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MEMORANDUM

November 18, 1991

TO: Executive Committee  
FROM: SCAG Staff  
SUBJECT: Tri-City Corridor Transportation Study

Recommendation:

It is recommended that the Executive Committee review and approve the Tri-City Corridor Transportation Study report and its recommendations prepared by SCAG staff and approved by the Transportation and Communications Committee (TCC) and the Tri-City Corridor Transportation Study Policy and Technical Advisory Committees.

Background:

The Tri-City Corridor Transportation Study was initiated by the Tri-City Transportation Coalition (TCTC) in 1990 to address the east-west directional traffic needs for the Cities of Burbank, Glendale and Pasadena. Composed of leaders from chambers of commerce, city councils, and communities of Burbank, Glendale and Pasadena, the Tri-City Transportation Coalition (TCTC) is the policy steering committee of this project. The Southern California Association of Governments (SCAG) has an overall responsibility for development of the study, and is assisted by the Southern California Rapid Transit District (SCRTD), the California Department of Transportation (Caltrans), the Los Angeles County Transportation Commission (LACTC), Commuter Transportation Services, Inc. (CTS), and the Cities of Burbank, Glendale and Pasadena.

The Tri-City Corridor Transportation Study has identified and quantified traffic problems in the study area as a result of existing and projected growth and development. The study has also developed a multimodal set of short-term, intermediate and long-term transportation strategies such as TSM/TDM, bus & rail transit, facility improvement, HOV, and so on. These strategies are intended to improve mobility in the study area.

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TRI-CITY CORRIDOR TRANSPORTATION STUDY

EXECUTIVE SUMMARY

FINAL DRAFT

OCTOBER, 1991

Prepared by:

The

Southern California Association of Governments

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## FOREWORD

As part of its response to the challenge of maintaining and improving the quality of life for the Region's residents, the Southern California Association of Governments has undertaken a major planning effort to address regional transportation needs as we move into the Twenty-First Century. This challenge of managing rapid growth, avoiding resultant severe congestion, and securing healthful air has evolved into the development of the 1989 Regional Mobility Plan which has been adopted by SCAG's Executive Committee. The Plan provides an overall framework to meet regional transportation needs.

This document, Tri-City Corridor Transportation Study, is intended to advance the goals and objectives outlined in SCAG's 1989 Regional Mobility Plan in the areas of transit (bus-rail) development, facility improvement, TSM (Transportation System Management), TDM (Transportation Demand Management), and Transit Finance, directly addressing the concerns with input from the local jurisdictions benefitting from and responsible for implementation of the proposed system improvements.



TRI-CITY CORRIDOR TRANSPORTATION STUDY

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# TRI-CITY CORRIDOR TRANSPORTATION STUDY

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TABLE OF CONTENTS

<u>TITLE</u>	<u>PAGE</u>
1. <u>Introduction</u> .....	1
2. <u>Existing (1987) Socioeconomic Conditions</u> .....	3
3. <u>Forecast Year (2010) Socioeconomic Conditions</u> .....	5
4. <u>1987 Travel Behaviors of the Study Area</u> .....	7
5. <u>1987 Transportation Conditions</u> .....	10
6. <u>2010 Transportation Conditions</u> .....	14
7. <u>Financing Strategies</u> .....	25
8. <u>Recommendations</u> .....	26

v

LIST OF TABLES

<u>NO.</u>	<u>TITLE</u>	<u>PAGE</u>
1	Population, Housing and Employment in the Study Area.....	3
2	Housing Composition in the Study Area.....	4
3	1987 Employment Composition in the Study Area.....	4
4	Regional Comparison of Job/Housing Ratios in 1987.....	5
5	Population, Housing and Employment in the Study Area.....	5
6	2010 Housing Composition in the Study Area.....	6
7	2010 Employment Composition in the Study Area.....	6
8	Regional Comparison of Job/Housing Ratios.....	7
9	1987 Distribution of Home-Work Trips.....	8
10	1987 Mode Splits of Home-Work Trips.....	13
11	Rail Stops and Park-N-Ride Facilities..... (Under Alternative 1 Model Run)	19
12	Rail Stops and Park-N-Ride Facilities (Under Alternative 2 Model Run).....	23
13	A Ridership Comparison of the East-West Rail Line and Other Relevant Rail Lines.....	24
14	Mode Splits in 1987 and 2010 (Productions).....	24
15	Mode Splits in 1987 and 2010 (Attractions).....	25

LIST OF FIGURES

<u>NO.</u>	<u>TITLE</u>	<u>PAGE</u>
1	Tri-City Study Area.....	2
2	1987 PM Peak Congestion Summary for Eight Major Corridors.....	11
3	2010 PM Peak Congestion Summary for Eight Major Corridors.....	15
4	Los Angeles 300-Mile Metro Rail Plan.....	18
5	Rail Alignment in Alternative 1.....	20
6	Rail Alignment in Alternative 2.....	22

# TRI-CITY CORRIDOR TRANSPORTATION STUDY

## EXECUTIVE SUMMARY

### 1. INTRODUCTION

The Tri-City Corridor Transportation Study (or the Burbank-Glendale-Pasadena Corridor Transportation Study), was initiated by the Tri-City Transportation Coalition (TCTC) in 1990 to address the east-west directional traffic needs for the study area. The Tri-City Transportation Coalition (TCTC) is the policy steering committee of this project. The Southern California Association of Governments (SCAG) has an overall responsibility for development of the study, and is assisted by the Southern California Rapid Transit District (SCRTD), the California Department of Transportation (Caltrans), the Los Angeles County Transportation Commission (LACTC), Commuter Transportation Services, Inc. (CTS), the Cities of Burbank, Glendale and Pasadena.

#### Goals and Objectives

The Tri-City Corridor Transportation Study has the goals and objectives as follows:

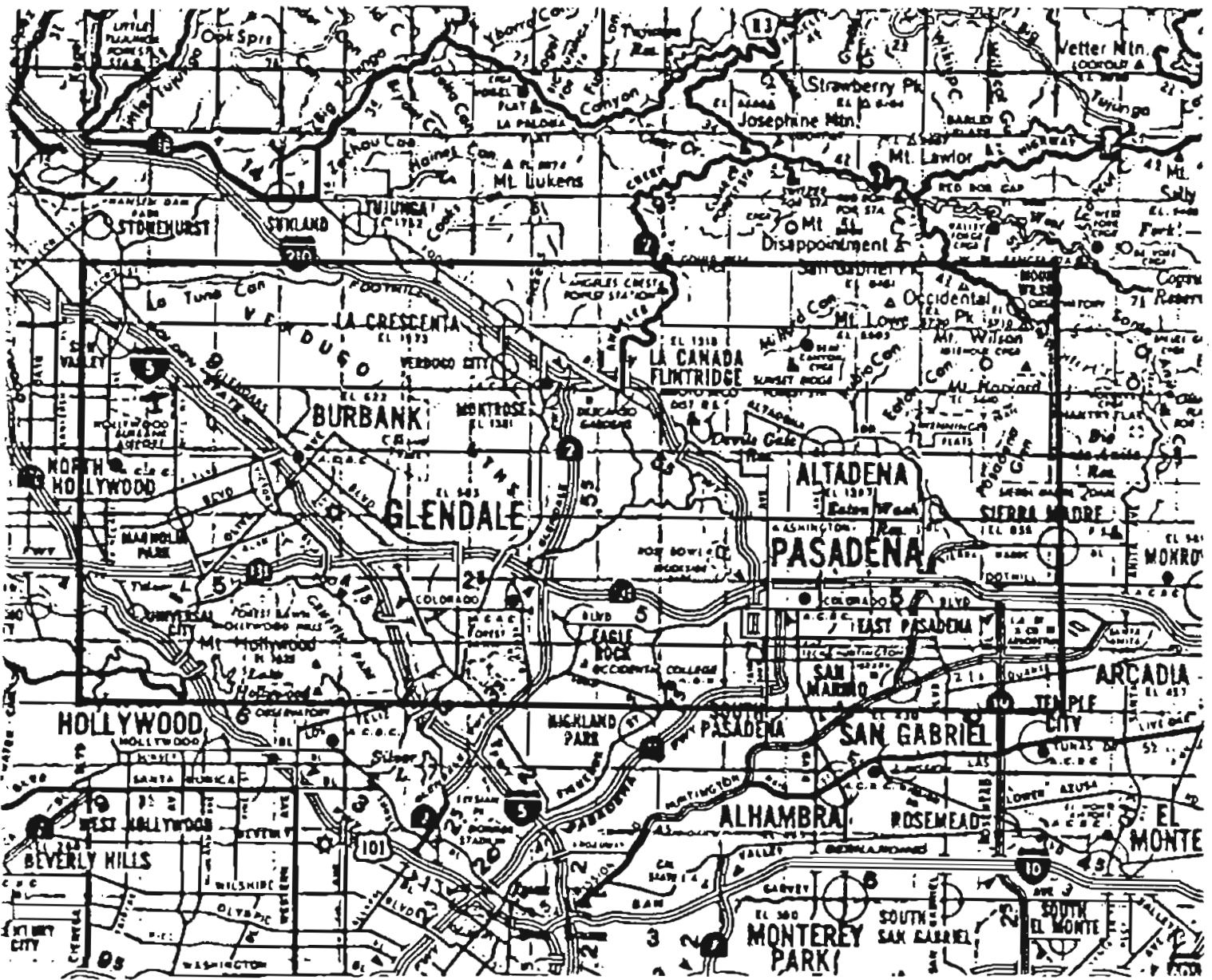
##### Goals:

- 1) To identify and quantify traffic problems in the study area stemming from existing and projected growth and development;
- 2) To develop a multi-modal set of transportation alternatives which would improve mobility in the study area.

##### Objectives:

- 1) To develop a multi-modal set of transportation improvements, including highways, high-occupancy vehicle lanes (HOVs), rail (monorail, light rail and commuter rail), Transportation System Management (TSM) and Transportation Demand Management (TDM) strategies, which would increase the capacity of the current system while reducing demand;
- 2) To develop a system of improvements which will preserve, or have the least negative impact on the physical environment of the study area;
- 3) To ensure that the selected transportation system will be cost-effective;
- 4) To develop a transportation system alternative for the study area that can be realistically attained under future available funding mechanisms;
- 5) To enhance the effectiveness of study recommendations by assisting the local jurisdictions to develop an implementation program of supportive policies and actions;

Figure 1 TRI-CITY STUDY AREA



(Source: LOS ANGELES AND VICINITY, The Automobile Club of Southern California (prepared for Commuter Transportation Services, 1980).

- 6) To design a transit system that meet study area needs and promote transit use, and investigate the feasibility of a tri-city bus system and other appropriate transprotation systems in both the short run and the long run;
- 7) To ensure that the proposed system is responsive to both general mobility and special transit service needs for area residents; and
- 8) To ensure a system design that is consistent with requirements and mandates of the Regional Mobility Plan, the Air Quality Management Plan.

**2. EXISTING (1987) SOCIOECONOMIC CONDITIONS**

Table 1 shows the existing (1987) population, housing and employment in the study area.

TABLE 1 POPULATION, HOUSING AND EMPLOYMENT IN THE STUDY AREA

City	Population	Housing	Employment
Burbank	91,040 (24.1%)	38,758 (25.1%)	90,291 (31.9%)
Glendale	156,831 (41.4%)	64,685 (41.9%)	90,387 (32.0%)
Pasadena	130,617 (34.5%)	50,807 (32.9%)	102,169 (36.1%)
Total	378,488 (100%)	154,250 (100%)	282,847 (100%)

Source: SCAG Data Base, 1987.

**Population**

According to Table 1, the 1987 total population of the Tri-City area amounted to 378,488 persons, which accounted for 4.5% and 2.8% of the total population residing in Los Angeles County and SCAG region, respectively. Of the three incorporated cities, Glendale occupied about 41.4% of the study area population, followed by Pasadena (34.5%) and Burbank (24.1%).

In 1987, population density in the study area was 5,360 persons/sq.mi., much higher than those in L.A. County (2,067 persons/sq.mi.) and SCAG region (351 persons/sq.mi.).

**Housing**

Table 1 also shows that housing units in the study area totaled about 154,250 in 1987. In terms of percentage shares of total housing units, the descending order was Glendale (41.9%), Pasadena (32.9%) and Burbank (25.1%). The housing density in the study area (2,185 units/sq.mi.) was much higher than those in L.A. County (742 units/sq.mi.) and SCAG region (129 units/sq.mi.).

TABLE 2 1987 HOUSING COMPOSITION IN THE STUDY AREA

	Total Housing	Single Family	Multi-family
Burbank	38,758 (100.0%)	21,303 (55.0%)	17,455 (45.0%)
Glendale	64,685 (100.0%)	27,629 (42.7%)	37,056 (57.3%)
Pasadena	50,807 (100.0%)	25,905 (51.0%)	24,902 (49.0%)
Total	154,250 (100.0%)	74,837 (48.5%)	79,413 (51.5%)

In terms of housing composition, Burbank had 10 percent more single family housing (55%) than multi-family housing (45%). Glendale had far more multi-family housing (57.3%) than single family housing (42.7%). Pasadena's housing composition was relatively balanced.

### Employment

The 1987 total employment in the Tri-City area was about 282,847, with Pasadena holding more jobs (36.1%) than both Glendale (32.0%) and Burbank (31.9%). Unlike population and housing distributions, the overall employment distribution across cities was evenly distributed and each of the three cities had about one third of total employment.

Table 3 indicates that the non-retail employment dominated over the retail employment in 1987. The percentage proportion of retail employment of each city is well below 20 percent of total employment. In particular, Burbank had retail employment only accounting for 9.8 percent of total employment.

TABLE 3 1987 EMPLOYMENT COMPOSITION IN THE STUDY AREA

	Total Employment	Retail Employment	Non-retail Employment
Burbank	90,291 (100.0%)	8,843 (9.8%)	81,448 (90.2%)
Glendale	90,387 (100.0%)	13,046 (14.4%)	77,341 (85.6%)
Pasadena	102,169 (100.0%)	17,915 (17.5%)	84,254 (82.5%)
Total	282,847 (100.0%)	39,804 (14.1%)	243,043 (85.9%)

### Jobs/Housing Balance

In 1987, the job/housing ratio in the tri-city area amounted to 1.83. Compared with job/housing ratio of SCAG region (1.31), the study area is job-rich (See Table 4).



TABLE 4 REGIONAL COMPARISON OF JOB/HOUSING RATIOS IN 1987

Area	Job/Housing Ratio
Burbank	2.33
Glendale	1.40
Pasadena	2.01
Tri-City Area	1.83
L.A. County	1.44
SCAG Region	1.31

Sources: Data for the three cities are from SCAG Data Base, 1987;  
Data for the L.A. County and SCAG Region are from SCAG Regional Growth Management Plan, 1989.

All the three cities of Burbank, Glendale and Pasadena had job/housing ratios higher than the SCAG region. Burbank's job/housing ratio (2.33) was especially high, greatly outstripping those of Glendale (1.40) and Pasadena (2.01).

### 3. FORECAST YEAR (2010) SOCIOECONOMIC CONDITIONS

The 2010 socioeconomic conditions of the study area are the best projections available based on current data and assumptions regarding the changes in socioeconomic conditions from 1987 to 2010 (Table 5).

TABLE 5 POPULATION, HOUSING AND EMPLOYMENT IN THE STUDY AREA  
1987 - 2010

	Population		Housing		Employment	
	1987	2010	1987	2010	1987	2010
Burbank	91,040	111,860	38,758	49,000	90,291	119,652
Glendale	156,831	185,302	64,685	77,413	90,387	109,126
Pasadena	130,617	147,094	50,807	59,001	102,169	112,077
Total	378,488	444,256	154,250	185,414	282,847	340,855

Source: SCAG Data Base, 2010.

#### Population

By 2010, the total population in the study area is projected to reach 444,256, 17.4 percent higher than the 1987 population. From 1987 to 2010, the average annual population growth rate for the whole study area is 0.7 percent. Burbank will grow at a faster average annual rate (0.9%) than Glendale (0.7%) and Pasadena (0.5%). But in terms of population shares, Glendale still has the largest population (41.7%), followed by Pasadena (33.1%) and Burbank (25.2%).

## Housing

From 1987 to 2010, the total housing units in the tri-city area will increase from 154,250 to 185,414, a 20.2 percent increase. The average annual growth rate of total housing units will be 0.8 percent. The descending order of average annual growth rates of housing units by city is the same as that of population: Burbank (1.0%), Glendale (0.8%), Pasadena (0.7%).

TABLE 6 2010 HOUSING COMPOSITION IN THE STUDY AREA

	Total Housing	Single Family	Multi-family
Burbank	49,000 (100.0%)	23,161 (47.3%)	25,839 (52.7%)
Glendale	77,413 (100.0%)	29,159 (37.7%)	48,254 (62.3%)
Pasadena	59,001 (100.0%)	27,117 (46.0%)	31,884 (54.0%)
Total	185,414 (100.0%)	79,437 (42.8%)	105,977 (57.2%)

As shown in Table 6, multi-family housing will continue outstripping single family housing for the whole tri-city area. Some changes during the projection period are noticeable. First, for the whole study area, the difference between the proportion of multi-family housing and single family housing in 2010 (14.4 percent) will be 3.8 times larger than the corresponding figure in 1987 (3 percent). Second, while Burbank and Pasadena had higher proportions of single family housing than multi-family housing in 1987, by 2010, both cities will have more multi-family housing than single family housing, thus making all three cities have more multi-family housing than single family housing.

## Employment

From Table 6, we can see that the total employment in the study area will increase by 20.5 percent to 340,855 from 1987 to 2010. The average annual growth rate of total employment will amount to 0.8 percent. The growth rate in Burbank is the highest one (1.2% per annum) in the three cities, followed by Glendale (0.8% per annum) and Pasadena (0.4% per annum). The data analysis indicates that employment distribution across cities will experience some changes in the future. In 1987, Pasadena had the highest percentage proportion of employment, and Burbank had the lowest one. But in 2010, Burbank is projected to have the highest percentage proportion of employment, and Glendale the lowest percentage proportion. In 2010, the non-retail employment is projected to be dominant in the total employment just as in 1987 (See Table 7).

TABLE 7 2010 EMPLOYMENT COMPOSITION IN THE STUDY AREA

	Total Employment	Retail Employment	Non-retail Employment
Burbank	119,652 (100.0%)	122,42 (10.2%)	107,410 (89.8%)
Glendale	109,126 (100.0%)	165,40 (15.2%)	92,586 (84.8%)
Pasadena	112,077 (100.0%)	199,46 (17.8%)	92,131 (82.2%)
Total	340,855 (100.0%)	48,728 (14.3%)	292,127 (85.7%)

## Job/Housing Balance

Table 8 shows that the job/housing ratios in the L.A. County and the SCAG region will decline from 1987 to 2010, but the job/housing ratio in the tri-city area rises. Hence, the study area becomes job-richer.

TABLE 8 REGIONAL COMPARISON OF JOB/HOUSING RATIOS  
1987 - 2010

	Job/Housing Ratio	
	1987	2010
Burbank	2.33	2.44
Glendale	1.40	1.41
Pasadena	2.01	1.90
Tri-cities Area	1.83	1.84
L.A. County	1.44	1.36
SCAG Region	1.31	1.22

Sources: SCAG Data Base, 1987, 2010.

## 4. 1987 TRAVEL BEHAVIORS OF THE STUDY AREA

SCAG's Regional Transportation Modeling System (RTMS) has been used to estimate the home-work trip distributions among the cities of Burbank, Glendale, Pasadena and the five outside areas. The five outside areas are chosen because of their dramatic impacts on the travel behaviors of the study area commuters. The boundaries of these five outside areas are (note: RSA means SCAG's Regional Statistical Area):

West of the study area: RSA 3 (Oxnard RSA), RSA 4 (Simi Valley RSA), RSA 5 (Thousand Oaks RSA), RSA 7 (Agoura RSA), RSA 12 (San Fernando Valley RSA), RSA 14 (Santa Clarita Valley RSA), RSA 15 (Malibu RSA), and rest of RSA 13 (rest of Burbank RSA after excluding city of Burbank);

East of the study area: southeast of RSA 25 (rest of West San Gabriel Valley RSA after excluding La Canada, Flintridge, Altadena, city of Pasadena), RSA 26 (East San Gabriel Valley RSA), RSA 27 (Pomona RSA), RSA 28 (West San Bernardino Valley RSA), RSA 29 (East San Bernardino Valley RSA);

South of the study area is located approximately south of I-101, including the following RSAs: RSA 16 (Santa Monica RSA), RSA 17 (West Coast RSA), RSA 18 (South Bay RSA), RSA 19 (Palos Verdes RSA), RSA 20 (Long Beach RSA), RSA 21 (East Central RSA), and RSA 22 (Norwalk/Whittier RSA);

Downtown Los Angeles corresponds to RSA 23 (Los Angeles CBD RSA);

Eagle Rock Area is defined as the southern part of RSA 24 (rest of Glendale RSA after excluding city of Glendale, and Montrose). Therefore, the so-defined

Eagle Rock area is much larger than the Eagle Rock District under the jurisdiction of the City of Los Angeles.

Table 9 summarizes the home-work trip distribution of the study area.

TABLE 9 1987 DISTRIBUTION OF HOME-WORK TRIPS

From\To	1	2	3	4	5	6	7	8	Total
1	17396	8030	1366	15415	1016	12880	3971	2830	62904
2	10338	24866	6535	11500	3468	21795	10374	9070	97946
3	2278	5794	29225	3604	13814	15438	7511	5128	82792
4	45989	20459	7095	799319	7050	160403	25688	10479	1076482
5	6428	11255	45158	14054	836107	211058	51653	21943	1197656
6	13420	13433	9930	54311	60820	2164808	193502	33715	2543939
7	522	821	483	1375	1010	27881	24536	2818	59446
8	5476	12615	8667	7524	9303	61268	37901	20658	163412
Total	101847	97273	108459	907102	932588	2675531	355136	106641	5284577

Note:

- 1 - Burbank
- 2 - Glendale
- 3 - Pasadena
- 4 - West of the study area
- 5 - East of the study area
- 6 - South of the study area
- 7 - Downtown Los Angeles
- 8 - Eagle Rock area

Home-Work Trips for Burbank

Trip Productions

Within the tri-city area, the Burbank residents preferred working in Glendale to working in Pasadena. They made 8,030 trips to Glendale and only 1,366 trips to Pasadena. It has been noted that the west side of the study area is a major destination for the Burbank commuters (24.5 percent of total trip production).

Trip Attractions

According to Table 9, the 1987 trip attractions in Burbank amounted to 101,847, 62 percent higher than its trip productions. This indicates that Burbank is a job-rich area.

Almost half (45 percent) of trips originated from the west of the study area. Therefore, Burbank is particularly important to the west side of the study area.

### Home-Work Trips for Glendale

#### Trip Productions

Of the total 97,946 trip productions, about a quarter occurred within the city of Glendale. The trips made by Glendale commuters to Burbank (10,338) were much larger than those to Pasadena (6,535). Because of their geographical adjacency to Glendale and abundant job opportunities, downtown L.A. and the Eagle Rock area attracted about 10.6 percent and 9.3 percent of total trips from Glendale, respectively (Calculated from Table 9).

#### Trip Attractions

As calculated from Table 9, though attracting about 20 percent of commuter trips (20,459 trips) from the west side of the study area, Glendale only produced about 12 percent of commuter trips (11,500 trips) to the west side of the study area.

Within the study area, Burbank residents tended to work in Glendale more than Pasadena residents did. Glendale was least attractive to the residents in downtown L.A. for the obvious reasons.

### Home-Work Trips for Pasadena

According to Table 9, trip productions in Pasadena amounted to 82,792, whereas trip attractions were 108,459. This means that Pasadena is a job-rich and very attractive city.

#### Trip Productions

Pasadena produced a much larger number of trips to the east of the study area (13,814) than those to Burbank (2,278), Glendale (5,794) and the west of the study area (3,604). This indicates that Pasadena has closer relations with the east of the study area than with the any other areas.

Downtown L.A., the Eagle Rock area and the south of the study area were more important than the areas west of Pasadena in terms of attracting commuters from Pasadena.

#### Trip Attractions

About 40 percent of in-trips originated from the east of the study area. Therefore, Pasadena was most attractive to areas in the eastern direction.

Pasadena had fewer attractions to the downtown L.A. Its attractions to the south of the study area, the Eagle Rock area, were greater than those to Burbank and Pasadena.

In summary, within the tri-cities area, Burbank-Glendale relation is closer than

both Burbank-Pasadena relation and Glendale-Pasadena relation. The data analysis has shown that the west of the study area is most important to Burbank, the Eagle Rock area most important to Glendale, and the east of the study area most important to Pasadena.

## 5. 1987 TRANSPORTATION CONDITIONS

### Highway Conditions in 1987

The following eight east-west corridors have been chosen by the Technical Advisory Committee (TAC) and approved by the Tri-City Transportation Coalition (TCTC) for the modeling purpose. The modeled results of these eight corridors are summarized here.

#### Corridor 1: I-5 Freeway

The base year (1987) I-5 freeway was very congested. The traffic volume of the average weekday PM peak period (3:00 - 6:00 PM) has indicated that the freeway segment in downtown Burbank was most congested. The southbound freeway seemed to be slightly less congested than the northbound freeway.

#### Corridor 2: I-134 Freeway

I-134 freeway was extremely congested in 1987. All intersections of freeway across Burbank, Glendale, Eagle Rock and Pasadena had LOS below D.

On the whole, the eastbound freeway was more congested than the westbound freeway during the PM peak period. In particular, the I-134/I-5 interchange was most congested. Its LOS was as low as F3. The connection of I-134/I-5 is a major problem identified by this study.

# 1987 PM PEAK CONGESTION SUMMARY FOR EIGHT MAJOR CORRIDORS

**LEGEND**

V/C : ——— under 0.8  
———— 0.8 ——— 1.0  
———— over 1.0

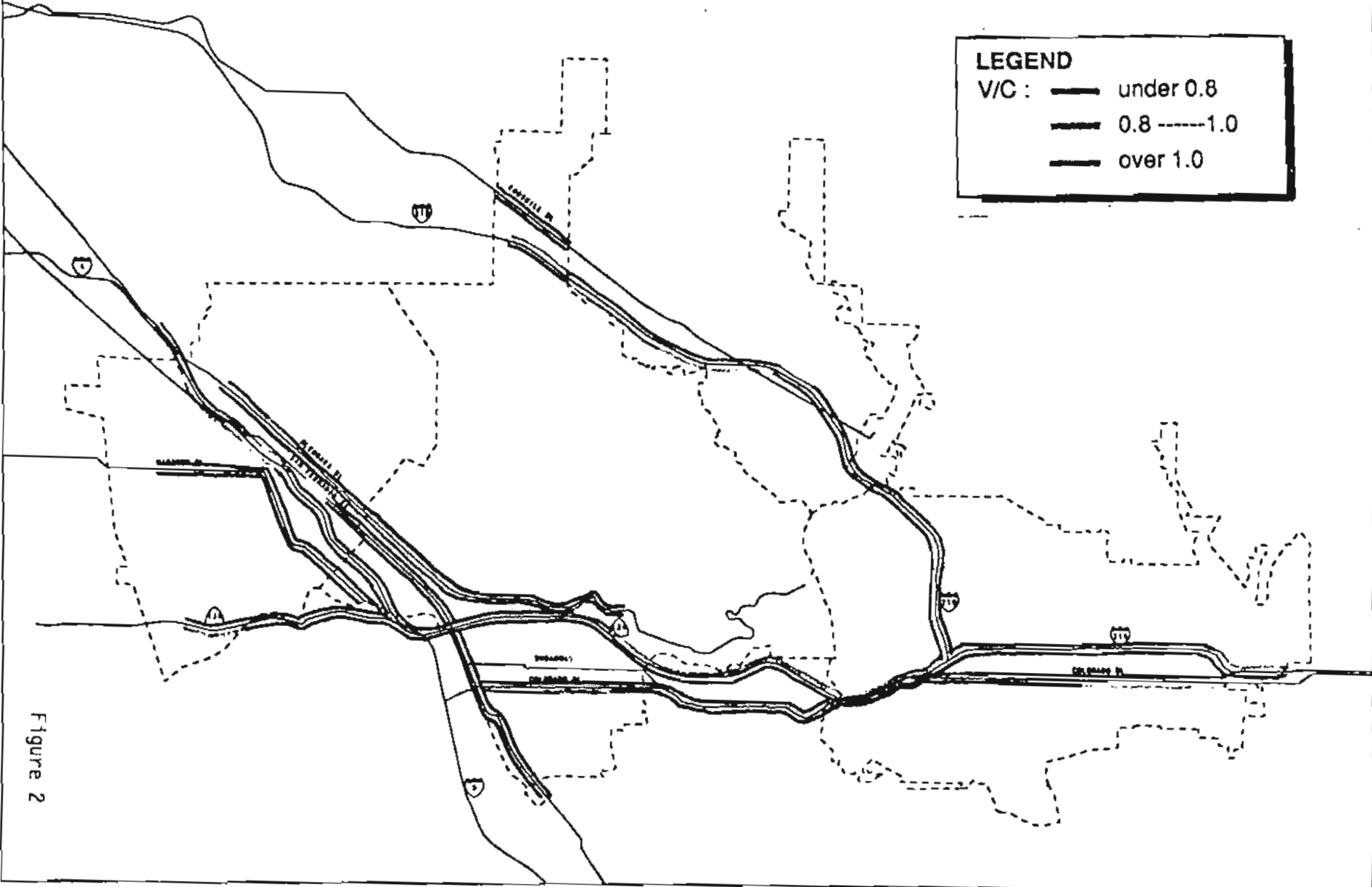


Figure 2

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### Corridor 3: I-210 Freeway

I-210 freeway was extremely congested in 1987, especially in the eastbound direction. The return trips of commuters to the east side of Pasadena in the evening apparently aggravated the traffic congestion.

The freeway segments in downtown Pasadena were much more congested than those in other parts of Pasadena. The segment between Arroyo Blvd. and Lincoln Av. was least congested.

### Corridor 4: Glenoaks Boulevard

The 1987 model run shows that Glenoaks Blvd. had a very good overall level of services. Most intersections had LOS A. The eastbound and the westbound had similar LOS distributions across the intersections.

In Burbank, the most congested segment of Glenoaks Blvd. was between Cambridge Dr. and Walnut Av. (LOS C - D). In Glendale, the most congested portion was found between Pacific Av. and Kenilworth Av. (LOS FO).

### Corridor 5: San Fernando Boulevard & Road

In the base year, San Fernando Blvd. of Burbank had an excellent traffic condition (LOS A) for both eastbound and westbound directions.

In Glendale, the most congested segment of San Fernando Rd. was between Grandview and I-134 (LOS FO). The roadway segments to the southeast of I-134 had LOS A for both directions.

### Corridor 6: Victory Boulevard

Most part of Victory Blvd. is located within the city limit of Burbank. Apart from the downtown portion (Burbank Blvd. - Victory Place), the remaining parts of Victory Blvd. had an excellent traffic condition (LOS A).

### Corridor 7: Colorado Street & Boulevard

In Glendale, the segment of Colorado St. between San Fernando Rd. and Central Av. had reasonably free-flow conditions in both directions. The segment from Glendale Av. to Route-2 had poor traffic conditions (LOS C - FO). In Eagle Rock, the segment between Sumner Av. and Figueroa St. had an excellent level of services (LOS A). In Pasadena, the westbound Colorado Blvd. seemed to have higher LOS than the eastbound Colorado Blvd. Except for the downtown portion, the remaining segments of Colorado Blvd. had pretty good traffic conditions.

### Corridor 8: Foothill Boulevard

Of all the links comprising Foothill Blvd., only two links are located in the study area: Pennsylvania Ave. - Dunsmore Ave., and Dunsmore Ave. - Lowell Ave. The model run shows that during the PM Peak period, the eastbound direction had an excellent travel condition (LOS A) all across the City of Glendale, whereas the westbound direction was relatively congested from Pennsylvania Ave. to



Dunsmore Ave. (LOS C). But the road segment from Dunsmore Ave. to Lowell Ave. also had LOS A.

**Transit Conditions in 1987**

Currently, the highest percentage of bus transit boardings occurred in the City of Pasadena where over 20,000 passengers board on a daily basis. Twice as many bus transit boardings occurred in Glendale, approximately 17,000, as compared to boardings in the City of Burbank. Burbank recorded the highest percentage of regular bus boardings (6% above system average), Pasadena the highest percentage of student boardings (15% above average) and Glendale the highest percentage of senior citizen/disable boardings (7% above average).

**Mode Splits in 1987 (Home-Work Trips)**

The model results of the 1987 mode splits are presented in the below.

TABLE 10 1987 MODE SPLITS OF HOME-WORK TRIPS

Mode	Productions	Attractions
Drive Alone	240,257 (76.1%)	291,123 (76.9%)
Shared Ride	53,511 (16.9%)	67,469 (17.8%)
Transit	22,154 (7.0%)	19,850 (5.3%)
<b>Total</b>	<b>315,922 (100%)</b>	<b>378,442 (100%)</b>

Therefore, in the study area, more than three quarters of commuters drove alone and only less than one tenth of commuters took transit in 1987. In comparison with trip production, trip attraction had higher percentage of drive alone and lower percentage of transit.

## 6. 2010 TRANSPORTATION CONDITIONS

The socio-economic forecasts were based on Growth Management Alternative I (baseline) for the purpose of this study. The SCAG Regional Transportation Modeling System (RTMS), which is a computer-based analytical forecasting technique, utilizing traditional trip generation, distribution, mode choice and assignment steps, was used to project future traffic volumes on the study area's highway and transit networks.

The rail alignment, location of the stations, and other system characteristics (speed, headway, etc.) are assumed for planning purposes and analysis. Further detailed studies are needed to establish the exact alignment and other system features.

### Highway Conditions in 2010

The 2010 highway network is based on the 1987 highway network plus the improvements made from 1987 to 2010 (e.g. adding HOV lanes, street widenings, etc.). Only one model run was performed for the highway assignment, since socioeconomic conditions, trip generation and distribution would remain constant regardless of the three alternatives modeled. The highway assignment presented in this chapter (corresponding to the base alternative) represents the "worst-case" scenario for traffic congestion, reflecting the highway deficiencies expected by the year 2010. The traffic conditions on the eight major corridors of Glendale-Burbank-Pasadena are reported below.

#### Corridor 1: I-5

In the year 2010, the I-5 freeway will be more congested than in 1987. The overall V/C ratio in 2010 (1.13) is larger than in 1987 (1.11). Both north bound and south bound freeways will have levels of service worse than E. The most congested area would still be in downtown Burbank.

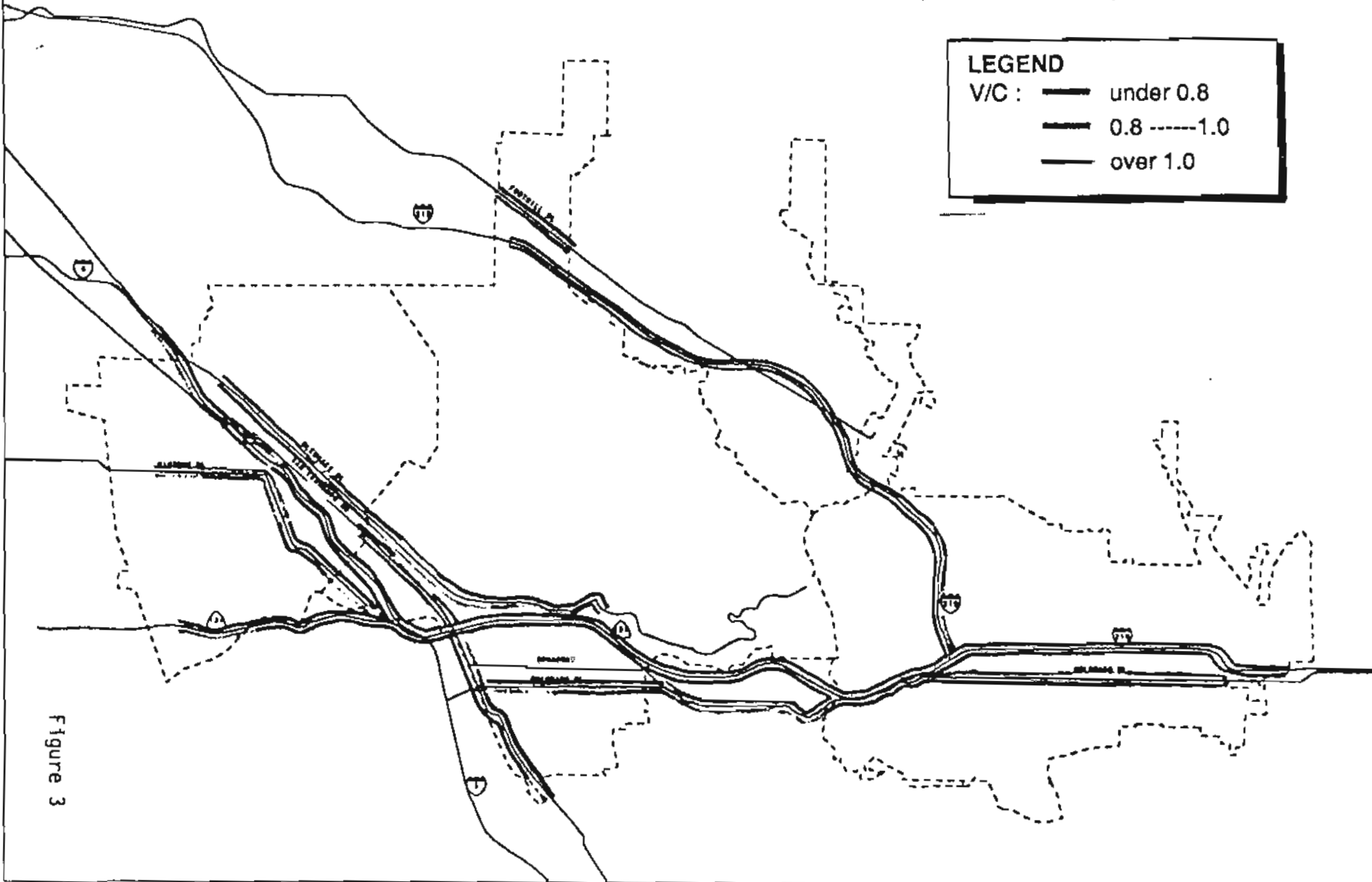
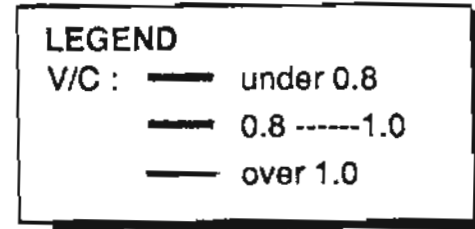
#### Corridor 2 : I-134

The I-134 freeway will be much more congested in 2010 than in 1987. The overall V/C ratio is expected to be around 1.19 by 2010, a 10% increase over 1987. Almost all of the road segments in both east and west bounds will have LOS well below F0, a forced flow. The most congested road segment is at the intersection of the I-5 and I-134 freeways.

#### Corridor 3: I-210

By the year 2010, the I-210 will be extremely congested. In particular, the east bound I-210 will be much more congested than the west bound. In comparison to the 1987 data, we found that the overall V/C ratio has increased by 9%.

# 2010 PM PEAK CONGESTION SUMMARY FOR EIGHT MAJOR CORRIDORS



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Figure 3

#### Corridor 4: Glenoaks Boulevard

By 2010, the east bound lanes of Glenoaks Blvd. will be more congested than west bound lanes. The overall LOS in 2010 will be much lower than that in 1987. It is interesting to see that the westbound Glenoaks Blvd. from Brand to Central has LOS A, but the opposite direction has LOS E.

#### Corridor 5: San Fernando Boulevard & Road

Though the 2010 traffic congestion on San Fernando Blvd. & Rd. will be worse than 1987 traffic congestion, the V/C ratios are distributed unevenly along the road segments. In the City of Burbank (Alameda - Verdugo), the LOS in both directions are expected to be A. In the City of Glendale, the most congested portion of San Fernando Rd. is between Grandview and I-134 (LOS F0 - F1), and the least congested portion is between Colorado and Chevy Chase (A).

#### Corridor 6: Victory Boulevard

Compared with service levels in 1987, all the roadway segments in 2010 will be much more congested. All of the original segments with LOS A in 1987 become LOS C - D by 2010. Downtown Burbank is the most congested area with LOS as poor as F3.

#### Corridor 7: Colorado St. and Blvd.

The overall V/C ratio in 2010 will probably reach 0.95, a figure much higher than that in 1987 (0.56). It is noted that the eastbound Colorado St. & Blvd. is expected to be more congested than the westbound. This is clearly related to the imbalanced PM peak traffic flows, in which work-home trips will be dominant.

#### Corridor 8: Foothill Blvd.

By 2010, Foothill Blvd. within the jurisdiction of Glendale will be much more congested than that in 1987, especially between Pennsylvania Ave. and Dunsmore Ave. The segment between Dunsmore Ave. and Lowell Ave. will maintain LOS A.

## Transit Conditions in 2010

### Modeling Assumptions

The 2010 transit network (existing plus funded) is composed of the 1987 bus system and the newly funded urban and commuter rail lines. Altogether five urban rail lines ((including Metro Blue Line Extension to Pasadena) and eight commuter rail lines have been coded into the transit network.

The urban rail lines are all called Metro lines and are distinguished by the following color designations:

- o Metro Blue Line. Long Beach to Los Angeles (21.3 miles) and later from Union Station to Pasadena (13.4 miles).
- o Metro Green Line. Norwalk to Space Park (19.5 miles) and Norwalk to Westchester (18.3 miles).
- o Metro Red Line. Union Station to North Hollywood (14.6 miles).
- o Metro Orange Line. Union Station to Western Avenue (5.1 miles).

The following eight commuter rail lines use existing railroad rights-of-way:

- o Saugus to Los Angeles (32.8 miles).
- o Moorpark to Los Angeles (46.8 miles).
- o San Clemente to Los Angeles (63.9 miles).
- o Riverside to Irvine (59.0 miles).
- o Riverside to Los Angeles (60.8 miles).
- o San Bernardino to Los Angeles (57.9 miles).
- o Hemet to San Bernardino (15.0 miles).
- o Menton to San Bernardino (11.7 miles).

Based on the above 2010 Transit Network, this study incorporates the east-west rail line and analyzes the home-work ridership data.



# Los Angeles

## 300-Mile Metro Rail Plan

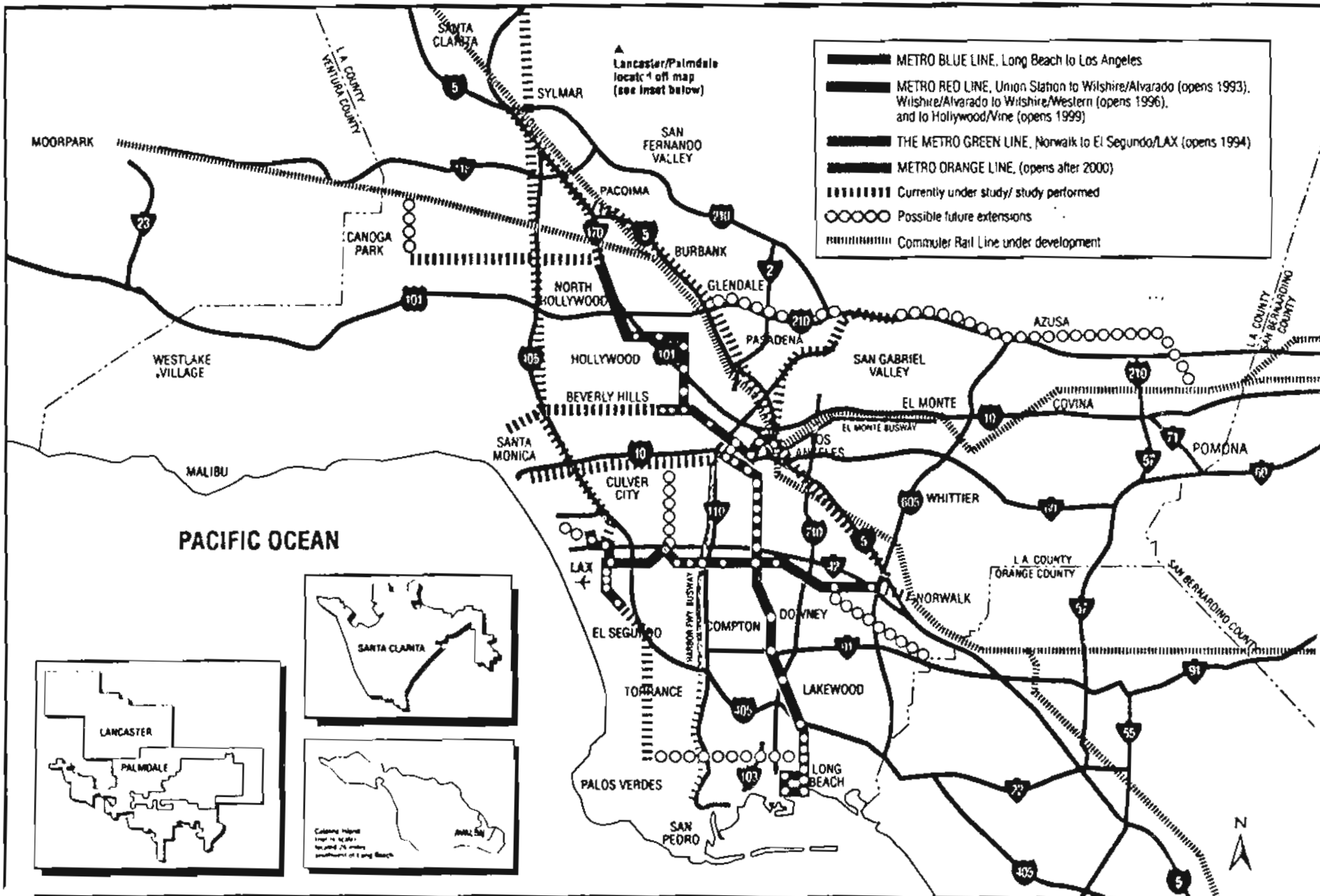


Figure 4

The Technical Advisory Committee (TAC) and the Tri-City Transportation Coalition (TCTC) have approved the alignment of the east-west rail line and station locations for the purpose of this analysis.

The rail line is proposed to originate from the Burbank-Glendale-Pasadena Airport, then follow San Fernando Blvd. to the junction of San Fernando Rd./I-134 and travel east along the median of I-134 and exits to the Eagle Rock Plaza. From there, the rail line follows Colorado Blvd. and passes through the Eagle Rock area. In Pasadena, the rail line approximately parallels the Los Angeles - Pasadena LRT by using the same railroad right-of-way on I-210; with the line terminating at Sierra Madre Villa.

For the modeling purposes, it was assumed that trains would reach a maximum operating speed of at least 70 miles per hour and that the average speed would be about 50 miles per hour. The line was programmed to run at a frequency of once every 10 minutes during the AM and PM peak periods. Fare levels were set approximately equal to the fares currently being charged on the Los Angeles - Long Beach light rail line.

For the east-west rail line, altogether two alternatives have been proposed as follows.

Alternative 1 Model Run

Alternative 1 model run only incorporates the east-west rail line into the 2010 transit network (See Figure ). Under this alternative, fourteen (14) rail stops and five (5) park-n-ride facilities have been proposed as follows:

TABLE 11 RAIL STOPS AND PARK-N-RIDE FACILITIES  
(Under Alternative 1 Model Run)

Rail Stops	Park-N-Ride Facilities
1) San Fernando/Kenwood	1) Near intersection of Olive/I-5
2) San Fernando/Empire	2) Glendale Ave./I-134
3) Olive/I-5	3) Eagle Rock Plaza
4) San Fernando/Grandview	4) Fair Oaks/I-210
5) Central-Brand/I-134	5) Sierra Madre Villa
6) Glendale/I-134	
7) Eagle Rock Plaza	
8) Hartwick-Figueroa/Colorado	
9) I-134/Orange Grove	
10) Fair Oaks/I-210	
11) Lake Ave./I-210	
12) Hill Ave./I-210	
13) Sierra Madre Blvd.	
14) Sierra Madre Villa	

# BURBANK - GLENDALE - PASADENA TRANSPORTATION STUDY

## ( RAIL ALIGNMENT IN ALTERNATIVE 1 )

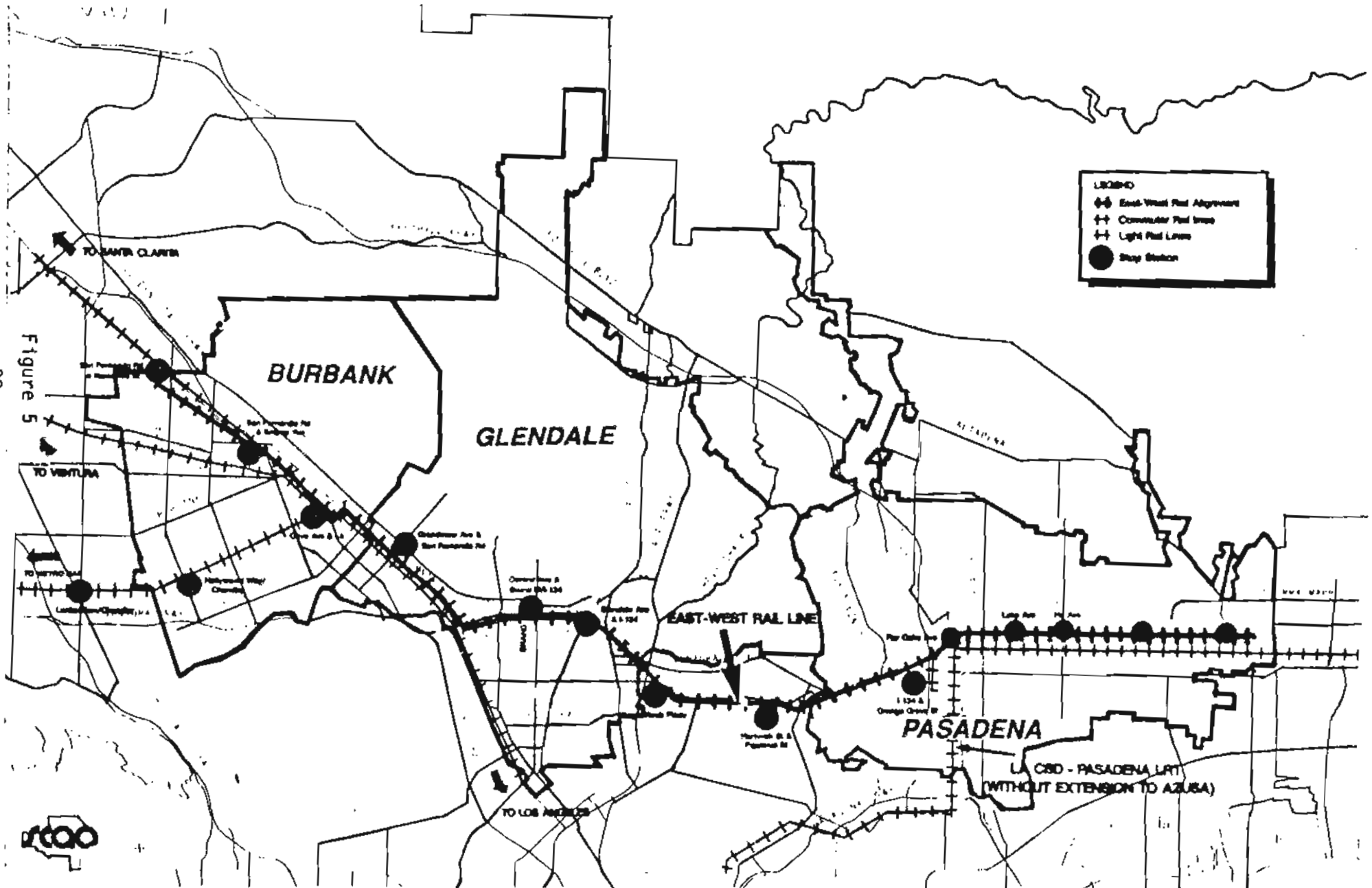


Figure 5

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The alternative 1 model run yields the following results:

Route Miles:	20.12
Daily Home-Work Ridership:	12,661
Passenger Miles:	85,401
Passenger Hours:	1,672
Peak Load:	5,967
Average Trip Length (Mile/Trip):	6.74
Average Trip Time (Min./Trip)	7.92

The SCAG regional model estimates transit trips undertaken for the home-work purpose (commuter trips). Model results for the year 2010 show that the east-west line is projected to carry approximately 12,700 commuters per day. As a rule of thumb, commuters constitute about 54% of the total ridership for an all day transit line. Under this precept, the east-west rail line would carry about 23,400 riders per day.

The model projections show that, though all segments of the line would carry significant ridership, passenger loads are projected to be lower in eastern Pasadena. This fact clearly has something to do with the diversion of trips from the east-west rail line to the paralleling LA - Pasadena LRT. The peak ridership load during the AM peak would be from Eagle Rock Plaza heading west to downtown Glendale. In general, most of the ridership is projected to ride westbound in the morning and eastbound during the PM peak. Of the overall home-work ridership (12,661), 4,028 trips is expected to occur in the eastbound direction, but the trips in the westbound direction would amount to as high as 8,633, more than two times that in the eastbound direction. The average commuter would travel 6.7 miles on this rail line.

#### Alternative 2 Model Run

The Alternative 2 differs from Alternative 1 in the following aspects (see Figure 6):

- o The Los Angeles - Pasadena LRT has been extended eastward to Azusa;
- o Instead of terminating in Sierra Madre Villa, the east-west rail line would meet the LA - Pasadena LRT at the del Mar Amtrak station in Pasadena, so the original links of the east-west rail line from the west boundary of Pasadena to Sierra Madre Villa become redundant and therefore have been eliminated;
- o The Chandler rail branch from downtown Burbank to the Chandler/Lankershim intersection in North Hollywood has been coded into the network so the east-west rail line and the Metro Red Line can be connected;
- o The potential LA - Glendale LRT along San Fernando Rd. has also been incorporated.

# BURBANK - GLENDALE - PASADENA TRANSPORTATION STUDY (RAIL ALIGNMENT IN ALTERNATIVE 2)

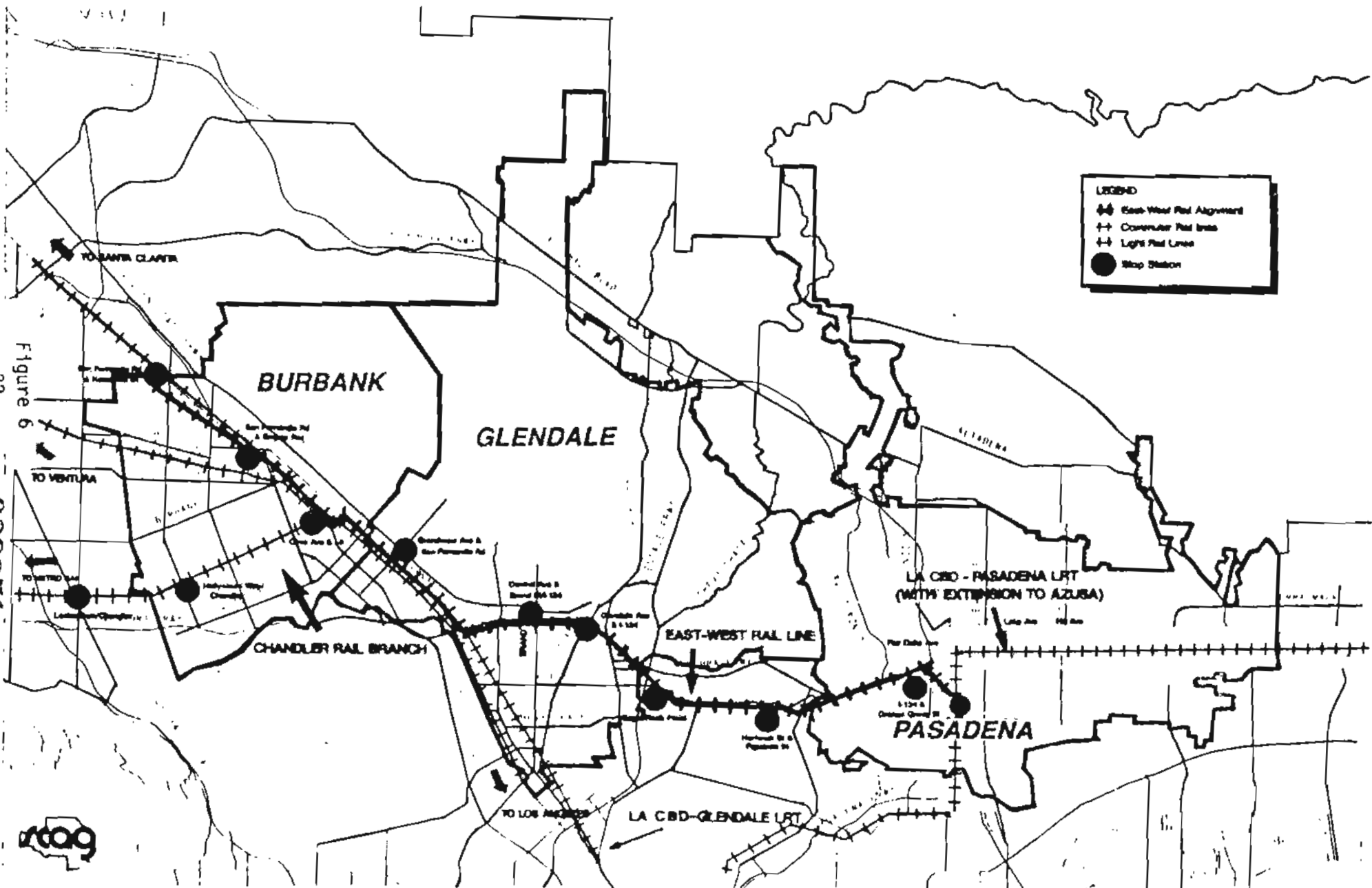


Figure 6  
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Under alternative 2 model run, the east-west rail line (including Chandler branch) has a total of thirteen (13) rail stops and five (5) park-n-ride facilities. (See Table 12).

TABLE 12 RAIL STOPS AND PARK-N-RIDE FACILITIES  
(Under Alternative 2 Model Run)

Rail Stops	Park-N-Ride Facilities
<b>Along the Trunk Line</b>	
1) San Fernando/Kenwood	1) Near intersection of Olive/I-5
2) San Fernando/Empire	2) Glendale Ave./I-134
3) Olive/I-5	3) Eagle Rock Plaza
4) San Fernando/Grandview	4) Del Mar Amtrak Station
5) Central-Brand/I-134	5) Chandler/Lankershim
6) Glendale/I-134	
7) Eagle Rock Plaza	
8) Hartwick-Figueroa/Colorado	
9) I-134/Orange Grove	
10) Del Mar Amtrak Station	
<b>Along the Chandler Branch</b>	
11) Chandler/Lankershim	
12) Chandler/Hollywood Way	
13) Olive/I-5	

The alternative 2 model run yields the following major results regarding the east-west rail line (including rail extension along Chandler Blvd.):

Route Miles:	19.45
Daily Home-Work Ridership:	22,474
Passenger Miles:	125,490
Passenger Hours:	2,495
Peak Load:	7,600
Average Trip Length (Miles/Trip)	5.58
Average Trip Time (Min./Trip)	6.66

Compared with alternative 1, which produces 12,700 commuters per day, alternative 2 model run generates about 22,500 commuters per day, a 77 percent increase. If the number of commuters is assumed to account for 54% of daily riders, then the east-west rail line is expected to carry about 41,600 total riders per day. The segmental distribution of riders in alternative 2 model run is similar to that in alternative 1 model run: passenger loadings tend to be higher in the city of Glendale than elsewhere and the westbound rail line would carry much much passengers than the eastbound rail line.

For a reference, a ridership comparison of the east-west rail line and other relevant rail lines is given in Table 13:

TABLE 13 A RIDERSHIP COMPARISON OF THE EAST-WEST RAIL LINE AND OTHER RELEVANT RAIL LINES

Rail Line	Home-Work Ridership
Blue Line (LB - LA)	21,473
Red Line (LA - N. Hollywood)	56,739
Blue Line Extension (LA - Pasadena - Azusa)	43,561
<b>East-West Rail</b>	
- Under Alternative 1 Model Run	12,661
- Under Alternative 2 Model Run	22,474

Mode Splits in 2010 (Home-Work Trips)

Trip Production

Table 14 shows mode splits (trip production) for the study area in 1987 and 2010.

TABLE 14 MODE SPLITS IN 1987 AND 2010 (PRODUCTIONS)

Mode 2)	1987 (1)	2010 (Base) (2)	2010 (Alt 1) (3)	2010 (Alt 2) (4)
Drive Alone	240,257 (76.1%)	264,380 (70.7%)	262,488 (70.2%)	262,043 (70.1%)
Shared Ride	53,511 (16.9%)	69,691 (18.6%)	68,766 (18.4%)	68,524 (18.3%)
Transit	22,154 (7.0%)	39,937 (10.7%)	42,754 (11.4%)	43,441 (11.6%)
<b>Total</b>	<b>315,922 (100%)</b>	<b>374,008 (100%)</b>	<b>374,008 (100%)</b>	<b>374,008 (100%)</b>

Therefore, in trip production, the percentages of drive alone trips are expected to decrease between 1987 and 2010. During the same period, the percentages of transit users are projected to increase consistently. After comparing the 1987 mode split and the 2010 base mode split, we found that of the total number abandoning drive alone, about 70% would take transit, and 30% would rideshare.

Trip Attraction

Table 15 shows mode splits (trip attraction) for the study area in 1987 and 2010.

TABLE 15 MODE SPLITS IN 1987 AND 2010 (ATTRACTIONS)

Mode	1987 (1)	2010 (Base) (2)	2010 (Alt 1) (3)	2010 (Alt 2) (4)
Drive Alone	291,123 (76.9%)	328,836 (72.5%)	327,232 (72.2%)	326,282 (72%)
Shared Ride	67,469 (17.8%)	94,540 (20.9%)	93,869 (20.7%)	93,491 (20.6%)
Transit	19,850 (5.3%)	30,041 (6.6%)	32,316 (7.1%)	33,644 (7.4%)
<b>Total</b>	<b>378,442</b> <b>(100%)</b>	<b>453,417</b> <b>(100%)</b>	<b>453,417</b> <b>(100%)</b>	<b>453,417</b> <b>(100%)</b>

On the whole, the mode split pattern of trip attraction is quite similar to that of trip production: the drive alone share decreases, whereas the transit share increases. The incorporation of the east-west rail line into the base network greatly increases the percentage of transit usage. But, one difference is noticed between trip attraction and trip production after comparing the 1987 mode split and the 2010 base mode split. In trip attraction, the shared riders account for 70% of total persons abandoning drive alone, and the transit riders account for the remaining 30%. But in trip production, the opposite composition has been observed: 30% by shared ride and 70% by transit.

## 7. FINANCIAL STRATEGIES

Since the east-west rail line is very important to the tri-city area but is not slated for Proposition A funding, it is recommended that diverse funding sources be actively sought.

For transit financing, four funding sources have been identified:

- o Federal Sources: Urban Mass Transportation Act, Federal Highway Act of 1970, Reauthorization of the Surface Transportation Act of 1987;
- o State Sources: Propositions 108 and 116;
- o Local Sources: Farebox, TDA Article 4, Financing (Bonds), Regional Impact Fees, Proposition A, Proposition C;
- o Public/Private Joint Development Strategies

For highway financing, three funding sources have been identified:

- o Federal Sources: Federal Aid Urban, Federal Aid Interstate, Highway Trust Fund;
- o State Sources: Proposition 111 (SCA 1), Flexible Congestion Relief Program, Transportation Development Act;
- o Local Sources: Benefit Assessment Districts, Developer Exactions (Mitigation Fees), Tax Increment Financing, the Mello-Roos Community

## Facilities District.

Moreover, one possible source is \$1 million in matching funds from the Southern California Rapid Transit District (SCRTD) for non-rail transit improvements.

## 8. RECOMMENDATIONS

### Highway Improvements

#### HOV Lanes

It is recommended that HOV lanes on I-210 Freeway be extended westward to the City of Burbank along the 134/210 freeway corridor. Incorporating HOV lanes along 134/210 freeway corridor should be conducive to potential transit services (e.g., bus ways) and access enhancements.

#### TSM Measures

This study also recommends the construction of ramp from the eastbound I-134 Freeway to northbound I-5 Freeway to improve connection between I-134 and I-5.

### Transit Improvements

#### East-West Rail Line

The proposed east-west rail line is expected to relieve traffic congestion on the paralleling arterials and freeways. Ridership analysis has indicated potential benefits of providing east-west rail service. However, further studies are needed prior to final designation of a east-west rail line alignment and station locations. Specifically, the following steps should be taken:

- A) Further feasibility studies on the east-west rail line from engineering and technological perspectives;
- B) Achieving consensus among the three cities on necessity of building such a east-west rail line and their respective benefits and costs;
- C) Undertaking a detailed environmental impact analysis;
- D) Seeking reliable funding sources.

#### Short-Range Transit Improvements

In response to the insufficient local transit service connecting the city centers, major generators and transportation centers within the study area, SCRTD prepared the "Tri-Cities Sector Study" which proposed a list of recommendations for improving the quality of short-range transit:

- A) Establish limited stop commuter service to reduce travel time for regional riders;
- B) Reroute regional service from secondary streets onto major arterial streets to make routes more direct;
- C) Improve local circulation service in the 1) southern and northwest areas of

Glendale, 2) northern and southern areas of Burbank, and 3) southern and northern areas areas of Pasadena;

- D) Modify regional bus routes to better meet local needs;
- E) Establish regional or local circulation services in Pasadena and an Electric Trolley Bus line between the LACBD and Burbank via the City of Glendale.

### **Traffic System Management (TSM)**

Three general TSM measures are proposed here:

- A) **Traffic Signal Synchronization:** Traffic signals at high volume intersections are recommended for modification to allow for the system to operate as an interconnected system of regulated signals. This tactic is especially convenient during peak hour travel and for major special attractor events.
- B) **Intersection Geometrics Improvements:** These improvements usually include the widening of streets at intersections, adding left turn or right turn lanes and disallowing left turns during peak hour periods. These improvements allow for the free flow of traffic, especially during congested periods.
- C) **Removal of On-street Parking:** This tactic improves the capacity of streets and allows free flow movement, decreases traffic congestion and reduces right turn accidents of automobiles and public transit vehicles. Removal of on-street parking is helpful during peak hours, because it provides an additional lane for usage.
- D) **Telecommunications:** Developing telecommuting policies for employers in the study area will help workers to avoid daily commutes which will reduce the total number of daily vehicle-trips.

### **Transportation Demand Management**

Commuter Transportation Services, Inc. (CTS) prepared a report of "Tri-City Transportation Study: Transportation Demand Management Preliminary Assessment." In the report, CTS made a list of recommendations.

- A) The primary recommendation for the Burbank Media District is to expand the services and membership of the Transportation Management Association (MDTMA). The TDM strategies include but are not limited to the following: parking management, shuttle service, ridesharing, education and information clearinghouse.
- B) For the Glendale Central Business District, CTS's recommendation is also to expand the Glendale Transportation Management Association (GTMA). Many of the TDM strategies are in response to Regulation XV, e.g. Trip Reduction Plan.
- C) The City of Pasadena's Commuter Services Program includes guidelines for carpooling, vanpooling, walking, biking, transit, parking, child care, a guaranteed ride home, and the use of fleet vehicles. The services and membership of the Pasadena Transportation Management Association (PTMA) are recommended to expand.