway	102	2	195	3
North Local	94	2	127	2
East Freeway	804	12	1444	21
East Local	205	3	278	4
South Freeway	429	6	583	9
South CBD	98	2	212	3
West Freeway	386	6	577	9
West Local	75	1	186	3
TOTAL	2193	34	3602	54

SOURCE: Kaku Associates; TDA, Inc.

Location of Stops. Routes planned to terminate in SCRTD's bus terminal will be #'s 483, 485, 487, and 489. These express routes will all use the El Monte Busway with service to the San Gabriel Valley and to Pasadena but do not go through to El Monte Station. Other express and local routes would continue to board passengers on the area's arterial street system or in downtown. Pedestrian volumes between the LAUPT/USPS site and area transit stops will increase by 1,200 to 1,500 persons in the afternoon peak hour.

Routes on streets more than 2 blocks from the periphery of the LAUPT/USPS site would need to be rerouted, to develop the assumed ridership levels. In particular, routes in the 410-419 family on Hill Street and Figueroa Street would require rerouting to Alameda, Main or Spring Street. Routes in the 420-430 family and routes 1-4 with service on Temple Street, Sunset Boulevard, and the Hollywood Freeway would require rerouting via Alameda Street or Los Angeles Street. Express routes to south Los Angeles in the 440-460 family would need connecting local service from Alameda and Spring Street, for example, or would require rerouting to those streets. North Broadway would probably be the most distant transit street acceptable to LAUPT/USPS users. Local routes already concentrate service on Main Street, Spring Street and North Broadway and are not expected to require rerouting. Transit stop and shelter facilities, however, may require expansion or relocation if sidewalk queues grow too large.

SCRTD Bus Terminal. SCRTD plans a 7-berth bus terminal adjacent to the east portal of Metro Rail's terminal station on the LAUPT site. This configuration is required primarily to give each route or group of routes its own berth, and assumes an average of 350 passengers per berth per hour, allowing for the fact that patronage is not evenly distributed among lines. (Based upon the Highway Capacity Manual rule of 8 to 10 buses or 400-500 passengers per berth in the peak hour, the terminal would have a peak hour capacity of about 56 to 70 buses or 2,800 to 3,500 boarding passengers.) SCRTD has no current estimate of bus boardings related to Metro Rail, except that it would be less than 2,000 riders. This estimate does not allow for diversion of Altadena and Sierra Madre passengers to LRT. As shown above in Table 45, site development will generate an estimated 2,200 to 3,600 additional peak hour boardings. Assuming all of the new busway corridor passengers will use buses originating at Union Station terminal, there appears to be sufficient capacity for the 20% mode split, and a 24% mode split could likely be accommodated if the Pasadena LRT diverts passengers from the four SCRTD lines which are planned to use the terminal. To be sure that terminal capacity would not constrain bus patronage, provision should be made for expanding the SCRTD bus terminal by one or two bays in Phases II and III of the site development.

The remainder of the site-related boarding passengers would be served by bus routes on Macy, Alameda, Main and Spring. In order to provide some "feel" for the magnitude

of these added volumes, Table 46 provides a preliminary estimate of the distribution of these boarding passengers to boarding location.

TABLE 46

PM PEAK HOUR PASSENGERS AND BUSES BY BOARDING LOCATION AT SITE BUILD-OUT

Boarding Location	Passengers	Departing Buses
Bus Terminal	550-900	11-18
Macy Street	150-300	5-10
Alameda Street	500-800	15-30
North Main Street	500-800	15-30
North Spring St.	500-800	15-30

Rail Service Implications

For Metro Rail, site-related demand at build-out would require the equivalent of one extra train in the peak hour (assuming 6 cars/train). This could easily be achieved by an increase in service frequency. Similarly, the maximum LRT demands would require an equivalent of between 2 and 3 trains in the peak hour (assuming three to four cars per train). Either increasing train extra length or increasing the frequency of service would meet this demand.

CONTINGENCY ANALYSIS

This section discusses the impact of unexpected events related to the transportation system serving the site. The potential responses to these events are also listed. It includes the effects of baseline actions not taken, and the effects of crucial, unanticipated actions.

1. Metro Rail Cancelled or Halted Indefinitely

(Unlikely in view of recent UMTA, Court, and City decisions.)

Effect. Inadequate transit connection to downtown Los Angeles and, for the long-term, restricted transit capacity to the west and south. Potential

postponement of SCRTD bus terminal completion would restrict transit capacity to the east. Passenger loadings on the Burbank Light Rail line, if built, could increase significantly (a diversion of half the Metro Rail boardings from on-site activities would add about 800 riders, a doubling of projected light rail boardings from the LAUPT/USPS site). Appropriate revisions to bus feeder lines would be required. Modal split would likely fall below target levels, and ultimate re-activation after construction on-site would present difficult retrofit problems and could be highly disruptive.

Responses.

- Change the site plan to allow for the downtown people mover and/or light rail connection to downtown (see alternative layouts in Working Paper #2), and for a less disruptive location for Metro Rail station.

- Provide interim bus loading space if bus terminal construction is delayed.

- Accelerate development of the Burbank light rail line and re-evaluate Santa Monica branch light rail.

- Reduce or delay office build-out.

2. Metro Rail Not Extended Past the First 4.4 Miles to Alvarado Street

(Possible if cost overrun and/or poor ridership.)

Effect. This would limit Metro Rail's role as a means of access for Union Station employees. As in #1, this could increase loadings on the Burbank light rail line, if that line is built.

Responses.

- Expand the bus service to Union Station from points west. Unless an off-street bus transfer facility were created at Alvarado, bus service in the vicinity of Union Station would have to provide for as many as 1,500 additional peak hour boardings (about 50 additional bus

departures). This would affect express route #'s 1, 2, 3, 4, 420-429, and 430-439.

- Re-evaluate an alternative rail connection to the west (Santa Monica branch light rail, for example), and develop if feasible.

- Accelerate development of the Burbank light rail line.

3. Metro Rail Delayed During Construction

Effect. This would delay construction on the LAUPT site.

Responses.

- Reschedule site development.

- Begin development on certain portions of the site unaffected by Metro Rail construction.

4. AMTRAK Ridership Exceeds Projections by a Significant Amount

Effect. Passenger loadings in Union Station would be higher than expected.

Response.

- Identify market served and evaluate impact on needs for AMTRAK parking and dropoff space.

5. AMTRAK Ceases to Provide Service

Effect. A major tenant of the site would no longer be there, and the pedestrian flow through the site would be reduced. Because of the current success of the San Diego runs, it is likely that someone else would take over, such as Caltrans; but the end of long-distance train service could reduce on-site parking demand.

Response.

- Re-evaluate parking and transit demand forecasts.

6. El Monte Busway Converted to Rail Technology

Effect. Bus ridership from San Gabriel Valley would shift to rail. This would reduce bus layover and circulation requirements in SCRTD bus terminal. Metro Rail plans ultimately to tie this line into a junction east of Union Station, and Union Station would become an intermediate stop instead of a terminal.

Responses.

- Develop an El Monte rail stop at Union Station if the presently planned connection is not built.

- Reallocate bus terminal space for parking or other uses, as available.

7. LA-Long Beach Light Rail Extended to Union Station Underground

Effect. If such a decision were made prior to site construction (mid-1990), it would create additional site development constraints and would increase passenger loadings at the site. If the decision came after on-site construction began, it would present difficult retrofit problems with respect to both Metro Rail and on-site development.

Response.

- None can be identified at this time; probability of this event seems low.

8. Burbank-San Fernando Commuter Rail Delayed Indefinitely

Effect. A restraint in higher phases of development on the percent of employees using transit (approximately 500 projected peak hour light rail users would be affected). This could result in some diversion of Burbank line passengers to Metro Rail, particularly if coupled with appropriate expansion of bus feeder service to Metro Rail.

Responses.

- Initiate express bus service from Union Station to the San Fernando Valley, to provide service levels comparable to that currently available for downtown Los Angeles. This would require addition of approximately 17 peak hour bus departures. (As LACTC and SCRTD may not be able to fully fund this expansion from presently available resources, developer may be faced with some financial responsibility for such a service expansion.); or

- Reduce planned office space by approximately 133,000 square feet.

9. Pasadena Light Rail Delayed Indefinitely

Effect. A restraint in higher phases of development on the percent of employees using transit (approximately 270 projected peak hour light rail users would be affected).

Responses.

- Expand the bus service from Union Station to Pasadena to provide service levels comparable to that currently available for downtown Los Angeles. This would require the addition of approximately 9 peak hour bus departures.

- Revise route #'s 81 and 402 to feed Metro Rail at Union Station.

10. Other Light Rail Lines Built With Connection to Union Station (Santa Monica or West Santa Ana, for Example)

Effect. Provides additional transit opportunities for higher employment levels. May pose constraints on site development by requiring extra terminal space.

Responses.

- Develop plan to integrate these lines with other transit functions at Union Station.

- Evaluate effect on transit travel time and "disutility" to see whether parking requirements can be reduced.

11. Downtown People Mover Resurrected With Service to Union Station Area (Unlikely in view of Metro Rail decision and high nose level of Vancouver prototype.)

Effect. This would have the positive effect of providing an additional connection to downtown and perhaps to areas other than served by Metro Rail. It would also require some adjustment to development plans to allow space for the downtown people mover.

Response.

- If it were to happen, find a way to include it on the site. (See alternative layouts in Working Paper #2.)

12. Union Station Area Employees Do Not Achieve the Projected Transportation Management Levels

Effect. For the given development levels, traffic volumes would be higher than projected.

Responses.

- Limit development accordingly.
- Increase the intensity of the Transportation Management Program.

13. Union Station Area Employees Exceed the Projected Transportation Management Levels of Transit, Ridesharing and Peak Spreading

Effect. Traffic volumes for given levels of development would be less than projected.

Responses.

- Reduce or delay on-site parking.
- Maintain integrity of Transportation Management Program.
- Postpone and re-evaluate need for traffic improvements.

- Review specific plan for higher development potential.

14. SCRTD Decides to Build Significantly Higher Numbers of Parking Spaces (2,500 as in EIS, for Example)

Effect. This would compete with both on-site space for parking and off-site traffic capacity given the plans for Union Station.

Responses.

- Encourage SCRTD to seek parking locations elsewhere where traffic and space is less of a limitation, and to gain passenger-miles by intercepting passengers in outlying areas.

- Convince SCRTD that it is not a likely place for remote parking anyway.

- Scale back on-site office development plans by approximately 15%.

15. Alameda Street Adjacent to Sites is Widened Beyond Present Plans.

Effect. This would discourage pedestrian flow across Alameda Street. It would most likely occur at Alameda Street / Sunset Boulevard / Macy Street and would impact El Pueblo visitors from crossing to Union Station.

Responses.

- Refocus connection from Sunset Boulevard/Macy Street to Los Angeles Street crossing of Alameda Street.

- Evaluate pedestrian bridge across Alameda Street to see whether it could be an effective mitigation measure.

- Delay widening until specialty retail on Union Station property is well established, independent of El Pueblo State Park or Chinatown.

IMPLEMENTATION STRATEGY

This section describes the interdependency among the various transportation improvements, preliminary schedules for these improvements, the conditions that will "trigger" the need for street system improvements and the responsibilities for improvements.

Concept

The recommended strategy recognizes the inter-relationship among external events, development desires and changing travel characteristics. Specifically:

- The development schedule is influenced not only by market forces, but also by the schedule of Metro Rail development. Metro Rail construction will dominate the site and prevent significant mixed use development until about 1991.[1] In addition, the Baseline transportation program included opening of light rail lines to the San Fernando Valley and to Pasadena by the mid-1990's. The development schedule and the key transit milestones are shown on Figure 62.

- The rate at which vehicular traffic will be generated will change over the period of development. As the on-site development matures and becomes more dense, ridesharing and transit will become more attractive. Likewise, the state of development of the transit programs will influence transit ridership.

- The need for traffic facility improvements will change over time. These needs will be determined not only by on-site demands, as described above, but also by the demands related to other downtown Los Angeles growth.

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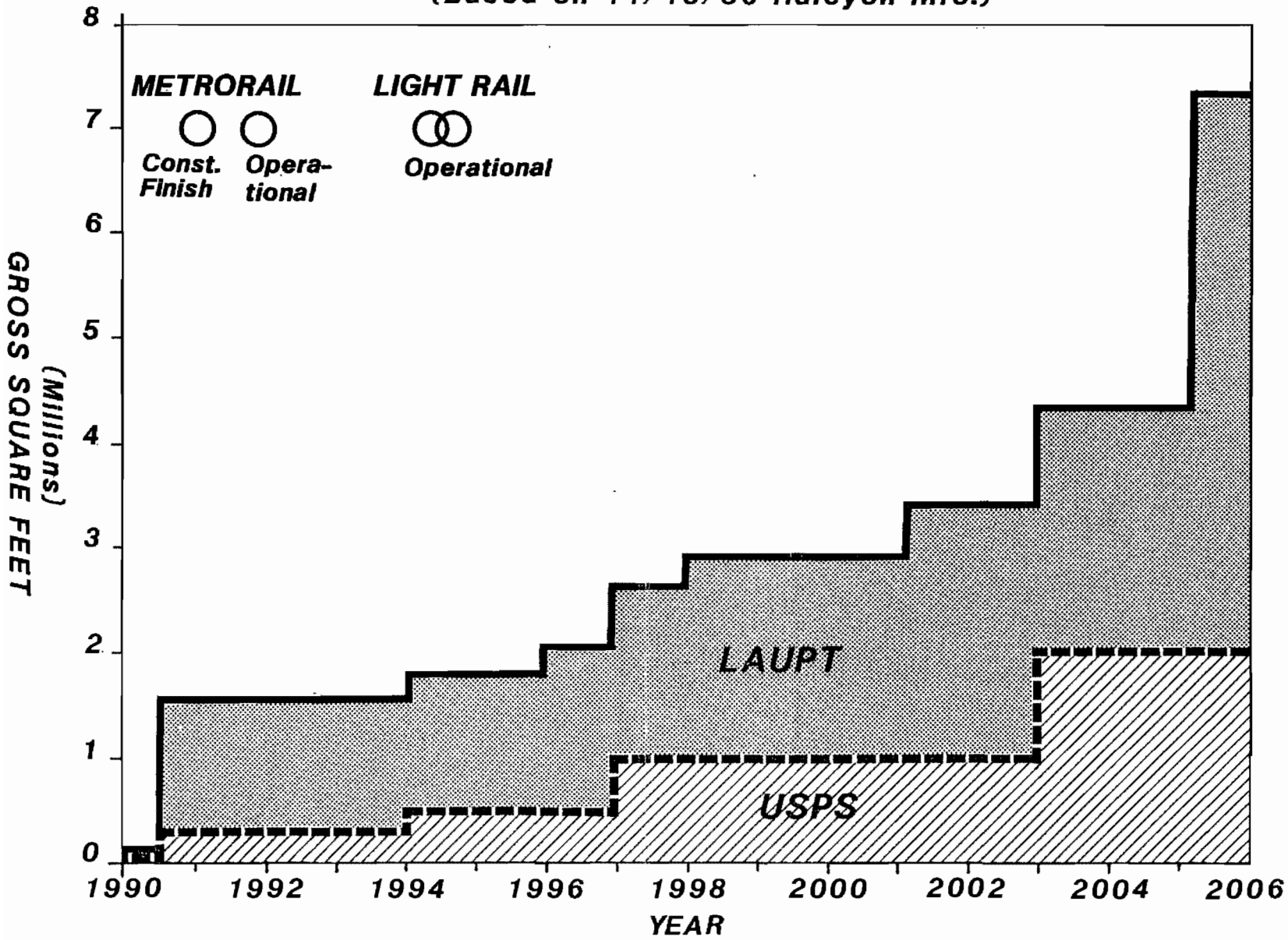
(1) By 1991, current schedules call for completion of on-site construction of the tunnel, station, bus terminal and the on-bound ramp from the bus terminal to the El Monte busway. Some landscaping activities would continue until Metro Rail opening in 1991.

SITE DEVELOPMENT SCHEDULE

(Based on 11/13/86 Halcyon Info.)



DEVELOPMENT SCHEDULE AND KEY TRANSIT MILESTONES **Figure 62**

The following pages will describe the transportation improvements, their sequence as related to the development program, and responsibilities for their implementation. Because motor vehicles will be the most important means of access, at least in the early phases, and because the capacity of the street system will be the first limit "bumped into" by LAUPT/USPS traffic, the street system will be dealt with first. The schedule requirements of the other transportation improvements will follow that.

Street System Improvement Timing

As described previously, three levels of street system improvement were defined (see Part III). These and the projects included in each are summarized below and the project's are located on Figure 63.

Level I. This is defined as the existing system; therefore, no projects are included.

Level II. Projects either currently planned or at least possible within existing rights-of-way. These projects must be complete by the end of 1991, based on the current development schedules (however, see the discussion of "thresholds" in the following section; the actual timing will be based on traffic generation experience of the LAUPT/USPS site or on City decisions unrelated to the site):

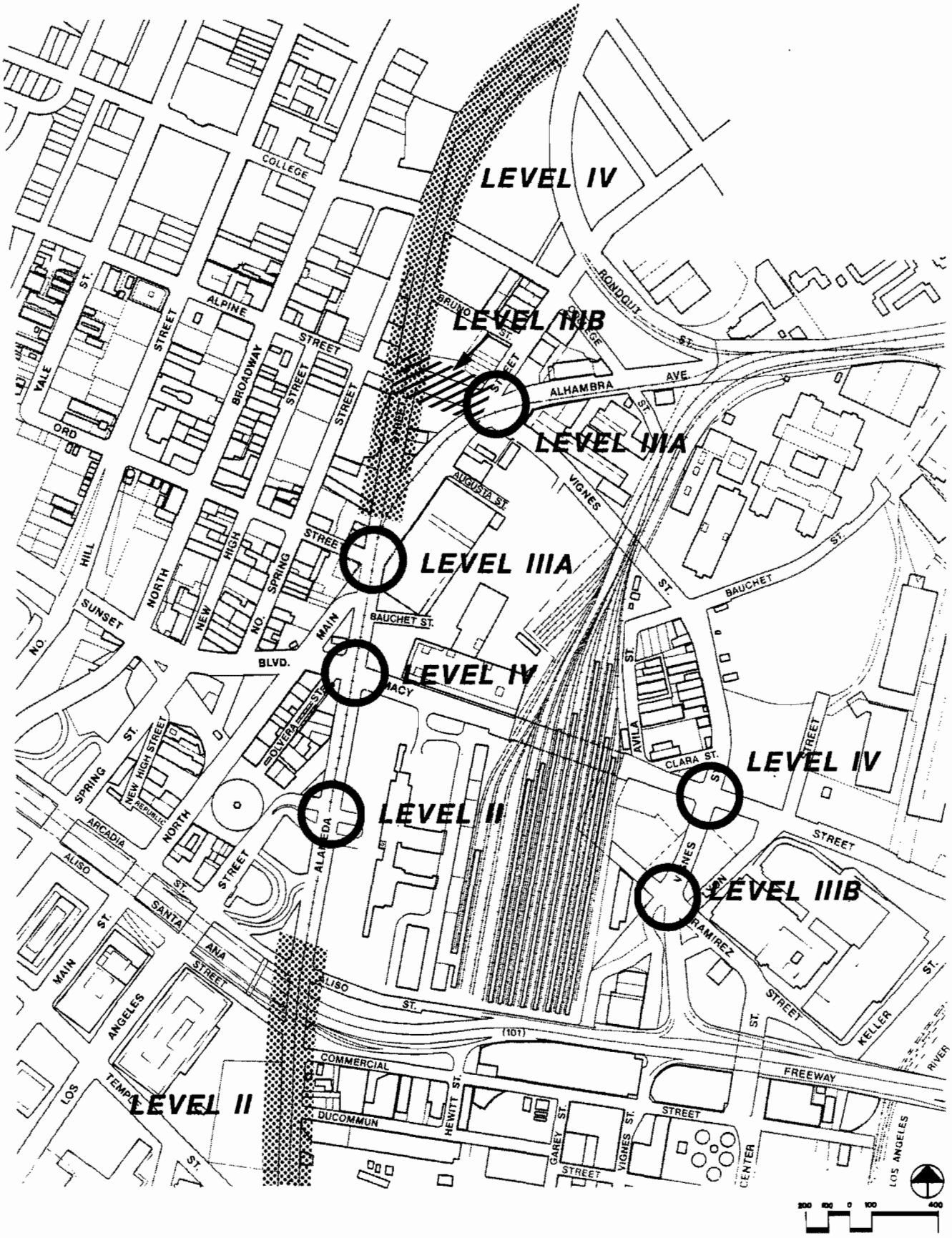
- Widening of Alameda Street from 4 lanes to 6 lanes from 400 feet north of Arcadia Street to Temple Street. The City of Los Angeles currently has this project underway.

- Realignment and signalization of Ramirez/Vignes Street intersection (for Metro Rail).

- Repavement of Alameda Street (present width) from 400 feet north of Arcadia to College Street.

Level III.A. Projects requiring right-of-way which should be easily available, and which are needed for Phase I development. These must be completed by mid-1992, based on current development schedules:

- Alameda/Main Streets intersection improvements.



Parsons Brinckerhoff TDA INC. KAKU ASSOC DON MILES ASSOC	**Union Station Area Transportation Study**	**FIGURE** **63**
	LOCATION OF LEVEL I, II AND III TRAFFIC IMPROVEMENTS	

- Main/Vignes Streets intersection improvements (triangle area).

Level III.B. Projects requiring right-of-way which should be easily available, and which are needed for Phase II development. These projects must be completed by the end of 1994, based on current development schedules:

- Vignes/Ramirez/Freeway Ramp intersection improvements (for LAUPT east side garage traffic).

- Alpine/Vignes Streets turn lanes onto N. Main Street northbound and onto southbound Alameda Street (for USPS north side garage traffic).

- Rebuilding Alameda/North Spring Streets from College Street to Elmyra Street near the Spring Street railroad yard.

Level IV. Other potential mitigating measures requiring the acquisition of additional rights-of-way. The projects below should be complete before occupancy of any Phase III development (technically, they will be needed before occupancy of the last 20% of Phase II. Based on current development schedules, these projects should be complete in the Year 2003 to 2005 period:

- Widening North Spring Street from Elmyra Street to I-5.

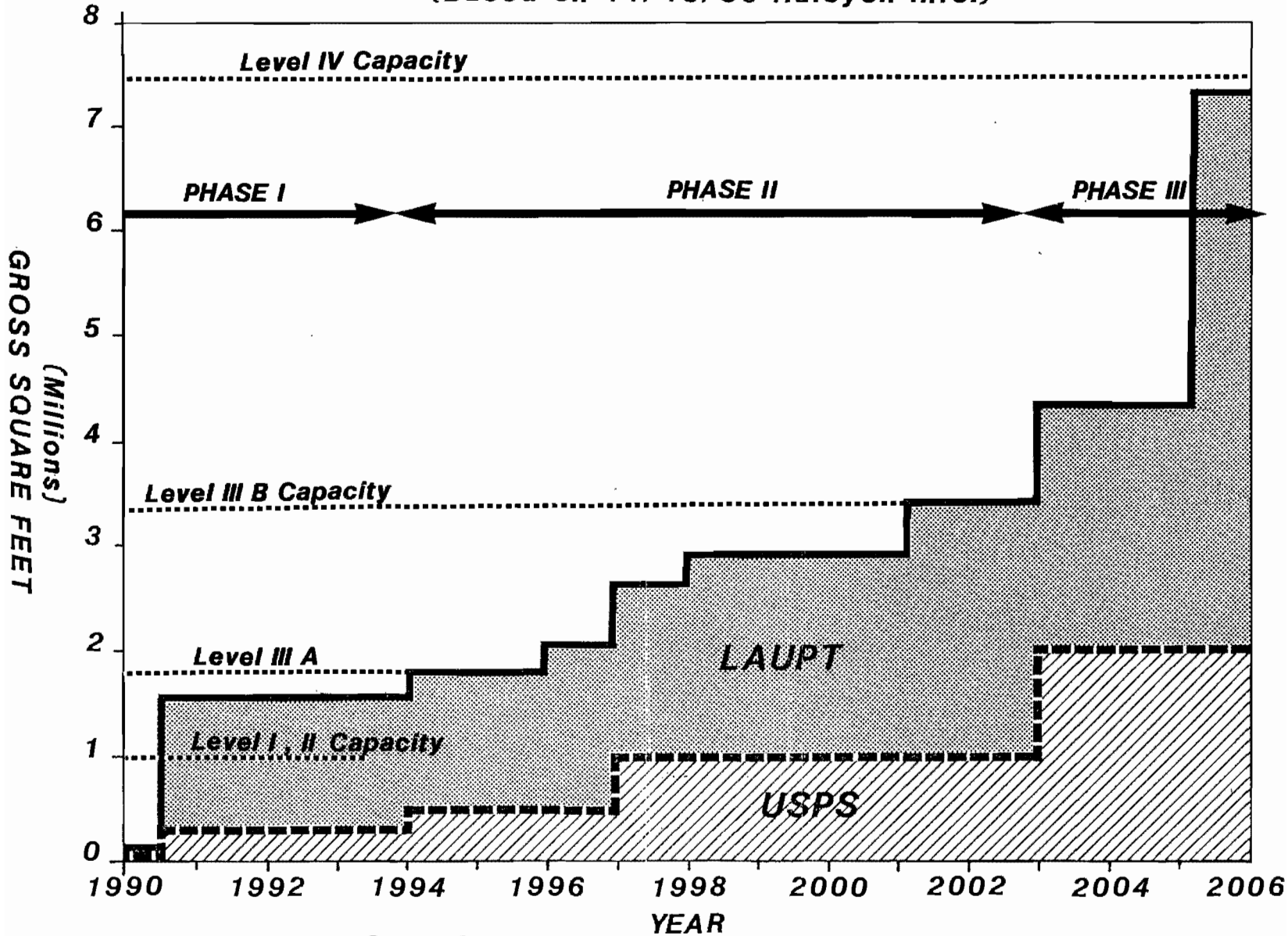
- Alameda/Macy Streets intersection improvements (requiring some R-O-W dedication from the site).

- Vignes/Macy Streets intersection improvements (requiring some R-O-W acquisition).

The capacity of the street system under these levels of improvement is compared to development phasing in Figure 64.

SITE DEVELOPMENT SCHEDULE

(Based on 11/13/86 Halcyon Info.)



Street Capacity by Level of Roadway Improvement and Compared to Development Phasing

Figure 64

Other On-Site Transportation Projects

AMTRAK

- Move the ticketing/waiting/baggage-handling facilities to east side of Union Station. This could begin after completion of the Metro Rail station shell (9/89). Completion should be concurrent with the opening of the intercity bus terminal (mid-1992).

- Revise tracks to add a release track for the most easterly AMTRAK platform. This could begin after completion of the structural elements of the new ticketing/waiting/baggage handling facilities.

- Build a new intercity bus terminal (see "Trailways"). This should be completed concurrently with the RTD bus terminal (mid-1992) and could start as early as the end of 1989.

Light Rail. With the possible exception of track work, completion of the San Fernando Valley and Pasadena lines is not critically linked to any on site construction.

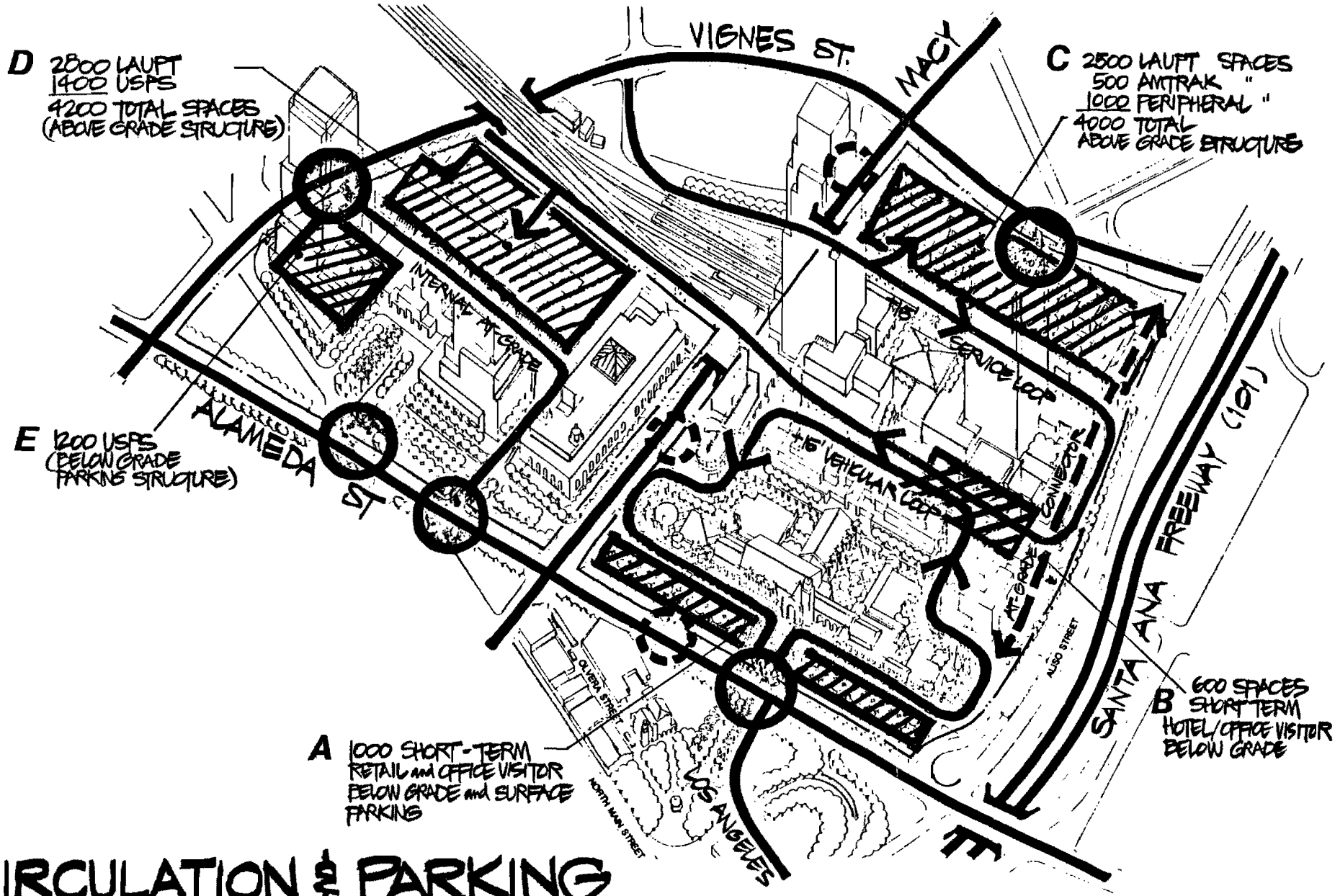
- Build new or revise existing platform and two tracks (if necessary). This could be done at the same time as other track work on the LAUPT site, either that related to Metro Rail and/or that for AMTRAK.

- Build ticketing facility (if needed). Complete by mid-1990's.

Parking. (See Figure 65, which shows the location of parking facilities.)

- Build Parking Area A. This can begin when Metro Rail site-work is complete (3/91) and should be complete by the opening of Phase I retail (7/92).

- Build Parking Area B. This should be complete for the Phase I office development on the Union Station site (mid-1992, based on current development schedules).



CIRCULATION & PARKING

Los Angeles Union Station Urban Design Plan

Prepared for the Community Redevelopment Agency, Los Angeles Union Passenger Terminal, United States Postal Service

Figure 65

Source: ROMA, PBQD

- Build Parking Area C.
  - Stage I (1,000 subsurface spaces). This subsurface portion must be completed by the time the SCRTD and Trailways/AMTRAK bus terminals are complete (4/92). Also the deck above the bus terminals level should be completed (but not finished) at this stage.

  - Stage II (1,500 spaces). This will be needed for on-site development; based on current schedules, it would be needed by 1995.

  - Stage III (1,500 spaces). This will be needed for on-site development/ based on current schedules, it would be needed by the Year 2000.

- Build Parking Area D.
  - Stage I (1,400 spaces less existing 900 removed). Based on current development schedules, this will be needed by 1993.

  - Stage II (1,400 spaces). Based on current development schedules, this will be needed by 1997.

  - Stage III (1,400 spaces). Based on current development schedules, this will be needed by 2009.

- Build Parking Area E (1200) spaces). Based on current development schedules, this will be needed by 2003.

Trailways

- Build the new intercity bus terminal (see "AMTRAK").

On-Site Roadways

- Revise the main entrance to LAUPT on Alameda Street. Complete with the Alameda/Los Angeles Street intersection revisions (by the end of 1991).

- Complete the supplemental entrance on Alameda Street to LAUPT site. Complete with the underground Parking Area "A" (mid-1992).

- Build the Vignes/Bauchet Street Entrances to LAUPT. Complete the westerly entrance with the service road loop; complete the easterly entrance with Stage I of Parking Area C.

- Build the Vignes/Ramirez Street Entrances to Parking Area C. This should be done in conjunction with the bus terminal (complete in mid-1992).

- Build the Avila Street Approach to the Service Road Loop and to Parking Area C. This should be done in conjunction with the bus terminal (complete in mid-1992).

- Build the Vignes Street Entrances to the USPS Site. Complete this in conjunction with the building of Parking Area D.

- Build the Alameda Street Entrances to the USPS Site. Complete this in conjunction with the building of Parking Area E.

- Build the Main Loop Road on the LAUPT Site. Complete this at the same time as completion of Phase II development of the LAUPT site.

- Build the Remainder of the Service Loop. Complete this at the same time as completion of Phase II development of the LAUPT site.

Pedestrian Facilities. Pedestrian circulation and facilities within and adjacent to the project should be defined as a development framework with specific implementation design and management guidelines. The pedestrian circulation framework and guidelines should function successfully at each phase of the project's development.

- Realign Los Angeles/Alameda Intersection (before mid-1992).

- Install signs and street furniture (before opening of LAUPT Phase I).

Schedule of Improvements. A schedule for these improvements is shown on Figure 66, and compared to the Phases of Development. This schedule is based on the current estimate of development phasing and traffic performance, and is shown for illustrative purposes only. As will be discussed in the following section, some of the external

Los Angeles
UNION STATION TRANSPORTATION AND TRAFFIC STUDY

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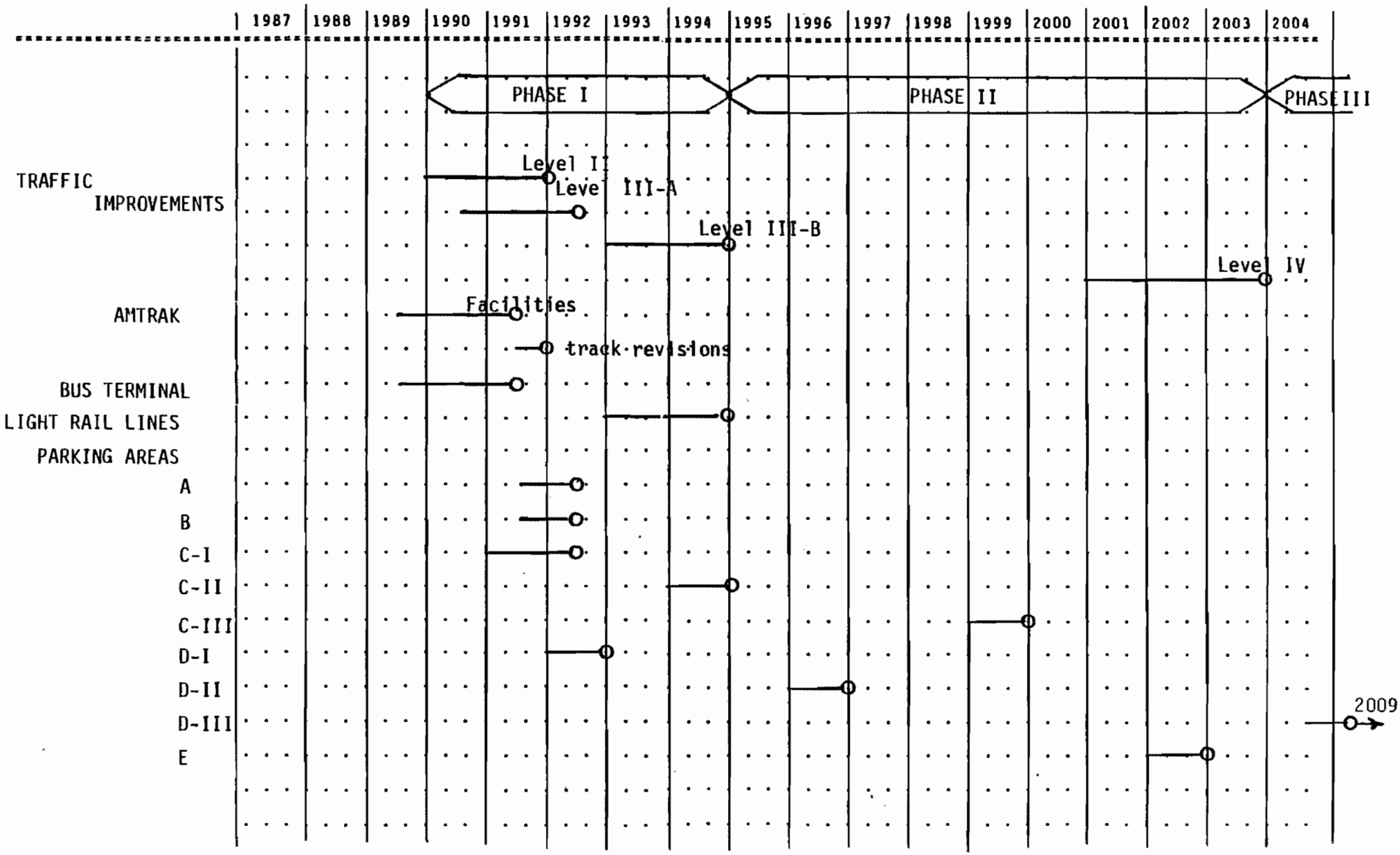


Figure **66** Schedule of Transportation Improvements.

Source: TDA Inc.
Nov., 1986

traffic improvements will be related to the actual travel behavior of the on-site uses, and, obviously, on site improvements will be related to the actual schedule of site development.

Implementation Responsibility

This section describes the "threshold" levels of traffic volume which will "trigger" needed off-site traffic improvements and the allocation of responsibility for implementation. The primary purpose is to identify the responsibilities of the site owners for off-site traffic improvements.

The recommended approach ties development to actual traffic performance, rather than to specified phases of development. Under this approach, a given level of traffic improvements will allow development up to a specified "trigger," measured by p.m. peak hour outbound trips from the LAUPT/USPS site. This permits recognition of any success or difficulty the site may have had in achieving trip generation rates different than those used in estimating the traffic volumes described in this report. The issue of lower trip generation rates was discussed in the previous section.

The results of this approach are shown in Table 47. It shows the development that could proceed with only the existing street system, not requiring any improvements beyond those already underway by the City, and three additional "triggers" that would require additional street improvements. To explain, consider the second "trigger," for example:

- When p.m. peak hour outbound traffic volumes from the LAUPT/USPS site total 1,740 vehicles, Level III-A traffic improvements (described previously, and summarized on the Table) would be required.

- These Level III-A improvements would allow development up to the point that P.M. peak hour outbound volumes reached 2,610 vehicles. These 2,610 vehicles, therefore, become the "trigger" for the next level of traffic improvement.

- Based on the current estimates of travel, these Level III-A improvements would permit site development up to about 1.5 million square feet. (This is

TABLE 47

REQUIRED TRAFFIC IMPROVEMENT ACTIONS BY THRESHOLD LEVEL OF TRAFFIC VOLUMES

"Trigger" Requiring Traffic Improvement (1)	Maximum Traffic at this Improvement Level (1)	Approximate Max. Devel. that can be Added to Site	Required Level of Street Improvement	Traffic Improvement Actions
(before occupancy of any new development)	1,740 vehicles	1 mil. gsf (+ replace 400,000 gsf on USPS site)	Levels I, II	1. Widen Alameda from north of Arcadia to Temple Streets 2. Realign and signalize Ramirez/Vignes intersection.
1,740 Vehicles	2,610 vehicles	1.5 mil. gsf	Levels III-A	1. Alameda/Main intersection improvements. 2. Main/Vignes intersection improvements.
2,610 Vehicles	5,390 vehicles	5 mil. gsf	Level III-B	1. Vignes/Ramirez/Freeway Ramp intersection improvements. 2. Add turn-lanes at intersections of Main/Vignes and Alameda/Vignes.
5,390 Vehicles	10,450 vehicles	7.6 mil. gsf	Level IV	1. Widen/improve N. Spring and Alameda Streets, north of site, to I-5.

shown only for illustration; this level of development does not become the "trigger.")

This "traffic trigger" concept can be applied only when there is a sufficient data base (three years minimum) to allow travel demands and mode choice to be projected over the "lead time" for decision-making and construction of traffic and parking improvements. Adjustments must be made for vacancies and projects based on full occupancy of floor area.

Transportation Strategy in Relation to Development

In Table 48, specific improvements have been linked to the incremental project schedule developed by the urban design consultant. Improvements are distributed among the phases of implementation with the idea that specific transit, street system, and parking facilities would be in place before completion of the corresponding increment of development. A very rough cost estimate is given in Table 481 for most of the site-related improvements. (Cost estimates for some of the baseline facilities and for restructuring of bus services, are omitted.)

Cost Assumptions

The cost presented in Table 48 are given purely for comparison purposes. Good cost estimates will require detailed engineering studies, which were not within the scope of this study.

Land costs are not included for street right-of-way, site land dedication, or land belonging to the railroads which own Los Angeles Union Passenger Terminal. Where other property would need to be purchased, typical land costs of $10 to $100 per square foot were assumed, depending on location and present use.

All estimates are in 1985 constant dollars, with no allowance for escalation.

The "traffic triggers" can discussed above gradually replace the schedule in Table 48, which is based on current estimates of development staging and of traffic generation. Table 48 should be used until 1994 or 1995 -- when the data base on Metro Rail, light

TABLE 48

TRANSPORTATION IMPROVEMENT STRATEGY

Site Activity	Related Improvements	Approx. Cost ($ millions)
Rehab Terminal Annex (USPS)	Streets and Highways	
	o Widen Alameda from Temple to 400' north of Arcadia and repave to College Street.	4.1[a]
	o Auxiliary lane extension, US 101.	NA[a]
	Transit	
	o Complete busway extension.	19.0[a]
	o Move bus layover space to SCRTD Central Maintenance.	
	Parking	
	o Open available USPS parking to LAUPT employees to offset temporary losses due to construction.	Neg.
Build Metro Rail Station[a] (LAUPT site by SCRTD)	Streets and Highways	
	o Widen Vignes Street, Macy to Ramirez.	2.0[a]
	o Realign and signalize Ramirez/ Vignes.	0.3[a]
	o Improve Macy/Vignes Intersections.	0.2[a]
	Transit	
	o Build Bus Terminal to serve SCRTD and Trailways.	NA[a]
	o Add on-ramp to eastbound busway from bus terminal.	NA[a]
	Parking	
	o Rebuild "A" parking for 1,000 spaces on 2 sub-surface levels and 1 surface level.	18.0[b]
	o Build 1,000-space "C.1" garage under bus terminal.	20.0[c]

(a) Baseline item. NA indicates data not available.
(b) At $15,000 per space, underground.
(c) At $20,000 per space, underground.

TABLE 48 (Continued)

TRANSPORTATION IMPROVEMENT STRATEGY

Site Activity	Related Improvements	Approx. Cost ($ millions)
Specialty Retail (LAUPT)	Streets and Highways	
	o Realign Los Angeles Street at Alameda, for better visual connection to site.	0.6
	Transit	
	o Finish Metro Rail and clean up site.	NA[a]
	o Move AMTRAK to east side of station.	0.1
	Parking	
	o None (Uses "A" Parking)	0.0
400-Room Hotel (LAUPT)	Streets and Highways	
	o None (baseline sufficient)	0.0
	Transit	
	o Open bus terminal, reroute SCRTD buses, and relocate Trailways.	NA[a]
	Parking	
	o Build 600-space "B" parking below grade.	9.0
750,000 sq. ft. Offices (LAUPT)	Streets and Highways	
	o Repave Alameda Street from College to Elmyra.	0.2
	o Widen EB approach on Vignes at N. Main for 2nd left turn pocket.	0.1
	o Widen/restripe Alameda/N. Main/ USPS intersection.	0.1
	Transit	
	o Increase bus frequencies.	---[e]

(a) Baseline item. NA indicates data not available.
(e) By rescheduling drivers and equipment freed-up by Metro Rail.

TABLE 48 (Continued)

TRANSPORTATION IMPROVEMENT STRATEGY

Site Activity	Related Improvements	Approx. Cost ($ millions)
75,000 sq. ft. Offices (Continued)	Parking o Build first 1,000 spaces of "C" area structure.	5.0(d)
200,000 sq. ft. Offices (USPS) Phase II	Streets and Highways o Close N. Main, Alameda-Vignes.	0.3
	Transit o Increase bus frequencies.	__(e)
	Parking o Build first 1,400 spaces of "D" structure and demolish old garage.	11.2(d)
345,000 sq. ft. Offices (LAUPT) Phase II	Streets and Highways o Further improve Vignes/Ramirez/ U.S. 101 ramp intersection.	0.5
	Transit o Build LRT line to Pasadena.	300.0(a)
	Parking o Build second 1,000 spaces of "C" structure.	8.0(f)
	o Build Bauchet connector.	1.5
500,000 sq. ft. Offices (USPS)	Streets and Highways o No additional improvements.	0.0
	Transit o Build LRT to Glendale.	400.0(a)
	Parking o Build "E" structure parking, 1,200 spaces base level of building.	18.0(g)

(a) Baseline item. NA indicates data not available.
(d) Assumes $8,000 per space (more if offices to go above structure).
(e) By rescheduling drivers and equipment freed-up by Metro Rail.
(f) $5 million for structure; $2 million allowed for connector.
(g) Assumes $15 million per space.

TABLE 48 (Continued)

TRANSPORTATION IMPROVEMENT STRATEGY

Site Activity	Related Improvements	Approx. Cost ($ millions)
345,000 sq. ft. Offices (LAUPT) - Second stage of Phase II	Streets and Highways o No additional improvements.	0.0
	Transit o Restructure bus routes	___(h)
	Parking o No additional parking	0.0
360,000 sq. ft. Offices (LAUPT) - Completing Phase II	Streets and Highways o Widen Vignes/Ramirez Intersection	0.5
	Transit o Extend Metro Rail 4.4 mile to west and/or northwest, and restructure bus service.	NA(a)
	Parking o Build final 1,000 spaces of "C" structure.	8.0(d)
1.0 million sq. ft. Offices (USPS)	Streets and Highways o Widen N. Spring to 6 lanes and turn lanes, Elmyra to N. Broadway	10.0
	Transit o Extend Metro Rail 8.8 miles to Westwood or San Fernando Valley.	NA(a)
	o Expand bus terminal.	0.5
	Parking o Build second 1,400 spaces of "D" structure.	11.2(d)

(a) Baseline item. NA indicates data not available.
(d) Assumes $8,000 per space (more if offices to go above structure).
(h) Using buses and drivers freed-up by LRT.

TABLE 48 (Continued)

TRANSPORTATION IMPROVEMENT STRATEGY

Site Activity	Related Improvements	Approx. Cost ($ millions)
3.15 million sq. ft. Offices and Accessory Retail (LAUPT) Phase III	Streets and Highways	
	o Widen N. Main/Vignes, add WB left turn lane.	0.1
	o Add lanes EB and WB at Alameda/ N. Main/USPS.	0.1
	o Add NB and SB left turn pockets at Vignes/Macy.	0.4
	o Add SB left turn pocket on Alameda at Macy.	0.1
	Transit	
	o Restructure bus routes	_(g)
	o Expand bus terminal	0.5
	Parking	
	o Build third 1,400 spaces of "D" structure.	11.2(d)
	o Relocate 1,000 Metro Rail parking spaces to park-and-ride facility (if pos.).	1.0 to 8.0

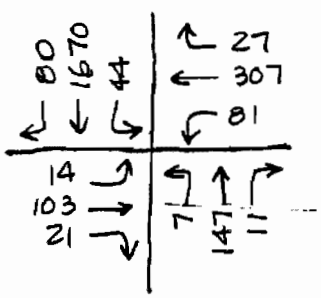
(d) Assumes $8,000 per space (more if offices to go above structure).
(g) Assumes redeployment of buses freed-up by Metro Rail extension.

rail transit, and ridesharing markets will be established for the site as well as for downtown Los Angeles.

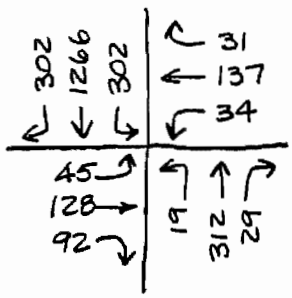
There is no attempt to assign financial responsibility in either Table 47 or Table 48. The improvements listed would be required by the City and CRA before proceeding with the next stage of development. Financial arrangements will be negotiated to balance equities in the context of funds available for capital improvements and "background" traffic growth.

APPENDIX A

HILL / ALPINE



BROADWAY/COLLEGE



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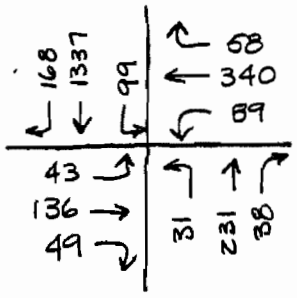
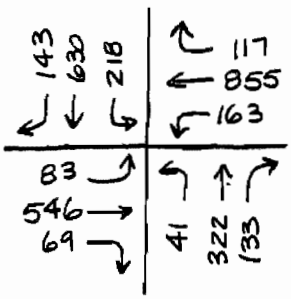
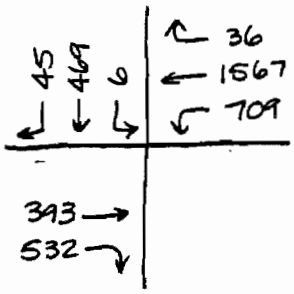


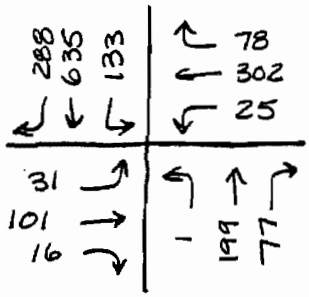
BROADWAY/SUNSET



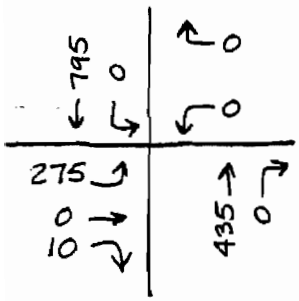
NEWHIGH/SPRING/MACY



MAIN /VIGNES



MAIN/ALAMEDA



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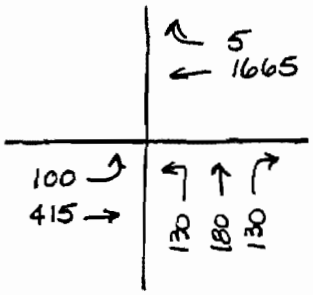


ALAMEDA/MACY

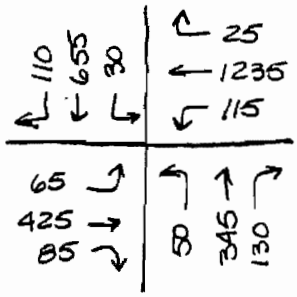
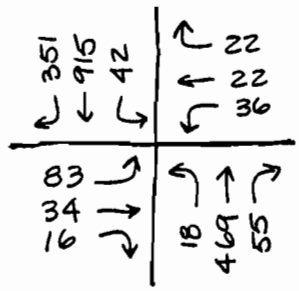
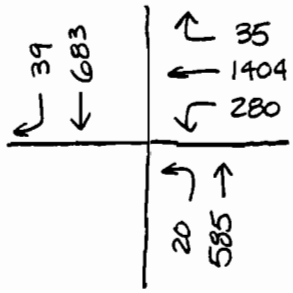


FIGURE A-1
A.M. PEAK HOUR TURNING MOVEMENT
TRAFFIC VOLUMES FOR STUDY INTERSECTIONS
EXISTING CONDITIONS

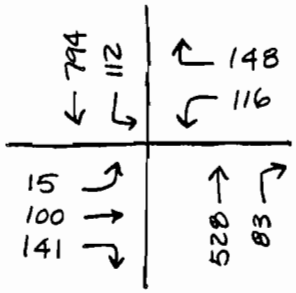
ALAMEDA/LOS ANGELES



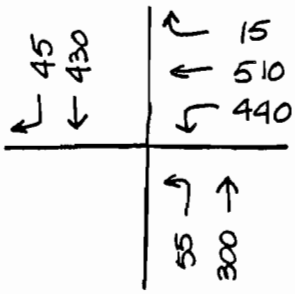
ALAMEDA/ALISO



ALAMEDA/COMMERCIAL

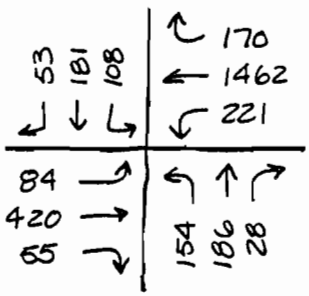


LOS ANGELES/ARCADIA

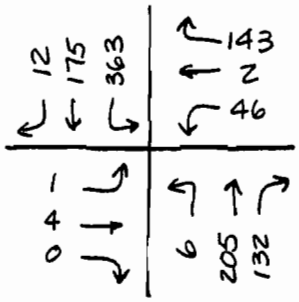


LOS ANGELES/ALISO

VIGNES/MACY



VIGNES/RAMIREZ



PLEASANT/MACY/BROOKLYN

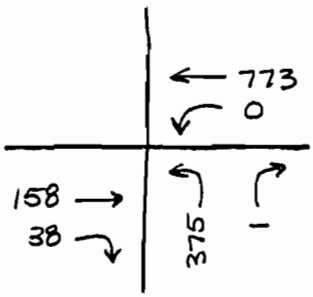


FIGURE A-1 (continued)
A.M. PEAK HOUR TURNING MOVEMENT
TRAFFIC VOLUMES FOR STUDY INTERSECTIONS
EXISTING CONDITIONS

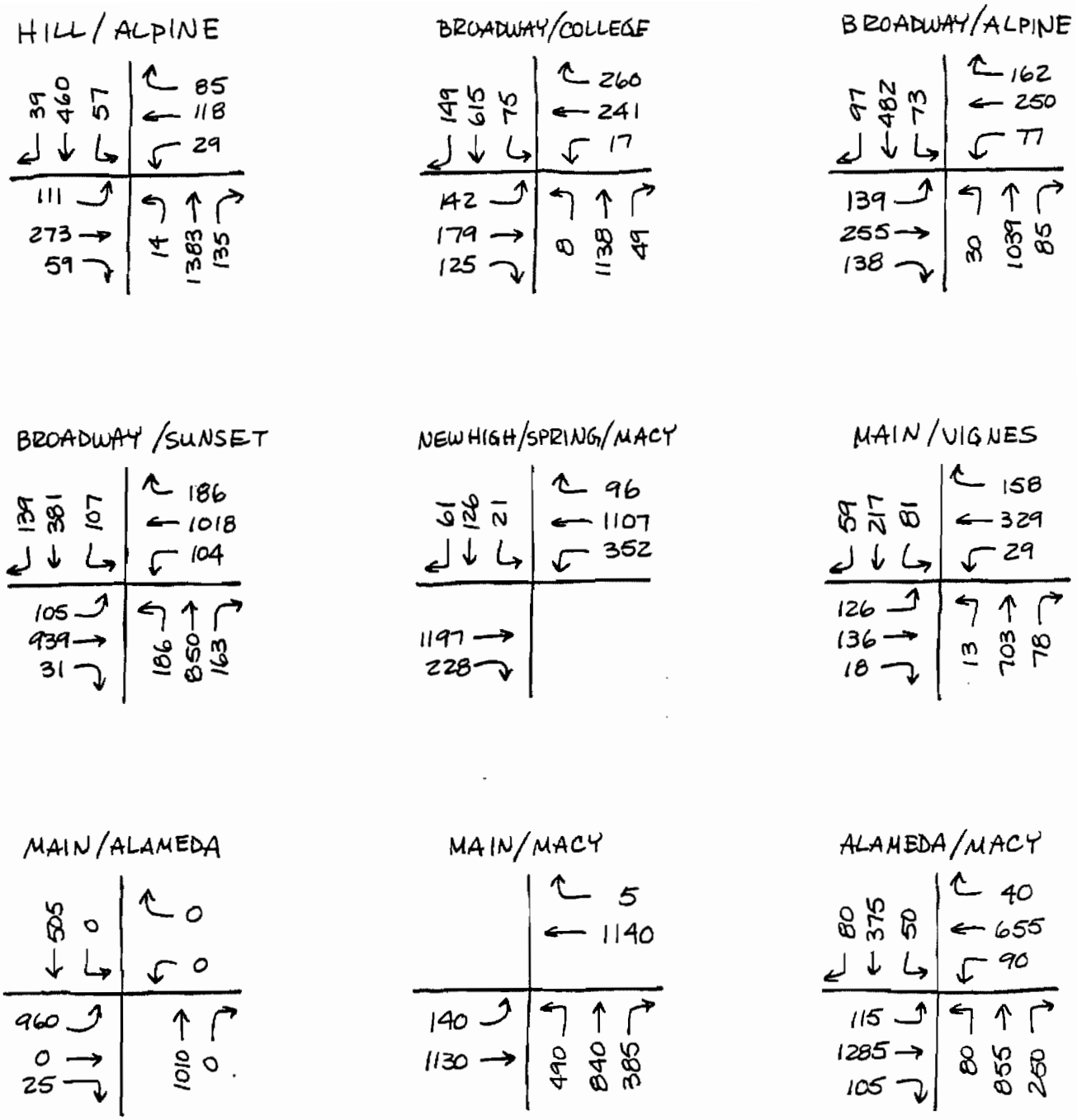
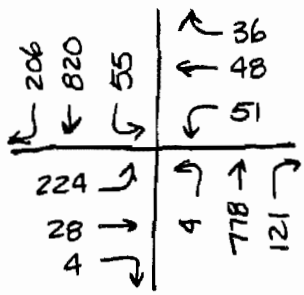
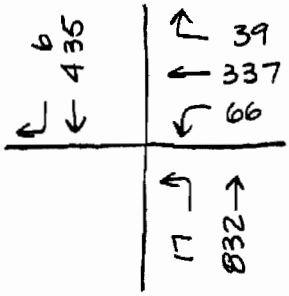


FIGURE A-2
P.M. PEAK HOUR TURNING MOVEMENT
TRAFFIC VOLUMES FOR STUDY INTERSECTIONS
EXISTING CONDITIONS

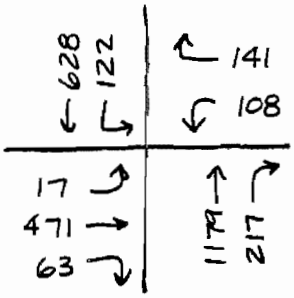
ALAMEDA/LOS ANGELES



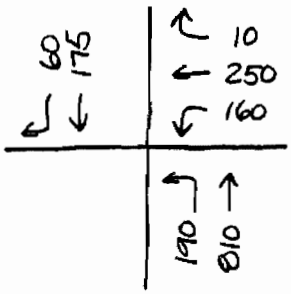
ALAMEDA/ALISO



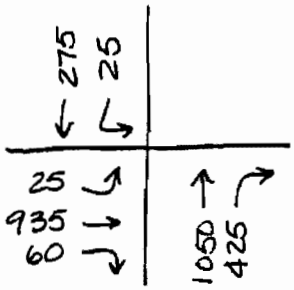
ALAMEDA/COMMERCIAL



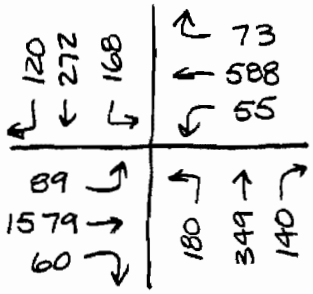
LOS ANGELES/ARCADIA



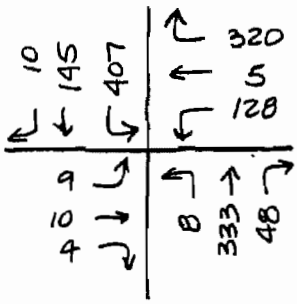
LOS ANGELES/ALISO



VIGNES/MACY



VIGNES/RAMIREZ



PLEASANT/MACY/BROOKLYN

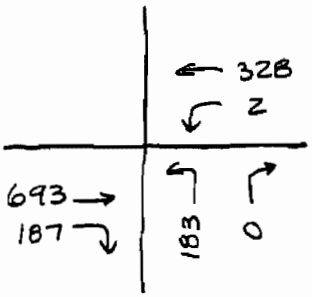
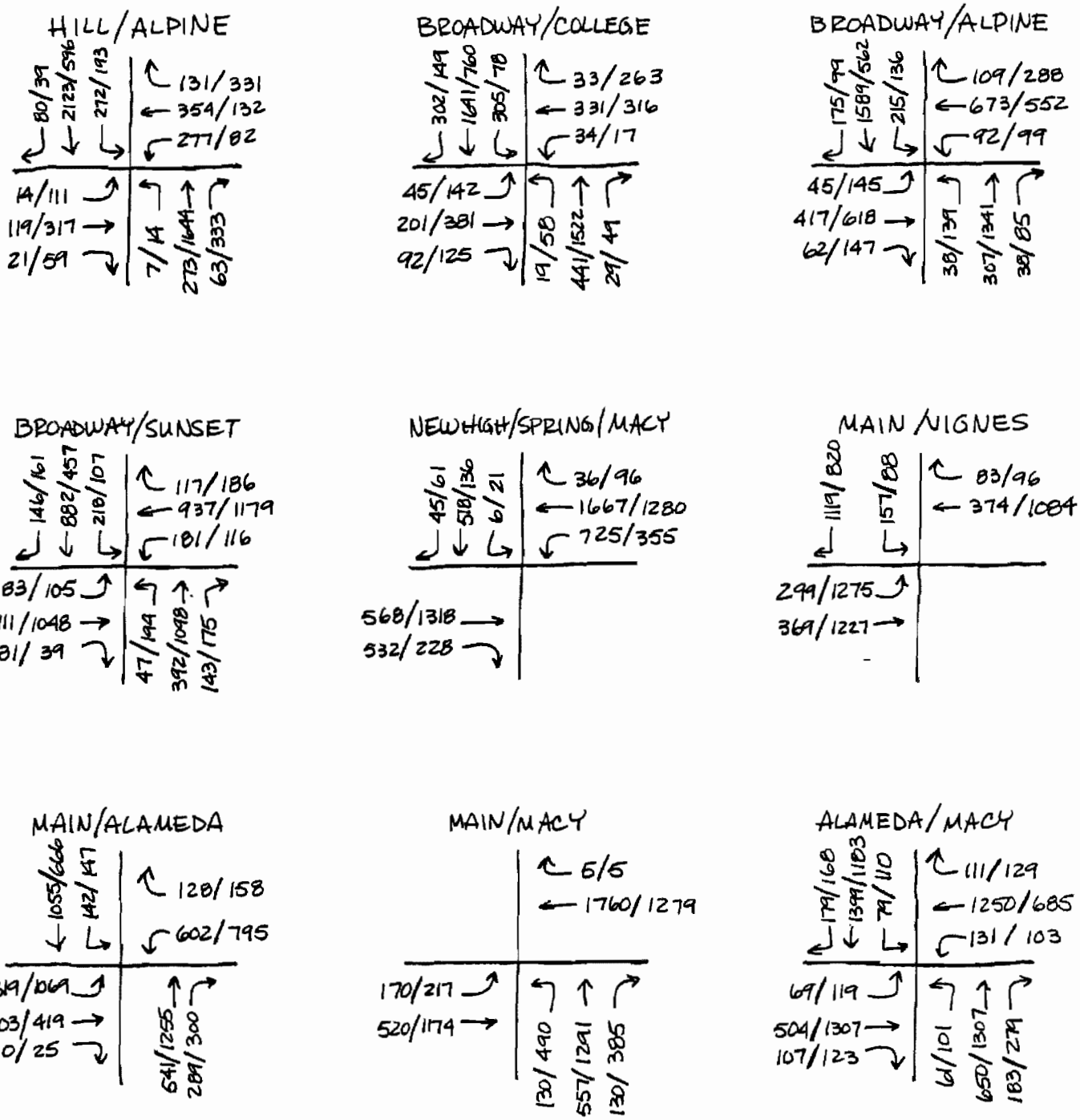


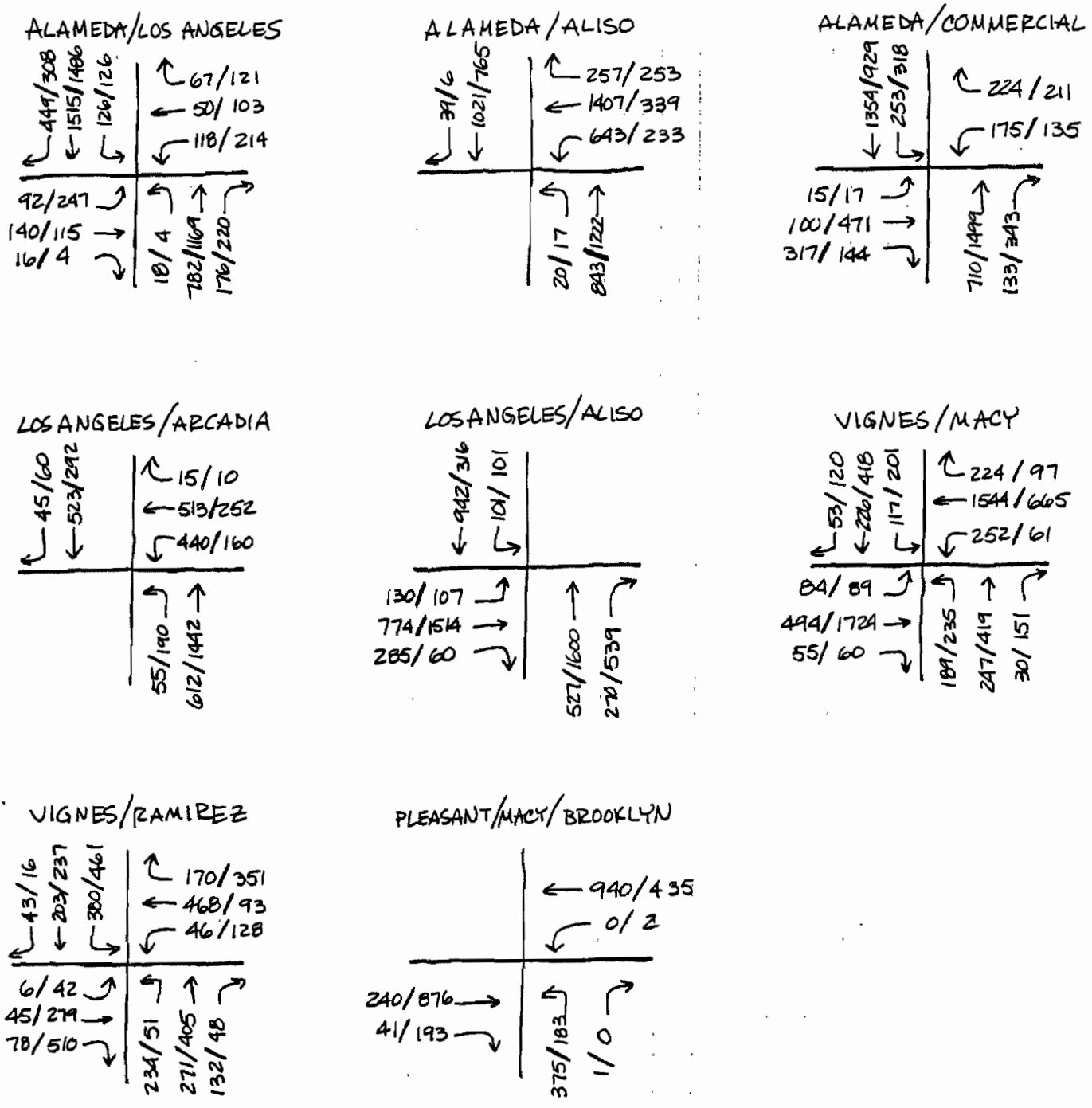
FIGURE A-2 (continued)
P.M. PEAK HOUR TURNING MOVEMENT
TRAFFIC VOLUMES FOR STUDY INTERSECTIONS
EXISTING CONDITIONS

APPENDIX B



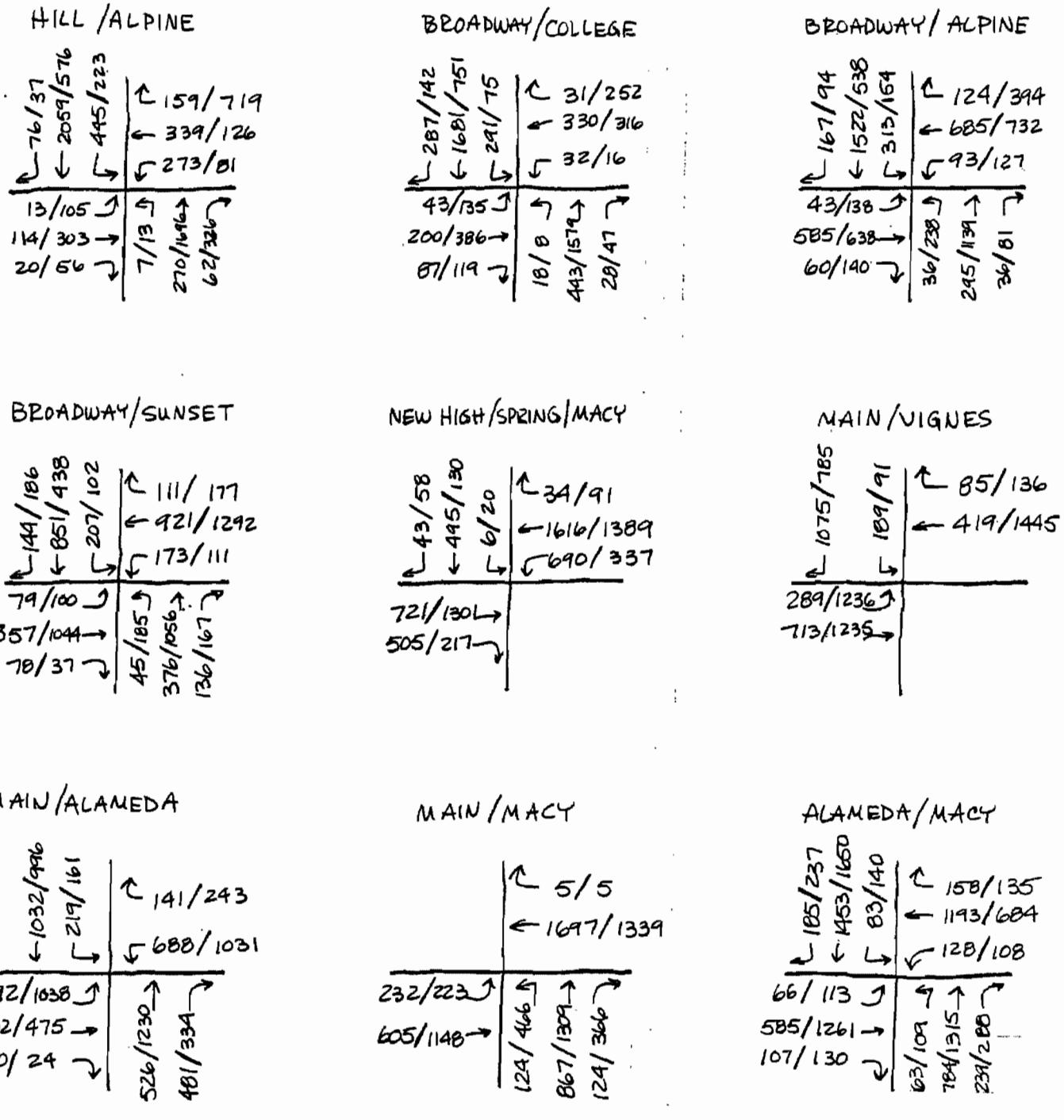
LEGEND: XXX/XXX = A.M. PEAK HOUR / P.M. PEAK HOUR

FIGURE B-1
PEAK HOUR TURNING MOVEMENT
TRAFFIC VOLUMES FOR STUDY INTERSECTIONS
FUTURE WITH PHASE 1



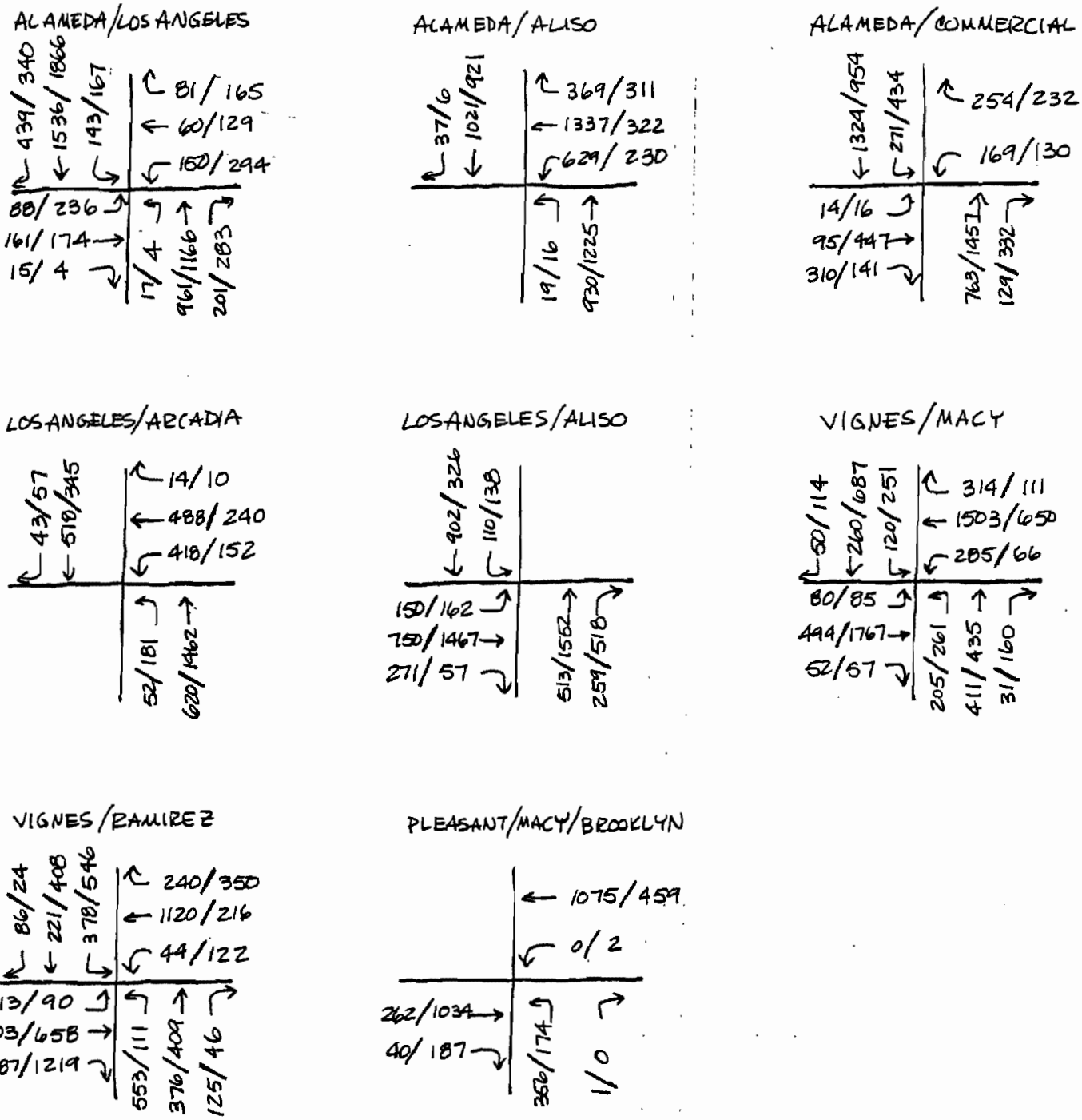
LEGEND: XXX/XXX = A.M. PEAK HOUR/P.M. PEAK HOUR

FIGURE B-1 (continued)
PEAK HOUR TURNING MOVEMENT
TRAFFIC VOLUMES FOR STUDY INTERSECTIONS
FUTURE WITH PHASE 1



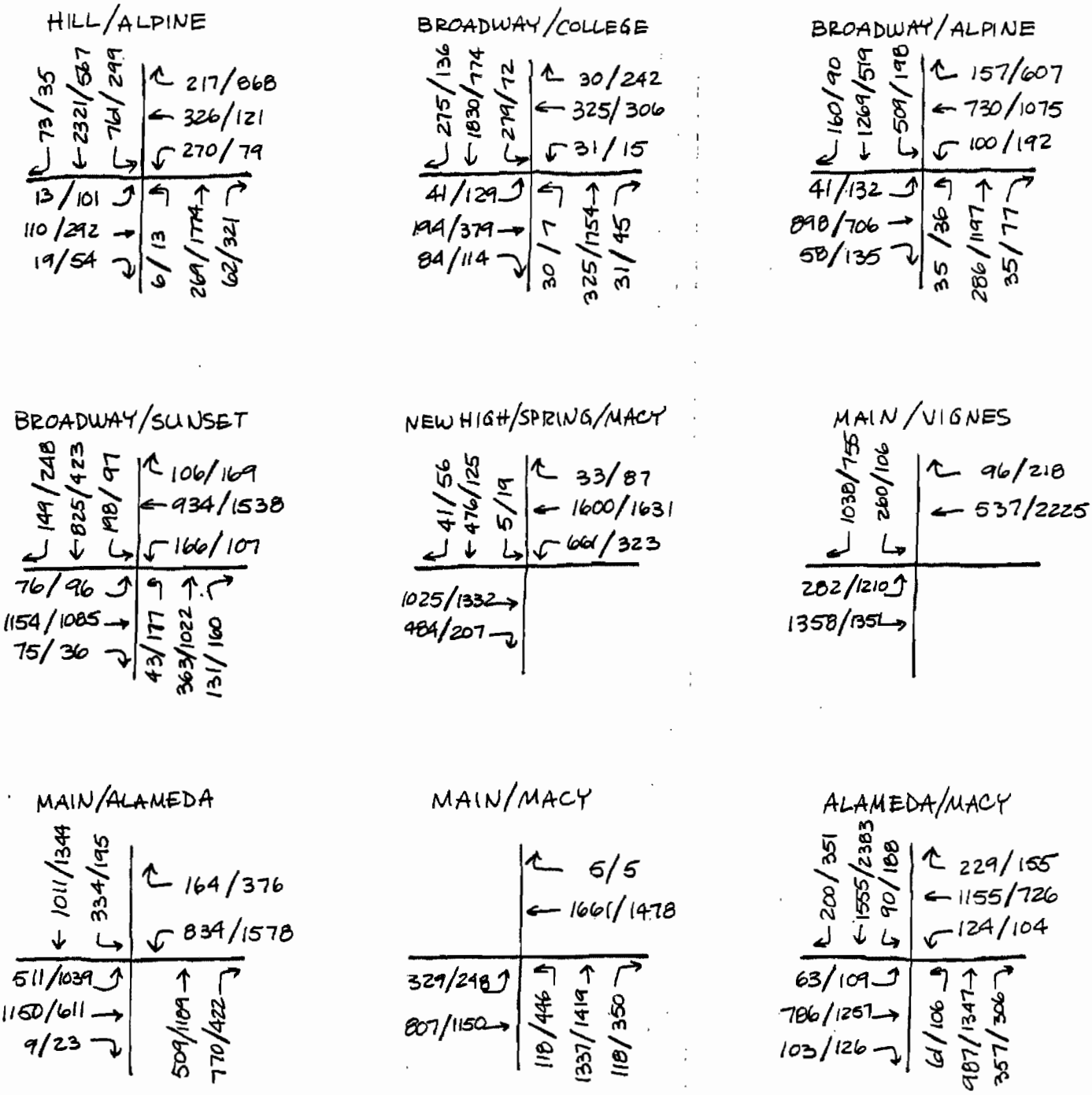
LEGEND: XXX / XXX = A.M. PEAK HOUR / P.M. PEAK HOUR

FIGURE B-2
PEAK HOUR TURNING MOVEMENT
TRAFFIC VOLUMES FOR STUDY INTERSECTIONS
FUTURE WITH PHASES 1 AND 2



LEGEND: XXX / XXX = A.M. PEAK HOUR / P.M. PEAK HOUR

FIGURE B-2 (continued)
PEAK HOUR TURNING MOVEMENT
TRAFFIC VOLUMES FOR STUDY INTERSECTIONS
FUTURE WITH PHASES 1 AND 2



LEGEND: XXX / XXX = A.M. PEAK HOUR / P.M. PEAK HOUR

FIGURE B-3
PEAK HOUR TURNING MOVEMENT
TRAFFIC VOLUMES FOR STUDY INTERSECTIONS
FUTURE WITH PHASES 1, 2, AND 3

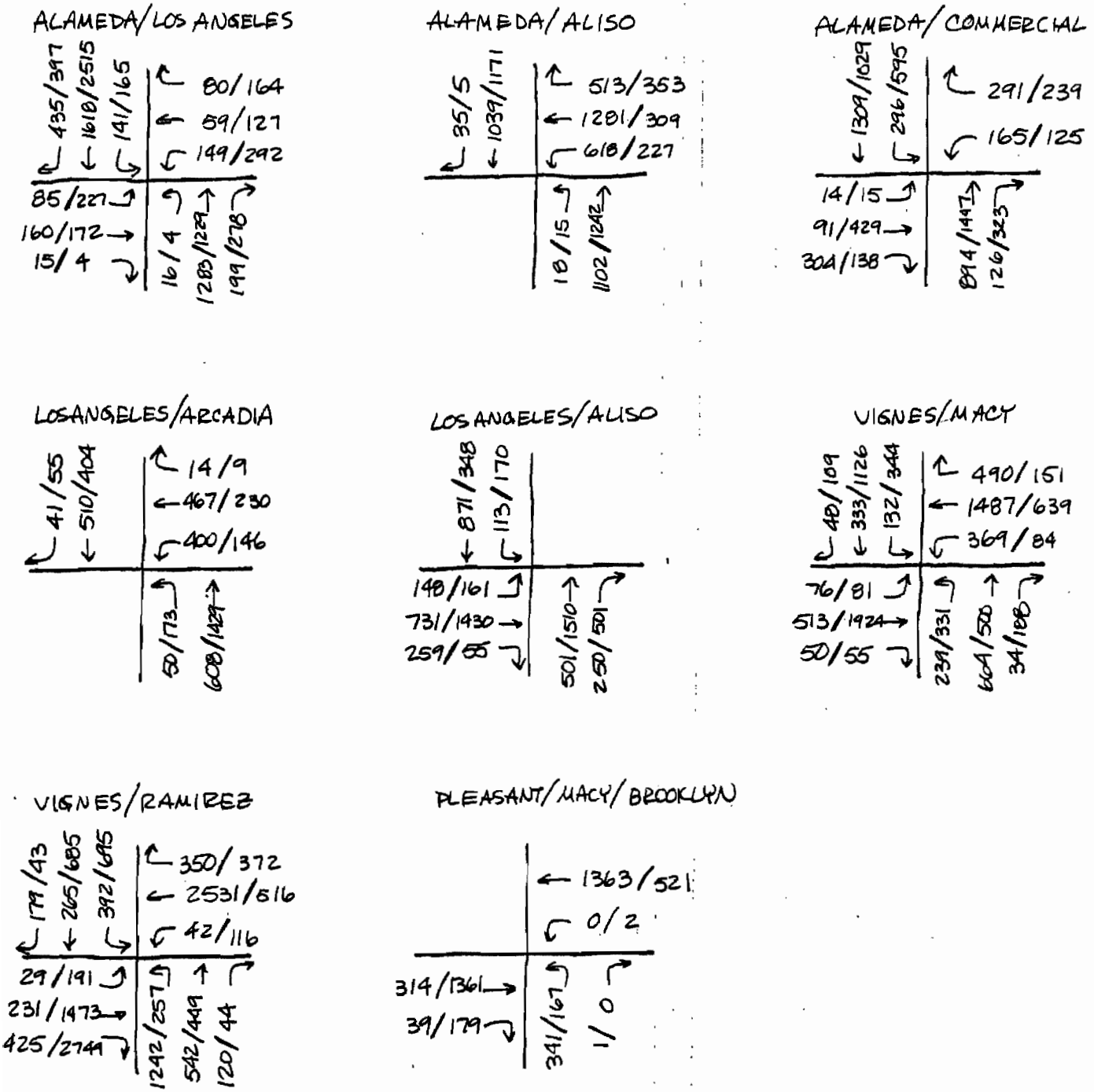


FIGURE B-3
PEAK HOUR TURNING MOVEMENT
TRAFFIC VOLUMES FOR STUDY INTERSECTIONS
FUTURE WITH PHASES 1, 2, AND 3

APPENDIX C

APPENDIX C (Continued)

CRITERIA NOT EVALUATED BY ALTERNATIVE AND REASONS FOR NOT EVALUATING THEM

	Criterion	Measurement	Objective	Significance	Reasons for Exclusion
11.	Pedestrian Security	Visibility and "police-ability of pedestrian areas and passages	Maximize	Very High	Design requirement, to be met in all alternatives
14.	Regional Access	Travel times and "disutilities" for typical trips between the site and major regional centers, low-car-ownership areas, high density residential areas, and high income residential areas	Minimize	Moderate	No perceptable difference among alternatives
17.	Freight Operations	Delay to freight from passenger trains or circulation improvements	Minimize	High	No perceptable difference among alternatives

APPENDIX D

TABLE D-1

ACCUMULATION COUNT AT UNION STATION
PARKING FACILITIES - JUNE 13, 1986

Time Interval Beginning	Vehicles Entering Station Parking				Out	Net Change	Accumulation
	Main	Alameda	Macy	Total			
7:00	28	3	1	32	13	19	341
7:15	45	2	6	53	12	41	382
7:30	56	6	4	66	26	40	422
7:45	43	3	2	48	21	27	449
8:00	43	3	2	48	101	-53	396
8:15	36	1	2	39	50	-11	385
8:30	43	3	1	47	58	-11	374
8:45	32	3	1	36	36	0	374
9:00	40	6	7	53	28	25	399
9:15	77	1	1	79	35	44	443
9:30	84	1	3	88	71	17	460
9:45	46	0	1	47	48	-1	459
10:00	38	4	2	44	36	8	467
10:15	25	1	3	29	27	2	469
10:30	36	4	5	45	33	12	481
10:45	29	2	0	31	39	-8	473
11:00	23	2	4	29	24	5	478
11:15	37	5	1	43	35	8	486
11:30	34	3	2	39	35	4	490
11:45	28	4	7	39	30	9	499
12:00	49	3	3	55	27	28	527
12:15	65	2	4	71	42	29	556
12:30	41	0	3	44	36	8	564
12:45	36	2	1	39	71	-32	532
13:00	32	3	0	35	57	-22	510
13:15	27	5	2	34	32	2	512
13:30	32	2	2	36	29	7	519
13:45	38	6	3	47	24	23	542
14:00	28	2	1	31	25	6	548
14:15	58	1	1	60	60	0	548
14:30	32	4	0	36	41	-5	543
14:45	35	1	2	38	40	-2	541
15:00	26	5	1	32	34	-2	539
15:15	25	3	2	30	37	-7	532
15:30	29	4	0	33	82	-49	483
15:45	27	2	2	31	32	-1	482
TOTAL	1403	102	82	1587	1427	160	
						Maximum	564
						Turnover	2.81

SOURCE: PBOD count.

Appendix Table D - 2

Inventory and Use of Off-street Parking

Union Station Master Plan Area and Environs

Block Description	Reserved Private	Open Private	Public Spaces	Total Unres.(a)	Observed Use (b)	Percent	Total Spaces
Union Station Property	60	667	0	667	564	85	727
Post Office Property	1000	0	66	66	63	95	1066
	1060	667	66	733	627	86	1793
Alameda - Freeway - Los Angeles	83	0	0	0	0	-0-	83
Alameda - Los Angeles - Arcadia - North Main - Macy (Olvera St. Plaza Block)	26	0	37	37	36	97	63
Arcadia - Spring - New High - Republic - North Main	16	180	0	180	178	99	196
New High - Spring - Sunset - N. Main - Repub.	50	0	250	250	240	96	300
Arcadia - N. Broadway - Sunset - N. Spring	34	256	0	256	251	98	290
Arcadia - N. Hill - Sunset - N. Broadway	190	0	0	0	----	----	190
Subtotal Olvera St./Plaza Area	399	1770	287	723	705	98	1122
Board of Education Property	1076	12	0	12	----	----	1088
Alameda - Macy - North Main	20	0	0	0	----	----	20
Alameda - Ord - North Spring - Alpine	71	95	0	95	95	100	166
Alpine - North Spring - Ord - New High	36	34	224	258	110	43	294
Alpine - New High - Ord - North Broadway	0	53	35	88	75	85	88
Alpine - North Broadway - Ord - North Hill	10	105	282	387	289	75	397
Alpine - North Broadway - College - N. Spring	0	21	232	253	177	70	253
Alpine - North Hill - College - N. Broadway	9	83	140	223	183	82	232
New High - Sunset - North Broadway - Ord	60	0	0	0	----	----	60
New High - Ord - North Spring - Sunset	0	52	0	52	47	90	52
North Main - Sunset - North Spring - Ord	80	80	74	154	107	69	234
North Broadway - Sunset - North Hill - Ord	12	54	320	374	330	88	386
Subtotal Chinatown (part)	278	577	1307	1884	1413	75	2162
GRAND TOTAL	2813	3026	1660	3352	2745	82	6165

(a) Does not include employee reserved spaces or service station parking.
(b) At noon in Chinatown & Union Station, later in Plaza area.

SOURCES: Wilbur Smith and Associates, Central City Parking Study, 1981
PRC Voorhees, Chinatown Redevelopment Project - Parking & Circulation Analysis, 1983
Field checks by PSDD staff