ECV

DRAFT

S.C.R.T.D. LIBRARY

TRANSIT TECHNICAL STUDIES

WEST LOS ANGELES TRANSIT PLANNING STUDY

SCRTD
1976
.W47
c.2

Wilbur Smith and Associates

WEST LOS ANGELES
TRANSIT PLANNING STUDY

Prepared For
Southern California Rapid
Transit District

By
Wilbur Smith and Associates

August 31, 1976

08262

SCRTD
1976
.W47
c.2

Wilbur Smith & Associates, Inc.

CABLE: WILSMITH
TELEX 57-3489

CONSULTING ENGINEERS AND PLANNERS

CALIFORNIA
5900 WILSHIRE BOULEVARD, SUITE 2950 • (213) 930-2188
Los Angeles, Calif. 90036

September 1, 1976

Mr. Howard C. Beardsley,
Assistant Manager
Rapid Transit and Surface Planning Department
Southern California Rapid Transit District
1060 South Broadway
Los Angeles, California 90015

Dear Mr. Beardsley:

We are pleased to submit our draft report, West Los Angeles Transit Planning Study, prepared in accordance with our agreement of August 1, 1975. A comprehensive study of the socio-economic development patterns, travel characteristics, and transportation services was undertaken and the transit needs and potentials within West Los Angeles were analyzed. The transit requirements for each individual area of the West Los Angeles area has been related to the principal origin areas of the Southern California region.

A series of alternative transit improvements to accommodate existing and future transit needs were developed and evaluated. The evaluation utilized the data obtained through an employee travel survey and an on-board travel survey conducted as part of this study.

The plan recommended has been termed "The Selected Alternative" as it is the plan developed through a series of route adjustments that will better satisfy the travel desires of existing and potential transit patrons. Preliminary levels of service are presented as is an estimate of the equipment requirements necessary for implementation. The emphasis of the plan development is toward a rationalization of the transit system utilizing the existing equipment available. As shown in the detailed discussion of the plan, only a small number of vehicles are required above the existing equipment available. However, it is expected that the SCRTD staff will adjust the proposed service levels upon completion of their line profile studies. The selected alternative also incorporates the Downtown Transit Plan recommendations as presented in April, 1976.

We have appreciated the opportunity to provide our services to the Southern California Rapid Transit District and trust these recommendations will provide improved transit service for West Los Angeles.

Very truly yours,
WILBUR SMITH & ASSOCIATES

William V. Sheppard
Western Region
Vice President

WVS/ss

TABLE OF CONTENTS

CHAPTER		PAGE
1	INTRODUCTION	1
	Purpose and Scope of Study	2
	Technical Approach	4
	Order of Presentation	5
2	SOCIO-ECONOMIC AND DEVELOPMENT PATTERNS	7
	Study Area	7
	Population and Population Density	8
	Sex and Age Characteristics	11
	Household Characteristics	13
	Auto Availability	14
	Land Use	15
	Employment and Labor Force	18
3	EXISTING TRANSPORTATION SYSTEM	21
	Highway Facilities	21
	Arterial Facilities	23
	Public Transportation in West Los Angeles	24
	Southern California Rapid Transit District Services	26
	Crosstown Service	28
	Linked Radials	38
	Single End Radials	44
	Frequency and Availability	50
	Coverage and Accessibility	58
	Transit Priority	63
	Service Reliability	64
	Bus Arrival Intervals	67

LIST OF FIGURES

FIGURE		PAGE
1	SCRTD Sector Improvement Program	1
2	Los Angeles Public Transportation System, June, 1939	1
3	Work Program	4
4	West Los Angeles Study Area	7
5	Traffic Zone and Census Tract Map	8
6	Past Projected Population Growth, 1960 to 2000	8
7	Population Density	9
8	Distribution of Elderly Persons	13
9	Distribution of Persons Under Age 16	13
10	Median Household Income	14
11	Households Without Automobiles	16
12	Land Use Map	16
13	Employee Population Locations	20
14	Santa Monica and Culver City Municipal Bus Lines	24
15	Existing Transit System Network	27
16	Daily Variation of Travel	50
17	Availability of Transit Service	52
18	Peak Hour Bus Volumes	53
19	Base Hour Bus Volumes	53
20	Owl Service	55
21	Existing Transit System Coverage	58
22	Schedule Adherence	65
23	Employee Survey Questionnaire	71
24	Card 07 - Surveyor's Record	74
25	On-Board Survey Form	76
26	LACBD Cordon Crossing By Hour	90
27	Trip Purpose Distribution	94
28	SCAG RSA Map	96

LIST OF FIGURES

FIGURE		PAGE
1	SCRTD Sector Improvement Program	1
2	Los Angeles Public Transportation System, June, 1939	1
3	Work Program	4
4	West Los Angeles Study Area	7
5	Traffic Zone and Census Tract Map	8
6	Past Projected Population Growth, 1960 to 2000	8
7	Population Density	9
8	Distribution of Elderly Persons	13
9	Distribution of Persons Under Age 16	13
10	Median Household Income	14
11	Households Without Automobiles	16
12	Land Use Map	16
13	Employee Population Locations	20
14	Santa Monica and Culver City Municipal Bus Lines	24
15	Existing Transit System Network	27
16	Daily Variation of Travel	50
17	Availability of Transit Service	52
18	Peak Hour Bus Volumes	53
19	Base Hour Bus Volumes	53
20	Owl Service	55
21	Existing Transit System Coverage	58
22	Schedule Adherence	65
23	Employee Survey Questionnaire	71
24	Card 07 - Surveyor's Record	74
25	On-Board Survey Form	76
26	LACBD Cordon Crossing By Hour	90
27	Trip Purpose Distribution	94
28	SCAG RSA Map	96

LIST OF FIGURES (cont'd)

FIGURE		PAGE
29	Internal-Interval Work Trip Desires	99
30	West Los Angeles Travel Time Assignments	114
31	West Los Angeles Plan Development	142
32	Selected Alternative	163
33	Schematic of "Culver Junction"	168
34	Proposed Owl Service	193

TABLE OF CONTENTS (cont'd)

CHAPTER		PAGE
4	EXISTING TRAVEL PATTERNS AND TRANSIT USAGE	69
	Travel Surveys	69
	The Employee Travel Survey	70
	The On-Board Travel Survey	77
	Patronage	80
	Characteristics of Transit Riders	84
	Transit Trip Characteristics	89
	Daily Variations in Transit Travel	89
	Weekly Variation	91
	Trip Purpose	91
	Travel Origin and Destinations	94
	Travel Mode To and From Bus Stops	111
	Transit Travel Times	113
	Travel Mode of Work Trips	118
5	EVALUATION OF TRANSIT SERVICE	122
	Routing Criteria	122
	Operating Criteria	125
	Criteria for Bus Stops	128
	Transit Terminals	129
	Transit Fare Structure	130
	Ride Promotion and Information Services	132
	Goals and Objectives	135
	Regional Transportation Policies	135
	Community Goals and Objectives	136
	Summary of Deficiencies	139

TABLE OF CONTENTS (cont'd)

CHAPTER		PAGE
6	ALTERNATIVE SERVICE PLANS	142
	Transit System Planning	143
	Planning Principles	144
	Development of Alternative Concepts	148
7	THE SELECTED ALTERNATIVE	162
	Summary of The Plan	162
	Detailed Description of Selected Alternative	170
	Expansion of Owl Service	193
	Saturday and Sunday Service	199
	Equipment Requirements	200
	Summary	200

APPENDICES

Appendix A

LIST OF TABLES

TABLE		PAGE
1	Estimated Population Statistics	9
2	Population and Population Density	10
3	Sex and Age Characteristics	12
4	Automobile Ownership Characteristics	16
5	Estimated Employment Population	18
6	Employment and Labor Force Statistics	20
7	Comparison of Three Transit Systems	24
8	Santa Monica Municipal Bus Line Service	25
9	Culver City Municipal Bus Line Service	26
10	Quantity of SCRTD Service in West Los Angeles	29
11	Operating Statistics of Crosstown Lines	30
12	Operating Statistics of Linked Radials	39
13	Operating Statistics of Single End Radials	46
14	Travel Demand Periods	51
15	Operating Statistics of Owl Service	56
16	Population Coverage	59
17	Employment and Labor Force Coverage	61
18	Coverage ofTransit Dependent Groups	62
19	Minutes Off Schedule	65
20	Per Cent of Bus Runs Off Schedule	66
21	Arrival Time Interval Analysis of Line 91	68
22	Summary of West Los Angeles Employee Survey	76
23	Results of On-Board Travel Survey	79
24	Patronage and Passenger per Bus Mile	82
25	Owl Patronage Leaving CBD	83
26	Sex and Age of West Los Angeles Employees	86
27	Sex and Age of West Los Angeles Base Period Transit Riders	87
28	Income Levels	88

LIST OF TABLES (cont'd)

TABLE		PAGE
29	Method of Transit Fare Payment	90
30	Daily Variation in Transit Travel	92
31	Trip Purpose By Line	93
32	Regional Analysis Zones and Descriptions	97
33	LARTS Work Trip Data	98
34	Internal-Interval Work Trip Matrix	100
35	Work Zone - RSA Employee Matrix	102
36	Travel Mode To and From Bus Stops	112
37	Transit Travel Time Matrix	114
38	Auto Travel Time Matrix	116
39	Transit-Auto Travel Time Ratio Matrix	117
40	Mode of Travel To Work	119
41	Travel Mode To Work By Sex	120
42	Goals and Objectives	137
43	Operating Statistics of Selected Alternative	165
44	Comparison of Existing Versus Proposed Systems	167
45	Operating Statistics of Owl Service	194

Chapter 1

INTRODUCTION

Several years ago the Southern California Rapid Transit District embarked on a ambitious program to improve public transportation within its service area. This was accomplished by dividing the County of Los Angeles into nine sectors and conducting a short range transit improvement study in each. These sectors are shown in Figure 1. The improvements in public transportation service derived from these studies have been the first major improvement in transit service in the Los Angeles region in many years.

West Los Angeles is the last of these sector improvement studies to be conducted. West Los Angeles as defined for this study is one of the largest sectors in the program. It is also the area with the heaviest concentration of transit routes, riders, equipment, and potential ridership.

There are several reasons for this heavy concentration of transit lines and transit riders, based primarily on the transit history of the area. West Los Angeles had an extensive public transportation system as early as 1910 when the Pacific Electric Company took over from its predecessors. In 1923 the Los Angeles Motor Coach Company was formed to link lines of the PE with the Los Angeles Railway. This was the beginning of a public transportation system that developed into the system shown in Figure 1. The similarity between those routes in 1939 and those in 1976 is striking - indicating that either development has continued along the same lines as those in the 1930's or that no changes or modifications in the transit system has taken place in nearly four decades.

SCRTD SECTOR IMPROVEMENT PROGRAM

WSA

Figure 1

LOS ANGELES PUBLIC TRANSPORTATION SYSTEM

June 1939

WSA

Figure 2

West Los Angeles has an approximate resident population of 1.4 million persons and is the location of nearly three-quarters million jobs. It also contains some of the heaviest concentrations of development in the region outside the Los Angeles Central Business District with areas such as Wilshire Corridor and Century City. There is also a significant proportion of elderly citizens in this area which only necessitates the operation of an efficient and viable public transportation system in the area.

Due to these factors and the size and magnitude of public transportation presently provided in West Los Angeles, this sector improvement will have an impact on more people than any of the previous studies in the area. Since West Los Angeles draws a sizeable number of employees for outside its study area, the impact is even more far-reaching.

An additional factor in the transit system for West Los Angeles is the future of rapid transit in the Los Angeles region. The Wilshire Corridor is presently under study as part of the starter line for a regional rapid rail system. Due to this recent development, the potential long-range impacts have to be kept in mind such that the bus transit system can be modified to complement the rapid rail system without completely restructing the route system.

Purpose and Scope of Study

In the summer of 1975, the Southern California Rapid Transit District commissioned Wilbur Smith and Associates to simultaneously conduct the North and West Los Angeles Transit Studies. The task was generally described as to conduct the appropriate studies and to develop a short-range transit improvement plan for the area

between downtown Los Angeles and the Pacific Ocean. The work program as envisioned at the outset of the project also included the integration of the transit improvement programs recently or simultaneously implemented in adjacent sectors.

A major task of a planning study is the development of goals and objectives of that study. These goals formalize the purpose of the study into a set of guidelines that establish a central theme throughout the conduct of the study. The goals and objectives developed in this phase of the project are general statements following a brief and cursory review of past studies and an intimate knowledge of the area with its political and economic aspects. The statements are refined into specific criteria only after the socio-economic studies, travel surveys, and public input have been gathered.

The major goals and objectives established at this time for the West Los Angeles Transit Study are:

1. Conduct the appropriate studies to determine and analyze the travel patterns within and adjacent to the study area,

2. Rationalize the existing transit service into a viable system that will facilitate transit travel to and from any area within or adjacent to the study area at travel times comparable to those of an automobile,

3. Review and formalize the regional and community goals and objectives for incorporation into this plan,

4. The integration of the various sector improvement plans that would have an impact on the travel patterns of employees or residents of the study area, and

5. Provide a higher level of transit service to the employees and residents of West Los Angeles with a minimum increase in equipment needs or other capital expenditures.

Technical Approach

To accomplish the study objectives in the allotted time and to establish a system of quality control throughout the term of the project, the study approach shown in Figure 3 was developed to insure logical and efficient progress through the various work tasks involved. The individual tasks involved are grouped in the five phases:

Phase I - Study Organization
Phase II - Inventory
Phase III - Survey
Phase IV - Analysis of Data
Phase V - Recommendations and Report

The Study Organization Phase is to establish the technical approach to the study and to define the goals, objectives and purpose of the study. Also included in this phase is the establishment of relationships with the various agencies and groups that are affected and/or would have input into the study.

The Inventory Phase is the review of past and present studies in the area. This includes data from the Census and other agencies. Any data not available from the other studies is obtained by conducting our own study to gather the required information.

WORK PROGRAM

WSA

Figure 3

Phase III utilizes the preliminary information gathered from the Inventory Phase to design travel surveys for the employees and transit riders of West Los Angeles. The surveys are conducted and processed in this phase.

Phase IV is the analysis and consolidation of all of the data obtained from the Inventory and the Surveys. Also, during this phase an evaluation procedure was developed that would serve as input in the development of the alternative plans.

The fifth and last phase is the Recommendations and Report. During this phase alternative plans have been developed and evaluated. The result is a final recommended plan and a report written to document all of the preceding work tasks, evaluation, and recommendations.

Order of Presentation

The report begins with a review of existing conditions in and adjacent to the study area. This information is presented in Chapters Two and Three. Chapter Two is the socio-economic data and Chapter Three presents a discussion of existing transportation in the study area, with particular emphasis on the existing public transportation services. Chapter Four is a discussion of the travel surveys and travel characteristics within and adjacent to West Los Angeles. The criteria used to evaluate the existing and proposed transit services is presented in Chapter Five. This if followed by the results of the analysis of the existing transit services relative to these criteria and the results of the travel

surveys. Chapter Six discusses the alternative concepts developed. Chapter Seven is the final chapter presenting the final recommended plan and the elements of that plan along with detailed statistics and data that will facilitate the earliest possible implementation of that plan.

Chapter 2

SOCIO-ECONOMIC AND DEVELOPMENT PATTERNS

The first step in developing a comprehensive transportation improvement program of any type is to conduct a comprehensive inventory and review of the conditions within and adjacent to the study area. Not only does this data identify what conditions presently exist in the area, but also provides the basis for projecting future growth and changes in travel demand.

Accordingly, a detailed inventory of past and present socio-economic conditions within the study was conducted. Data from the various transportation and planning agencies such as SCAG, LARTS, City and County traffic and planning departments, and SCRTD as well as the 1970 Census of Population were gathered and tabulated to develop a socio-economic profile of the study area. An inventory of the existing transportation facilities was also conducted. This includes a street inventory and a comprehensive inventory of public transportation presently provided in the study area.

Study Area

West Los Angeles is defined roughly as the area west of the Los Angeles Central Business District to the Pacific Ocean. The study area is bounded by Mulholland Drive and Riverside Drive on the north, the Los Angeles River and the Harbor Freeway on the east, and Slauson Avenue on the south, and includes the incorporated cities of Santa Monica, Beverly Hills, and Culver City. The remainder of the study area is largely within the City of Los Angeles as shown in Figure 4.

WEST LOS ANGELES STUDY AREA
(AND GOVERNMENTAL ENTITIES)

WSA

Figure 4

PAST AND PROJECTED POPULATION GROWTH

1960 to 2000

WSA

Figure 6

TRAFFIC ZONE AND CENSUS TRACT MAP

WSA

Figure 5

The unit of analysis for the West Los Angeles Transit Study is the traffic zone used by LARTS. This was done since the LARTS 1974 data is the only up-to-date and reliable source of employment population statistics. Also, the LARTS data has population figures and other pertinent data on a more recent basis than the 1970 Bureau of Census data. However, demographic data not available from the LARTS data was obtained from the Census. This was possible since traffic zones are groups of one to five traffic zones. This procedure would also permit comparison of LARTS, SCAG and Census Data.

Since there are approximately 150 traffic zones within the study area, the traffic zones have been grouped into groups of three-to-five traffic zones as shown in Figure 5 to form units corresponding to city boundaries and Los Angeles City planning areas.

Population and Population Density

About one-fifth of the total population of Los Angeles County reside in the West Los Angeles study area. Based on the 1970 Census of Population, there were 1.4 million persons residing in the study area. As shown in Table 1, this is an 8.5 per cent increase since the 1960 population and an average annual growth of 0.8 per cent. However, according to SCAG the population has decreased by approximately 20,000 persons, or 1.5 per cent, over the last five years.(1) As shown in Figure 6, it is expected to then be an average increase in population, approximately 0.3 to 0.4 per cent per year until the year 2000 when there will be slightly more than 1.5 million persons residing in the West Los Angeles study area.

(1) SCAG, D/2e December 1975, revised forecasts

Table 1

ESTIMATED POPULATION STATISTICS

West Los Angeles Transit Study

YEAR	LOS ANGELES COUNTY	WEST LOS ANGELES POPULATION	WEST LOS ANGELES AVERAGE CHANGE/YEAR
1960	6,040,805	1,290,479	--
1970	7,038,764	1,400,360	+0.8 Per Cent
1975	7,020,772	1,379,995	-0.2
1980	7,196,900	1,404,600	+0.4
1990	7,557,000	1,467,900	+0.4
1995	7,732,000	1,489,400	+0.3
2000	7,905,000	1,510,900	+0.3

SOURCE: SCAG D/2e December 1975
Revised Forecasts

Population Density - Studies done by the National Committee on Urban Transportation have found that population densities of 3,200 persons or more per square mile will support regular public transportation service and that densities between 2,200 and 3,200 persons per square mile would support some type of limited transit service, particularly during the commuter hours.(2)

As can be seen in Figure 7, the study area has very few areas with a population density of less than 5,000 persons per square mile. These areas are to the north of Sunset Boulevard in the Santa Monica Mountains and in the Baldwin Hills Area. Table 2 is a summary of the total population and population densities of each of the various study zones. The average density for the entire study area is slightly over 6,600 persons per square mile. The

(2) The National Committee on Urban Transportation.

POPULATION DENSITY

WSA

Figure 7

Table 2

POPULATION AND POPULATION DENSITY[1]

West Los Angeles Transit Study

AREA NAME	POPULATION	PERSONS/S.M.
Marina Del Rey	37,074	5,617
Venice	48,875	9,381
Santa Monica N.	53,454	10,029
Santa Monica S.	34,835	10,483
West Los Angeles	45,312	9,285
Culver City	33,587	6,385
Mar Vista	44,135	10,712
Palms	46,528	9,534
Westwood	29,887	8,166
Century City	19,579	7,800
Beverly Hills S.	21,911	12,738
Beverly Hills N.	21,609	4,180
Pacific Palisades	27,036	788
Brentwood-Bel Air	17,010	1,092
Hollywood Hills	48,475	3,672
Beverly Hills	9,869	1,111
Miracle Mile	73,869	11,142
Mid-Wilshire	41,826	14,885
Wilshire Center	38,802	20,974
Sunset Strip	56,967	15,111
Hollywood	53,540	10,336
Echo Park	47,076	16,289
Westlake	45,256	16,517
University	23,126	10,908
Santa Barbara	77,682	14,201
Exposition Park	68,253	13,678
West Adams	67,167	12,257
South Vermont	80,393	11,851
Baldwin Hills	98,797	7,767
Silver Lake	88,424	7,995
Griffith Park	0	0
TOTAL	1,400,360	6,609

(1) Based on (1970) Population Data

major concentration of persons are in the Westlake and Wilshire Center areas with less widespread concentrations in Sunset Strip, Exposition Park and Central Santa Monica. The majority of the area has a density of between 10,000 and 15,000 persons per square mile.

Sex and Age Characteristics

Of the 1.4 million persons residing in the West Los Angeles area, slightly less than 750,000 are female, over 650,000 persons are male, making the male-to-female ratio 1.13. Table 3 shows these statistics for the various age categories. For the younger age group the number of females and males are relatively equal. The under 16 age group comprises one-fifth of the total population. This age group composes 30 per cent of the total county population. Fifteen per cent of the population is between the ages of 16 to 24 years. One-fourth of the population is between 25 and 44 years of age and 45 and 65 years of age. Less than 15 per cent are 65 years of age or older.

Past studies have shown that a significant proportion of certain age groups are more or less transit dependent. These persons primarily come from two groups: Those persons 65 years of age and older and those persons under 16 years of age. These persons therefore, comprise the prime market for potential transit riders and warrant more detailed review.

Persons Age 65 and Older - The persons in this age group are largely transit dependent for two primary reasons: (1) because of reduced physical abilities many persons in this age group no longer have the ability nor the desire to drive an automobile, and (2) many persons in this age group are in the lower income

Table 3

SEX AND AGE CHARACTERISTICS

WLA Transit Study

AGE GROUP	WEST LOS ANGELES MALES NO.	MALES PER CENT	FEMALES NO.	FEMALES PER CENT	TOTAL NO.	TOTAL PER CENT	L.A. COUNTY TOTAL	PER CENT OF COUNTY
Less Than 16	145,713	10.4	143,887	10.3	289,600	20.7	2,013,604	28.6
16-24	97,037	6.9	111,879	8.0	208,916	14.9	1,061,819	15.1
25-44	189,800	13.5	186,073	13.3	375,873	26.8	1,807,502	25.7
45-65	152,009	10.9	180,994	12.9	333,003	23.8	1,496,751	21.3
Over 65	72,869	5.2	120,099	8.6	192,968	13.8	652,399	9.3
TOTAL	657,428	46.9	742,932	53.1	1,400,360	100.0	7,032,075	100.0

NOTE: Based on 1970 census.

bracket, and therefore no longer own an automobile. The result of these conditions is that many senior citizens cannot or prefer not to use private auomobiles for their trip making. The only alternative these persons have are to impose on a neighbor or relative to provide transportation service, or to utilize public transportation.

There are about 200,000 persons over 65 years of age and older residing within the West Los Angeles study area. This represents slightly less than 14 per cent of the resident population, while only 10 per cent of the entire county of Los Angeles is in this age group. As shown in Figure 8, the major concentrations of senior citizens are in the Miracle Mile, Sunset Strip, and Santa Monica areas. There is also a sizeable senior citizen population in Echo Park and Hollywood areas with over 15 per cent of the areas residents age 65 and over.

Persons Under Age 16 - The persons under age 16 comprise a group that must have transportation provided for them either by an adult driver or by transit. However, the transit rider would be from the older ages of this group. Figure 9 shows the percentage of the resident population that is under 16 years of age. The largest concentration of young persons are in the Exposition Park and South Vermont areas, where over 30 per cent of the resident population is under age 16.

Household Characteristics

The average family size for the entire West Los Angeles area is 2.35 persons per household as compared to a Los Angeles average of 2.68. Households in Brentwood, Bel Air and Culver City have the most persons per household with averages of 3.60 and 3.24

DISTRIBUTION OF ELDERLY PERSONS

WSA

Figure 8

DISTRIBUTION OF ELDERLY PERSONS

WSA

Figure 8

DISTRIBUTION OF PERSONS UNDER AGE 16

WSA

Figure 9

rspectively. The lowest average household size is in the Sunset Strip, Wilshire Center, and Hollywood areas where the range is 1.74 to 1.85.

Median family income is shown in Figure 10. The lower income areas are concentrated in the University and Westlake areas where the median family incomes are less than $4,000 per year. The entire areas of Echo Park, Westlake, Wilshire Center, University, Santa Barbara, and Exposition Park and most of Hollywood, West Adams, South Vermont and Venice have incomes of less than $6,000. There are areas of the lowest income group in Silver Lake, Santa Barbara, Santa Monica and West Los Angeles, however, the area in West Los Angeles is the UCLA campus where a low household income is expected.

The highest income areas are in the North Wilshire area of Beverly Hills north of Santa Monica Boulevard, where the annual median income is over $40,000. The area north of this area also has an annual median income of over $18,000. There is also an area of high income in Baldwin Hills, but this is because there are only a small number of households.

Auto Availability

Past studies have determined that "automotive availability is the most important single factor influencing travel mode."(1) There is a definite relationship between households without cars and the work trips by transit. Therefore, the determination of areas with low automobile ownership identifies areas of potential transit patronage.

---

(1) Wilbur Smith and Associates, Transportation Parking for Tomorrows' Cities, pp. 116 - 128.

MEDIAN HOUSEHOLD INCOME

WSA

Figure 10

Table 4 shows the automobile availability for the various zones within the study area. There are over 140,000 households that have no automobile available for transportation. This is nearly one-fourth of the total households in the study area. Almost half of the households have one auto, one fourth have two and only a minor portion have three or more.

In 1970 there were over 620,000 automobiles in the study area. The ratio of autos to household was 1.09 and there were 2.10 persons per auto in the area.

As shown in Figure 11, the zero vehicle households are concentrated in the older areas such as near the CBD, central Hollywood and central Santa Monica. These are also the areas where elderly persons reside. In fact, in some areas of Westlake, over three-quarters of the households have no vehicle available.

Land Use

The purpose of the land use inventory is to obtain information that can be used to determine where there is a demand for travel. This data when correlated with the results of an origin-destination survey can be used to develop travel indices to be used in forecasting travel demand. A more refined land use study can also provide data to be used to determine the mode split for those trips.

Accordingly, data was gathered on the existing land use patterns in the West Los Angeles study area. The source for this information was the land use inventory conducted by LARTS. The land use map for West Los Angeles is shown in Figure 12.

Table 4

AUTOMOBILE OWNERSHIP CHARACTERISTICS

West Los Angeles Transit Study

AREA NAME	HOUSHOLDS WITH 0 VEH.	1 VEH.	2 VEH.	3-MORE	AUTO/ HLD.	PERSONS/ AUTO (1)
Marina Del Rey	842	5,538	4,212	941	1.46	2.17
Venice	3,629	8,630	5,275	953	1.19	2.22
Santa Monica No.	5,692	12,640	5,881	1,097	1.09	2.00
Santa Monica So.	2,687	7,773	3,543	591	1.14	1.83
West Los Angeles	2,484	11,130	6,022	910	1.26	1.79
Culver City	1,271	4,607	3,687	815	1.39	2.33
Mar Vista	1,445	8,884	8,579	1,212	1.48	1.49
Palms	2,075	9,389	7,096	1,413	1.39	1.61
Westwood	1,533	5,290	3,645	835	1.33	2.08
Century City	778	4,876	3,189	477	1.36	1.56
Beverly Hills So.	2,100	5,185	2,797	450	1.15	1.72
Beverly Hills No.	1,425	4,211	3,038	1,044	1.38	1.59
Pacific Palisades	308	2,423	4,845	1,399	1.82	1.66
Brentwood - Bel Air	135	1,158	2,157	1,273	1.97	1.82
Hollywood Hills	4,513	12,257	6,610	1,350	1.19	1.61
Beverly Hills	54	866	2,076	571	1.89	1.47
Miracle Mile	8,460	15,541	10,244	1,564	1.14	1.79
Mid-Wilshire	6,836	10,781	2,811	540	0.86	2.27
Wilshire Center	9,416	10,428	1,944	314	0.69	2.38
Sunset Strip	7,328	16,727	8,226	531	1.06	1.69
Hollywood	9,974	14,447	3,361	1,140	0.85	2.04
Echo Park	7,718	11,795	2,548	346	0.80	2.33
Westlake	15,156	9,365	1,401	354	0.50	3.33
University	4.091	3,722	726	224	0.67	3.70
Santa Barbara	9,966	13,451	3,835	718	0.83	3.23
Exposition Park	8,248	10,837	3,860	611	0.87	3.23
West Adams	6,678	12,939	5,302	773	1.01	2.50
South Vermont	5,459	13,215	6,715	808	1.11	2.57
Baldwin Hills	5,044	17,842	12,046	2,561	1.32	1.89
Silver Lake	8,119	17,293	7,566	1,281	1.06	2.38
Griffith Park	0	0	0	0	0	0
TOTALS	143,464	283,240	143,237	27,096	1.09	2.10

HOUSEHOLDS WITHOUT AUTOMOBILES

WSA

Figure 11

LAND USE MAP

WSA

Figure 12

Commercial Development - Commercial development in the West Los Angeles area is characterized by strip commercial development connecting satellite CBD's. These CBD areas are located in Santa Monica, Culver City, Century City, Hollywood Boulevard, Wilshire Center - Mid Wilshire, and Westwood. The corridors along which there is intense commercial development are Sunset Boulevard, Hollywood Boulevard, Santa Monica Boulevard and Wilshire Boulevard. In fact, Wilshire Boulevard between downtown Los Angeles and La Brea Avenue is the most intense commercial development outside the Los Angeles CBD.

Industrial Development. Industrial development is concentrated in the Santa Monica, Culver City, and University areas. There are less intense industrial areas located in West Adams and Baldwin Hills.

Residential Development - As in most areas, an extremely large proportion of the area in West Los Angeles is devoted to residential development, both of single and multiple units. Since strip commercial development has taken place along most of the arterials, the area between these thoroughfares is occupied by residences. The area in the northern portion of the study area is largely single family housing, as is the larger portions of Venice, Mar Vista, Palms, Miracle Mile, and the southeastern quadrant of the study area. There is a dense concentration of multi-family housing in the Hollywood-Sunset Boulevard Corridor and the area east of Western Avenue, south to Santa Barbara. Palms, Santa Monica (north and south), West Los Angeles, and Westwood also have a large portion of their area accupied by multi-family housing..

Employment and Labor Force

Employment and labor force population statistics were gathered to develop and evaluate the daily work trip patterns. The employment data also formed the basis for the development of expansion factors and controls for the Employee Travel Survey. Additionally, these data provide an estimate of the number of trips with origins and destinations within the study area for the evaluation of inter-urban versus intra-urban work travel.

There are nearly three-quarter million persons employed in the West Los Angeles area. This is approximately a three per cent increase since 1970. As shown in Table 5, SCAG estimates that there will be an average annual increase in the employee population of 0.5 per cent.

TABLE 5

ESTIMATED EMPLOYMENT POPULATION

WEST LOS ANGELES TRANSIT STUDY

YEAR	ESTIMATED EMPLOYMENT	AVERAGE ANNUAL CHANGE
1970	750,842	+.5%
1975	770,076	+.5%
1980	789,800	+.5%
1990	828,400	+.5%
1995	847,400	+.5%
2000	866,600	+.5%
2020	955,000	+.5%

SOURCE: SCAG D/2e December 1975
Revised Forecasts

Employee and labor force populations and densities are shown for each zone in Table 6. Westlake has the largest number of employees with over 63,000 workers, which is almost 22,000 workers per square mile. Wilshire Center has an employee density of nearly 21,000 workers per square mile. The Mid-Wilshire, Hollywood, Echo Park, University and Beverly Hills-South all have an employee density of over 10,000 employees per square mile. These density statistics can be compared to an employment density in the Central Business District of over 69,000 employees per square mile.

Figure 13 illustrates the employment populations in the West Los Angeles area on a traffic zone basis. The largest concentration of employees is in the Westlake, Wilshire Center and Mid-Wilshire areas in the eastern portion of the study area. Santa Monica, West Los Angeles, Century city and Wilshire South are the primary concentrations in the remainder of the study area. Generally there is heavy employment over the length of Wilshire Boulevard between downtown Los Angeles and Century City, Santa Monica Boulevard from Century City to Santa Monica, and the Sunset Boulevard - Hollywood Boulevard corridor.

The areas of the lowest employment populations are in Venice, Mar Vista, West Adams and the areas north of Sunset Boulevard. South Vermont, Baldwin Hills and Exposition Park are also areas of few employment opportunities.

The resident labor force of the West Los Angeles study area is approximately 675,000 persons. The Baldwin Hills and Silver Lake areas have the largest numbers with 49,000 and 44,000 respectively. Wilshire Center, however, has the largest number of resident workers per square mile, with over 17,000.

TABLE 6

EMPLOYMENT AND LABOR FORCE STATISTICS

WEST LOS ANGELES TRANSIT STUDY

	EMP.	L.F.	Area (S.M.)	EM./S.M.	L.F./S.M.
Marina del Rey	19,071	16,157	6.60	2,893	2,448
Venice	12,979	22,433	5.21	2,491	4,306
Santa Monica North	38,978	26,355	5.33	7,313	4,945
Santa Monica South	20,412	17,342	3.28	6,223	5,287
West Los Angeles	32,035	24,130	4.88	6,565	4,945
Culver City	22,292	16,447	5.26	4,238	3,127
Mar Vista	7,352	22,611	4.12	1,784	5,488
Palms	15,532	24,488	4.88	3,183	5,018
Westwood	34,744	14,652	3.66	9,493	4,003
Century City	22,405	10,287	2.51	8,926	4,098
Beverly Hills South	19,701	10,266	1.72	11,454	5,969
Beverly Hills North	32,549	10,358	5.17	6,296	2,003
Pacific Palisades	4,608	11,402	34.31	134	332
Brentwood-Bel Air	4,768	7,204	15.57	306	463
Hollywood Hills	12,389	27,172	13.20	939	2,058
Beverly Hills	3,567	2,578	8.88	402	290
Miracle Mile	50,157	33,897	6.63	7,565	3,817
Mid-Wilshire	31,434	22,605	2.81	11,186	8,044
Wilshire Center	38,601	21,975	1.85	20,865	17,284
Sunset Strip	22,098	34,314	3.77	5,862	9,102
Hollywood	56,597	29,117	5.18	10,926	5,621
Echo Park	27,735	23,858	2.74	10,122	8,707
Westlake	63,386	21,418	2.89	21,933	7,411
University	28,011	9,852	2.12	13,213	4,647
Santa Barbara	26,647	30,075	5.47	4,871	5,498
Exposition Park	20,546	26,209	4.99	4,117	5,252
West Adams	19,825	30,287	5.48	3,618	5,527
South Vermont	14,361	32,726	6.83	2,103	4,792
Baldwin Hills	23,944	48,997	12.72	1,882	3,852
Silver Lake	43,028	44,086	11.06	3,890	3,466
Griffith Park	324	0	5.91	55	-
Totals	770,076	673,298	205.03	3,756	3,284
L.A. C.B.D.	180,052	1.14	2.59	69,498	-

EMPLOYEE POPULATION LOCATIONS

WSA

Figure 13

Chapter 3

EXISTING TRANSPORTATION SYSTEM

The residents of West Los Angeles generate an estimated 3.2 million person trips and 2.3 million auto trips per day.[1] Obviously travel demand is primarily accommodated by the automobile operating on an extensive network of freeways, expressways, and arterials. Transit services accommodate less than 8 per cent of the total person trips generated in the West Los Angeles area.

Because of this large volume of travel that occurs daily in the study area, transportation services represent a major interest to all workers and residents of the study area. The following section discusses the transportation services provided in West Los Angeles. The discussion of the street and highways is brief as the section pertaining to public transportation is in depth.

Highway Facilities

The West Los Angeles area has an extensive street and highway system including all or part of seven freeways. The basic street network is a grid pattern extending over the entire area between the Santa Monica Mountains and Baldwin Hills which form natural barriers.

There are seven freeways operating in the area carrying approximately 1.1 million vehicles a day. The Santa Monica, Harbor, Hollywood, Golden State, and Pasadena are radials from the Central Business District. The San Diego is the major north-south freeway in the region and the Marina Freeway is only a minor freeway serving Marina del Rey.

---

(1) LARTS, May 1970

The Santa Monica Freeway is one of the most heavily traveled freeways in the United States and is also the subject of a major experiment in public transportation with the Santa Monica Diamond Lane Project. The freeway carries 230,000 vehicles a day[2] and is therefore the major east-west highway facility in the region.

The San Diego Freeway is a major north-south facility within the Los Angeles region. This freeway is the major access facility to the San Fernando Valley from West Los Angeles across the Santa Monica Mountains and extends southward through Long Beach to San Diego. The typical daily volume is over 200,000 vehicles.

The Harbor Freeway is another north-south freeway extending radially from the CBD to Long Beach. This facility carries 188,000 vehicles daily along the southeastern boundary of the study area.

The Hollywood Freeway links the Los Angeles CBD with the San Fernando Valley. The average daily traffic volume is 185,000 vehicles.

The Golden State Freeway compliments the Hollywood Freeway by linking Los Angeles with the San Fernando Valley. This facility carries 169,000 vehicles daily.

The Pasadena Freeway extends from the Los Angeles CBD to Pasadena. Only a portion of the freeway is within the West Los Angeles study area. However, the average daily volume is well over 120,000 vehicles between the Golden State and Hollywood Freeways.

---

(2) Central Area Cooperation Transportation Study, 1970, City of Los Angeles, Dept. of Traffic.

Arterial Facilities

In addition to the previously described freeway system, West Los Angeles has an extensive network of major arterials. The arterial network is primarily east-west and north-south in the eastern half of the study area and is slightly skewed to the northwest in the western half.

The major east-west arterial is obviously Wilshire Boulevard which typically carries between 30 and 50 thousand vehicles daily. Sunset Boulevard has a comparable daily volume. However, Sunset is not a through street running only between the CBD and Beverly Hills before becoming narrow and winding. Santa Monica and Venice Boulevards are the remaining major east-west arterials. These roadways carry approximately 40,000 and 30,000 vehicles, respectively. The peak daily volumes occur in the vicinity of the San Diego Freeway where the ADT is up to twice as high as the average volumes along the arterial.

There are a number of north-south arterials in the West Los Angeles area. The major one is La Cienega Boulevard. This is the only through-route across Baldwin Hills and links the central section of the study area which includes Beverly Hills, West Hollywood and the Miracle Mile area with the Airport. The daily volume along La Cienega ranges from 30,000 in the West Hollywood area to 56,000 in the vicinity of the Santa Monica Freeway. In the eastern half of the study area La Brea Avenue, Highland Avenue, Crenshaw Boulevard, Western Boulevard, and Vermont Avenue are the major north-south arterials with a typical daily volume of between 30 and 35 thousand vehicles. Crenshaw and Highland are the only ones that are not through streets. However, the daily volume on Highland is as high as 71,000 vehicles in the vicinity of the Hollywood Freeway.

In the western half of the study area the major north-south arterials are Sepulveda, Centinela, and Lincoln Boulevards.

Sepulveda and Centinela carry between 20 and 25 thousand vehicles daily. Lincoln Boulevard carries approximately 35,000 vehicles daily along most of the length, but has a volume of 51,000 immediately adjacent to the Santa Monica Freeway.

Public Transportation in West Los Angeles

Public transportation is provided to West Los Angeles residents by three transit systems: Santa Monica Municipal Bus Lines, Culver City Municipal Bus Lines and Southern California Rapid Transit District. As shown in Table 7 these three systems carry an estimated 612,000 passengers on a typical weekday. Figure 14 shows the Santa Monica and Culver City Municipal Bus lines (Muni's).

Table 7

COMPARISON OF THREE TRANSIT SYSTEMS

West Los Angeles Transit Study

BUS SYSTEM	NUMBER LINES	APPROXIMATE DAILY PASSENGERS
Santa Monica	13	35,000
Culver City	5	7,000
SCRTD	58	570,000
TOTAL	76	612,000

Santa Monica Municipal Bus Lines primarily serves Santa Monica, Venice, Marina del Rey, Westwood, Brentwood, and Century City. One line operates into downtown Los Angeles via the Santa Monica Freeway Diamond Lane. The other 12 bus lines are confined to a service area in the western portion of the study area. The routes operated by SMMBL, and their operating statistics are shown in Table 8.

SMMBL presently operates 100 buses over approximately 140 route miles. The typical daily patronage is approximately 36,000 passengers.

SANTA MONICA AND CULVER CITY

MUNICIPAL BUS LINES

WSA

FIGURE 14

Table 8

SANTA MONICA MUNICIPAL BUS LINE SERVICE

West Los Angeles Transit Study

APRIL, 1976

ROUTE NUMBER	ROUTE NAME	HEADWAYS (Minutes) A.M. PEAK	BASE	P.M. PEAK	NIGHT
1	Santa Monica Blvd.	10	10	10	30
2	Wilshire Blvd. - Victoria Ave.	15	15	15	30
3	Lincoln Blvd. - Montana Ave.	20	20	20	30
5	Los Angeles - Century City	20	30	20	60
7	Pico Blvd.	12	12	12	30
8	Ocean Park Blvd. - Carlyle Ave.	15	15	15	30
9	Pacific Palisades - Olympic Blvd.	30	60	30	60
10	Blue Diamond Express	20	60	20	--
11	14th-20th Crosstown Loop	30	30	30	--
12	Robertson Blvd. - Palms	30	30	30	--
13	Airdrome - Cheviot Hills	30	--	30	--
14	Bundy Dr. - Centinela Ave.	30	30	30	--
17	Santa Monica - El Segundo	--	--	--	--

Culver City Municipal Bus Lines operates five lines that focus on Washington Boulevard in Culver City. Line 3 runs south to Los Angeles International Airport and Line 1 runs west to Venice. The remainder of the service operates within the immediate area of Culver City. CCMBL operates a total of 24 buses. There are slightly over 60 route miles over which these lines operate. Table 9 is a list of the lines and the frequency of service operated by CCMBL.

Table 9

CULVER CITY MUNICIPAL BUS LINES SERVICE

West Los Angeles Transit Study

APRIL, 1976

ROUTE NUMBER	ROUTE NAME	HEADWAYS (Minutes) A.M. PEAK	BASE	P.M. PEAK	NIGHT
1	Washington Blvd.	15	15	15	30
2	Sunkist Park	30	30	30	--
3	Crosstown	30	30	30	30
4	Fox Hills - West L.A. College	60	60	60	--
5	Braddock Drive	60	60	60	--

Southern California Rapid Transit District Services

The Southern California Rapid Transit District (SCRTD) operates a complex network of bus lines in West Los Angeles. All of the statistics shown in this section are developed from the public schedules available as of April, 1976. This date followed the implementation of the San Gabriel Valley Transit Improvement Plan. However, it is prior to implementation of the South Bay sector

improvement plan. This date also followed the equipment changes made in April as reflected in Report 4-12, April, 1976.

There are 58 transit lines operating in West Los Angeles. These lines have been divided into three groups based on the type of service provided in relation to the Los Angeles Central Business District (CBD) and are shown in Figure 15. These groups are as follows:

- Crosstown,
- Radial - Linked, and
- Radial - Single End

Crosstown lines are those lines that link major activity centers without traveling through the CBD. These lines are usually lightly traveled lines that feed the heavier radial trunk lines. However, in West Los Angeles this is not always the case. The north-south crosstown on Fairfax, Western, and Vermont are three of the most heavily traveled lines in the SCRTD system. There are 27 crosstown lines operating in the study area.

The lines serving downtown Los Angeles have been divided into linked and single and radials. There are 13 linked radials operating in West Los Angeles. These lines span out radially from the CBD and travel through the downtown area linking adjacent or opposite quadrants. The single end radials are radials that terminate in the downtown area. There are 18 lines that fall into this category.

One thousand buses, or almost half of the SCRTD bus fleet, operate within the West Los Angeles study area. These buses operate over 1,000 route-miles providing 7,300 one-way bus trips

EXISTING TRANSIT SYSTEM NETWORK

WSA

FIGURE 15

and 127,000 revenue miles daily. Less than half of this mileage is devoted to crosstown service with the remainder oriented toward downtown. As shown in Table 10 the amount of service provided in the West Los Angeles area represent a major portion of the total SCRTD system with over a third of the route miles operated by the entire system on lines that operate in West Los Angeles. One-fourth of the routes are to, from, and within West Los Angeles, and these lines carry over one-half of the total riders in the SCRTD system.

Crosstown Service - Crosstown service is provided by 26 lines in West Los Angeles. This type of service is oriented north-south in the central portion of the study area. However, in the southeastern portion, the crosstown lines form a "grid" type pattern. The operating statistics for these lines are shown in Table 11. Peak hour frequency ranges 60 minutes to 4 minutes. The one-hour service is on the Long Beach-Santa Monica and Santa Monica - Malibu line. Except for the Silverlake-Riverside line, all the remaining lines operate at 20-minute headways or less. The highest level of service is on the Western and Vermont Avenue lines which operate at 4 and 5 minute headways, respectively. Line 23 is the only crosstown line that does not operate during the peak hour. This is the line that serves the Griffith Park Zoo and operates only during the base hours and on Saturday and Sunday.

The following is a description of each of the crosstown routes:

Crosstown Route 10 operates between the East Adams district of Los Angeles and South Bay Center in Torrance via Inglewood, operating over parts of many former shuttle routes. It primarily carries passengers between neighborhoods and connecting routes.

Table 10

QUANTITY OF SCRTD SERVICE IN WEST LOS ANGELES

West Los Angeles Transit Study

April, 1976

ITEM	CROSSTOWN	LINKED RADIAL	SINGLE END RADIAL	TOTAL W. L.A.	TOTAL SCRTD
Number of Routes	27	13	18	58	215
Daily O-W Trips	2,435	2,741	2,133	7,309	--
Daily O-W Route Miles	423	216	400	1,039	3,800
Revenue Miles	36,652	50,247	40,176	127,075	290,000
Equipment Asst'd.	276	409	387	1,072	2,170
Estimated Daily Passengers	151,000	286,000	146,000	583,000	910,000

SOURCE: Assignment of Buses (Report #4-12), dated April 6, 1976, and SCRTD Public Time Schedules.

Table 11

LEVEL OF SERVICE OF CROSSTOWN LINES

West Los Angeles Transit Study
APRIL, 1976

LINE NO.	ROUTE IDENTIFICATION	FREQUENCY OF SERVICE (.P.H.) PEAK	BASE	NITE	SAT.	SUN.	FIRST DEP.	LAST ARR.
10	Adams Blvd. - Normandie Ave.	3	2	-	2	2	6:00 A	10:00 P
18	E. Jefferson - Coliseum	3	3	15	2	2/3	5:30 A	10:30 P
21	Culver City - Hollywood	2	1	-	1	1	6:00 A	7:30 P
23	Griffith Park - Zoo	-	5T	-	8T	17T	9:30 A	2:30 P
27	Santa Barbara - La Cienega	4	3	2	3	3	5:30 A	12:30 A
41	Alvarado	6	4	2	3	3	5:30 A	1:00 A
65	Silverlake - Riverside	2	2	-	2	1	6:00 A	7:30 P
73	Van Ness - Arlington Ave.	3	3	1	3	3	5:30 A	10:30 P
76	Bev. Hills - UCLA - Pac. Palisadea	4	1	1	1	1/2	6:00 A	10:30 P
78	Talmadge - Hyperion	4	2	-	2	-	6:30 A	8:00 P
81	Woodland Hills - Burbank Apt.	3	3	1	3	3	5:00 A	1:00 A
84	Western Avenue	15	4	2	4	3	5:00 A	2:30 A
85	Crenshaw - Vine - La Brea	9	3	2	3	3	5:00 A	2:30 A
88	San Diego Frwy. Flyer	5	2	1	2	1	5:00 A	11:00 P
89	Fairfax Ave. - Hollywoodland	7.5	7.5	3	7.5	6	6:00 A	1:00 A
95	Vernon Ave. - Vermont Ave.	12	6	3	4	3	5:00 A	5:00 A
96	Normandie Ave.	4	3	2	3	3	5:00 A	1:00 A
150	Long Beach - Santa Monica	1	1	1	1	1	6:30 A	12:00 A
175	Santa Monica - Malibu	1	1	1/2	3/4	3/4	5:00 A	11:30 P
176	So. L.A. - Pacific Palisades	4	-	-	-	-	5:30 A/ 3:30 P	10:00 A/ 7:00 P
205	Westwood Mini-bus (1)	See Footnote						
353	Vermont Avenue	3	3	1	3	3	6:00 A	10:30 P
354	54th Street	3	3	1	3	3	6:00 A	10:30 P
436	Hollywood - Glendale - Burbank	4	4	2	4	3	5:00 A	2:00 A
774	Van Nuys - Century City P-R	4	1	-	-	-	6:30 A	7:00 P
828	Marine Del Rey - Huntington Park	4	4	1	3	3	5:30 A	1:00 A

(1) Service on Friday and Saturday Nights Only.

The portion of the route north of downtown Inglewood is primarily through an older community of single family residences. The route is very circuitous and operates on principally residential streets. South of downtown Inglewood the line operates along Prairie Avenue, a strip commercial street, passing through a predominantly single family, low income area. Principal traffic generators along this portion of the route are Freeman Hospital, Hollywood Park Race Track, The Forum, and the Northrop Aircraft Plant.

Crosstown Route 18 operates between La Brea and Compton Avenues in the City of Los Angeles via Coliseum, Exposition and Jefferson Avenue. The route acts as both a "feeder" and "connector" to the various routes it intersects. The principal generators along the route are USC and Exposition Park. The entire route operates in a predominantely black community of low to medium income. Housing is primarily single family dwellings except on the west end which is mostly garden apartments.

Crosstown Route 21 operates between Hollywood and Culver City via Fairfax Avenue and Robertson Boulevard. Along the Robertson Boulevard portion of the route Santa Monica Municipal Bus Lines operates a line which continues to Westwood and Pico Boulevards. The Hollywood portion of Line 21 is primarily commercial with medium income single family housing on adjoining streets. The line serves a Jewish community along Melrose and Fairfax Avenues. The Farmer's Market, CBS Studios, and May Company and Orhbachs are all served directly by the route. Robertson Boulevard is primarily strip commercial; however the adjoining streets to the west are high income and to the east medium income single and

multiple family housing. There is some light manufacturing in the Culver City area. The route operates on Washington Boulevard, the main thoroughfare of Culver City, and terminates at Memorial Hospital.

Connector Route 23 serves the Los Angeles Zoo in Griffith Park from the junction of Sunset Boulevard and Vermont Avenue. Minimcal service is maintained for persons traveling to and from the Zoo.

Crosstown Route 27 is "L" shaped and provides service from the south central area of Los Angeles to West Hollywood via Santa Barbara, Vernon and La Cienega Avenues. South Central Los Angeles is a high density Black community of low and medium income. The Crenshaw area is primarily Garden apartments surrounding the large Crenshaw retail center. The route along La Cienega serves a light manufacturing district and a mixed commercial area surrounded by middle income housing of single and multiple dwellings.

Crosstown service is provided along Alvarado by Route 41 between USC and the Echo Park District of Los Angeles. The ethnic composition along the route is a mixture of blacks, Chicanos, senior citizens, and college students. This route intersects every bus line entering the CBD from the westside. There is scattered commercial development along the entire route with a mixture of apartments and boarding houses. There is extensive retail development in the vicinity of MacArthur Park.

Route 65 is a local crosstown line operating between the north Wilshire district and north Lincoln Heights district in Los Angeles via Silver Lake and Riverside. The route primarily serves single and multiple dwelling units of medium income families. There is very little business activity along the route but the San Fernando Road terminal is in an industrial area.

The 73 route is a north-south crosstown operating along Van Ness Avenue between the Wilshire district and the Gardena city line. The street is primarily residential in nature with a few small commercial and light industrial developments along its route. Two hospitals are directly served by the route. The neighborhoods served are primarily black, single family, and of middle income households.

Route 76 operates between Beverly Hills, Westwood, and Pacific Palisades via Sunset Boulevard. The UCLA Campus, Westwood, Beverly Hills and Pacific Palisades are the major activity centers served by this route. This is the most exclusive section of Los Angeles with the finest homes along the entire route. Near each commercial center there are fine apartments.

Route 78 is a neighborhood "feeder" line operating in the Silver Lake area of Los Angeles. All streets are residential and hilly. There are two principal generators along the line, ABC Television Studio and John Marshall High School. The route begins and ends at Sunset Boulevard and intersects no other transit routes.

Route 81 is a San Fernando Valley service operated between Woodland Hills and Burbank Lockheed Industrial District via Hollywood business district. Ventura Boulevard is a prosperous avenue of commerce. The adjoining residential area is mixed single and multiple dwellings of middle and upper income. The western half of the route is paralleled by Line 35 which provides direct service to downtown Los Angeles. The portion of the route in Burbank and operates through light commercial development and is flanked by a medium density and medium income residential area. Light to heavy industrial activity surrounds the Lockheed facilities.

Route 84 is one of the principal crosstown routes operating between Hollywood and Athens via Western Avenue. The dominate housing pattern south of Pico Boulevard is one of single family residences in a predominantly black community. North of Pico Boulevard to the terminal in Hollywood, lower and medium income multiple housing dominates. Strip commercial activity lines the entire route. Southwest Los Angeles College is located at the southern terminal in Athens.

Route 85 is a long inverted "U" shaped crosstown service operating between Baldwin Hills and Hawthorne via Hollywood. From Hollywood to Baldwin Hills the line travels along La Brea Avenue, a strip commercial arterial terminating at the edge of urban development at Coliseum Street. Housing along this part of the route is one of medium income single and multiple family units. South of Pico Boulevard the ethnic composition is primarily Black. The Crenshaw Boulevard portion of the route is lined by fine residents north of Wilshire. Medium income predominantly Black

housing dominates the route south to Imperial Boulevard. The portion of the route operating to the terminal is middle income single family income. The large Crenshaw Shopping district is located on this line, with a number of high schools located adjacent to the line. In Hawthorne, Line 85 serves the Northrop Aircraft plant and adjacent industrial plants.

Crosstown route 88 operates between Van Nuys and Los Angeles International Airport via Westwood. There are a number of Commercial Centers on the route located in Van Nuys, Sherman Oaks, Westwood, including the UCLA Campus, Westchester, and the Airport. The residential communities along the route are of medium and high income and of single and multiple family dwellings.

Route 89 is a westside crosstown service operating between Hollywood and West Adams district of Los Angeles. Fairfax Avenue is primarily commercial, although south of Pico the street is medium income single family housing. Along Fairfax Avenue large retail stores are located near Wilshire Boulevard. The Farmer's Market and CBS Television City are located between Beverly and Third and Fairfax High School is at Melrose Avenue. The residential neighborhood is primarily single and multiple family dwellings, ethnicly it is a Jewish neighborhood. The spur along Beachwood Drive is an older residential area of single and multiple family medium income. The area along Franklin Avenue is primarily apartments of medium income. The line operates through the entire Hollywood district, a mixture of apartments, retail, commerce, and transit attractions.

Route 95 operates between Vernon and Hollywood via Vernon and Vermont Avenues. The City of Vernon is a heavy industrial community. Vernon Avenue is a lower income black community of older single and

multiple family homes. Vermont Avenue is a strip commercial street. Housing is of low and medium income single and apartment dwelling units. Principal generators along the route are Exposition Park, USC Campus, Wilshire midtown district, Los Angeles City College, and the large hospital complex at the northern end of the line.

Crosstown Route 96 operates on Normandie Avenue from Hollywood Boulevard to Rosecrans Avenue in the City of Gardena. The line passes near Southwest Los Angeles College and Pepperdine University. The northern portion of the route serves the Mid-Wilshire and Hollywood commercial centers. Most of the housing in this area is medium income apartments. The southern portion of the line serves a lower income, single family, predominantly black community.

Line 150 is a crosstown running between Long Beach and Santa Monica via Wilmington, Harbor City, Lomita, Torrance, Redondo Beach, Hermosa Beach, Manhattan Beach, El Segundo, and Venice. There is also a loop through LAX. This line operates over several streets, however, in the West Los Angeles area this line operates via Sepulveda Boulevard, Manchester Avenue and Lincoln Boulevard. The northern terminal is in Santa Monica. The major generators along its routes is the Santa Monica CBD and LAX.

Crosstown 175 operates via the Pacific Coast Highway from Malibu to Santa Monica. The primary trip generators along its route are Pepperdine University - Malibu and the Santa Monica CBD. This line travels through the sparsely developed area along Pacific Coast Highway which is primarily single family housing units.

Line 176 is a crosstown line connecting Pacific Palisades with South Los Angeles. This line follows the same route as the

76 from Pacific Palisades to Beverly Hills. However, east of UCLA it operates via La Cienega, the Santa Monica Freeway, Western, Vernon, Manchester, and Wilmington. The portion west of Beverly Hills travels through an area of high income, single family housing. La Cienega is strip commercial surrounded by middle income households. Western Avenue is also lined by strip commercial. The eastern portion of the line travels through a low income area.

Route 205 is the Westwood Shuttle. This route operates only on Friday and Saturday nights providing a shuttle service in the Westwood area.

Crosstown Route 353 operates north-south along Vermont Avenue for its entire length. The northern terminal is at Wilshire Boulevard. This line operates along a major arterial lined by strip commercial development in an area of low to middle income households.

Crosstown route 354 operates from Crenshaw to Alameda along 54th Street. This line also operates through an area of low to middle income households.

Route 436 is a connector line between Pasadena and Hollywood via Glendale and Eagle Rock. This line primarily operates via Lake Avenue, Colorado Boulevard, Broadway Boulevard in Eagle Rock and Hollywood Boulevard. Colorado Boulevard is primarily commercial. Hollywood Boulevard is heavily developed with strip commercial activities. The areas surrounding these commercial areas is single and multiple family dwelling units, housing is of low to medium income households.

Line 774 is a park-ride line from Van Nuys to Century City. This line operates via the San Diego Freeway and Santa Monica Boulevard. It originally went to the CBD but was cut back at Century City because of lack of patronage.

Crosstown Route 828 operates between Marina Del Rey and Paramount via Slauson and Florence Avenues. The principal commercial developments are Marina Del Rey, Fox Hills Mall, and downtown Huntington Park. Marina Del Rey is an exclusive commercial and residential development. In Culver City and Baldwin Hills the line serves a medium income residential area. Slauson Avenue is a predominantly black neighborhood of low to medium income. Between Western and Pacific Avenues the street is lined by the Santa Fe tracks and an industrial district. Florence Avenue is a strip commercial area surrounded by low to medium income housing.

Linked Radials - Linked radials are defined as those lines that extend radially off from the CBD but run through the CBD rather than terminating in the downtown area. There are only 13 lines that fall into this category operating in the West Los Angeles study area. The operating statistics for these lines are shown in Table 12. All of these lines, except three, provide all night service even though cut back severely and at one-hour headways. Base hour headways vary from 5 to 30 minutes. Pico, West Third, Olympic and Melrose have a base hour headway of 5 to 6 minutes. Peak hour headways for these lines are all less than 6 minutes except for 8 minutes on Venice and Washington and 12 minutes on West 54th and West 9th Streets. All of these lines operate on Saturdays and Sundays.

Table 12
LEVEL OF SERVICE OF LINKED RADIALS
West Los Angeles Transit Study
APRIL 1976

LINE NO.	ROUTE IDENTIFICATION	FREQUENCY OF SERVICES (B.P.H.) PEAK	BASE	NITE	SAT.	SUN.	FIRST DEP.	LAST ARR.
3	West 6th - Central Ave.	12	8	3	8	4	24 Hour Service	
4	Melrose - W. Olympic Blvd.	20	10	3	8	4	24 Hour Service	
6	Highland Park - Vermont Ave.	10	6	2	5	3	24 Hour Service	
8	West 54th St. - N. Main	5	3	2	3	2	24 Hour Service	
9	West Jefferson - South Gate	14	4	3	3	2	24 Hour Service	
12	W. Washington - N. Broadway	8	3	2	4	3	24 Hour Service	
25	N. Figueroa - West 9th St.	5	2	2	3	2	4:30A	1:30A
26	West Pico - East 1st	20	12	3	12	12	24 Hour Service	
28	Whittier - West Third	15	12	3	12	6	24 Hour Service	
29	San Pedro - West 7th	11	6	3	6	3	4:30A	3:00A
44	Beverly - West Adams	10	6	2	5	3	24 Hour Service	
75	Venice Blvd. - Echo Park Ave	8	6	1	4	4	5:00A	2:00A
177	Dodger Stadium (1)							

(1) Schedule varies dependent upon Game Time.

Route 3 is a linked radial operating between Compton and Beverly Hills via downtown Los Angeles. The principal streets used by this route are West Sixth, West Third, and Central Avenues. Between Compton and Downtown Los Angeles the ethnic composition is primarily black with low and medium income single family homes and a mixture of local business and light manufacturing. Along West Sixth Street the development is mixed commercial. Housing is primarily apartments of low to upper medium income. West Third Street is medium to upper income single families to La Brea, high rise apartments and the Farmer's Market, a major tourist attraction, to Fairfax and single and multiple family dwelling units to La Cienega.

Route 4 operates between West Hollywood and Santa Monica via Melrose Avenue, Downtown Los Angeles, Olympic Boulevard through Beverly Hills along Santa Monica Boulevard to the Ocean. One leg of the Olympic Boulevard service terminates at Century City and express service is provided during commute hours in the peak direction on the Olympic Boulevard portion of the line. The Melrose Avenue portion of the route is primarily strip commercial. Housing in the area is of modest income and mixed apartments and single family dwellings. There is some light industry in the Hollywood area, and the location of Paramount studios. The new Fashion Design is located near the line terminal.

Olympic Boulevard is commercial from Downtown Los Angeles to Vermont. The Korean community of Los Angeles dominates the route to Crenshaw. Primarily single family dwellings of medium income and Los Angeles High School line the street to Fairfax. West of Fairfax the route passes through Beverly Hills to Century City. The area is primarily medium to upper income single and multiple unit

dwellings. The portion of the route to Santa Monica also travels through a primarily upper income apartment district along Burton Way. Downtown Beverly Hills and Century City are skirted on Santa Monica Boulevard. From Westwood to downtown Santa Monica the route serves a strip commercial development flanked by a mixture of single and multiple family dwellings of primarily medium income households. Between Westwood and Santa Monica the Santa Monica Municipal Bus System operates in competition with Line 4.

Line 6 operates from Highland Park to South Vermont at 120th Street via the CBD. This line serves USC by the southern leg. This leg operates through an area that is primarily Black and with low to medium income households. North of the CBD this route travels to Highland Park via North Broadway within the study area. This area is largely industrial development.

Linked Route 8 operates between Inglewood and Lincoln Heights via West 54th Street and the Spring Street Contra-flow. This line parallels Route 354 over most of its length along 54th. The area along 54th Street is mostly low to medium income households. The area along Spring and Main Streets in the downtown area is light industrial in the southern portion and the northern through a portion of the old financial and business areas of the downtown area. The section along North Main is industrial and Lincoln Heights is low to medium income single family housing.

Linked Route 9 operates between Hollydale and the westside of Los Angeles via South Gate, Huntington Park, and Vernon. Two legs are operated in South Gate: one to the Lynwood city line via California Avenue, and one to Rancho Los Amigos via Tweedy Boulevard. The portion of the route along West Jefferson Boulevard serves USC and a primarily older single family residential black

community. Light industry and strip commercial are sparsely located along the route. The Shrine and Olympic Auditoriums and the Los Angeles Technical Trade College are also located on the westside portion of the route. The line travels along 7th Street through downtown and continues south through the heavy industrial area of Vernon. Downtown Huntington Park and business districts in Lynwood, South Gate, and Hollydale are also located on the line. Most of the housing along this part of the line is single family. Huntington Park has a large Chicano population. St. Francis and Rancho Los Amigos Hospital are located at the end of each leg of the route.

Linked Route 12 links West Washington Boulevard and Monterey Hills via the CBD and North Broadway. There is lightly developed commercial activity along Washington Boulevard, industrial activity along the North Broadway sections and single and multiple family housing to the terminus of the line.

Linked Route 25 runs from Eagle Rock to Vermont via Figueroa, North Broadway and 9th Street. Within the West Los Angeles study area this line operates along North Broadway north of the CBD which is an industrial area. West of the CBD this line operates via 8th and 9th Streets to 9th at Vermont. This is an older area characterized by high density multi-family housing of low to medium income households.

Linked Route 26 operates between East Los Angeles College and the West Pico area via two legs. Service is operated from the College to Rowan Avenue via East First Street and Floral Avenue by alternate trips. The eastside of the line operates through a predominantly Chicano neighborhood of older single family residences. East First Street is strip commercial. The downtown portion of the

route serves Little Tokyo, the Civic Center, Occidental Center, Convention Center and a light manufacturing district. Pico Boulevard is an older commercial street surrounded by single family residences of low and middle income.

Linked Route 28 operates between Montebello City line and the north Wilshire district via Whittier Boulevard, Seventh and Third Streets. The east leg of the route is primarily in a Chicano neighborhood of single family dwellings and strip commercial along Whittier Boulevard. There are retail centers at Commerce and East Los Angeles. The route passes through downtown along Seventh Street serving the garment and retail districts. West Third and Seventh Streets are mixed commercial with high density apartment dwellings occupying most of the adjoining streets.

Route 29 links the city of Compton and the south Wilshire district of Los Angeles via Avalon Boulevard and West Seventh and Eighth Streets. The southern portion of the route operates through a predominantly black neighborhood of low and middle income single family dwellings with some strip commercial. There is industrial development immediately south of downtown and in the vicinity of Gage Avenue. Downtown the line operates through the garment and retail districts. West of town the line serves an area of strip commercial and predominantly moderate income apartments and houses. Along the remainder of West Eighth Street the composition is primarily Korean.

Route 44 links Beverly Hills and the West Adams District of Los Angeles via Beverly Boulevard, Hill Street, and Adams Boulevard. The Adams leg of the line is a low to middle income Black neighborhood of predominantly single family residences. Adams Boulevard is

strip commercial. Along Hill Street there is light industrial activity south of town, and retail in the downtown area. Both the Occidental Center and Civic Center are along Hill Street. Beverly Boulevard is a mixture of office and strip commercial from Downtown to Western Avenue, then residential to La Brea, and commercial to Beverly Hills. The ethnic mix is primarily Chicano and Jewish. The neighborhoods along the entire street are primarily a mixture of single and multiple family dwellings, with the income generally higher in the western portion. CBS Television City and Cedars-Sinai Hospital are located along the western end of the route. The line terminates in downtown Beverly Hills.

Route 75 links the Echo Park District of Los Angeles with Venice and Santa Monica via Downtown. The Echo Park district is primarily a single and multiple unit housing area with a minor business district. In Los Angeles the route serves the Civic Center and uses the Spring Street contra-flow lane to the Garment District. The entire length of Venice Boulevard is a combination of light manufacturing, commercial, and multiple and single family housing, of low and medium income. In Venice and Santa Monica the same type of development prevails. Downtown Santa Monica is a viable commercial center.

Route 177 is a special service operated between downtown Los Angeles and Dodger Stadium. The Downtown terminal is in the vicinity of the California Mart trade center and then operates via Spring/Main Streets and Sunset Boulevard.

Single End Radials are those lines that extend out radially from the Los Angeles CBD terminating downtown. The operating statistics for the 19 single end radials operating in West

Los Angeles are shown in Table 13. These line's have base hour headways of 5 to 20 minutes except for some of the Diamond Lane Express Lines (606 and 607) which operates at 60 and 30 minute headways, respectively. Peak hour service is obviously of a high level. For the locals, all lines operate at less than 15 minute headways. Only two lines have headways of longer than 6 minutes, Line 4 to Redondo Beach and Line 94 on Santa Monica Boulevard. Line 144 operates only during peak hours from the San Fernando Valley at 8 minute headways. Nine of the 18 lines operate via the Diamond Lane to Los Angeles. The headways on these lines vary from 20 to 60 minutes. All of these lines except 606 and 607 operate only during the peak hours.

Route 5 operates between downtown Los Angeles and South Bay Center in the City of Torrance. Operating from Union Station, the line moves south on Broadway through the principal retail district of Los Angeles, serving the Civic Center and Occidental Center. South Broadway is primarily light industrial. The line passes Exposition Park on Santa Barbara Avenue which is primarily strip commercial and a medium income Black neighborhood, this type of development continues along Crenshaw Avenue.

Next, the route serves downtown Inglewood, which is presently a viable commercial and government center. This community is now primarily a middle class Black community. From Inglewood to South Bay Center the line operates along Hawthorne Boulevard, a very wide thoroughfare of mixed strip commercial. The adjoining streets serve primarily an older single family residential area. In Hawthorne a large regional shopping center is presently under construction.

Table

LEVEL OF SERVICE OF SINGLE END RADIALS
West Los Angeles Transit Study
APRIL, 1976

LINE NO.	ROUTE IDENTIFICATION	FREQUENCY OF SERVICES (B.P.H.) PEAK	BASE	NITE	SAT.	SUN.	FIRST DEP.	LAST ARR.
5	Hawthorne - Union Station	12	6	2	6	4	24 Hour Service	
35	West Valley Freeway Flyer	10	3	2	3	3	5:00A	11:00P
42	Sunset - Temple	18	6-12	4	6	4	24 Hour Service	
51	Redondo Beach - Los Angeles	4	2	1	2	1	5:00A	2:00A
83	Wilshire Boulevard	25	12	5	8	6	24 Hour Service	
91	Hollywood Boulevard	20	6	3	6	4	24 Hour Service	
93	L.A. - Panorama City	20	4	3	4	3	4:30A	1:00A
94	Santa Monica Boulevard	8	6	2	3	2	5:00A	1:30A
144	San Fernando Valley - Wilshire	8	-	-	-	-	6:00A/4:00P	9:00A/7:00P
601	Sunset Blvd. Frwy. Express	1	-	-	-	-	6:00A/3:00P	8:30A/7:00P
602	Beverly Glen Blvd. Frwy. Exp.	4	-	-	-	-	6:30A/3:30P	8:30A/6:30P
603	Burton Way - La Cienega Fwy. Exp.	4	-	-	-	-	6:00A/3:00P	8:30A/6:30P
604	Venice Blvd. Frwy. Exp.	8	-	-	-	-	6:00A/4:00P	8:30A/6:30P
605	Marina del Rey Frwy. Express	3	-	-	-	-	6:30A/3:00P	9:30A/7:00P
606	Culver Blvd. Frwy. Express	3	1	-	3/4	-	6:00A/3:00P	9:00A/7:00P
607	LAX Freeway Express	4	2	-	-	-	6:00A	7:30P
608	Malibu - Pacific Palisades	2	-	-	-	-	7:00A/4:30P	9:00A/7:15P
708	Santa Monica Park-N-Ride	4	-	-	-	-	6:30A/4:00P	9:00A/7:00P
746	Fox Hills Park-N-Ride	4	-	-	-	-	6:30A/4:00P	9:00A/7:00P

A freeway flyer service is also provided along the Harbor Freeway. Most of the route is a former trolley line operating to Hawthorne. The flyer service operates from South Bay Plaza to Los Angeles via Hawthorne, Manchester, and the Harbor Freeway during weekday commuter hours.

Radial route 35 operates between Northridge in the San Fernando Valley and downtown Los Angeles via the Civic Center, Hollywood Freeway, Ventura and Reseda Boulevards. The arterials used in the Valley are primarily intense commercial development. The adjacent areas are residential with single and multiple family dwellings of medium to high income.

Route 42 operates between Hollywood and Los Angeles a Flyer service during commuter hours along the Hollywood Freeway. The Temple Street route turns back at Edgemont and Fountain Streets and the Sunset route operates to Laurel Canyon Boulevard. Along Temple Street the area is of strip commercial and mixed housing in a Chicano neighborhood. Queen of Angels and Rosemont Hospitalsare both located in this area. Los Angeles City College is served by the Sunset route. The Temple route terminates at Cedars of Lebanon Hospital. The Sunset route in Hollywood primarily serves a highly developed area of apartments, commercial, television and movie studios, and office buildings.

Route 51 operates between Los Angeles RTD Station and Redondo Beach via Los Angeles International Airport, El Segundo, Manhattan Beach, and Hermosa Beach. From Exposition Park to Ladera Park the route traverses a predominantly black neighborhood. The income level of the residents increases as the line moves west. There is a large shopping complex at Crenshaw. Along La Tijera Boulevard the line passes through a medium income area. There is

a large Shopping Center at Westchester. The airport district is a mixture of hotels, light manufacturing and office buildings. El Segundo is a medium income community surrounded by primarily storage and manufacturing activities. The remainder of the route operates along the narrow streets of the beach cities. The housing is high density apartment and single family dwellings with some small commercial areas interspersed. The line terminates in an exclusive residential community.

Route 83, Wilshire, is the most heavily traveled route on the RTD system operating between downtown and Santa Monica via Beverly Hills. The entire route is one of interspersed commercial activity. A cut back service operates into the UCLA Campus, and some trips operate via San Vicente Boulevard in the Santa Monica area. There is a limited stop operation during commute hours in both directions. This is a unique line in that travel demand is almost equal in both directions throughout the entire day. Housing along the entire route is mixed single and multiple family and primarily middle to upper income. High rise office buildings dominate the route.

Route 91 operates between Los Angeles and Beverly Hills and Century City via Hollywood over two legs. There is also a Flyer service operated from Beverly Hills via the Hollywood Freeway. Hill Street and the Civic Center are served downtown. Sunset Boulevard is strip commercial flanked by single and multiple family housing of lower income. Hollywood Boulevard is also strip commercial with the intensity of development increasing westward. The 91S leg of the route operates to Beverly Drive and Pico via Sunset and downtown Beverly Hills. The 91W leg of the route operates to Century City via West Hollywood and Beverly Hills. Housing in the Sunset Strip and West Hollywood areas is primarily medium and upper income apartments. Housing in Beverly Hills is primarily upper income in single family housing units.

Route 93 operates between the San Fernando Valley and Los Angeles via Hollywood. The Flyer and Limited service bypass the Hollywood area during commuter hours. From downtown Los Angeles the route uses the Hollywood Freeway to Hollywood. South Hollywood is a lower income area of mixed housing and light industry. The housing pattern along the route in the Valley is predominantly middle income single family, except in the Pacoima area where lower income housing prevails. There are commercial centers at Western and Santa Monica, Hollywood, North Hollywood, Van Nuys, Panorama City, and Northridge. The principal attractions along the route are the Hollywood Bowl, General Motors Plant, Universal Studios, Veteran's Hospital, and State College at Northridge.

Route 94 provides service between Los Angeles and West Hollywood via Sunset and Santa Monica Boulevards. Hill Street and the Civic Center are served downtown. The portion of the route along Sunset Boulevard is primarily strip commercial flanked by single and multiple family housing of lower income. The only retail center along the route is located at Western Avenue and Los Angeles City College is located at Vermont Avenue. Santa Monica Boulevard is primarily strip commercial and light industrial. Housing is mixed single and multiple family with income levels increasing as the line moves west.

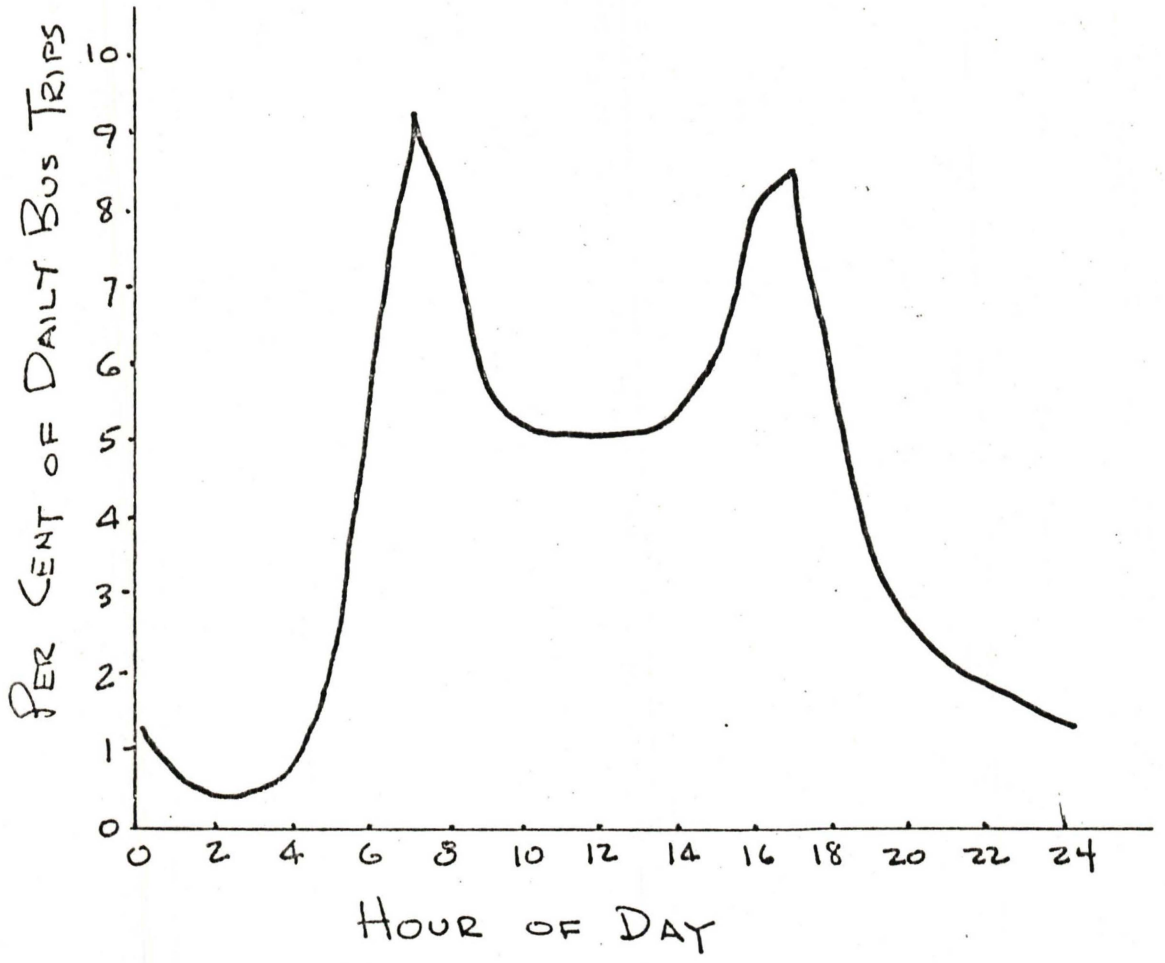
Commuter Route 144 operates between downtown Los Angeles and Reseda in the San Fernando Valley. The principal purpose of the route is to provide fast service from Reseda and Van Nuys to the Hollywood and Mid-Wilshire areas of Los Angeles. Both San Fernando Valley communities are medium income single and multiple family residential areas.

Route 601 through 608 are the recently implemented Santa Monica Freeway Diamond Lane lines. Lines 601 and 608 operate in Pacific Palisades which is high income household, primarily in single family units. Line 602 operates via Beverly Glen in the Beverly Hills area. Line 603 operates from Century City via Santa Monica Boulevard, Burton Way and La Cienega. Burton Way is through a high income area of multi-family dwelling units and La Cienega is primarily commercial. Line 604 operates between Venice and Los Angeles via Venice Boulevard and Line 605 goes to Marina Del Rey via Washington Boulevard. Both of these lines serve Culver City in addition to their terminal areas. Line 606 operates via the Marina area and Culver City between El Segundo and Los Angeles. Los Angeles Airport is served by Line 607 which operates primarily along La Cienega Boulevard.

Lines 708 and 746 are new park-ride lines that also operate via the Santa Monica Diamond Lane. Line 708 terminates in the vicinity of Bundy and the Santa Monica Freeway, therefore serving the Santa Monica area. Line 746 is the park-ride line from Fox Hills via La Cienega to Downtown Los Angeles.

Frequency and Availability

The scheduled headways of buses operating in the area is a measure used to evaluate the frequency and availability of transit service and therefore an indicator of the level of transit service. There are six district periods in the typical day during which travel fluctuates. As shown in Figure 16, these periods are morning peak, afternoon peak, evening, night, and owl (all night). The hours represented by these periods and the amount of service provided during these times are shown in Table 14. Another indicator of ransit service is the transit service provided on



DAILY VARIATION OF BUS TRAVEL

TABLE 14

TRAVEL DEMAND PERIODS

WEST LOS ANGELES TRANSIT PLANNING STUDY

PERIOD	HOURS	ONE-WAY TRIPS	TRIPS PER HOUR
AM Peak	6 AM to 9 AM	1,699	566
Base	9 AM to 3 PM	2,290	382
PM Peak	3 PM to 6 PM	1,662	554
Evening	6 PM to 10 PM	1,036	259
Night	10 PM to Midnight	383	96
Owl	Midnight to 6 AM	242	60
	TOTAL	7,312	

Saturdays and Sundays. The lines that operate during these distinct periods are illustrated in Figure 17.

Peak Hour Bus Service - The highest level of service is obviously provided during the peak periods. During the peak periods there are roughly 1,700 one-way bus trips which is an average of 560 trips per hour during these periods. All the existing transit lines with the exception of the lines to the zoo and the stadium which are of a special nature, operate during the peak hours.

The peak hour frequency ranges from 60 minutes on the Malibu Beach and Long Beach lines, to 2.5 minutes on the Wilshire Boulevard line. Six lines have thirty and sixty minute service, eight lines have twenty minute service, and fourteen lines have fifteen minute service. The remaining twenty-seven lines, about half the lines, operate at a twelve minute frequency or less. The most frequent service is along Wilshire Boulevard, which has twenty-five buses traveling in the peak direction during the afternoon peak hour. There are twenty buses during the peak hour on lines 4, 26, 71 and 93 which are the Melrose-Olympic, Pico, Hollywood and Santa Monica, respectively.

The West Los Angeles area is also served by the Santa Monica Diamond Lane line. There are presently ten lines using the Diamond Lane connecting the Westside area with downtown Los Angeles. Presently all these lines operate during the peak hour and lines 606 and 607 (Culver Boulevard and LAX, respectively continue to operate during the base hours at 60 and 30 minute headways.

AVAILABILITY OF TRANSIT SERVICE

WSA

Figure 17

88, the San Diego Freeway and 150 on Lincoln. All these lines have one BPH in each direction. Along Main Street and Pacific Coast Highway in Santa Monica, the number of buses during a base hour varies from 6 to 12 BPH.

Evening Service - Evening service is the period between 6:00 P.M. and 10:00 P.M. There are over a thousand trips during this period which is an average of 250 trips per hour. However, this number is misleading, since there is a transition period between the afternoon peak and the evening hours. The majority of the service is provided by the crosstown lines and the linked radials. The single-end radials have significantly reduced service largely due to most of these lines being commuters and have less demand for travel after the peak hours.

Night Service - Night service is only slightly reduced from the evening service for the same basic reasons as for the evening hours. However, there is a significant reduction in the number of bus trips per hour. There is only a total of 383 bus trips between 10:00 P.M. and midnight on a typical weekday.

Owl Service - Owl service is provided between the hours of midnight and approximately 6:00 A.M. In West Los Angeles there are fourteen lines operating during this period, providing a total of 242 one-way bus trips. This includes some night trips which extend into the owl service period. Figure 20 shows the lines along which all night service is provided and the operating statistics are shown in Table 15.

There are only two lines that operate west of La Brea, lines 83 and 91. Line 83 terminates at Century City and 91 at the Beverly Hills Station. There is no way to transfer from one line to another west of Vermont, since the lines do not intersect and

OWL SERVICE

WSA

Figure 20

Table 15

OPERATING STATISTICS OF OWL SERVICE

West Los Angeles Transit Study

LINE NO.	O-W RT. MILES	O-W RUN TIME (MIN.)	BUSES PER HOUR	O-W BUS TRIPS	BUS HOURS	BUS MILES
3	7.2	26	1	12	5.2	86.4
4	5.0	21	1	12	4.2	60.0
5	18.2	54	1	12	10.8	218.4
6	13.7	43	1	12	8.6	164.4
8	7.1	24	1	12	4.8	85.2
9	12.5	56	1	12	11.2	150.0
12	6.2	27	1	12	5.4	74.4
26	9.8	46	1	12	9.2	117.6
28	9.3	50	1	12	10.0	111.6
42	5.8	24	1	12	4.8	69.6
44	6.3	23	1	12	4.6	75.6
83	10.2	42	1	12	8.4	122.4
91	13.0	52	1	12	10.4	156.0
95	9.2	39	1	12	7.8	110.4
TOTAL	133.5	--	--	168	105.4	1,602.0

the only north-south service is on Vermont from Melrose to Vernon Avenue. The remainder of the lines operate primarily east-west.

There are only two lines that operate west of La Brea, lines 83 and 91. Line 83 terminates at Century City and 91 at Beverly Hills Station. There is no way to transfer from one line to another west of Vermont since the lines do not intersect and the only north-south service is on Vermont from Melrose to Vernon Avenue. The remainder of the lines operate primarily east-west in the extreme eastern portion of the study area. All headways are 60 minutes in each direction.

Saturday and Sunday Service - Service is generally the same as base hour service on Saturday and reduced on Sunday. On Saturday, service is provided by 44 lines. Line 607 is the only line that operates during base hours and does not on Saturday.

Sunday service is provided by 42 lines. In addition to all of the commuters and park-ride lines that are curtailed on the week-ends, line 76 is also out of service on Sunday.

Coverage and Accessibility

One of the prime indicators of the level of service provided by the transit system is the coverage provided. Figure 21 shows the overall coverage provided by the existing transit system. The coverage in the eastern portion of the study area is relatively complete as compared to the western half. Coverage is not provided in the Santa Monica mountains, primarily because of operational problems in the rugged terrain. Neither is coverage provided in the vicinity of Elysian Park.

In the western portion of the study area, there are rather extensive areas without SCRTD transit service. The areas along Montana Avenue in Santa Monica, around Santa Monica City College, the Mar Vista area, and Culver City east of Culver Boulevard are without service. However, it should be noted that these areas are within the service areas of Santa Monica and Culver City Municipal Bus Lines and are therefore not entirely without public transportation. The coverage provided by SCRTD transit lines was analyzed on a traffic zone basis for various socio-economic indices. The following is a brief summary of each of these factors:

Population Coverage - Eighty per cent of the persons residing in the West Los Angeles study area live within one quarter-mile of an SCRTD transit line. As shown in Table 16, 1.1 million of 1.4 million residents are within the coverage area of SCRTD. Most of the areas in the eastern half of the study area have a coverage factor of 90 per cent or better.

The western half of the study area has noticeably less coverage. All of the areas except Santa Monica South and the areas in the Santa Monica Mountains have 50 per cent coverage or better. The major areas that lack coverage in the western half of the study area are Santa Monica South, Venice, Mar Vista and Santa Monica North.

EXISTING TRANSIT SYSTEM COVERAGE

WSA

FIGURE 21

Table 16

POPULATION COVERAGE

West Los Angeles Transit Study

AREA NAME	POPULATION TOTAL	POPULATION COVERED	PER CENT
Marina Del Rey	37,074	26,853	72
Venice	48,875	30,166	62
Santa Monica N.	53,454	35,010	65
Santa Monica S.	34,835	13,548	39
West Los Angeles	45,312	27,319	60
Culver City	33,587	18,008	54
Mar Vista	44,135	18,383	42
Palms	46,528	34,913	75
Westwood	29,887	25,209	84
Century City	19,579	13,507	69
Beverly Hills S.	21,911	21,296	97
Beverly Hills N.	21,609	16,158	75
Pacific Palisades	27,036	6,051	22
Brentwood - Bel Air	17,010	3,402	20
Hollywood Hills	48,475	22,176	46
Beverly Hills	9,869	0	0
Miracle Mile	73,869	67,982	92
Mid-Wilshire	41,826	41,826	100
Wilshire Center	38,802	38,802	100
Sunset Strip	56,967	56,511	99
Hollywood	53,540	53,540	100
Echo Park	45,256	45,256	100
Westlake	47,076	47,076	100
University	23,126	23,126	100
Santa Barbara	77,682	77,682	100
Exposition Park	68,253	63,374	93
West Adams	67,167	67,167	100
South Vermont	80,393	63,994	80
Baldwin Hills	98,797	79,897	81
Silver Lake	88,424	83,210	94
Griffith Park	0	0	0
TOTALS	1,400,354	1,121,442	80

There are also areas without coverage in Culver City and Baldwin Hills. However, Baldwin Hills lacks any major development, and Culver City has transit service provided by the Culver City Municipal Bus Lines.

Employment and Labor Force Coverage - Of the nearly three-quarter million workers employed in the West Los Angeles study area, 86 per cent work within walking distance of an existing bus line. Over 660,000 persons work within this area. As shown in Table 17, the number of persons comprising the resident labor force residing within the coverage area of the existing SCRTD transit system is 120,000 less, or over 540,000 persons. This is only 80 per cent of the resident labor force.

Transit-Dependent Population Groups - Persons that are transit dependent are those persons who are elderly or have no automobile available for transportation. These persons are dependent on friends or relatives to provide transportation for them or on public transportation and therefore, warrant special attention.

As shown in Table 18, there are nearly 200,000 persons residing in the study area that are 65 years of age or older. Of these, over 160,000 are within the coverage area (4 standard blocks or one-quarter mile) of the existing transit system. This is about 84 per cent of the elderly population in the study area.

Also shown is the coverage provided of the no-vehicle household. About one-fourth of the total households in the study area have no auto available within their households. However, 90 per cent of these households are within the service area of the transit system. With almost 130,000 no-vehicle households within the one-quarter mile band, the coverage provided vehicle households is more extensive

Table 17

EMPLOYMENT AND LABOR FORCE COVERAGE

West Los Angeles Transit Study

AREA NAME	EMPLOYMENT			LABOR FORCE		
	TOTAL	COVERED	PER CENT	TOTAL	COVERED	PER CENT
arina Del Rey	19,071	10,868	57	16,157	11,736	73
Venice	12,979	9,705	75	22,433	13,672	61
anta Monica N.	38,978	30,487	78	26,355	17,452	66
anta Monica S.	20,412	4,106	20	17,342	6,785	39
Culver City	22,292	13,487	61	16,447	8,840	54
r Vista	7,352	3,692	50	22,611	9,335	41
lms	15,532	11,599	75	24,488	18,596	76
Westwood	34,744	31,586	91	14,652	12,255	84
ntury City	22,405	17,069	76	10,287	7,115	69
verly Hills, South	19,701	19,055	97	10,266	9,974	97
erly Hills, North	32,549	29,208	90	10,358	8,213	79
acific alisades	4,608	1,516	33	11,402	2,433	21
entwood - Bel Air	4,768	954	20	7,204	1,441	20
lywood Hills	12,389	6,815	55	27,172	12,036	44
erly Hills	3,567	0	0	2,578	0	0
racle Mile	50,157	47,608	95	33,897	31,063	92
Wilshire	31,434	31,434	100	22,605	22,605	100
lshire Center	38,601	38,601	100	21,975	21,975	100
rket Strip	22,098	21,716	98	34,314	34,023	100
l ywood	56,597	56,597	100	29,117	29,117	100
ho Park	27,735	27,735	100	23,858	23,858	100
s lake	63,386	63,386	100	21,418	21,418	100
i ersity	28,011	28,011	100	9,852	9,852	100
ica Barbara	26,647	26,647	100	30,075	30,075	100
xposition Park	20,546	19,467	95	26,209	24,318	93
t Adams	19,825	19,825	100	30,287	30,287	100
tn Vermont	14,361	11,564	81	32,726	26,436	81
d in Hills	23,944	20,166	84	48,997	39,562	81
v r Lake	43,028	40,217	93	44,086	41,403	94
ffith Park	324	97	30	0	0	0
l s	770,076	660,552	86	673,298	540,552	80

Table 18

COVERAGE OF TRANSIT DEPENDENT GROUPS

West Los Angeles Transit Coverage

AREA NAME	ELDERLY (OVER 65) TOTAL	ELDERLY (OVER 65) COVERED	ELDERLY (OVER 65) PER CENT	NO. VEHICLES - HOUSEHOLDS TOTAL	NO. VEHICLES - HOUSEHOLDS COVERED	NO. VEHICLES - HOUSEHOLDS PER CENT	TOTAL HOUSEHOLDS TOTAL	TOTAL HOUSEHOLDS COVERED	TOTAL HOUSEHOLDS PER CE
Marina Del Rey	2,601	1,614	62	842	675	80	11,533	8,359	72
Venice	4,322	2,858	66	3,629	2,685	74	18,487	11,768	64
Santa Monica N.	10,880	7,171	66	5,692	3,964	70	25,310	16,795	66
Santa Monica S.	3,601	1,317	37	2,687	1,186	44	14,594	5,790	40
West Los Angeles	5,209	3,166	61	2,484	1,460	59	20,546	12,519	61
Culver City	2,978	1,658	56	1,271	746	59	10,380	5,905	57
Mar Vista	3,962	1,808	46	1,445	859	59	20,120	9,640	48
Palms	5,873	4,293	73	2,075	1,582	76	19,973	15,113	76
Westwood	3,927	3,164	81	1,533	1,267	83	11,303	9,233	82
Century City	3,713	2,660	72	778	497	64	9,320	6,545	70
Beverly Hills S.	5,339	5,204	97	2,100	2,035	97	10,532	10,230	97
Beverly Hills N.	4,305	3,561	83	1,425	1,388	97	9,718	8,079	83
Pacific Palisades	2,232	524	23	308	60	19	8,975	1,966	22
Brentwood-Bel Air	1,477	295	20	135	27	20	4,723	945	20
Hollywood Hills	8,280	4,368	53	4,513	2,509	56	24,730	11,410	46
Beverly Hills	693	0	0	54	0	0	3,567	0	0
Miracle Mile	19,129	18,111	95	8,460	7,858	93	35,809	33,281	93
Mid-Wilshire	7,899	7,899	100	6,836	6,836	100	20,968	20,968	100
Wilshire Center	7,438	7,438	100	9,416	9,416	100	22,102	22,102	100
Sunset Strip	12,965	12,900	99	7,328	7,290	99	32,812	32,534	99
Hollywood	9,635	9,635	100	9,974	9,974	100	28,922	28,922	100
Echo Park	7,837	7,837	100	7,718	7,718	100	22,407	22,407	100
Westlake	9,652	9,652	100	15,156	15,156	100	26,276	26,276	100
University	2,336	2,336	100	4,091	4,091	100	8,763	8,763	100
Santa Barbara	7,822	7,822	100	9,966	9,966	100	27,970	27,970	100
Exposition Park	6,184	5,697	92	8,248	7,629	90	23,556	21,684	92
West Adams	6,361	6,361	100	6,678	6,678	100	25,692	25,692	100
South Vermont	5,529	4,678	85	5,459	4,037	74	26,197	20,798	79
Baldwin Hills	10,048	8,185	81	5,044	4,418	88	37,493	30,675	82
Silver Lake	10,741	10,162	95	8,119	7,698	95	34,259	32,316	94
Griffith Park	0	0	0	0	0	0	0	0	0
TOTALS	192,468	162,374	84	143,464	129,505	90	597,037	488,685	82

Table 18

COVERAGE OF TRANSIT DEPENDENT GROUPS

West Los Angeles Transit Coverage

AREA NAME	ELDERLY (OVER 65) TOTAL	ELDERLY (OVER 65) COVERED	ELDERLY (OVER 65) PER CENT	NO. VEHICLES - HOUSEHOLDS TOTAL	NO. VEHICLES - HOUSEHOLDS COVERED	NO. VEHICLES - HOUSEHOLDS PER CENT	TOTAL HOUSEHOLDS TOTAL	TOTAL HOUSEHOLDS COVERED	TOTAL HOUSEHOLDS PER CE
Marina Del Rey	2,601	1,614	62	842	675	80	11,533	8,359	72
Venice	4,322	2,858	66	3,629	2,685	74	18,487	11,768	64
Santa Monica N.	10,880	7,171	66	5,692	3,964	70	25,310	16,795	66
Santa Monica S.	3,601	1,317	37	2,687	1,186	44	14,594	5,790	40
West Los Angeles	5,209	3,166	61	2,484	1,460	59	20,546	12,519	61
Culver City	2,978	1,658	56	1,271	746	59	10,380	5,905	57
Mar Vista	3,962	1,808	46	1,445	859	59	20,120	9,640	48
Palms	5,873	4,293	73	2,075	1,582	76	19,973	15,113	76
Westwood	3,927	3,164	81	1,533	1,267	83	11,303	9,233	82
Century City	3,713	2,660	72	778	497	64	9,320	6,545	70
Beverly Hills S.	5,339	5,204	97	2,100	2,035	97	10,532	10,230	97
Beverly Hills N.	4,305	3,561	83	1,425	1,388	97	9,718	8,079	83
Pacific Palisades	2,232	524	23	308	60	19	8,975	1,966	22
Brentwood-Bel Air	1,477	295	20	135	27	20	4,723	945	20
Hollywood Hills	8,280	4,368	53	4,513	2,509	56	24,730	11,410	46
Beverly Hills	693	0	0	54	0	0	3,567	0	0
Miracle Mile	19,129	18,111	95	8,460	7,858	93	35,809	33,281	93
Mid-Wilshire	7,899	7,899	100	6,836	6,836	100	20,968	20,968	100
Wilshire Center	7,438	7,438	100	9,416	9,416	100	22,102	22,102	100
Sunset Strip	12,965	12,900	99	7,328	7,290	99	32,812	32,534	99
Hollywood	9,635	9,635	100	9,974	9,974	100	28,922	28,922	100
Echo Park	7,837	7,837	100	7,718	7,718	100	22,407	22,407	100
Westlake	9,652	9,652	100	15,156	15,156	100	26,276	26,276	100
University	2,336	2,336	100	4,091	4,091	100	8,763	8,763	100
Santa Barbara	7,822	7,822	100	9,966	9,966	100	27,970	27,970	100
Exposition Park	6,184	5,697	92	8,248	7,629	90	23,556	21,684	92
West Adams	6,361	6,361	100	6,678	6,678	100	25,692	25,692	100
South Vermont	5,529	4,678	85	5,459	4,037	74	26,197	20,798	79
Baldwin Hills	10,048	8,185	81	5,044	4,418	88	37,493	30,675	82
Silver Lake	10,741	10,162	95	8,119	7,698	95	34,259	32,316	94
Griffith Park	0	0	0	0	0	0	0	0	0
TOTALS	192,468	162,374	84	143,464	129,505	90	597,037	488,685	82

than the overall coverage of households. Of 600,000 total households, nearly 490,000, or 82 per cent, are within the coverage area of the existing transit system.

Transit Priority

An important and reliable tool for improving the quality of transit service is the priority facilities for transit vehicles. Through the use of these facilities a number of benefits can be derived such as improved vehicle speed, therfore reducing the travel times of transit patrons and improved reliability of transit schedules. An additional valuable benefit, though not quantifiable, is that priority treatments lend the transit operation a sense of identify separate from auto travelers and carries over to the transit riders.(1)

However, there are no transit priority facilities on any of the major arterials in West Los Angeles. The railroad median along portions of Santa Monica Boulevard, however has unique possibilities to be investigated in developing a system of preferential facilities in West Los Angeles.

Caltrans recently instituted the Santa Monica Freeway Diamond Lane project. However, public criticism to the allocation of an existing freeway lane for transit vehicles resulted in its operation being terminated as of August 13, 1976, endangered other priority treatment plans for the Los Angeles freeway system.

RTD operated ten lines on the Diamond Lane and Santa Monica Municipal operated one. These lines carried approximately 3,600 persons to and from downtown Los Angeles daily. This is primarily

(1) Evaluation of Spring Street Contra Flow Lane by WSA for SCRTD, November, 1975.

because travel time for these passengers is about the same as if he had driven an auto.

Service Reliability

The ability of a bus to adhere to the published time schedules is an important factor in evaluating the reliability of transit service. Bus riders who are forced to wait unnecessarily long periods of time or miss a bus due to early buses will soon become dissatisfied and seek other modes of transportation. A schedule adherence study was undertaken to determine the reliability of buses relative to public timetables.

Running ahead of schedule cannot be attributed to external circumstances beyond the control of the driver. Buses which operate ahead of schedule result in lost passengers, particularly riders who regulate their travel habits to conform to public transit timetables. Where riding is heavy, early operation could result in overloading the next bus on the line by creating a longer time interval during which more than the normal number of passengers accumulate at stops.

Likewise, late performance is not acceptable to transit operations. Passengers who are forced to wait even short periods soon become disatisfied with transit service. Other modal alternatives such as private auto or taxi do not normally create a prolonged waiting period for the traveller.

A number of factors can affect the "on-time" performance of buses. The most common factor is the degree of traffic congestion. However, weather conditions and load factors also have an impact of the reliability of the bus. If a bus is consistently "off-schedule" the assigned running times must be checked to determine if they are inadequate.

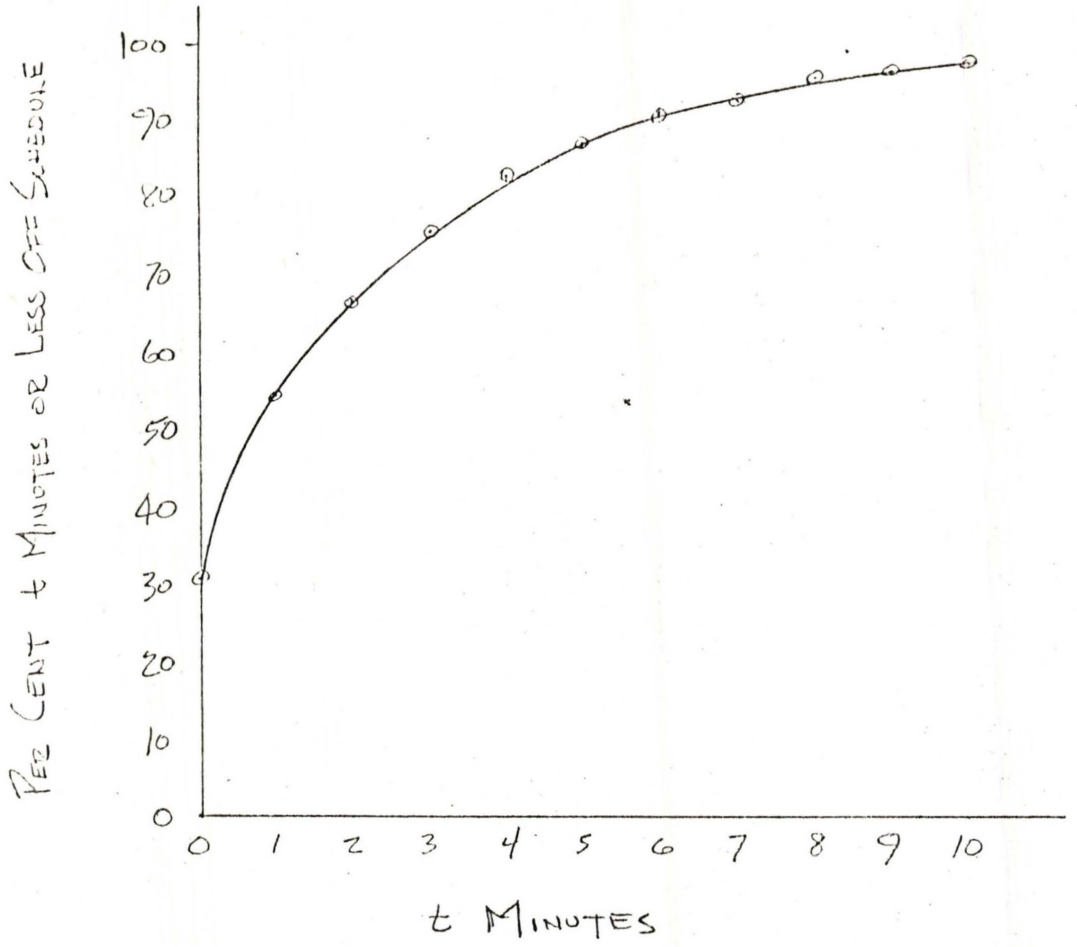
The standard practice is to consider a bus "on-time" if it passes the control station or check point within two-minutes of the scheduled time. Buses passing the check point two minutes ahead of schedule are considered early and those two minutes behind schedule are considered late. Base on this criteria, two-thirds of the buses surveyed were "on-time." As shown in Table 19 and Figure 22, over half of the bus runs were one minute or less off-schedule. Ninety per cent of the bus runs crossed the control point within six minutes of the scheduled time.

Table 19

MINUTES OFF SCHEDULE

West Los Angeles Transit Study

MINUTES (t)	PER CENT OF BUS/RUNS OFF SCHEDULE	PER CENT OF RUNS OFF-SCHEDULE BY (t) MINUTES OR LESS
0	30.9	30.9
1	23.6	54.5
2	12.5	67.0
3	9.2	76.2
4	6.8	83.0
5	4.2	87.2
6	3.2	90.4
7	2.5	92.9
8	2.2	95.1
9	1.5	96.6
10	1.4	98.0
Over 10	2.0	100.0



Schedule Adherence

WSA

Figure 22

It is generally accepted that buses should never operate ahead of schedule. Table 20 shows the percentage of the bus runs surveyed that were either ahead (+) or behind (-) schedule. One-fifth of the buses surveyed were ahead of schedule.

Table 20

PER CENT OF BUS RUNS OFF-SCHEDULE

West Los Angeles Transit Study

TIME OFF-SCHEDULE (t) MINUTES	PER CENT	CUMMULATIVE PER CENT
Over 10	0.0	0.0
+10	0.0	0.0
+ 9	0.1	0.1
+ 8	0.4	0.5
+ 7	0.1	0.6
+ 6	0.4	1.0
+ 5	0.4	1.4
+ 4	1.2	2.6
+ 3	2.4	5.0
+ 2	5.0	10.0
+ 1	9.2	19.2
0	30.9	50.1
- 1	14.4	64.5
- 2	7.5	72.0
- 3	6.8	78.8
- 4	5.6	84.4
- 5	3.8	88.2
- 6	2.8	91.0
- 7	2.4	93.4
- 8	1.8	95.2
- 9	1.4	96.6
-10	1.4	98.0
Over 10	2.0	100.0
TOTALS	100.0	

Bus Arrival Intervals

Another indicator of the reliability of transit service is the headways at which the vehicle arrives at the bus stop along the route. The time intervals of bus arrivals was determined at several locations within the study area. An example of one of these is given in Table 21 of the 91 Line at Hollywood and Western.

The time interval indicates a wide range of time intervals between the arrivals of vehicles ranging from 1 minute to 12 minutes. A delay is mostly caused by traffic congestion during peak periods and some variation in arrival rates is inherent in transit operations. However, when this interval becomes excessively long and random, it creates confusion and frustration on the part of the transit patron causing him to seek other means of transportation and to use public transportation only as a last resort. This random arrival rate adds to the confusion and uncertainty of the transit rider in that if he misses his bus, he doesn't know how long it will be until the next bus arrives.

Table 21
Arrival Time Interval Analysis of Line 91
West Los Angeles Transit Planning Study

Time of Arrival	Interval (Min.)
4:34	
4:40	-
4:42	6.
4:53	2.
5:01	11.
5:02	8.
5:08	1.
5:19	6.
5:26	11.
5:32	7.
5:38	6.
5:50	6.
5:58	12.
5:59	8.
	1.
AVERAGE	7.

Location: Hollywood Boulevard at Western Avenue

CHAPTER 4

EXISTING TRAVEL PATTERNS AND TRANSIT USAGE

In order to gain an understanding of the travel patterns in the West Los Angeles area, certain information regarding the travel characteristics, both auto and transit, are required. Among the information needed is:

1. Trip origin and destination.
2. Mode of travel and reasons for using that mode, and
3. Socio-economic profile of persons using a particular mode.

This information is then used to evaluate the existing transit services in the study area and to identify the deficiencies, if any, and develop remedial plans. This information is then used to evaluate the recommendations.

The sources of these data are varied and sometimes contradictory. The most readily available source of data is the LARTS data. However, for purposes of this study and to obtain an updated base, a series of surveys were conducted in the West Los Angeles area. These surveys, their objectives and methodology are discussed in the following section. Additional data were obtained from studies conducted by SCRTD and these are discussed next. Following this is a discussion of the characteristics of transit travel and of transit patrons in the West Los Angeles area. The characteristics of transit travel and transit patrons are then used as input into the evaluation of both existing and needed transit services.

Travel Surveys

No origin-destination data had been collected in the West Los Angeles area since the LARTS surveys done in 1968. This study

conducted a home interview survey and obtained only a one percent sample. There have obviously been major changes in the area over the last eight years that would have a significant impact on travel patterns in the West Los Angeles area. Because of these factors, a major task of this study was to conduct the appropriate surveys to develop travel characteristics in the West Los Angeles area. An Employee Travel Survey was conducted over the area to obtain the travel patterns of the employees working in the study area. This provided comprehensive origin-desination data on the daily work trip patterns in the area, and when used to calibrate the latest LARTS data, yielded reliable origin-destination data on the remainder of the trips to, from, and within the study area.

Secondly, an On-Board Travel Survey was conducted on the major transit lines operating in the West Los Angeles area. The results of this survey were used to develop origin-destination data of the mid-day transit riders to supplement the Employee Survey. The two surveys therefore yielded up-to-date and comprehensive data on travel in the West Los Angeles area.

The Employee Travel Survey

An employee survey was conducted in the West Los Angeles area. The major purpose of this survey was to obtain information relative to the travel patterns and trip characteristics of the three-quarter of a million employees in this area. This data will be used to develop work trip origin-destination patterns and identify potential transit riders within the study area and the adjacent areas.

The survey is divided into four major phases:

1. Development of survey form,
2. Development of sampling plan,
3. Distribution of survey forms, and
4. Development of office controls.

Development of Survey Form - The survey form shown in Figure 23 was developed to determine all pertinent social and travel characteristics of the study area employees. The survey form was printed in Spanish and English.

Development of Sampling Plan - The Sampling Plan is a sampling procedure developed to obtain a representative sample of the entire employee population so that sampling bias is minimized. A representative sample was obtained by disaggregating specific employee types in the study areas, and dividing the study areas into specific workplace locations. These divisions were made using existing employee data and land use charateristics in each study area.

Employee travel patterns are dependent upon salary, occupation, job type, etc. These types of data related to workplace are not currently available from existing data sources. The most accurate source of data is the LARTS 1974 employee data by traffic zone of workplace. These data separate only retail and non-retail employment. These data were used to divide sample population into high-rise office and other. Thus, three general employment categories were used to divide sample employment: retail, high-rise office, and other.

The LARTS employment statistics are tabulated on the basis of traffic zones. These traffic zones are groups of census tracts. There are approximately 150 traffic zones within the proposed study area. This is far too many units to survey as the logistics of defining the units to the field crews would be difficult if not impossible to develop. Therefore, the traffic zones were grouped into units that represent groups of traffic zones that relate to governmental and community areas. Data was obtained that would provide the number of employees for various categories of employment. In this case, these categories were:

1. Retail employment,
2. High-rise non-retail employment, and
3. Other non-retail employment.

The retail category was identified from updated LARTS employment data, and the high-rise office data was obtained from a list of major office buildings supplied by Western Economic Research to 1970 and average occupancy factors (85 per cent net square feet x 85 per cent occupancy x 1 person per 250 square feet). Both of these estimates are probably conservative, in that LARTS data was expanded from old data and the high-rise office does not include all new buildings; however, the travel characteristics of these two groups are homogeneous for any one area in comparison to the "other" category, so that these two categories do not require as large a sample as the "other" category.

The population in high-rise office buildings can be determined relatively easily when managers are contacted for permission to conduct the survey. Retail sales employee population is a more difficult number to determine, especially those persons working in small shops or in strip commercial areas.

The "other" category contains the largest number of employees surveyed; it was also the least well defined employment category. The survey of this employment category was the most carefully controlled to minimize survey bias. Procedures to minimize bias were used both during the survey and in the survey sampling plan.

It is assumed initially that the number of employees in each work category in the entire study area is proportional to the number of employees in each work category residing in Los Angeles (1970 census data). Thus, the sampling procedure was to survey employment categroies in proportion to categories in the 1970 census.

Nº 211999

[illegible] IMPROVEMENT PROGRAM
EMPLOYEE TRAVEL STUDY

TO LOS ANGELES EMPLOYEES:
A los empleados de Los Angeles

We would appreciate your cooperation in completing and returning this question are for analysis. Your time and courtesy in providing information concerning your daily trip to work will allow us to plan for future transportation improvements in the Los Angeles Area.

PLEASE CHECK ONE (Marque uno) — Ud. puede ayudar a mejorar nuestro servicio respondiendo a todas las preguntas siguientes. Muchas gracias.

1 ☐☐
3 ☐☐☐☐☐☐
9 ☐☐☐
12 ☐☐☐☐

1. Sex and age group: / Sexo y edad
   - male ☐ hombre — 16-24 ☐ 16-24
   - female ☐ mujer — 25-44 ☐ 25-44
   - 45-64 ☐ 45-64
   - 65 and over ☐ 65 o mas

16 ☐
17 ☐

2. Place of residence / Residencia
   _____
   Community name and zip code / nombre de comunidad y zip

18 ☐☐☐☐☐

3. What are your working hours? / ¿Cuales son sus horas de trabajo?
   - start work / empezar _____ A.M. / P.M.
   - finish work / terminar _____ A.M. / P.M.

23 ☐☐☐☐
27 ☐☐☐☐

4. What is your occupation? / ¿Cual es su ocupacion?
   - Professional or technical ☐ profesional o técnico
   - Secretarial or clerical ☐ secretarial u oficinista
   - Retail sales ☐ ventas
   - Service or maintenance ☐ servicio o mantenimiento
   - Crafts & trades ☐ arte o comercio

31 ☐

5. How long does it take you to get from home to work? / ¿Cuanto tiempo le dura a Ud. llegar a su casa de su trabajo?
   - 5 to 10 minutes ☐ 5 a 10 minutos
   - 10 to 15 minutes ☐ 10 a 15 minutos
   - 15 to 30 minutes ☐ 15 a 30 minutos
   - 30 to 60 minutes ☐ 30 a 60 minutos
   - Longer than 1 hour ☐ mas de 1 hora

32 ☐

6. Approximately how many miles do you live from work? / ¿Aproximadamente cuantas millas viaja Ud. desde su casa a su trabajo?
   - Less than 3 miles ☐ menos de 3 millas
   - 3 to 5 miles ☐ 3 a 5 millas
   - 6 to 10 miles ☐ 6 a 10 millas
   - 11 to 15 miles ☐ 11 a 15 millas
   - 16 to 20 miles ☐ 16 a 20 millas
   - More than 20 miles ☐ mas de 20 millas

33 ☐

7. How do you usually come to work? / ¿Como llega a su trabajo usualmente?
   - Bus ☐ autobus
   - Car Driver ☐ conductor de auto
   - Carpool (organized) ☐ Carpool (organizado por computador)
   - Car Passenger (Share-a-ride) ☐ pasajero participando en un carro
   - Taxi passenger ☐ taxi
   - Walk ☐ caminando
   - Other _____ ☐ otro _____

34 ☐

8. If you usually come to work by bus / Si ud viene a su trabajo en autobus:

35 ☐
26 ☐

a. How do you most often get to the place where you board the bus in your trip from home? (Check one) / ¿Como llega a la parada en su viaje al trabajo la mayoria del tiempo? (Marque uno) (Marque uno)
   - [illegible] ☐ caminando
   - [illegible] near bus stop ☐ manejo y estaciono cerca de la parada
   - [illegible] ☐ alguien me deja en la parada

b. Do you ride the bus because (Check one) / Usa Ud. el autobus porque: (Marque uno)
   - No car available ☐ no hay carros disponibles
   - Cannot share auto ride ☐ no puedo participar en un carro con otro
   - Prefer bus ☐ prefiero autobus
   - Parking problem ☐ problema de estacionamiento con carro

9. If you participate in a carpool / Si participa en un carpool:

37 ☐
38 ☐

a. How often do you drive? / Cuantas veces maneja ud?
   - ____ days a week / ____ dias la semana
   - Every other week / cada dos semanas
   - Other _____ / otro _____

b. How many persons participate in your carpool? _____ / Cuantas personas participan en su carpool? _____

39 ☐
40 ☐
41 ☐☐☐☐
42 ☐

10. If you usually come to work as a car driver / Si siempre viene a su trabajo como conductor de carro:

a. Where do you park? (Check one) / Donde se estaciona? (Marque uno)
   - Public lot ☐ lote publico
   - Public garage ☐ garaje publico
   - Private lot ☐ lote privado
   - Private garage ☐ garaje privado

b. [illegible] / Costo ordinario por mes:
   - [illegible] ☐ Gratis
   - [illegible] ☐ 0 - $10
   - [illegible] ☐ $11 - $20
   - [illegible] ☐ $21 - $30
   - [illegible] ☐ $31 - $40
   - [illegible] ☐ mas de $40

c. Location of lot or garage _____ (nearest crew street) / Localidad del lote o garaje _____ (calle traviesa cercana)

d. Why do you do a instead of taking the bus? / Porque manejo Ud. en vez de tomar autobus? (Marque uno)
   - [illegible] ☐ necesito el carro en mi trabajo
   - [illegible] ☐ prefiero la comodidad e intimidad
   - [illegible] ☐ vivo lejos de la parada
   - [illegible] ☐ viaje por autobus toma mucho tiempo
   - Other _____ ☐ otro _____

[illegible]

Este estudio es conducido en nombre de SCRTD por:

The survey area contains approximately 750,000 employees. This is much too large a sample population to consider a complete survey of the entire population within a reasonable amount of time and cost. Thus, a sample of the entire population was chosen for the survey which was expaned to the entire employee pupulation size. A sampling plan was developed that would assure a survey of approximately 5 per cent of the study area employee population.

Distribution of Survey Forms - The distribution of the survey forms was the most critical phase of the employee survey in that adequate controls and bookkeeping procedures must be maintained in order to obtain results that can be used with confidence. In order to obtain this control, the employee survey was divided into two phases; (1) The major office building survey, and (2) the field employee survey.

The major office building survey was the easiest part of the survey to undertake. A list of the major office buildings in the West Los Angeles study area was compiled and data relative to the survey has been filed on index cards. The building managers were contacted and information concerning the major tenants and the number of employees were obtained along with permission to conduct the survey on their premises. Once permission has been received, the major tenants in the building were contacted and given questionnaires for distribution to their employees. At this time the following information was recorded.

1. Day and Date
2. Building Name
3. Company Name
4. Company Address
5. Type of Business
6. Number of Employees
7. Beginning and Ending Questionnaire Numbers
8. Follow-up to be undertaken.

Since the major buildings represent only about 10 per cent of the employee population, the remaining employee questionnaires were distributed randomly in the field. Specific form numbers were assigned for distribution in the various study areas. In this manner, those forms remaining after the major building survey were distributed until the supply had been exhausted. When the surveyors distributed the forms, they filled out the Surveyor Record shown in Figure 24. This form provided the information to develop control totals for determining the proper expansion factors for the various survey areas and the categories of employees.

Development of Office Controls - The survey was controlled by assigning particular survey form numbers to particular analysis areas and particular employment categories. A breakdown of form numbers was made to assign a range of card numbers to a particular area. Secondly, each range of numbers was broken down into the three major employment categories. Third, as a part of the survey, the range of cards handed out to each employment location was recorded on survey control forms along with the company or building name, address, and type of business. Additional correlation was obtained from the questionnaire form from question Number 5 which asks type of occupation.

A continuous record was maintained of the total number of forms handed out in each area to each employment category. When the appropriate number of forms were distributed to a particular category of employee, surveyors were instructed not to survey this type of employment. When all forms were distributed, a check was made of the proportion of forms handed out in each category as compared to the proportion in the 1970 census.

SURVEYOR'S RECORD

	First	Last	
Questionnaire	_____	_____ (3&9)	1 ☐☐ 3 ☐☐☐☐☐☐ 9 ☐☐☐☐☐☐
Numbers	_____	_____ (15&21)	15 ☐☐☐☐☐☐ 21 ☐☐☐☐☐☐
Area	_____	_____ (27)	27 ☐☐

Business Name _____

Building Name _____ (29) 29 ☐☐☐☐

Address _____ 33 ☐☐☐☐☐

_____ Zip Code _____ (33)

Type of Business _____ (38) 38 ☐

Number of Employees _____ (39) 39 ☐☐☐☐

Floor Area _____ (43) 43 ☐☐☐☐☐☐

Follow Up: ☐ Mail Back ☐ Pick Up

Date _____

Number Forms Returned _____

Surveyor's Name _____ Date _____

CARD 07

Figure 24

Results of The Employee Survey - The control statistics for the West Los Angeles employee survey is shown in Table 22. The review of employment statistics shows that there are 735,000 employed in the West Los Angeles study area. Upon the application of expansion factors the difference between the survey total and the control total was only 165, an error of 0.02 per cent. The error is the result of rounding in the computer program and unfortunately unavoidable.

Over 100,000 questionnaires were distributed and 30,000 were returned for a 30 per cent return rate which was as planned in the survey design phase. This yields an overall survey sample of 4 per cent which is 4 times larger than any other survey in the area to date.

The results of the survey were expanded on a study zone basis. There were two primary reasons for this: (1) The data could be analyzed for each of the individual zones since the entire study area was much too large to yield usable results, and (2) This method allowed better control of the expansion factors in that if one area was out of range for the established survey controls it could be resurveyed if time allowed. The expansion factors ranged from 11.5 for Century City to 124.5 for Pacific Palisades. There are a number of reasons for the poor return in this area but the primary one is the poor return rate. The other primary reason is that most of the employees in the Pacific Palisades area are domestics making it difficult to distribute questionnaires since there are not areas in which they are concentrated.

Table 22
Summary of West Los Angeles Employee Survey
West Los Angeles Transit Planning Study

STUDY AREA NAME	ESTIMATED EMPLOYMENT	EXPANDED EMPLOYMENT	INTERVIEWS ISSUED	INTERVIEWS RETURNED	PERCENT SAMPLE	EXPANSION FACTOR
Culver City	22,292	22,282	3,750	1,310	5.9	17.01
Marina del Rey-Venice	32,050	32,051	3,082	980	3.1	32.70
Santa Monica South	20,412	20,405	2,374	1,022	5.0	19.97
Santa Monica North	38,978	38,966	6,950	2,426	6.2	16.06
West Los Angeles	32,035	32,034	5,651	1,385	4.3	23.13
Palms - Mar Vista	22,884	22,877	4,319	1,005	4.4	22.77
Westwood	34,744	34,737	5,998	948	2.7	36.65
Century City	22,405	22,420	5,786	1,957	8.7	11.45
Beverly Hills-South	19,701	19,706	2,319	463	2.4	42.55
Beverly Hills-North	32,549	32,504	5,001	1,520	4.7	21.41
Pacific Palisades	4,608	4,605	225	37	0.8	124.54
Miracle Mile	50,157	50,154	5,076	1,357	2.7	36.96
Mid-Wilshire	31,434	31,423	4,729	1,620	5.2	19.40
Wilshire Center	38,601	38,565	6,680	2,908	7.5	13.27
Sunset Strip	22,098	22,073	3,733	1,071	4.8	20.63
Hollywood	56,597	56,576	7,728	2,153	3.8	26.29
Echo Park	27,735	27,722	2,379	547	2.0	50.70
Westlake	63,386	63,387	7,307	2,368	3.7	26.77
University	28,011	28,031	2,226	607	2.2	46.15
Santa Barbara	26,647	26,635	5,150	1,406	5.3	18.95
Exposition Park	20,546	20,549	2,275	613	3.0	33.52
West Adams	19,825	19,830	2,197	370	1.9	53.58
Baldwin Hills	23,944	23,944	1,672	278	1.1	86.13
Silver Lake	43,028	43,026	3,872	1,204	2.8	35.74
TOTAL	734,667	734,502	100,479	29,555	4.0	24.85

The On Board Travel Survey

The numbers and travel habits of persons riding buses within the area was determined by survey as a step towards understanding and evaluating the service provided by buses. This information, together with data on the numbers of employed persons in West Los Angeles and the residential patterns of workers as determined in earlier comprehensive origin-destination surveys provide insights needed in developing a bus routing plan that is more suitable than the present service.

The on-board travel survey form shown in Figure 25 was distributed on selected bus lines in the West Los Angeles study area. The one-day survey was conducted on each selected line between the hours of 9 A.M. and 5 P.M. These hours were selected for the following reasons:

1. Peak hour usage of buses was at capacity, therefore, no new equipment would be available even if the results of the survey indicated their need;
2. The travel patterns of the commuters that would be using the bus immediately prior to and following the above time period would have already been determined by the employee travel survey;
3. The primary purpose of the on-board survey is to determine the travel patterns of non-worker bus riders.

A detailed description of the design, methodology and procedures is contained in Appendix C.

Survey Returns - During the on-board survey every third bus was surveyed on each line. Obviously, on some of the heavier lines such as the 83 smaller portions of the runs were surveyed. A total of 24,000 questionnaires were distributed and 3,300 were returned for an overall return rate of 10 per cent. The range of the

LOS ANGELES AREA
TRANSIT IMPROVEMENT PROGRAM
ON-BOARD TRANSIT SURVEY

YOU CAN HELP IMPROVE OUR SERVICE BY ANSWERING ALL OF THE FOLLOWING QUESTIONS. PLEASE ANSWER AGAIN, EVEN IF YOU HAVE ALREADY FILLED OUT THIS FORM TODAY. DROP IN ANY MAILBOX, NO POSTAGE REQUIRED. THANK YOU FOR YOUR HELP.

USTED PUEDE AYUDAR DE MEJORAR NUESTRO SERVICIO RESPONIENDO A TODOS LOS CUESTIONES SIGUIENTES. FAVOR DE CONTESTARLAS OTRA VEZ AUNQUE YA LO HAYA ANTERIORMENTE. ECHALO AL CORREO ADONDE-QUIERA. FRANQUEO NO ES NECESARIO. Y MUCHAS GRACIAS.

PLEASE CHECK ONE:
Marque uno

1 [0][8]

3 [ ][ ][ ][ ][ ][ ]

1. A. Where did this trip begin? / ¿Donde comenzo este viaje?

9 [ ]

Home	☐	Casa
Work	☐	Trabajo
Shopping area	☐	Centro mercantil
School	☐	Escuela
Medical bldg.	☐	Edificio medico
Other _____	☐	Otro _____

10 [ ][ ][ ][ ]

B. Please give the nearest intersection and zip code of that location.
Favor de indicar la interseccion y ZIP donde empezo este viaje.

14 [ ][ ][ ][ ]

_____ north/south norte/sur _____ east/west este/oeste _____ ZIP code

18 [ ][ ][ ][ ][ ]

2. A. How did you get to the bus stop where you boarded this bus?
¿Como llego a esta parada de autobus?

23 [ ][ ]

Walked (Number of blocks) _____		Caminado (Numero de cuadras)
Another bus	☐	Otro autobus
Drove	☐	Manejando
Auto passenger	☐	Pasajero en carro
Other _____	☐	Otro _____

B. How many buses do you ride to complete this trip? _____
¿Cuantos autobuses toma Ud. para este viaje? _____

25 [ ]

3. A. Is the place you are going?
¿A donde va?

26 [ ]

Home	☐	Casa
Work	☐	Trabajo
Shopping area	☐	Centro mercantil
School	☐	Escuela
Medical bldg.	☐	Edificio medico
Other _____	☐	Otro _____

27 [ ][ ][ ][ ]

B. Please give the nearest intersection and zip code of that location.
Favor de indicar la interseccion mas cerca de su destinacion y ZIP.

31 [ ][ ][ ][ ]

_____ north/south norte/sur _____ east/west este/oeste _____ ZIP code

35 [ ][ ][ ][ ][ ]

4. How will you get to your final destination after leaving this bus?
¿Como llegara Ud. a su destinacion final a bajarse de este autobus?

40 [ ][ ]

Walk (Number of blocks) _____		Caminando (Numero de cuadras)
Another bus	☐	Otro autobus
Drove	☐	Manejando
Auto passenger	☐	Pasajero en carro
Other _____	☐	Otro _____

5. Are you? / ¿Es Ud.

42 [ ]

Male	☐	Hombre
Female	☐	Mujer

6. To what age group do you belong? / ¿A Cual grupo de edades pertenece Ud?

43 [ ]

Under 15	☐	15 o menos
16-24	☐	16-24
25-44	☐	25-44
45-64	☐	45-64
Over 65	☐	65 o mas

7. Please indicate the total annual income of all persons in your household.
Favor de indicar los ingresos anual de todos que viven en su casa.

44 [ ]

Under $6,000	☐	$6,000 o menos
$6,000–10,000	☐	$6,000–10,000
$10,000–15,000	☐	$10,000–15,000
Over $15,000	☐	$15,000 o mas

45 [ ][ ]

47 [ ][ ][ ][ ]

This survey is being conducted for the Southern California Rapid Transit District by:
Este estudio es conducido en nombre de SCRTD por: *Wilbur Smith and Associates*

5900 Wilshire Blvd., Suite 2950
Los Angeles, California 90036

ON BOARD SURVEY FORM

return rate was 5.1 per cent to 19.0 per cent with only one line with less 12 per cent. The data was expanded for each route variation. In other words the data for the 4 line from Los Angeles to Santa Monica run was expanded differently from the Los Angeles to Fairfax run. However, the overall survey sample size was 4 per cent. The survey return statistics are sumarized in Table 23 for each line surveyed.

Table 23

Results of the On-Board Travel Survey

West Los Angeles Transit Study

Line	Total Trips	Trips Surveys	Trips	Survey Interviews Issued	Survey Interviews Returned	%	% Sample
4	231	66	28.6	3,745	460	12.3	3.6
21	21	8	38.1	373	19	5.1	2.0
27	51	20	39.2	1,816	224	12.3	4.7
42	132	47	35.6	2,240	292	13.0	4.7
44	226	76	33.6	3,244	399	12.3	4.0
75	99	30	30.3	1,741	222	12.8	3.9
83	219	53	24.2	3,212	612	19.0	4.0
91	108	32	29.6	3,230	466	14.4	4.3
94	59	16	27.1	992	125	12.6	3.4
95	140	40	38.1	3,095	460	14.9	4.3
Totals	1,286	388	30.2	23,688	3,279	10.0	4.0

Patronage

The typical weekday patronage was determined for each of the study lines operating in West Los Angeles. SCRTD carries approximately one million passengers daily. Over half of these persons utilize lines operating in West Los Angeles. This is a total of 585,000 passengers daily.

The percentage of persons who use West Los Angeles lines was determined by applying the proportion of the total route miles of each line in West Los Angeles to the total boarding passengers on that line. Using this procedure it was determined that 60 per cent of the riders of these lines were in the West Los Angeles study area. This was a total of 355,000 passengers.

Line Patronage - Using the one-way route mileage statistics in SCRTD Report 4-10 dated March 15, 1976 and Daily Fare and Passenger Analysis prepared by the SCRTD Schedule Department, a line-by-line analysis of passengers per bus mile was conducted. The proportion of route miles of each line within the study was applied to total daily bus miles in the same manner in which it was applied to the daily passengers discussed above.

Line 83 carries the largest number of passengers of any line in West Los Angeles carrying over 46,000 passengers in West Los Angeles daily. Lines 4, 44, 84 and 91 have a daily ridership of between 20 and 25 thousand persons within West Los Angeles. Lines 6, 85, 89 and 95 carry approximately 15,000 passengers in West Los Angeles daily.

The total daily bus miles was estimated for each line by multiplying the one-way route miles by the total number of trips. This will result in a slightly low number of passengers per mile since the passenger counts are for a 14-hour period and the number of bus miles are the total for the entire day. This analysis also assumes that boarding and alighting characteristics are homogeneous along the entire route of the line. However, this is a reliable and comparable index for predicting weekday transit ridership.

This analysis is tabulated in Table 24. As expected the flyers and express lines have a very low ridership per bus mile. Therefore the analysis must be restricted to local lines in order to analyze meaningful relationships.

The highest number of passengers per mile was on Line 41 (Alvarado) which has 11.8 passengers per bus mile. Line 84 has an index of 9.0 and line 25 has 8.4. Lines 89, 94, 83 and 26 carry between 7 and 8 passengers per mile and Lines 95, 12, 44, and 91 carry between 6 and 7 persons per mile.

Owl Patronage - A special passenger survey was conducted downtown to determine the degree of transit ridership during the owl service period. The results of this passenger count is shown in Table 25.

A total of 81 trips were counted leaving the CBD carrying a total of 784 passengers. The average load factor was 0.2. The average load factor of all the lines leaving the CBD declined through the owl service period from 0.29 at 12:10 to 0.07 at 4:10. Two thirds of the passengers carried during this period left the downtown area during the first two hour period of the owl service period.

Table 24

PATRONAGE AND PASSENGERS PER BUS MILE
WLA Transit Study

Route No	Route Miles Total	Route Miles WLA	% In WLA	Patronage Total	Patronage WLA	Estimated Daily Bus Miles Total	Estimated Daily Bus Miles WLA	Psgrs per Mile
3	20.9	7.4	35.4	25,354	8,980	5,980	2,120	4.2
4	28.2	17.9	63.5	38,290	24,300	8,200	5,230	4.6
5	18.6	7.2	38.7	19,780	7,660	4,780	1,850	4.1
6	19.1	11.4	59.7	24,215	14,450	4,200	2,510	5.8
8	14.1	9.4	66.7	8,211	5,470	1,750	1,170	4.7
9	24.1	12.0	49.8	21,640	10,780	5,040	2,510	4.3
10	19.6	7.1	36.2	2,961	1,070	1,250	450	2.4
12	13.7	6.2	45.3	14,124	6,390	2,160	980	6.5
18	7.2	5.6	77.8	3,121	2,430	670	520	4.7
21	9.9	9.9	100.0	1,650	1,650	410	410	4.1
23	5.2	5.2	100.0	65	65	50	50	1.2
25	13.2	3.0	22.7	10,320	2,340	1,228	280	8.4
26	13.4	3.7	27.6	40,259	11,120	5,640	1,560	7.1
27	19.3	16.0	82.9	13,316	11,040	2,280	1,890	5.8
28	12.9	3.6	27.9	19,507	5,440	3,540	990	5.5
29	16.8	3.0	17.9	16,271	2,910	3650	650	4.5
35	28.3	7.6	26.9	9,023	0	4,250	—	—
41	5.5	5.5	100.0	8,603	8,603	730	730	11.8
42	10.6	8.8	83.0	16,672	13,840	3,250	2,700	5.1
44	18.5	15.8	85.4	29,045	24,810	4,790	4,090	6.1
61	27.5	3.4	12.4	3,909	480	1,980	250	2.0
65	7.0	6.5	92.9	578	540	330	310	1.8
73	11.8	8.9	75.4	2,432	1,830	1,062	800	2.3
75	21.5	18.3	85.1	14,071	11,980	4,040	3,440	3.5
76	15.3	15.3	100.0	1,559	1,559	660	660	2.4
78	3.1	3.1	100.0	439	439	230	230	1.9
81	31.0	2.9	9.4	6,829	640	2,980	280	2.3
83	17.2	15.1	87.8	50,551	46,135	7,280	6,390	7.2

Table 24 (Cont'd)

PATRONAGE AND PASSENGERS PER MILE
WLA Transit Study

Route No.	Route Miles Total	Route Miles WLA	% In WLA	Patronage Total	Patronage WLA	Estimated Daily Bus Miles Total	Estimated Daily Bus Miles WLA	Pass'rs per Mile
84	12.8	12.2	95.3	22,511	21,460	2,490	2,370	9.0
85	22.3	18.3	82.1	20,437	16,770	3,700	3,040	5.5
88	25.0	18.6	74.4	2,191	740	1,550	1,150	0.6
89	9.6	9.6	100.0	16,200	16,200	2,210	2,210	7.3
91	16.3	13.5	82.8	28,416	23,540	4,760	3,940	6.0
93	33.8	8.3	24.6	16,814	1,000	6,830	1,680	0.6
94	12.1	9.3	76.9	16,798	12,910	2,290	1,760	7.3
95	13.7	8.9	65.0	24,460	15,890	3,620	2,350	6.8
96	14.1	11.3	80.1	6,372	5,110	1,610	1,290	4.0
144	24.8	9.8	39.5	839	280	520	180	1.6
150	35.3	6.1	17.3	1,302	225	1,130	200	1.2
175	26.3	4.5	17.1	733	120	740	130	1.0
176	34.7	27.4	79.0	971	770	450	360	2.2
177	Not Available							—
205	1.5	1.5	100.0	Not Applicable				—
353	9.8	9.8	100.0	5,032	5,032	850	850	5.9
354	5.6	3.2	57.1	1,449	830	490	280	3.0
436	18.4	5.0	27.2					
601	25.2	22.1	87.7	42	40	250	220	0.2
602	16.2	13.1	80.7	705	705	310	250	2.3
603	15.6	12.5	80.1	96	96	310	310	0.3
604	17.5	14.4	82.3	879	723	350	290	2.5
605	24.3	21.2	87.2	179	160	510	440	0.4
606	21.2	13.7	64.6	360	230	740	480	0.5
607	19.3	10.9	56.5	421	421	1,060	1,060	0.4
608	53.0	29.5	87.4	117	117	200	200	0.5
708	15.0	11.5	76.7	183	183	240	240	1.3
746	13.0	10.8	83.1	109	80	270	230	0.4
774	28.8	9.0	31.3	Not Available				
828	30.6	14.6	47.7	Not Available				

Table 25

OWL PATRONAGE LEAVING CBD

West Los Angeles Transit Study

Line No. & Identification		Trips	12:10	1:10	2:10	3:10	4:10	TOTAL
4	Melrose	5	19	3	7	5	3	37
4	Olympic	2	16	5	-	-	-	21
5	Hawthorne	5	24	44	29	6	6	109
6	Vermont	2	16	31	-	-	-	47
6	York	5	5	3	4	5	4	21
9	Jefferson	5	30	18	10	6	3	67
9	South Gate	5	7	9	4	10	5	35
12	Washington	5	22	11	8	6	8	55
26	Pico	5	23	24	17	11	3	78
26	First	5	14	10	7	7	0	38
28	West Third	5	14	17	20	6	7	64
28	Whittier	5	12	7	7	7	5	38
29	Avalon	5	5	7	2	0	0	14
42	Temple	5	7	8	2	2	2	21
44	Adams	5	17	9	3	3	1	33
83	Wilshire	5	18	13	14	2	1	48
91	Hollywood	5	5	17	14	5	7	48
93	Van Nuys	2	6	4	-	-	-	10
		81	260	240	148	81	55	784

Date: 7-17-76

It should be noted however that these numbers are not truly indicative of the total ridership of these lines. An example is the 91 Line. The passenger count shows a load factor ranging from 0.3 to 0.1 indicating little ridership being generated from the CBD to the Hollywood Blvd. corridor. However, observation of this line along Hollywood Boulevard and Sunset Boulevard show standing loads, indicating the ridership boards the bus within that corridor.

Characteristics of Transit Riders

The travel surveys supplied the data necessary to develop a profile of the transit riders in West Los Angeles. It is feasible to analyze the characteristics of the transit riders during peak and base service periods individually since the employee survey data was tabulated separately for those employees using automobiles and transit and assuming that the majority of these people travel to and from work during the peak commute periods. The on-board survey was used to gather data about the characteristics of transit riders during the base service period. Using this information, the sex, age, and income of transit riders were determined and analyzed.

SCRTD revenue and patronage summaries were also used to develop characteristics of transit patrons. The type of fare payment was determined for each study line in West Los Angeles. Data regarding the number of handicapped riders was inferred by this analysis and was also evaluated.

Sex and Age - The sex and age characteristic of West Los Angeles transit riders were evaluated and analyzed for two categories of transit riders: work trip commuters and base period transit riders. The employee travel survey yielded the characteristics

of those persons who utilize transit to travel to and from work. In this manner the sex and age characteristics of transit riders during the peak commute periods was determined.

Table 26 shows the sex and age distribution of those employees who utilize transit for their work trips. Approximately half of the transit riders during the peak travel periods are in the 25 to 44 year age group. One fourth between 45 and 64 years and one fifth between 16 and 24 years. Obviously, only a small percentage are in the over 64 year age group because people in this age group are retired. Generally, female transit riders during this service period are twice the number of male transit riders.

The age and sex profile of the transit riders during the base period was obtained directly from the on-board survey. This data was obtained for all of the lines surveyed and are summarized in Table 27. The distribution of the ages of the transit riders during this period are more uniformly distributed for this time period than for the peak commute periods. The range of percentage of transit riders comprising each of the four age groups over 16 years of age is 19 to 28 per cent with an average of 24 per cent. The ratio of females to males however has dropped to 3 to 2 from 2 to 1 for the work trips.

Income of Transit Riders - Table 28 shows the income levels of transit riders obtained from the on-board travel survey. Approximately half of the riders during the base period had an income of less than $6,000 annually. Slightly over one-fifth had an annual income between $ 6,000 and $ 10,000. Approximately 14 per cent of the transit riders come from the $ 10 - 15,000 and over $ 15,000 income brackets, each.

Table 26

SEX AND AGE OF WEST LOS ANGELES EMPLOYEES
USING TRANSIT TO AND FROM WORK

West Los Angeles Transit Planning Study

	MALE		FEMALE		NO RESPONSE		TOTAL	
Age Group	#	%	#	%	#	%	#	%
16-24	4,990	5.0	15,852	16.0	97	0.1	20,939	21.1
25-44	14,725	14.8	29,502	29.7	405	0.4	44,632	44.9
45-64	8,310	8.4	17,056	17.2	454	0.5	25,820	26.0
Over 64	401	0.4	522	0.5	38	0.0	961	1.0
No Response	2,240	2.3	4,207	4.2	517	0.5	6,964	7.0
TOTAL	30,666	30.9	67,139	67.6	1,511	1.5	99,316	100.0
All Modes	335,140	45.6	385,838	52.5	13,524	1.9	734,502	100.0

Source: West Los Angeles Employee Travel Survey, Wilbur Smith & Associates, 1976, Table 13B.

Table 27

SEX AND AGE OF WEST LOS ANGELES BASE PERIOD TRANSIT RIDERS

West Los Angeles Transit Planning Study

	MALE		FEMALE		TOTAL	
Age Group	#	%	#	%	#	%
Under 16	1,149	1.4	1,273	1.6	2,422	3.0
16-24	9,319	11.5	13,188	16.3	22,507	27.8
25-44	10,424	12.9	12,575	15.5	22,999	28.4
45-64	5,244	6.5	10,884	13.4	16,128	19.9
Over 64	5,041	6.2	10,409	12.8	15,450	19.0
No Response	110	0.1	431	0.5	541	0.6
TOTAL	31,287	38.6	48,760	60.1	80,047	98.7
			No Response to Sex		1,042	1.3
				TOTAL	810,089	100.0

Table 28

INCOME LEVELS

West Los Angeles Transit Study

Line No.	Under $6,000	$6,000 to $10,000	$10,000 to $15,000	Over $15,000	No Response	Total
4	5,296	2,967	1,891	1,951	551	12,656
21	357	204	103	204	102	969
27	2,190	1,116	676	399	336	4,717
42	3,238	1,531	773	664	65	6,271
44	4,543	2,051	1,348	1,348	624	9,918
75	2,717	1,060	933	699	336	5,745
83	5,646	3,311	2,131	3,550	803	15,441
91	4,890	2,729	1,301	1,502	459	10,881
94	2,083	676	587	177	147	3,670
95	5,317	2,396	1,607	1,056	445	10,821
Total	36,277	18,041	11,353	11,550	3,868	81,089

Type of Fare - Table shows the percentage of transit passengers who use each type of fare payment. These statistics were summarized from line passenger and revenue summaries conducted by SCRTD Schedule Department are for the entire line and are not adjusted to represent the fraction of the passengers boarding and/or alighting in West Los Angeles.

Over a third of the riders use passes and approximately one-fourth pay the cash fare. Another tenth pay the cash fare, but also buy a transfer. Only about five per cent of the total passengers pay the senior citizen fare of 10 cents. However, many senior citizens possess bus passes and are included in the category of "all passes". Nearly 6 per cent of the passengers pay the student fare with or without a transfer.

Transit Trip Characteristics

Of particular interest in the transit planning process is the determination of present travel characteristics and of transit travel in particular. A number of characteristics were investigated during this study. Among these were the daily variation of transit travel, transit trip purpose, origin-destination patterns, major generators, mode of access and egress, travel time and mode split. The primary sources of information for these investigations were SCRTD statistics furnished by the Schedule Department and the travel surveys conducted as part of this study.

Daily Variations in Transit Travel

As with all modes of travel, the amount of transit travel varies through the day with the peaks occurring during the commute periods as shown in Figure 26. The data used to evaluate the daily

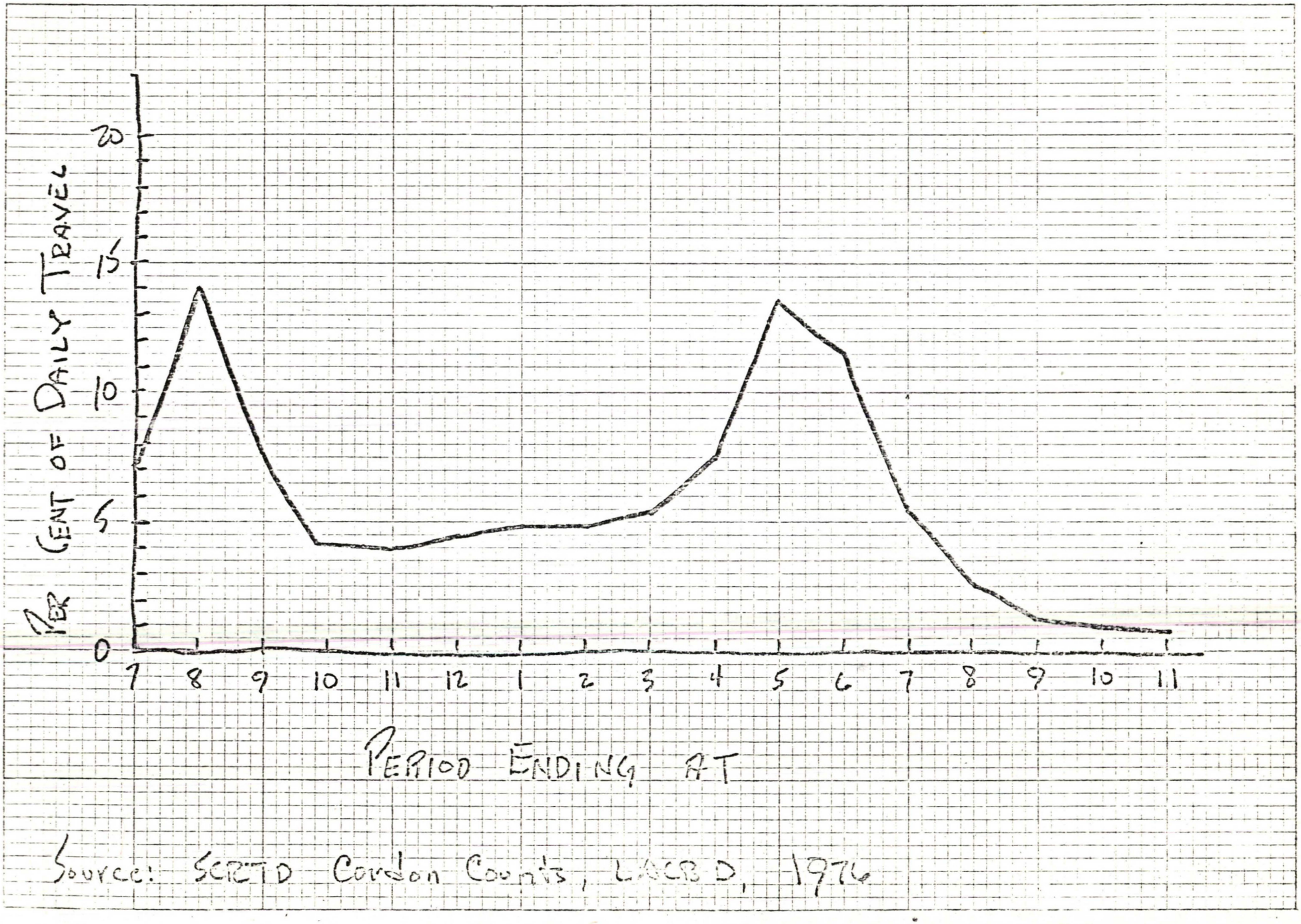
Table

METHOD OF TRANSIT FARE PAYMENT

West Los Angeles Transit Planning Study

Method of Fare Payment	Per Cent
Cash	23.8
Cash & Transfer	11.2
Student	3.6
Student & Transfer	2.0
Senior Citizen	4.7
Senior Citizen & Transfer	0.6
Transfer	17.8
All Passes	35.4
Blind - Free	0.3
Tickets	0.6
	100.0

PADMASTER ® / 66-54 10x10



Source: SCRTD Cordon Counts, LACBD, 1976

travel variation was obtained from the annual cordon count conducted by SCRTD during the Spring of 1976. The percentage of cordon crossings during a time interval is indicative of the ridership occurring during that period over the entire system.

The data obtained from the cordon count is summarized in Table 30. The morning peak occurs between 7 and 8 A.M. when 14 per cent of the daily cordon line crossing are made. The afternoon peak is between 5 and 6 PM when 12 per cent of the daily crossings occur. During the base period the average cordon crossing comprises 4.6 per cent of the daily trips. Only 6 per cent of the daily travel occurs after 7 PM.

Weekly Variation in Transit Travel - is more difficult to establish. The passenger counts are divided into only three categories: Weekday, Saturday, and Sunday. As yet Saturday and Sunday data are not available on all lines operating on these days and therefore a comparative analysis is not possible.

However, based on observation, there are certain corridors of travel along which Saturday and Sunday travel is equal to or greater than the typical weekday. An example is the Broadway in downtown Los Angeles. In West Los Angeles these corridors are Wilshire, Hollywood, Sunset, Pico, Vermont, Fairfax and Western.

Trip Purpose - The statistics on trip purpose for the bus riders of the ten lines surveyed are shown in Table 31. Because of the nature of the questions on the survey form, the data is based on the response to question 1A on the questionnaire which asked the beginning of that transit trip.

Table 30

DAILY VARIATION IN TRANSIT TRAVEL

West Los Angeles Transit Planning Study

Time Period	Cordon Crossings	Per Cent
6 AM - 7 AM	22,747	7.1
7 8	44,911	14.0
8 9	24,100	7.5
9 10	13,490	4.2
10 11	12,975	4.0
11 12 PM	14,347	4.5
12 PM - 1 PM	15,500	4.8
1 2	15,435	4.8
2 3	17,401	5.4
3 4	23,566	7.4
4 5	43,473	13.6
5 6	37,246	11.6
6 7	18,030	5.6
7 8	8,235	2.6
8 9	3,850	1.2
9 10	3,352	1.0
10 11	2,345	0.7
TOTAL	321,003	100.0

Table 31

TRIP PURPOSE BY LINE

West Los Angeles Transit Study

TRIP PURPOSE

Line	Home	Work	Shopping	School	Medical	Other	NR	GRAND TOTAL
4	3,725	3,358	2,240	850	572	1,708	203	12,656
21	204	510	51	51	-	153	-	969
27	1,242	1,264	945	336	380	465	85	4,717
42	1,614	1,540	892	681	615	730	199	6,271
44	2,661	2,299	1,374	1,005	827	1,370	382	9,918
75	1,783	1,318	751	519	415	855	104	5,745
83	4,039	4,236	1,976	1,673	1,400	1,983	134	15,441
91	2,371	2,769	2,047	697	962	1,963	72	10,881
94	915	998	441	440	203	644	29	3,670
95	4,095	1,929	753	1,862	869	1,147	166	10,821
TOTAL	22,649	20,221	11,470	8,114	6,243	11,018	1,374	81,089
%	27.9	24.9	14.1	10.0	7.7	13.6	1.8	100.0

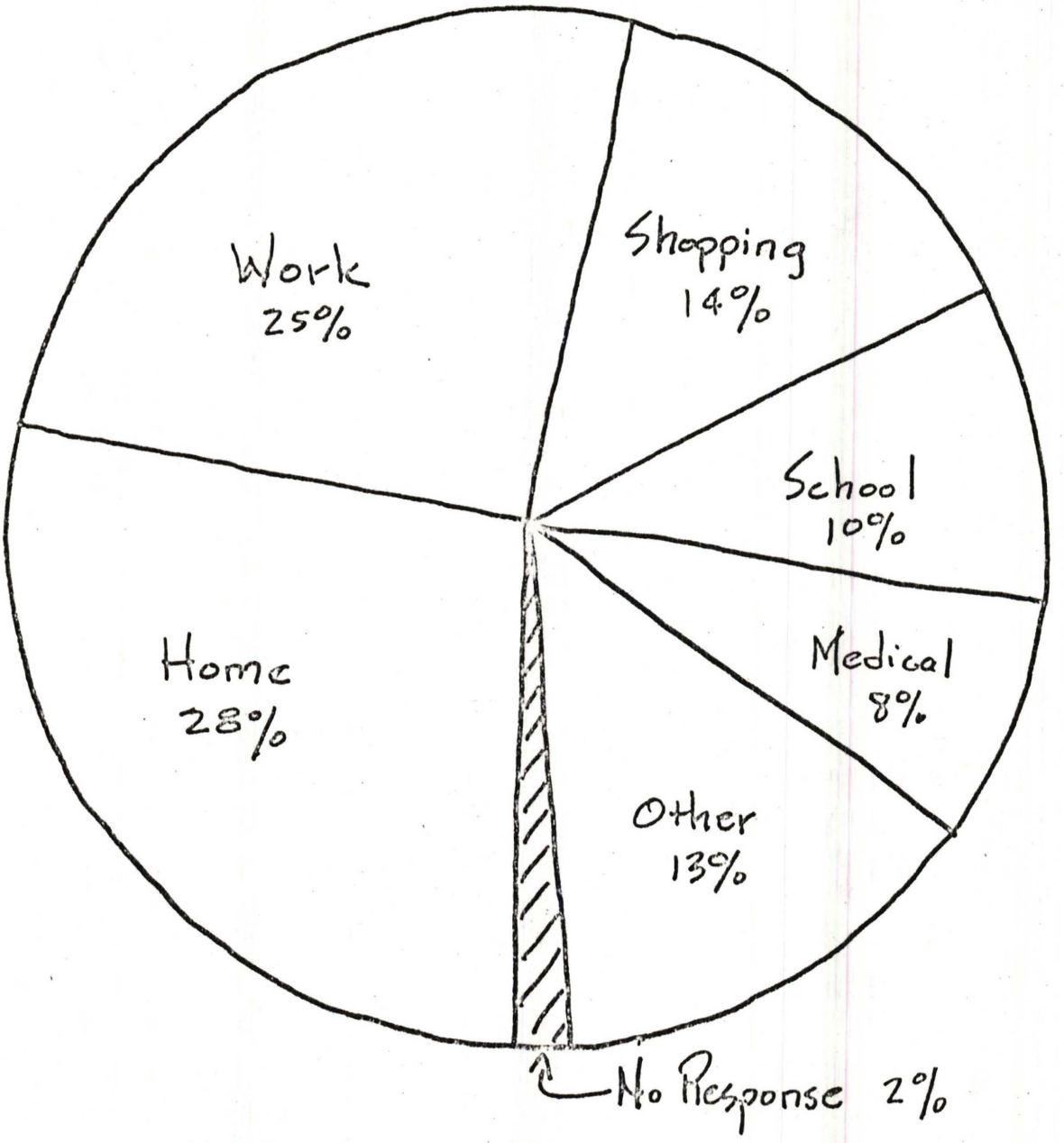
Approximately one fourth of the total trips surveyed began either at home and work each. A tenth of the trips were to or from school and 14 per cent were for shopping purposes. Less than two per cent did not respond and 14 per cent of the trips were for purposes other than those on the questionnaire. The distribution of trip purposes is shown graphically in Figure 27.

Travel Origin and Destinations

The primary purpose of the Employee Survey was to identify the travel characteristics of the persons employed in the study area. There are several reasons for emphasizing work travel:

1. Peak commute hours are the peak travel periods on all street facilities and therefore periods of peak congestion.
2. Workers traveling to work require long-term parking facilities to sotre their autos that are unused for long periods during the day.
3. In the West Los Angeles study area, work trips represent over one-fourth of the total person trips generated from the study area.
4. Work trips are the most consistently repeated type of trip and therefore can be predicted with the most reliability.

Work trip origin and destination data are used to identify travel patterns. When evaluated relative to the existing bus service provided along the corridors determined from these data the level of transit service be be identified and alternative transit improvement concepts developed.



TRIP PURPOSE DISTRIBUTION

(OFF-PEAK ON-BOARD SURVEY RESULTS)

Wilbur Smith & Associates

Figura 27

The West Los Angeles Employee Travel Survey identified employee residence locations and West Los Angeles work locations, mode of travel to and from work as well as related socio-economic data. The employee survey identified the employee residence location by zip code and the work location by each of the 24 work analysis zones. However, since the actual address of each employer surveyed was recorded on the control cards, the capability to refine the work location to traffic zones, census tracts or even corridors and individual office buildings is available.

The residence location zip codes have been grouped into the Regional Statistical Areas (RSA) used by LARTS and SCAG. These areas are shown in Figure 28 and are identified in Table 32. The tabulation of data was done in this manner such that the results of this survey could be correlated with the data available from LARTS, Caltrans and SCAG. The total person work-to-home plus home-to-work trips according to LARTS are shown in Table 33. The total one-way persons trips generated by the Regional Statistical Areas (RSA) in the West Los Angeles area is 2.8 million with 730,000 work trips. The West Los Angeles Transit Study control total was 735,000 or less than one per cent difference. This would indicate that the overall totals would be reliable when compared to LARTS travel and socio-economic statistics.

SCAG RSA MAP

WSA

Figure 28

Table 32

REGIONAL ANALYSIS ZONES AND DESCRIPTION

West Los Angeles Transit Study

ZONE NO.	ZONE DESCRIPTION	IDENTIFICATION
1	Central City	Los Angeles Central City
2	South Central L.A.	Compton, Lynwood, South Gate, Bell, Maywood, Huntington Park, Watts
3	West Central L.A.	Culver City, S.W. Los Angeles
4	Wilshire-Hollywood	Wilshire Corridor, Miracle Mile, West Hollywood, Hollywood
5	West Los Angeles	Venice, Santa Monica, Beverly Hills, Malibu, Topanga, Calabasas, Pacific Palisades, West Los Angeles
6	South Bay	Inglewood, El Segundo, Manhattan Beach, Hawthorne, Lawndale, Redondo Beach, Gardena, Wilmington, Long Beach, Lakewood, Torrance, Palos Verdes, Lomita, Harbor City, San Pedro, Carson
7	Mid-Cities	Pico Rivera, Downey, Paramount, Bellflower, Artesia & Cerritos, Norwalk, Santa Fe Springs, Whittier, La Mirada
8	East-Northeast	Montebello, East Los Angeles
9	Glendale-Burbank	Glendale, Burbank
10	San Fernando Valley	San Fernando Valley north of Mulholland and west of Burbank
11	San Gabriel Valley	San Fernando Valley east of East Los Angeles and west of San Bernardino County
12	Orange County	
13	Riverside County	
14	San Bernardino County	

Table 33

LARTS WORK TRIP DATA

West Los Angeles Transit Study

RSA	Total Person Trips Generated	Home-Work Person Trips	Per Cent	Bus Trips
21	98,400	14,700	14.9	400
22	350,900	77,700	22.1	5,900
23	522,400	132,400	25.3	16,400
24	415,700	115,200	27.7	19,500
32	579,000	155,600	26.9	10,100
33	826,600	233,800	28.3	28,000
Total	2,793,000	729,400	26.1	80,300

In order to relate interval-internal and external-internal trips, the West Los Angeles Study area includes the whole of RSA's Wilshire-Hollywood, West Los Angeles and West Central Los Angeles plus the following zip codes with percentages of partial zip codes shown:

RSA	Zip Code	Per Cent
Central City	90015	50
	90017	70
	90057	100
East-Northeast	90012	100
	90026	100
	90031	5
Glendale-Burbank	90027	100
	90039	70

From this correlation an internal-interval trip matrix was developed. The travel desire lines are shown in Figure 29 and are tabulated in Table 34.

The heaviest single trip movement is between North and South Santa Monica where there are nearly 7,700 work trips daily. The second largest number is 5,700 daily work trips between Santa Monica North and Venice-Marina del Rey. There are approximately 5,300 trips between Culver City and Venice-Marina del Rey. Generally, the study zones in the western half of the study are comprising mostly the West Los Angeles RSA is both origin and destination of work trips. However, few are by transit as this is the area with the least extensive transit service.

The central portion of the study area draws its work trips from the more immediately adjacent areas. An example is the Miracle

INTERNAL-INTERNAL WORK TRIP DESIRES

WSA

Figure 29

Table 34

INTERNAL-INTERNAL WORK TRIP MATRIX

West Los Angeles Transit Planning Study

Mile study zone which has 4,200 internal trips daily. Surprisingly, over 75 per cent are by auto indicating that the auto is preferable over transit even on very short trips. There is also a significant trip movement between Miracle and Sunset Strip and Hollywood.

The Santa Monica North has the largest number of internal work trips with 7,800 trips beginning and ending in that area. There are 5,500 internal trips in Venice-Marina del Rey and 7,000 in West Adams.

Table 35 shows the RSA of residence of the employees of each work zone as defined in the employee travel survey. The largest number of employees reside in West Los Angeles which is within the study area. One-sixth of the West Los Angeles employees reside in this area. A comparable number live in the West Central Los Angeles area and Wilshire-Hollywood each with 110,000 employees. There are also 110,000 employees from the San Fernando Valley which is interesting in that the transit service between the San Fernando Valley and West Los Angeles is minimal. Approximately 76,000 employees reside in South Bay, 55,000 in Glendale-Burbank and 53,000 in the San Gabriel Valley. All other areas are the residence location of less than 13 per cent of the total employee population of West Los Angeles.

The residence location of employees from each study zone was analyzed on an individual basis in order to better understand the transit needs of each community within the study area prior to assessing the regional needs. The following is a zone-by-zone discussion of the travel pattern to each zone.

Table 35

WORK ZONE-REGIONAL STATISTICAL AREA MATRIX

West Los Angeles Transit Study

RESIDENCE RSA

WORK ZONE	Ctrl. LA	S.Cen. LA	W.Cent. LA	Wilsh.-H'wood	West LA	South Bay	Mid-Cities	East N.E.	Glen-Burb	S.F.V.	S.G.V.	Orange Co	Riv Co	S.B. Co	NR & Other	TOTAL
Culver City	51	374	10,032	1,360	3,131	3,319	188	357	476	1,939	408	136	-	51	460	22,28
Venice-Marina	99	326	7,847	1,769	7,851	7,578	524	458	687	2,850	753	723	-	-	586	32,05
S.Mon.-S.	40	240	4,215	953	8,248	1,899	160	459	437	2,856	338	200	20	-	340	20,40
S.Mon.-N.	16	177	6,365	1,298	23,091	2,426	129	208	306	4,131	290	96	16	-	417	38,96
W.L.A.	254	738	7,004	2,470	7,795	3,705	277	464	808	6,620	877	326	23	46	627	32,03
Palms-MV	90	754	8,261	2,409	3,647	3,572	249	705	819	1,571	593	23	23	-	161	22,87
Westwood	145	256	3,857	2,232	12,336	3,706	147	293	623	8,876	1,169	769	-	37	291	34,73
Cent.City	81	193	2,918	2,949	6,100	2,324	318	319	814	4,687	1,095	310	22	12	278	22,42
Wilshire So.	171	172	2,510	3,832	6,040	936	129	254	850	4,214	469	86	-	43	-	19,70
Wilshire No.	298	149	3,363	5,679	8,744	2,201	214	551	1,068	8,480	967	427	-	-	363	32,50
Pac.Pal.	-	124	125	-	3,358	-	-	-	-	748	-	-	-	-	250	4,60
Mir.Mile	406	814	4,623	14,966	7,389	4,360	777	1,405	2,698	8,428	2,477	1,404	37	-	370	50,15
Mid-Wilshire	289	698	2,658	6,667	2,753	2,894	812	1,240	(3,331 / 5,456)	5,670	3,301	703	57	60	290	31,42
Wilshire Ctr.	526	980	2,846	9,459	1,643	3,214	1,304	1,880		5,218	4,507	1,109	53	106	264	38,56
Sunset Strip	124	269	2,453	6,495	3,067	1,516	82	685	1,399	4,988	603	123	-	-	269	22,07
Hollywood	394	815	3,158	15,796	3,306	2,177	631	2,186	8,380	15,559	2,990	448	27	52	657	56,57
Echo Park	305	710	3,344	4,962	2,537	1,422	354	1,322	5,015	4,763	2,278	457	-	51	202	27,72
Westlake	1,013	1,846	4,574	7,618	2,332	8,093	(3) 828	3,894	7,148	6,719	12,252	3,449	-	216	405	63,38
University	924	2,079	(5,633	(3,647	(1,297	(4,104	971	(2,633	(2,213	(1,065	(2,585	696	-	-	184	28,03
Santa Barbara	341	911	4,891	3,052	3,632	4,467	512	1,309	2,009	1,608	2,727	929	38	152	57	26,63
Expo.Pk.	572	3,254	3,957	2,413	536	2,417	936	2,277	1,239	703	1,372	672	-	134	67	20,54
W.Adams	752	1,127	5,199	3,752	1,447	2,411	747	590	751	1,714	803	322	-	-	215	19,83
Baldwin Hills	-	947	12,577	2,584	172	5,082	259	775	172	344	688	172	-	-	172	23,94
Silver Lake	608	1,288	1,285	3,284	1,146	2,097	(2) 106	7,366	7,507	4,282	9,370	1,899	72	250	466	43,02
Griffith Park	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	7,499	19,241	113,695	109,646	121,598	75,920	15,654	31,630	54,205	108,033	52,912	15,479	388	1,210	7,391	734,50
PER CENT	1.0	2.6	15.5	14.9	16.6	10.3	2.1	4.3	7.4	14.7	7.2	2.1	0.1	0.2	1.0	100.0

Culver City draws most of its employment force from the immediately adjacent area. Nearly half of the 22,300 employees reside in West Central Los Angeles which includes Culver City and portions of Palms and Mar Vista where over 8,700 Culver City employees live. Over 3,100 employees reside in West Los Angeles with 1,300 living in the Westwood area. Over 3,300 employees reside in the South Bay area with the residences spread relatively uniformly in Inglewood, Hawthorne, and Manhattan Beach. Nearly 2000 employees reside in the San Fernando Valley with the only significant concentration in Van Nuys where over 500 live.

Venice - Marina del Rey has a total employee population of 32,000. Three quarters come from West Central LA, South Bay, and West Los Angeles. Approximately 3,500 employees live in Venice which is a tenth of the employee population of the study zone. Over 7,800 employees reside in West Central Los Angeles with most of them located in the Palms-Mar Vista area. Approximately 7,800 employees also reside in West Los Angeles with 1,700 and 1,800 from Westwood and Santa Monica, respectively. Only 6,800 employees come from the San Fernando Valley with nearly 600 living in Van Nuys.

Santa Monica South has an employee population of 20,400. Over 8,200 live in the West Los Angeles area. Over 4,100 reside in Santa Monica, 2,000 in Westwood, and 1,700 in Venice. Approximately 4,200 reside in West Central Los Angeles. Only 800 employees are from Culver City and 2,600 are from the Palms-Mar Vista area. Slightly over 2,800 residents of the San Fernando Valley work in Santa Monica South. Approximately 500 employees reside in Van Nuys and Canoga Park each. There are also over 900 employees from the Wilshire-Hollywood area with the majority of them coming from the western portion of the area.

Santa Monica North is the work location of 39,000 persons. Nearly 6,400 reside in West Central Los Angeles and are spread uniformly over the area. Over half of the Santa Monica North employees, or 23,100 persons, reside in West Los Angeles. Nearly 13,800 live in Santa Monica and 4,400 in the Westwood and Brentwood areas. Over 4,100 persons live in the San Fernando Valley where the only significant concentration of residences is in Van Nuys with 800, Canoga Park with 700 and Woodland Hills with 500.

West Los Angeles has an employee population of over 32,000 persons. Approximately 7,800 reside in the West Los Angeles RSA where 3,000 live in Santa Monica and 3,400 in the West Los Angeles and Westwood zones. The West Los Angeles area is the residence of 7,000 employees with the majority residing in the Palms and Baldwin Hills areas. Over 6,600 employees live in the San Fernando Valley, where 1,700 live in Van Nuys and 1,000 in San Fernando. Approximately 2,500 reside in the Wilshire-Hollywood area and 800 in Glendale-Burbank and the San Gabriel Valley.

Palms-Mar Vista is the location of 22,900 jobs. A third of, or 8,300, the employees come from the West Central Los Angeles area with most of them living in the western half. Approximately 3,600 employees come from West Los Angeles and the South Bay each. Westwood, Santa Monica, and Venice each contributing approximately 1,100 employees to the Palms-Mar Vista work force. Over 1,100 employees live in Inglewood. Slightly over 2,400 employees reside in the Wilshire-Hollywood area with most living west of Western Avenue. Nearly 1,600 live in the San Fernando Valley with one fourth of them from Van Nuys.

Santa Monica North is the work location of 39,000 persons. Nearly 6,400 reside in West Central Los Angeles and are spread uniformly over the area. Over half of the Santa Monica North employees, or 23,100 persons, reside in West Los Angeles. Nearly 13,800 live in Santa Monica and 4,400 in the Westwood and Brentwood areas. Over 4,100 persons live in the San Fernando Valley where the only significant concentration of residences is in Van Nuys with 800, Canoga Park with 700 and Woodland Hills with 500.

West Los Angeles has an employee population of over 32,000 persons. Approximately 7,800 reside in the West Los Angeles RSA where 3,000 live in Santa Monica and 3,400 in the West Los Angeles and Westwood zones. The West Los Angeles area is the residence of 7,000 employees with the majority residing in the Palms and Baldwin Hills areas. Over 6,600 employees live in the San Fernando Valley, where 1,700 live in Van Nuys and 1,000 in San Fernando. Approximately 2,500 reside in the Wilshire-Hollywood area and 800 in Glendale-Burbank and the San Gabriel Valley.

Palms-Mar Vista is the location of 22,900 jobs. A third of, or 8,300, the employees come from the West Central Los Angeles area with most of them living in the western half. Approximately 3,600 employees come from West Los Angeles and the South Bay each. Westwood, Santa Monica, and Venice each contributing approximately 1,100 employees to the Palms-Mar Vista work force. Over 1,100 employees live in Inglewood. Slightly over 2,400 employees reside in the Wilshire-Hollywood area with most living west of Western Avenue. Nearly 1,600 live in the San Fernando Valley with one fourth of them from Van Nuys.

Westwood - has an employee population of 34,700. Slightly over 6,400 reside in the West Los Angeles portion of West Los Angeles, which is Westwood and Brentwood, and 3,000 live in Santa Monica. Nearly 8,900 Westwood employees live in the San Fernando Valley. Over 2,100 live in Van Nuys and 1,100 in San Fernando an Woodland Hills each. Over 2,100 reside in the Palms and Mar Vista areas and 700 in Culver City. The remainder of the employees are from the West Central Los Angeles area. Over 2,200 Westwood employees have residences in the Wilshire-Hollywood area with no significant concentrations.

Century City - employs over 22,400 persons. Over a fourth of the employees, or 6,100 persons, reside in West Los Angeles. Almost 3,400 are from the Westwood and Brentwood areas and the area surrounding Century City. Nearly 1,200 reside in Santa Monica, 600 in Venice, and 500 in Beverly Hills. Approximately 4,700, or 20 per cent of the total employees, reside in the San Fernando Valley. Van Nuys is the residence of 1,100 persons, between 400 and 500 persons reside each in North Hollywood, Northridge, San Fernando, Thousand Oaks, and Woodland Hills. Approximately 3,000 persons reside in the Palms-Mar Vista and Culver City areas of West Central Los Angeles. South Bay contributes 2,300 employees to the Century City work force with over 400 employees from Inglewood and approximately 300 from Redondo Beach, Palos Verdes, and Manhattan Beach each. There are 1,100 employees from the San Gabriel Valley. However, there are not cities which contribute a significantly large number as the largest number is 175 from Pasadena.

Wilshire South is that portion of the City of Beverly Hills south of Wilshire Blvd. There are 19,700 persons employed in this area. Approximately 1,300 live in the City of Beverly Hills, 1,500 in Santa Monica and 2,400 in the Brentwood-Westwood area. Over 4,200 live in the San Fernando Valley with nearly 1,700 in Van Nuys alone. There are 700 employees from North Hollywood and 500 from San Fernando. Over 3,800 persons are working in this area and reside in the Wilshire-Hollywood area. Slightly less than a thousand live in the South Bay area with over 200 from Inglewood. Approximately 800 persons reside in Glendale and Burbank and 500 in the San Gabriel Valley.

Wilshire North is the area north of Wilshire Blvd. within the City of Beverly Hills. Over 32,500 persons are employed in this area. The largest number reside in the West Los Angeles BSA where 8,700 persons live that are employed in Wilshire North. Over 1,600 live in Santa Monica, 2,100 in Beverly Hills, and 3,700 in Westwood-Brentwood. Approximately 8,500 persons reside in the San Fernando Valley. The largest concentration is the 2,400 persons from Van Nuys. There are also 1,400 employees from North Hollywood. There are approximately 700 employees from Canoga Park, Woodland Hills and San Fernando each. Approximately 3,400 employees reside in West Central Los Angeles with most of them in the Palms and Mar Vista areas. Nearly 5,700 residents of the Wilshire-Hollywood area work in this area. South Bay is the residence location of 2,200 employees with 300 from Inglewood and Manhattan Beach each. Approximately 1,000 employees reside in Glendale-Burbank and the San Gabriel Valley each.

Pacific Palisades has an employment population of 4,600 persons. The vast majority of these employees come from the Wilshire-Hollywood and San Fernando Valley. Of the employees surveyed, over half reside within the Pacific Palisades area and 500 persons reside in Santa Monica.

Miracle Mile has an employee population of 50,200 persons. The largest number of these comes from the Wilshire-Hollywood area where 15,000 of the employees reside. Over 8,400 employees from this area reside in the San Fernando Valley. Approximately 2,900 live in Van Nuys and 1,900 in North Hollywood. Nearly 7,400 employees live in the West Los Angeles area. Slightly over 3,100 live in the Westwood-Brentwood area, 1,600 in Santa Monica, and 1,200 in Beverly Hills. Over 4,600 employees reside in West Central Los Angeles with most of them in Palms, Mar Vista and Culver City. Nearly 4,400 residents of the South Bay area are employed in this area. Approximately 2,500 residents of Glendale-Burbank and the San Gabriel Valley also work in Miracle Mile. Over 1,400 employees of this area reside in Orange County and there is an equal number from the East-Northeast area.

Mid-Wilshire has an employee population of over 31,400. Nearly 6,700 are residents of the Wilshire-Hollywood area and 5,700 from the San Fernando Valley. Approximately 1,300 of the residents are from Van Nuys and North Hollywood respectively. The same number also comes from Glendale and Burbank each. Nearly 2,900 of the employees reside in South Bay and 2,700 in West Los Angeles and West Central Los Angeles each. Over 3,300 employees live in the San Gabriel Valley with nearly 700 from Pasadena and over 1,200 are from the Eagle Rock-Highland Park area. Only 800 are from the Mid-Cities RSA and 700 from South Central Los Angeles and Orange County each.

Wilshire Center has nearly 38,600 employees. Nearly 9,500 are residents of the Wilshire-Hollywood area. Over 5,000 residents of both Glendale-Burbank and the San Fernando Valley are also employees of this area. Approximately 4,500 employees reside in the San Gabriel Valley and 3,200 in South Bay. There are no

cities in either of these areas in which Wilshire Center employees are concentrated. Even though most of the employees of this area reside in the area to the northwest and northeast of the zone, there are significant numbers from South Central, Mid-Cities, and Orange Counties comprising nearly 3,400 persons.

Sunset Strip has over 22,000 employees. The largest number of them live in the Wilshire-Hollywood area with 6,500 and nearly 5,000 in the San Fernando Valley. Approximately 1,300 live in Van Nuys and 1,400 in North Hollywood. Slightly over 3,100 live in the West Los Angeles area and 2,500 from the West Central Los Angeles. Only 1,400 are from the Glendale-Burbank, 700 from East-Northeast and 600 from the San Gabriel Valley.

Hollywood has an employee population of 56,600. Approximately 15,800 live in the Wilshire-Hollywood area and 15,600 from the San Fernando Valley with nearly 5,700 are from North Hollywood. Nearly 8,400 are from the Glendale-Burbank area and 3,200 from West Central Los Angeles. Over 3,300 of the employees reside in the West Los Angeles RSA. Nearly 3,000 are from the San Gabriel Valley. However, in all these areas, there are no concentrations and the employees are rather widely spread over the area.

Echo Park has an employee population of over 27,700. Approximately 5,000 are from Wilshire-Hollywood and the San Fernando Valley, each with slightly over 1,000 from North Hollywood and Van Nuys. Slightly over 5,000 employees are from the Glendale-Burbank area. Over 2,500 are from the West Los Angeles RSA of which 1,200 come from the Palms-Mar Vista area. Nearly 2,300 reside in the San Gabriel Valley.

Westlake has an employee population of 63,400 persons. It is interesting that that largest number of employees come from the San Gabriel Valley. There are 12,300 persons who live in the San Gabriel Valley and work in this zone. Nearly 1,700 live in Pasadena, 1,400 in Alhambra, 1,000 in Arcadia and Monterey Park each. Over 7,600 employees come from the Wilshire-Hollywood area, 8,100 from South Bay and 7,200 are from the Glendale-Burbank area. Of the 6,700 employees from the San Fernando Valley, 1,800 reside in North Hollywood and 1,400 from Van Nuys.

University is the employment location of 28,000 persons. West Central Los Angeles is the area of residence of 5,600 of these employees with the majority of them living in the eastern half of the area. Over 4,100 reside in South Bay with half in or near Inglewood. Approximately 2,600 come from Northeast Los Angeles and the San Gabriel Valley each. Over 3,600 reside in the Wilshire-Hollywood area.

Santa Barbara is the site of 26,600 jobs. The majority of the employees are concentrated in West Los Angeles, Wilshire-Hollywood and West Central Los Angeles. Over 3,600 employees from this area reside in West Los Angeles with 1,200 in Westwood-Brentwood and 1,300 in Santa Monica. Slightly less than 4,500 employees reside in South Bay. Nearly 800 of them are from Inglewood. Approximately 4,900 employees of this area live in West Central Los Angeles, half of which live in Culver City, Venice, Palms and Mar Vista. The remainder reside in the eastern half of the RSA. Over 3,000 employees reside in Wilshire-Hollywood, mostly in the eastern half, and each 2,700 live in Orange County and the San Gabriel Valley.

Exposition Park has an employee population of 20,500 persons drawn largely from the southwestern quadrant of the study area and East-Northeast. Slightly less than 4,000 employees from this area reside in West Central Los Angeles mostly in the South Central areas adjacent to Exposition Park. Los Angeles is the residence area of 3,300 employees with most of them living in or near the cities of South Gate and Huntington Park. Wilshire-Hollywood and South Bay each contribute 2,400 persons to the work force in this area. Nearly 1,400 come from the San Gabriel Valley. Over 900 employees reside in Mid-Cities and 700 are from Orange County.

West Adams has an employee population of 19,800 persons. The largest number of the employees of this zone live in the West Central Los Angeles RSA and 3,800 live in Wilshire-Hollywood indicating that most of the employees of this area reside in adjacent areas. Over 2,400 employees come from South Bay and 1,400 from West Los Angeles. Approximately 500 each come from Brentwood-Westwood, Santa Monica and Inglewood. Over 1,100 come from South Central Los Angeles and 1,700 from the San Fernando Valley. La Puente in the San Gabriel Valley, has 300 residents employed in this area. Over 700 employees come from Orange County.

Baldwin Hills is the employment location of 24,000 persons. Half of the employees reside in West Central Los Angeles with most of them from the southern portions and in the vicinity of Baldwin Hills. Approximately 5,100 of the employees are from the South Bay of which Inglewood is the residence of 2,400. Nearly 2,600 employees come from Wilshire-Hollywood and 1,000 from South Central Los Angeles.

Silver Lake has an employee population of over 43,000. Approximately 9,400 come from the San Gabriel Valley with over 1,000 from Alhambra and Monterey Park. Over 7,500 are from Glendale-Burbank and 4,300 from the San Fernando Valley. Nearly 3,300 are from Wilshire-Hollywood and 7,400 are from East-Northeast. Approximately 2,000 each come from Orange County and Mid-Cities. Slightly less than 2,100 come from the South Bay.

Travel Mode To and From Bus Stops

The method of travel to and from bus stops was determined by the on-board travel survey. The travel modes are summarized in Table 36. Over 56,000 or 70 per cent of the persons surveyed walk to the bus stop at which they boarded the bus and will walk to their final destination after alighting from the bus, slightly more than 80 per cent walked to or from their boarding or alighting bus stop indicating that approximately 10 to 15 per cent walk either to or from the stop, but use another mode on the other end of their trip.

Over 10,000 persons indicated that they arrived at their bus stop by another bus and 13,000 will board another bus when they alight. Only 2,500 persons, or 3 per cent of the interviewees travel both to and from the surveyed trip by bus, meaning they must transfer at least twice to complete their trip while approximately 15 per cent of the riders surveyed had to make a single transfer.

Table 36

TRAVEL MODE TO AND FROM BUS STOPS

West Los Angeles Transit Planning Study

Mode To	Walk	Bus	Drive	PSGR	Other	N/R	Total
Walk	70	13	335	373	218	798	84
Bus	9	3.0	19	0	132	237	13
Drive	512	83	67	0	-	78	740
Psgr.	843	133	23	24	-	-	1,023
Other	197	78	0	0	16	-	291
N/R	395	65	0	0	-	234	694
Total	81	16	444	397	366	1,347	81,089

Transit Travel Times

A study was made of the travel time between centroids of the study zones in West Los Angeles via transit and auto. For purposes of this analysis, the centroid was either the geographical center or the major activity center of that centroid. The purpose of this study was twofold. The first was to measure the existing level of transit source relative to travel spends. The second was to establish a quantifiable measure of the improved level of transit service obtained by improvements in the transit system. Travel time was selected as this measure because it is one of the few elements of travel that can be related to both auto and transit riders and because one of the objectives of this transit improvement program is the reduction of transit times.

Transit Travel Times - Table 37 shows the peak hour travel times between the study zones in West Los Angeles along with the number of transfers required to complete the trip. The travel times shown represent the minutes of travel obtained from public timetables. The times used are shown on the network in Figure 30 , which includes not only SCRTD lines, but also SMMBL and CMMBL. The following guidelines were used to calculate the times:

1. The penalty for a transfer was one-half of the longer headway of the intersecting lines,
2. Alternative routes between centroids were checked to assure that the shortest travel time was used even though it may be indirect,
3. Waiting times were one-half of the headway of the bus line taken,
4. Walking rates were assumed to be 3 feet per second,

Table 37

TRANSIT TRAVEL TIME MATRIX

West Los Angeles Transit Planning Study

5. Centroids were located on the bus lines; therefore there were no walking travel times included; however, 5 minutes would be a constant walk time.

Travel times to the hills above Sunset and to Griffith Park were not calculated primarily because of the inaccessibility to transit services. One of the major observations was the long travel times from Marina del Rey, Venice, and Culver City to the Westwood and West Los Angeles areas. Mar Vista was an area that had difficult access to or from any area within West Los Angeles except the immediately adjacent areas. Travel times between the study zones in the eastern portion were good and the number of transfers were down to one or none in all but a few cases. This is because of the short headways and number of heavy truck lines. The portion west of La Cienega was difficult to travel to and from except for those areas along Wilshire, Santa Monica Boulevard and Olympic Boulevard. Travel north-south between zones in the western portion were long and required several transfers.

An interesting side note is that this analysis confirmed many of the complaints received from the public at meetings and through letters. However, the problem in alleviating these long travel times is the fact that there are other transit operators providing service in the western portion of the study area. Because of this it is difficult to make mitigating improvements.

Auto Travel Times - A travel time matrix similar to the transit travel time matrix was constructed for autos and is shown in Table 38. These statistics were obtained from travel times recorded from driving the routes between centroids during peak commute hours. This data was then used to calculate the ratio of transit travel time to auto travel time from centroid to centroid. These ratios are shown in Table 39. This ratio

TABLE 31

TRANSIT - AUTO TRAVEL TIME MATRIX

West Los Angeles Transit Study

	Marina	Venice	S.Mon. N.	S.Mon S.	WLA	Culver	MarVista	Palms	Westw'd	Century	Wilshire S	Wilshire N	Mir. Mile
Marina	—												
Venice	1.6	—											
S.Mon.N.	2.7	3.2	—										
S.Mon.S.	2.5	3.2	2.0	—									
WLA	3.3	3.8	1.4	3.1	—								
Culver	1.1	2.1	3.5	2.6	5.9	—							
MarVista	3.6	1.8	3.4	1.6	4.3	1.4	—						
Palms	2.1	3.0	5.0	2.2	5.5	1.3	3.3	—					
Westw'd	3.3	3.2	1.8	1.8	1.6	3.1	2.0	3.4	—				
Century	3.3	3.2	1.7	2.6	1.9	2.5	2.4	2.9	2.4	—			
Wilshire S	3.0	2.7	1.4	2.5	2.4	2.8	2.5	3.4	1.2	2.6	—		
Wilshire N	2.8	2.7	1.6	2.3	1.6	3.1	2.1	3.5	1.4	1.2	1.0	—	
Mir. Mile	2.5	2.6	2.5	3.3	2.5	2.6	3.7	3.4	1.6	1.9	1.4	1.6	—
Mid Wilsh.	2.3	2.5	2.7	3.3	2.7	2.7	3.9	3.4	1.9	2.0	1.6	1.8	2.0
Wilshire Ctr	2.2	2.4	2.6	2.6	2.6	2.5	2.6	3.1	1.9	2.0	1.6	1.9	2.0
Sunset	1.6	2.0	1.7	2.1	1.8	1.8	2.4	2.9	2.0	1.3	2.4	1.4	1.5
H'wd	2.1	2.3	2.3	2.8	1.9	2.4	2.8	2.9	1.8	1.6	2.1	1.7	2.0
Echo Park	2.1	2.3	2.3	2.6	1.9	2.2	2.7	2.7	1.9	1.7	2.1	1.8	2.4
Wst Lake	2.7	2.6	2.7	2.7	2.7	2.7	3.7	3.2	2.0	2.0	1.6	1.8	1.9
University	2.1	2.8	2.2	2.5	2.7	3.1	3.4	2.9	3.2	1.9	2.4	2.3	2.6
S. Barbara	2.4	2.6	2.8	3.3	2.8	3.1	4.4	4.2	2.9	1.8	2.3	2.2	2.4
Ep. Park	2.4	2.3	2.4	2.7	2.8	3.0	3.9	4.0	2.9	1.9	2.3	1.7	3.1
W. Adams	2.2	2.6	4.4	4.8	3.6	3.9	5.5	5.8	3.1	4.0	2.3	2.3	2.5
S. Vermont	2.4	2.6	2.4	2.1	2.9	2.7	3.4	3.4	2.4	1.2	2.4	1.8	2.8
Baldwin H.	1.6	2.4	3.7	2.4	2.6	2.9	4.1	3.9	2.7	2.6	2.2	2.2	2.2
[illegible]lake	1.4	2.1	1.7	2.0	2.1	1.8	2.6	2.3	2.1	1.7	2.0	1.8	2.1

TRANSIT - AUTO TRAVEL TIME MATRIX
West Los Angeles Transit Study

	Mid Wilsh	Wilsh. Ctr	Sunset	H'wd	Echo Park	West Lake	University	S. Barbara	Exp. Park	W. Adams	S. Vermont	Baldwin H.	Silverlake
Marina													
Venice													
S.Mon.N.													
S.Mon.S.													
WLA													
Culver													
Mar Vista													
Palms													
Westw'd													
Century													
Wilshire S													
Wilshire N													
Mir. Mile													
Mid Wilsh.	—												
Wilshire Ctr	2.0	—											
Sunset	2.1	1.9	—										
H'wd	1.9	2.1	2.0	—									
Echo Park	1.9	1.3	2.0	2.0	—								
West Lake	1.8	1.7	2.0	2.4	1.8	—							
University	2.3	2.3	2.6	1.7	1.8	2.4	—						
S. Barbara	2.9	2.0	2.0	1.9	1.6	2.6	3.0	—					
Exp. Park	2.5	2.1	2.0	2.0	1.7	2.6	1.4	2.5	—				
W. Adams	3.4	2.8	2.2	2.2	2.2	2.5	2.1	3.7	3.0	—			
S. Vermont	2.2	2.6	2.2	1.9	2.2	2.8	1.6	2.0	1.8	2.5	—		
Baldwin H.	3.0	2.2	2.0	2.1	2.4	2.3	2.3	2.8	3.0	1.9	2.4	—	
Silverlake	2.1	2.1	1.8	2.0	2.0	1.7	1.6	2.2	1.8	2.3	1.6	2.3	—

P. 117

Table 40

MODE OF TRAVEL TO WORK

West Los Angeles Transit Planning Study

STUDY ZONE	TRAVEL MODE TO WORK								
	BUS	DRIVER	CARPOOL	PASS.	TAXI	WALK	OTHER	N/R	TOTAL
Culver City	1224	17912	306	1054	85	1054	477	170	22282
Venice-Marina	1079	26991	854	1821	32	554	491	229	32051
S.Monica So.	1088	15132	860	1839	20	798	578	140	20405
S.Monica No.	3913	27703	1012	2502	16	2602	994	224	38966
West LA	1573	25181	2456	1781	46	627	324	46	32034
Palms-MarVis	2181	16075	223	1303		887	136	67	22877
Westwood	3629	26748	1285	1428		1026	404	217	34737
CenturyCity	2368	17100	1014	1244		297	321	81	22420
Wilshire So.	3759	13666	296	1151	43	427	213	171	19706
Wilshire No.	5482	25301	1114	1623	21	643	213	107	32504
Pac.Palis.	498	3110	125	124		623		125	4605
MiracleMile	6536	37060	1478	2515	37	1516	370	222	50154
MidWilshire	5451	18828	2809	2551	39	1259	269	217	31423
WilshireCtr	7892	28170	1726	3663	79	2123	242	170	38585
SunsetStrip	2829	17597	620	1126	21	513	229	42	22073
Hollywood	8382	48587	1363	2627	53	1997	477	130	56576
Echo Park	1980	23105	812	1116	51	555	101	102	27722
Westlake	19573	32310	5343	4875	53	563	376	294	63387
University	5408	19383	870	2212		185	92	186	28031
S.Barbara	1832	19870	1563	1953		947	474	56	26635
Exp. Park	4355	13746	435	1376		368	168	101	20549
W. Adams	3113	14844	161	749		266	643	54	19830
BaldwinHill	5425	16797	86	948		602		86	23944
Silver Lake	5380	28520	4754	3214		788	212	178	43026
Total	99316	526316	31040	44795	596	21220	7804	3415	734502

Table 41

TRAVEL MODE TO WORK BY SEX AND AGE

West Los Angeles Transit Planning Study

SEX	AGE	TRAVEL MODE TO WORK- BUS	DRIVER	CARPOOL	PASS.	TAXI	WALK	OTHER	N/R	TOT
Male	16 - 24	4990	24915	866	1455		1577	1082	223	351
	25 - 44	14725	137705	9345	5899	100	3795	2847	623	1749
	45 - 64	6510	79993	5879	3827	14	1936	1106	474	1015
	65 & Over	401	3998	59	173		133	19		46
	N/R	2240	14505	460	906		659	314	84	189
Subtotal		30866	261014	16609	12260	114	8100	5368	1409	3351
Female	16 - 24	15352	45975	3006	7496	114	2590	532	298	758
	25 - 44	29502	159774	7497	14862	185	5496	1194	557	1990
	45 - 64	17056	53936	3169	8199	66	3921	465	542	923
	65 & Over	522	1387		126	49	122	36	116	23
	N/R	4207	9654	378	1273	17	561	52	56	161
Subtotal		67139	268724	14050	31956	431	12690	2279	1569	3853
N/R	16 - 24	97	551	73	47		35		73	8
	25 - 44	405	2728	66	210		137	14	33	35
	45 - 64	434	4080	159	218		205	33	87	52
	65 & Over	36	370	16		51	16		27	5
	N/R	517	2049	87	304		37	110	217	33
Subtotal		1511	9778	401	779	51	430	157	437	135
TOTAL		99516	526516	31040	44795	596	21220	7804	3415	7345

Table 38

AUTO TRAVEL TIME MATRIX

West Los Angeles Transit Planning Study

WEST LOS ANGELES TRAVEL

TIME ASSIGNMENTS

WSA

Figure 30

provides an index which is indicative of the level of transit service.

The highest ratio of 5.9 was between West Los Angeles and Culver City. A third of the travel time between these zones, however, was due to delays encountered in transfers because there is no direct service between them. A comparable ratio was for travel between West Adams and Palms. Again, the high ratio was due to delays at transfers. The analysis of these ratios indicate that in the service areas of the other transit operators interzonal transit travel is handicapped by indirect routing necessitating transfers where delays of up to 30 per cent of the total travel times are encountered in waiting for a bus.

Interzonal transit travel in the eastern half of the study area averages slightly over twice that of the auto. This is primarily because the lines are more direct, the frequency of service is better, and the majority of travel can be accomplished with one or no transfers.

Travel Mode of Work Trips

The mode of travel used by employees to travel to and from work was determined for each study zone by the employee travel survey. This data is shown in Table 40. Approximately 14 per cent travel to work by bus while over 70 per cent drive to work. Nearly 76,000 persons are either passengers or participate in a carpool. The driver of the carpool most likely indicated that he was an auto driver on the survey and is therefore is included in that category rather than in the carpool category.

Table 41 shows the travel mode to and from work by sex and age group. Nearly a tenth of the employees are females who ride the bus to and from work. Approximately 260,000 males and

females each drive to work and twice as many women as men are auto passengers. Four per cent of all employees are female, between 25 and 44 years old, and ride the bus.

Chapter 5

EVALUATION OF TRANSIT SERVICE

The evaluation of a transit system requires the use of established transit planning criteria. Therefore, the first step in developing a transit improvement program is to define the criteria upon which the existing and proposed transit systems will be evaluated.

The evaluation factors can be divided into two groups: one based on those considerations of the transit passengers and those of the transit operators. The major areas of concern to the transit patron are coverage, frequency of service, directness of routing, and travel times while the primary concerns of the transit operators are cost per mile of operation and revenue miles of passenger service.

Therefore, a major objective of this study was to establish guidelines for development of a high quality rapid transit system with features designed to attract new ridership as well as to retain present patronage. To attain this objective, certain criteria for levels of service were developed and are presented in this section.

Routing Criteria

Since a bus line cannot operate directly between each individual's point of trip origin and destination, routings must be designed to provide the greatest convenience possible

for the most people. This service must be provided within limits of economic feasibility as determined by operating costs, passenger revenues, and the existing street system.

Coverage - In the United States, any area within one quarter-mile (1,320 feet) of a transit line is considered to be within a reasonable transit service area. This generally accepted guideline is based on a normal walking speed of approximately 250 feet per minute, or slightly over 5 minutes for a quarter-mile walk.

Directness of Routing - Direct and simple routings between trip origin and destination points are desirable. Crosstown travel should be reasonably easy and should require a minimum of transferring from one bus to another.

To promote public knowledge and familiarity with transit route lines, the routes should follow the same street inbound and outbound, except where prevented by one-way street regulations or when one-way loops are used in outlying portions of routes to expand the service coverage in low-density areas.

Turning movements should be minimized on each route, and provisions should be made for turn-around at each end of line. The outer-end and turn-around loop generally should be as short as possible, except where substantial added patronage can be achieved by a wider loop.

Radial Routes - Since the Central Business District (CBD) and such major trip generators as governmental, medical, educa-

tional, and cultural complexes represent the main concentration of bus transit destinations, the principal transit routes generally radiate from the city center to outlying sections.

In order to provide quarter-mile service coverage on each side of the radial lines, these routes should be spaced no closer than at half-mile intervals, to the maximum degree feasible. In some instances, however, routing compromises are necessary because of inadequate street patterns, lack of street pavement, and such topographic barriers as cliffs, mountains, rivers, and streams.

Construction of new urban freeways also will sometimes require transit route adjustments on local streets, but have offsetting benefits in that the freeways generally divert considerable traffic from surface streets and thus permit higher transit operating speeds.

Function of Crosstown Lines - Circumferential (crosstown) lines provide linkages between neighborhoods and individual communities and important commercial, service, and employment subcenters, as well as interconnecting two or more radial lines so that passengers making trips between two outlying locations can take more direct routes instead of being required to make unwanted trips to a central transfer location to transfer to another line to reach their trip destinations.

Crosstown lines generally serve only riders who are transferring from a major radial line, and rarely generate sufficient farebox revenue to cover operating costs. However,

they are often justified in terms of giving support to main radial lines, as well as in reducing the need for riders to travel longer distances in order to transfer to a line serving their destination point.

Duplication of Coverage - Any area within a quarter-mile of more than one bus line utilizing a parallel route is considered to have a duplication of service. This is often necessary and desirable when bus routes converge on a central area, or within heavily traveled corridors leading to that area. Such duplication can be used to provide shorter headways and to reduce overcrowding of buses.

At other locations, however, duplicating lines tend to divide potential patronage and diminish the amount and frequency of service that can be operated on any one line. Duplication of coverage thus may be beneficial in some areas but detrimental in other areas.

Operating Criteria

The determination of essential levels of transit service involves consideration of travel time, convenience, and cost of operation. These factors both influence and are influenced by the area served.

Loading - The standards for passenger loading are probably the single most important consideration in the economic success of a transit operation.

The peak-hour loading standards should be such that the maximum number of passengers passing any point would not exceed 150 per cent of the seating capacity of the bus, when averaged over a 30 minute period.

Ideally, every passenger would have a seat; however, loading standards are a compromise between what the transit operator would like to do and what he can afford to do. Load standards of 110-120 per cent may become attainable through public understanding and cooperation.

During the base (midday) period, the maximum number of passengers should not exceed 100 per cent of the seating capacity of the bus.

Frequency of Service - The headway (time spacing) between buses determines the frequency of service. Headways to be operated during any period must be considered in connection with passenger loads generated during that period.

The maximum headway or the travel time for one round-trip, should not exceed one hour. If possible, the running time should be adjusted to provide even headways which will be repetitive from hour to hour.

During the base period, the governing consideration for a minimum headway is the "policy headway" rather than volume of passengers carried. While service could be reduced and still provide ample seats in this period, it would be poor business to lengthen headways, because enough people would be lost as riders to offset any savings in operating expenses.

For a high level of transit service, base-period headways should be one-half hour at maximum. For peak travel hours, headways on heavily patronized lines should be less than 15 minutes when passenger loads (at the maximum load point on each line) approach 150 per cent of seating capacity.

Schedule Adherence - Dependability of service is an important measurement of transit performance. Schedule adherence is considered good if buses meet time schedules 90 per cent of the time during the base (midday) period, and 70 per cent of the time during the peak periods.

Buses are considered "on time" if they pass their time check locations on each line no earlier than one minute before scheduled time and no later than three minutes beyond scheduled time. This standard is commonly accepted industry practice for measuring schedule adherence.

Travel Speed - Buses should be operated at the highest practical speed consistent with safety, frequency of passenger stops, density of traffic, and operating characteristics of the street system. Traffic improvements which will permit transit vehicles to travel at increased speed should be considered and implemented.

From the standpoint of operating economy, the average speed of buses should approach 15 miles per hour for local service, which takes into account time losses due to curb stops for loading and discharge of passengers; 20 to 25 miles per hour for express (non-stop or limited-stop) service on arterial streets, and 35 to 40 miles per hour for express service on freeways.

For local service routes, efforts should be made to select streets which are continuous, with a minimum of jogs. Narrow streets with extensive curb parking and heavy traffic turning movements into and out of roadside commercial and industrial

establishments generate frequent traffic delays. These should be bypassed unless alternate routes are not available to adequately provide transit service within the neighborhood.

Criteria for Bus Stops

A generally accepted criteria for bus-stop spacing is one stop every 600 feet, for local transit service, or approximately every 2 blocks under the usual city street pattern. This means a maximum lateral walking distance for riders of only 300 feet, or less than 1.5 minutes walking time.

Closer spacing of bus stops would increase the number of stops by buses for pickup or discharge of passengers, thereby sharply reducing bus travel speeds and making the service less satisfactory for all riders.

Longer spacing of stops is desirable when a bus traverses relatively undeveloped sections of the urban area on portions of its route, since the few passengers that might be lost by the longer spacing will be more than offset by the reduction in delays and travel time for the great majority of riders.

Bus Loading Zones and Bays - Loading zones are curb spaces reserved for bus stops, with stopping or parking by other vehicles prohibited. Loading bays are created by cutting back a street curb to create space where buses can pull out of the traffic stream to load or discharge passengers.

All bus stopping areas should be clearly marked. On streets where curb parking is prohibited, only a standardized identification

marker and sign are needed. The identifying sign should be attractive, highly visible, and vandal-proof.

When curb space is reserved for bus loading zones, informational signs should be erected to warn motorists of the no-stopping regulation, and the designated space should be clearly identified by distinctive painting of the curb.

Lengths of Loading Zones - A "nearside" bus stop (a bus loading zone ahead of an intersection) should preferably be about 100 feet in length, measured from the front of the halted bus to the front of the nearest legal curb parking space behind the bus. An additional 45 feet is desirable for each additional bus expected to stop simultaneously at that location.

A "farside" bus stop (across the interesection) should preferably be 80 feet long, measured from the rear of the halted bus to the rear of the nearest curb parking space ahead. The same additional 45-foot length for stopping by each additional bus is needed as in the case of nearside zones.

A midblock bus zone for a single bus should be 140 feet long, with another 45 feet for each additional bus making a simultaneous stop. Similarly, when a street curb is indented to create a bus loading bay, a 140-foot space clear of parked vehicles is desirable to permit buses to enter and leave the loading bay safely and conveniently.

Transit Terminals

At major trip-generating and transfer locations, special terminal facilities are desirable. These facilities should be

designed to accommodate large numbers of passengers, and to facilitate prompt interchange from one transit line to another

They also should include such passenger conveniences as pay telephones, waiting areas, restrooms, coin-operated newspaper vending machines, and display racks containing printed schedules of all transit lines serving the particular terminal, as well as a systemwide route map.

Transit Fare Structure

If viewed strictly as a commercial enterprise, urban transit must restrict its operations to those inner parts of an urban area which have sufficient population density, and involve sufficiently short routes, to meet all operating costs from farebox revenue and provide additional revenue for periodic equipment replacements and other capital improvements. This view has led to the collapse of many transit systems.

Provision for levels of transit service sufficient to achieve a better balance between private and public transport, to relieve peak-period urban traffic congestion and air pollution, to provide for the needs of persons who must depend on transit for mobility, and to expand service into newly developing outlying areas requires that public funds be utilized to help meet operating and capital costs.

Under the "community benefits" approach to transit financing, now being adopted by an increasing number of cities and states throughout the nation, transit fares are being held at levels which do not increase out-of-pocket costs to riders. Various

types of state and/or local government financial grants are being made to cover transit operating losses as well as to provide the local share of costs for new buses and other capital investments which are eligible for two-thirds Federal grants.

Transit Fare Increase Impacts - The formula historically used in the transit industry is that each 10 per cent increase in average fares results in a 3 per cent immediate decline in patronage. This fare-impact formula has been found to be generally valid over the years.

In addition, growth in automobile ownership, and expansion of population into low density outlying areas, has a further adverse impact on transit riding. At some point, fare increases to meet rising transit operating costs can become self-defeating by discouraging ridership to a degree that total revenue is lower after a fare increase than before it.

Because the basic objective of improving and expanding urban transit service today is to encourage the highest possible level of ridership, particularly during the peak morning and afternoon travel hours when urban freeways and major streets are critically overloaded, substantial transit fare increases would be in direct conflict with this objective.

Transfer Fares - A transfer generally involves a substantial time loss in trip-making, because of the need to leave one bus, then wait for the arrival of a second bus. Since bus schedules cannot be adjusted to fit requirements of all transfer passengers, this may involve a wait of up to 30 minutes when buses operate on half-hour headways.

When a special charge is imposed on a transferring passenger, he is, in effect, being doubly penalized: first, by the extra charge collected because the first bus does not travel to his trip destination; and second, by the lost time involved in making the transfer.

The need to make a transfer, combined with the additional charge, usually discourages an individual from using public transportation unless he has no alternative travel mode available.

Reduced-Fare Riders - It is desirable to provide reduced fares for certain segments of the population. Such groups might include students, senior citizens, and persons with handicaps.

Administrative procedures must be developed to identify those eligible for reduced fares in order not to require the bus driver to make judgments about the eligibility of particular riders. Such judgments often lead to arguments or physical violence, and always cause delays and embarrassment.

Ride Promotion and Information Services

While regular transit riders generally are aware of the routes and frequency of service of the bus lines they patronize, a high per cent of non-riders or persons who rarely use bus service have little knowledge about the location of bus stops, their routes, and service frequency.

A key criteria of any program seeking to increase transit ridership, therefore, is a transit route promotion and information activity. This involves such services as:

1. Installation of a small metal receptacle at a conspicuous location on each bus, containing printed leaflets which show the route of the line, and the time schedule for successive bus arrivals at selected locations along the route.

2. Advance notice of new routes and schedules should be prepared, and placed in the leaflet receptacle on all affected runs, well in advance of the date of any change in a schedule or route. In addition, a large display poster should notify riders of the impending change, and call attention to the revised schedule leaflets.

3. A complete map of the transit system routes, and schedule leaflets for all routes, should be provided at all major terminals and transit passenger shelters.

4. A customer service office should be provided, where maps, schedules, and various types of customer information and services can be available from transit system staff during regular business hours. These special services include processing of inquiries regarding articles lost on buses, and issuing tickets to persons authorized to ride buses at rates below the adult fare.

5. Ride promotion campaigns should be developed. These include weekly and monthly passes, bulk sale of transit tokens at a slight cost savings to riders, door-to-door ride promotion activities in neighborhoods to be served by route extensions, and merchant-participation programs under which customers are given free transit tickets upon making purchases of a specified amount.

Although the relative merits of each of these approaches may vary, it is recognized that special ride-promotion activities are an important element of a good transit operation, and that transit management should be alert to opportunities to publicize new routes and services, and to improve knowledge by the general public of the location of bus routes and the frequency of service on each line.

Goals and Objectives

The goals and objectives developed during this phase of the project differ from those developed in the initial phases of the planning process in that the previous goals established the general work scope to insure the specific concerns of area residents were addresed to be undertaken. The goals and objectives established during the alternative analysis are used to develop the alternative plans for testing and evaluation. In addition to the goals of the communities within the study area, thos of the entire region must be kept in mind and considered. Additionally, the established transit planning criteria used in the evaluation process in Chapter 5 yields goals relative to the operational elements of proposed transit improvement systems.

Regional Transportation Planning Policies

The Southern California Association of Governments (SCAG) has developed a series of policies and programs that not only address those elements specifically related to transportation but also broader and more far-reaching issues. (1) The areas which SCAG has addressed are:

- Land Use
- Air Quality
- Energy
- Accessibility/Mobility
- Allocation of Resources
- Institutional Arrangements
- Technological Change
- Phased Decision-Making

(1) SCAG, 1976 Regional Transportation Plan, April 1976

The individual issues addressing each of these areas will not be discussed. It is sufficient that regional as well as local goals were considered in the development of the various transit improvement alternatives. Also since SCAG is the regional planning authority and will review all sector improvement plans developed for and by SCRTD, their goals and criteria must be considered.

Community Goals and Objectives

A series of meetings were held in the study area with chambers of commerce and civic organizations as well as the planning agencies of the cities involved. Studies and recommendations were solicited from these organizations in order to identify what was expected of a transit system by these communities.

Additionaly community meetings were held at various locations in the study area to solicit comments about the transit service in the West Los Angeles area and to acquaint the public with the study. Although many of the comments were repetitious, several had merit and warranted further consideration. Also there were many comments concerning Santa Monica and Culver City MUNI's and these were passed on to them. The results of these meetings are summarized in Table 42 and is discussed briefly below.

Serve People Without Access to Automobiles -

The study shows that a significant proportion of the study population of West Los Angeles (24 percent of the households in 1970) does not own or have access to an automobile. Unless public transportation is available, many of these people will continue to be further disadvantaged: low-income residents will not have

TABLE 42

GOALS AND OBJECTIVE

WEST LOS ANGELES TRANSIT STUDY

1. Provide an Alternative to the Automobile.
2. Provide Mobility to People Without Access to Automobiles.
   * Young
   * Elderly
   * Handicapped
   * Economically Disadvantaged
3. Increase Interation Between All Parts of the Community.
4. Extend Labor Market and Increase Job Opportunities.
5. Improve Access to Educational and Health Care Facilities.
6. Enhance the Image of West Los Angeles.
   * Existing and New Residents
   * Tourists
   * Industry
7. Help Relieve Traffic Congestion.
   * Downtown
   * During Peak Hours
   * Parking Demand
8. Help Reduce Costs of Personal Transportation to Residents.
9. Aid Comprehensive Planning in Shaping Community Development.
10. Reduce Cost of Social Service Agency and School Bus Transportation.
11. Provide a Modern, Comfortable,Transit System.
    * Frequent Service
    * Modern Buses
    * Convenient Bus Stops
    * Easy-To-Read Schedules and Maps

accessibility to jobs, health care service will not be accessible to the elderly and handicapped, and the young will be dependent upon their elders for transportation.

Increase Interation Between All Parts of The Community -

The availability of public transit means improved interaction of the residents of the West Los Angeles and adjacent areas. Libraries are better utilized civic functions supported, education and employment opportunities increased.

Relieve Traffic Congestion -

The capacity of passengers carried in one bus is the equivalent of over 30 automobiles carrying 1.5 persons per car. Therefore, utilization of a public transportation system will minimize increasing traffic volumes during peak traffic periods, reduce parking demand, and lower automobile emissions.

Provide a Modern, Comfortable Transit System -

Merely providing bus transportation will not in itself encourage people to ride it. Riders expect clean, modern, comfortable vehicles to ride in. They also expect vehicles to be available when they desire to ride. Thus, the frequency of service should be the best the community can afford. Convenience also means that the problem of transferring from one vehicle to another should be minimized, and waiting times for the vehicles reduced to reasonable levels.

Easy-to-read maps and schedules or operating procedures help keep the rider informed about the system. The system must be

advertised and promoted and must be accepted by community residents. Without these elements, a public transit system will not attract or keep its riders.

Summary of Deficiencies

After a complete analysis of the operational characteristics of the existing transit system and the travel patterns and characteristics as defined by the travel surveys, the deficiencies of the existing transit service have been identified in light of the criteria established in this chapter. Deficiencies were further defined by the public during community meetings. The following is a summary of the deficiencies that were identified:

1. SCRTD coverage in the western portion of the study area is much less extensive than in the eastern half of the study area.
2. Travel times in the western half of the study to any other zones exceed auto travel by a factor of 2.5 to 6.0, with some of the higher ratios between Santa Monica South, Westwood, Culver City, Mar Vista and Palms.
3. The residents north of Sunset and Hollywood Boulevards are entirely without transit service.
4. Indirect routing of Lines 3, 4, and 91 create a "stair stepping" alignment and excessively and excessively long inter zonal travel times.
5. Significant delays are encountered by transit riders in making transfers in the western half of the study area, in particular, in the vicinity of Culver City, Mar Vista, and Palms.

6. There is no direct service between Hollywood and UCLA.
7. The number of cutbacks on several east-west trunk lines create difficulty and confusion for the transit rider to determine which bus will travel through to their destination.
8. There is no direct service other than the 91W from the Wilshire-Hollywood corridor to Century City which is a major employment center as well as a shopping area.
9. It is not possible to travel along Third Street without having to transfer three times. This also applies to Sunset, Santa Monica, Olympic, Pico, and Washington Boulevards.
10. There is no direct service between Beverly Hills and South Central Los Angeles.
11. There is a lack of north-south service in the Western portion of the study area.
12. There is no direct service from the Hollywood area to LAX.
13. Split lines such as Lines 4 (Olympic), 89, 91 (S & W) and 42 creates confusion for the transit rider in determining which bus to use.
14. There is no direct service from the San Fernando Valley to the area west of Highland except for Line 88 which stops only at UCLA, Westwood, and LAX as it is a flyer on the San Diego Freeway.
15. There is no north-south trunk line operating across the study area.
16. More base period service is needed along Wilshire, Fairfax, and Vermont.

17. Owl service is extremely deficient in that no line goes west of Century City and most of the lines terminate before intersecting another line making it impossible to travel anywhere to, from, or within the study area during this period.

This listing includes only those deficiencies that pertain to the transit planning process. There are other deficiencies that relate to the other transit operators in West Los Angeles. The major complaint expressed by transit patrons is the difficulty in transferring between operators. However, these are policy problems and cannot be alleviated within the short time till implementation of the transit improvements outlined in this plan.

CHAPTER 6

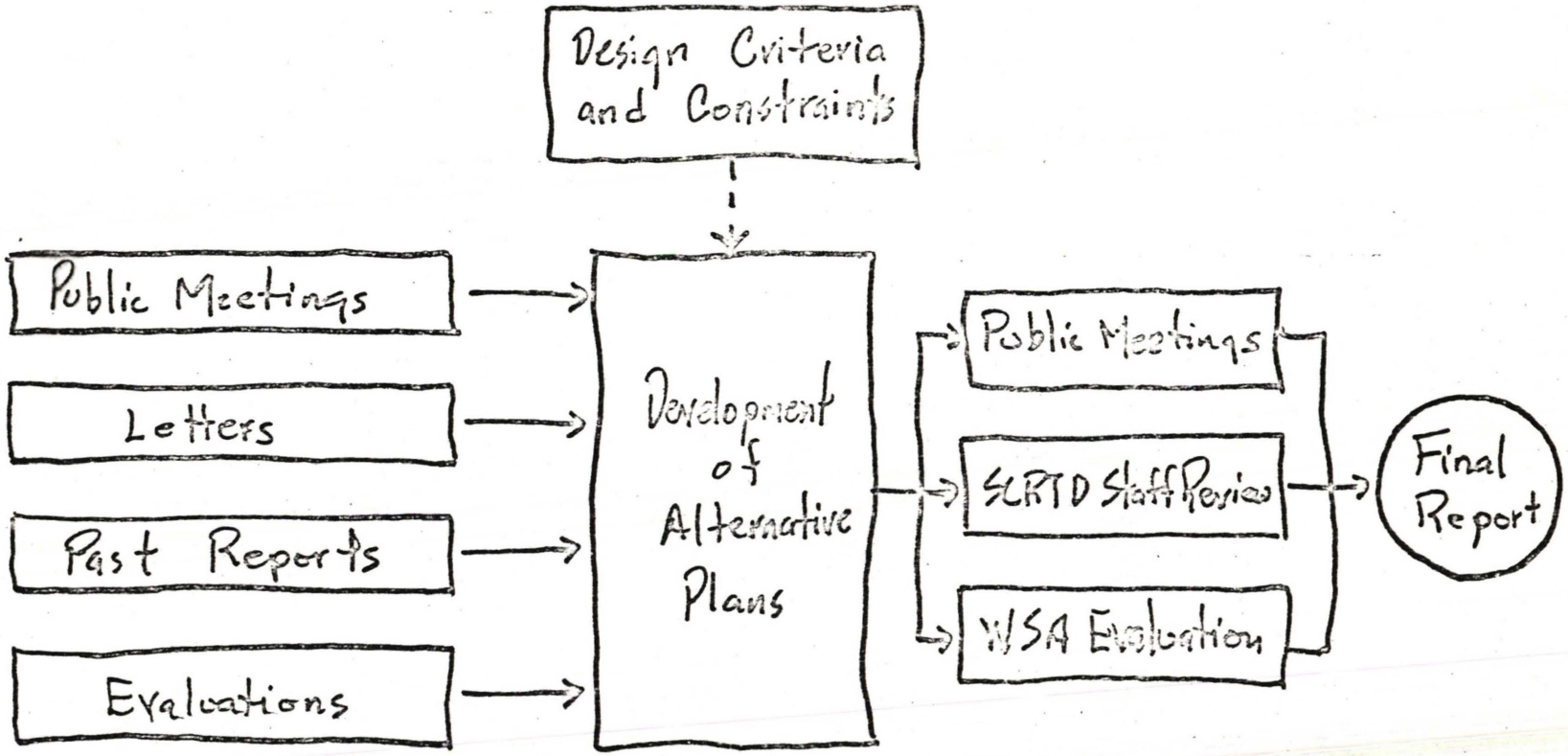
ALTERNATIVE SERVICE PLANS

The development and evaluation of alternative transit improvement concepts is the first step in the preparation of a recommended transti plan. The number of alternative concepts to be evaluated can vary greatly depending on the amount of input from various sources.

The principal element of effective transit planning is the reduction of a number of alternative concepts to a single recommended plan which will provide the optimum level of transit service within the economic and technical constraints imposed by real world considerations. The process of developing a transit improvement plan for West Los Angeles is shown schematically in Figure 31.

Prior to the development of the final plan, a number of alternative concepts must be developed and evaluated in order to determine which system can best satisfy the adopted objectives of the program. The alternative concepts which are evaluated are developed based upon input from a number of sources including public meetings, written requests for improved service, as well as civic organizations. Additional input is obtained from past planning studies conducted in the area, established community goals and objectives, and the evaluation of the existing transit system relative to established transit planning criteria and experience.

The final transit improvement concepts developed during this study are presented in the following sections of the chapter. Prior to the development of the alternatives, transit service



WEST LOS ANGELES PLAN DEVELOPMENT

WSA

Figure 31

concepts, the goals, objectives, and constraints used as an overall guide in the development of alternatives were identified and discussed in the previous chapter.

TRANSIT SYSTEM PLANNING

A series of transit improvements are required in West Los Angeles to better serve current transit patrons, improve resident mobility and to provide a viable alternative mode of travel. A comprehensive transit program will be necessary to meet the expanding economy and continued growth of intra-urban and inter-urban travel in and adjacent to the study area.

The planning of these improvements must be carefully developed through a systems approach which recognizes and evaluates individual community requirements in terms of regional travel demands. Transit system planning therefore, sets forth planning principles and concepts and evaluates a variety of alternative concepts in terms of regional goals and objectives. The transit requirements of West Los Angeles are too complex to allow for continued expansion and development of new routes purely on a local basis.

Transit system planning therefore, should reflect a careful balance between regional travel desires, local service requirements and transit system capabilities. Effective transit system planning can produce plans which are innovative yet meaningful and practical. Transit system planning recognizes the need to balance transportation concepts with the economic resources of the region.

Development of a regional transit system which affords optimum efficiency and economy suggests a broad strategy for system planning. Existing well patronized lines should be optimized to the maximum extent possible. New and improved routes should be provided in travel corridors where major trip movements exist and in corridors which have the highest potential for developing increased transit patronage.

Planning Principles - A series of transit planning principles were established to guide the development and evaluation of alternative transit improvements for West Los Angeles. These transit planning principles serve to develop a systemwide program after the deficiencies of the individual lines and service areas have been identified. The major transit planning principles utilized for the San Gabriel Valley Planning study included:

- Through Routing Techniques - "Through routing" is defined as the continuation of a route through a major generator. This is usually the CBD, but may be any area where a large number of potential transit trips will be generated. This principle is in contrast to the basic route structure in which a route terminates at the generator. Since unnecessary transfers will readily discourage the use of transit by those trip makers who have the option of using automotive transportation, through routing has potential in that it enables a transit passenger to travel to his destination with less chance of having to make a transfer.

To accomplish through routing effectively, the following criteria must be satisfied:

1. Two routes should serve travel corridors which are located on opposite sides of the CBD or a major generator.
2. The number of buses required and the times during which there is a demand for service must be nearly identical.
3. There should be an existing or potential demand for through travel for a portion of the transit riders.
4. Both routes should be stable and well-established since one cannot be changed without affecting the other, and
5. The combined length of the two routes should not be excessively long and should permit convenient scheduling and operation.

Downtown Routing - A significant improvement in the operation of the bus system can be accomplished by consilidating several routes along a few streets which can be operated to optimize bus traffic. The benefit derived by bus patrons is that with buses concentrated on fewer streets they can choose between several routes which would serve their travel desires equally well. Headways are decreased and transfers are also facilitated by eliminating the need for patrons to walk to another site. A side effect of this improvement is that auto traffic operations on streets from which these buses are removed will be improved.

- Bus Priorities - Express bus demonstration projects have shown that tripmakers can be diverted from auto to bus if they can realize a significant time saving. Not only are bus priorities justified in attracting additional bus riders, but also because buses, due to higher passenger loadings and lower pollution rates per passenger, are more efficient than automobiles. Bus priorities are appropriate on radial travel routes and in downtown areas since buses use a sizeable portion of the curb for bus stops. Bus priority measures are:

    1. Exclusive bus lanes which may be curb lanes, median lanes, or contraflow lanes.
    2. Busway and exclusive bus streets,
    3. Semi-exclusive facilities to be shared with other high-use vehicles,
    4. Signal phasing, timing, and operation at intersections that would favor buses, and
    5. Express bus routes.

- Improved Transit Coverage - Analysis of socio-economic data and the coverage area of the existing transit system will usually reveal areas that are not served. Consideration should be given to expanding bus service to cover these areas if this area has a potential for producing transit trips. However, the choice must be made between extending existing routes to cover those areas or introducing new routes.

- Schedule Adherence - Irregular and unreliable transit service will readily discourage riders and will result in their loss to the auto. Therefore, it is necessary to have

schedules that are realistic for both highway travel time and passenger loading conditions during peak and off-peak hours and for various days of the week.

- Frequent Service and Policy Headways - Studies have shown that as the headways between bus runs increase, transit utilization declines rapidly. In fact, with a headway of 20 minutes or more, only 75 per cent of the potential passengers are being served. Therefore, the headways between bus runs should be as small as is economically and operationally feasible. Bus frequency should be based on the following considerations:

    1. The existing demand as determined from actual field counts;
    2. The existing demand plus potential demand; and
    3. Policy considerations for minimum service.

- Route Rationalization - Ideally, bus routes should run along the major arterials or major streets outward from the city center in a radial pattern. However, in the San Gabriel Valley, many transit passenger origins are located off of the major arterials, this systmm may not be practical for all areas and a more circuitous route must be followed. Therefore, a compromise is required between minimum operating costs and maximum patronage.

- Principle of Route Numbering - The adoption of a simple and logical system of route numbering allows patrons to know which buses serve the area and their origin and/or destination.

Development of Alternative Concepts

At the outset of this project it was established that no new equipment would be available to implement new services. Therefore, the overriding constraint on the development of a transit improvement plan was to maintain the number of buses required to operate in West Los Angeles at the present level. The fact that funds may become available at some future date for capital expenditures permitted the development of a long-range alternative that would require major expenditures but would have to be prioritized on a cost effectiveness basis.

Another major constraint was the fact that there were two other transit operators in the West Los Angeles study area - Santa Monica Municipal Bus Lines and Culver City Municipal Bus Lines. Under the conditions of the Transportation Act of 1971 (SB325) no changes can be made in routing by an operator within three-quarters mile of the route of another operator without mutual consent.

Bearing in mind these constraints and the regional and community transportation goals and objectives, there are three alternative transit improvement alternatives. These alternatives were:

Alternative 1 - The Basic Grid
Alternative 2 - Short-Range Limited Improvement Plan
Alternative 3 - A Long-Range Transit Improvement Plan

Each of these systems was evaluated on a conceptual basis to determine the most attractive aspect relative to the particular geographical and socio-economic characteristics of West Los Angeles.

Basic Grid Plan - The development of a series of north-south and east-west routes on one-half mile intervals has been advanced as a desirable concept for the topography of the Southern California area. The operation of transit routes on streets at one-half mile intervals would insure all residential areas would be located within one-quarter mile walking distance of a transit line. The one-quarter mile distance is designated as the maximum walking distance desired by residents for reaching a transit boarding location.

The concept of the basic grid plan, therefore, is to provide maximum coverage throughout the area. The development of "policy" headways of 20 minutes or less on this basic grid network ensures a high level of transit service over an extended coverage area. Among the advantages of the transit grid plan are the high coverage factors and service levels that can be obtained from the system. In addition, a grid system is easily understood by residents and can be utilized extensively without schedules.

The disadvantages of a grid transit system include inefficiency of operation and indirectness of routing. A basic grid plan, to be effective, must operate continuously over long stretches of roadway which, in many instances have low-transit demand. Within the West Los Angeles study area, a absic grid plan would have to cross various industrial, vacant, or open space areas where there are little transit origins or destinations, but is necessary to keep the grid concept in operation. This through routing over many long areas would produce little transit patronage and serve to be inefficient and costly in terms of transit operation.

The grid plan also requires a transfer with almost all transit trips. In many instances, two or three transfers are necessary to reach the final destination.

Even with high frequency headways, the time lost in transfers and the inconvenience associated with the indirectness of travel becomes more of a disadvantage than the high level of coverage produced by this plan.

A basic grid plan would encounter problems in West Los Angeles that would hamper its implementation and operation. The major impediment would arise from the other municipal transit operators in the area, Santa Monica and Culver City, who most likely, would not like the arterial streets in their service area taken over by SCRTD.

Another factor is that West Los Angeles contains several of the most heavily traveled corridors in the region. The basic headway inherent in the operation of a grid system would leave Wilshire, Santa Monica, Sixth, Third, Melrose, Sunset, Hollywood, Vermont, Western, Pico, and La Brea sorely underserved during the peak periods.

Alternative 2 - A Short Range Transit Improvement Plan - The short-range transit improvement plan as envisioned in this plan is the minimum number of improvements necessary to provide an integrated transit system in the West Los Angeles area. Improvements under this plan were limited to increased service during base, night, and owl hours, minor extensions of lines to facilitate transfers, and relocation of layover points. The maximum extent of changes recommended under this plan would be the relinking of certain lines. This alternative also includes the recommendations of Downtown Transit Plan submitted to SCRTD in April, 1976, with refinements. However, care must be exercised to assure that no new vehicles or any other capital expenditure would be incurred.

This plan includes adjustments within existing corridors in which transit service is presently provided. This primary objective of this plan is to improve the efficiency of the transit system within the West Los Angeles area and the viability of the system.

The first step in the development of this alternative was to identify the alternative remedies to the deficiencies identified in the previous chapter. The following is a discussion of the major deficiencies, the alternative remedies, and the selected alternative solution follows.

Coverage cannot be significantly improved as the areas which are not covered by existing SCRTD service is limited to two areas: Santa Monica Mountains and the western half of the study area within the general service areas of Santa Monica and Culver City Municipal Bus Lines. The two primary corridors that are available for new service to improve coverage are the following:

. La Brea Avenue between Rodeo Road and Inglewood - most likely route to extend into this area is the La Brea Avenue portion of line 85. This, hoever, would make the entire length of the line (La Brea plus Crenshaw) unwieldy,creating scheduling problems. Line 81 (Hollywood Way) may also be extended south via La Brea Avenue and into Inglewood and/or LAX. This later alternative appeared more likely to satisfy more travel desires than the U-shaped La Brea-Crenshaw line and possesses the potential of becoming a regional north-south trunk line through the study area terminating at two major generators and intersecting all or most of the east-west transit lines.

. San Vicente Boulevard between Rimpau and Sunset Boulevard could be served by creating a new leg of line 75. This is undesirable,as one of the deficiencies of the existing transit system is the many branches of lines that are confusing transit riders making one of the primary objectives of this planning study the elimination of as many branches as possible. The other solution is the extension of line 26.

Travel time delays are a major deficiency that can be readily alleviated by two methods. The first is to facilitate transfers between lines through scheduling adjustments or minor route adjustments. The second method is to establish more direct routes between the major origins and destinations. Admittedly, few transit trips can be completed without a transfer, but where there is a concentrated trip movement along a corridor, special service in the form of flyer, express, or subscription routes should be implemented.

The major travel delay locations as identified in the evaluation and the alternative solutions are as follows:

. Palms-Mar Vista is an area that is essentially isolated in terms of transit service, since people cannot utilize transit because they do not have access to a transit line without experiencing a significant travel time delay often as greater as the total travel time by auto. This area is within the service area of the Santa Monica and Culver City Municipal Bus Lines, making any route adjustments subject to mutual consent between the three transit operators. Bearing in mind this factor, there are only two alternatives that would help solve this problem for the residents of this area that should not encounter opposition from SMMBL and CCMBL delaying implementation. The first is to reroute

the section of line 602 on Overland, Pico, and Beverly Glen. The second alternative is to provide a north-south route on Sepulveda. Realizing that this will duplicate service on Sepulveda between National and Charnock provided by SMMBL's line 12, it may encounter some opposition. However, it is within an existing SCRTD corridor of service (line 88) and has received substantial support from the public and is a constant item cited by the public at these meetings. This alternative is selected because it has received support from the public and is more centrally located in the deficient area. Also, one of the goals of the planning phase of this study was to not adjust the Santa Monica Diamond Lane lines as they were under evaluation by Caltrans.

. The vicinity of La Cienega and Venice is an area where substantial delays are encountered when transferring between bus lines. The lines involved in this are lines 9, 12, 18, 21, 27, 44, 75, 89 and 877. The location of a centralized transfer area in the vicinity of Robertson and Washington Boulevards would be the only site at which all but one line would interface and is therefore the prime location. However, this area is in the business area of Culver City and does not have adequate facilities for the layover area or circulation of the buses. Also, this would necessitate the extension of lines 12, 89, 9, 18, 44 along Washington Boulevard which is the focus of the Culver City lines, would require either the rerouting or addition of a spur line on line 27 and the duplication of service along Rodeo. There would be the same disadvantages if retained at its present location at Fairfax.

Another less radical option would be to reroute the portion of line 9 presently turning south on La Cienega north to meet line 44. The problem with this and the previous alternative is that there is still no direct route into the Beverly Hills-West Hollywood area.

The alternative selected was to extend the lines to the present layover area at Adams and Washington Boulevards, where there are adequate facilities for buses to park and sufficient area for the erection of benches and even a kiosk with schedule information. The linkage of line 9 to Robertson Boulevard would provide a direct connection from Beverly Hills to South Central Los Angeles, allowing trips from Beverly Hills to transfer to the southbound lines without an intermediate transfer.

Another area in which significant travel time delays are encountered is along Santa Monica Boulevard between Fairfax and Westwood. Santa Monica Boulevard serves many major generators along the Westwood, Beverly Hills and Hollywood corridor. However, it is not possible to travel along this corridor without having to transfer. The remedial alternative for the solution of these problems would also alleviate the deficiency of the existing system that does not allow transit patrons to travel from the Wilshire-Hollywood corridor to Century City, except for line 91W, without having to transfer.

There were three areas into which the Santa Monica Boulevard, Melrose Avenue, Beverly Boulevard, and Third Street lines could be extended to provide a centralized transfer location: Beverly Hills, Century City or Westwood. Beverly Hills is already linked to the Wilshire-Hollywood area by lines 4 (Olympic), 44 (Beverly), and 91 (S & W).

The extension of the lines to Westwood would eliminate the need for many of the transfers at Beverly Hills and Century City. However, this extension would place a substantial number of buses onto Santa Monica Boulevard into an area in which there are existing traffic congestion problems. The rerouting of the lines along

Wilshire between Beverly Hills and Westwood was also deemed impractical as it would then by-pass Century City while the purpose of this extension was to link it with the other major travel generators.

The Century City site was selected for the centralized transfer area because it was a major trip attractor from the Wilshire-Hollywood area, acting as an anchor for the east-west lines through Wilshire-Hollywood. Also, the congestion created by the additional bus moves would not be as widespread. This site was also selected because of the new 94 to be discussed in the section regarding rationalization.

Route Rationalization - As used in this study, route rationalization applies to two deficiencies of transit service. The branching of lines creating spurs that confuse patrons, indirect routing which causes undesirably long travel delays, and the grid type effect acquired by operating a single line over the entire length of an arterial. The recommendations and their evaluation is a complex matter in that the relocation of a line onto another street creates a void that must be replaced by another adjustment.

The elimination of the spur of line 4 could be accomplished by cutting off either the San Vicente-Burton Way-Santa Monica leg or the Olympic Boulevard leg to Century City. The elimination of the Olympic leg is not desirable because it is a direct line into Century City from the Olympic corridor. The retention of the San Vicente-Burton Way-Santa Monica leg would retain the indirect routing from Santa Monica to downtown Los Angeles.

Additionally, Santa Monica Boulevard should be served by the same bus lines in both Hollywood and the western half of the study. The alternatives were to either extend line 4 to replace line 94 or to extend line 94 west to Santa Monica. The relocation of 4 onto Santa Monica would necessitate the separation of the Olympic Boulevard leg negating the advantages of 4 being a through line in the CBD. This would be necessary as the 4 running from Santa Monica through West Los Angeles, Hollywood, downtown Los Angeles, and Olympic would be too long to maintain adequate schedule adherence.

There was also the consideration that line 4 has been associated with Melrose in the past as 94 has been with Santa Monica Boulevard. Because of these considerations the extension of line 94 west replacing the Santa Monica portion of line 4 would eliminate branching of line 4, create a true Santa Monica Boulevard bus, and provide a more direct route from Hollywood to Santa Monica.

This would also require an adjustment of other lines to replace San Vicente and Burton Way. This was easily accomplished by extending line 3 to Century City to replace Burton Way and to link Wilshire-Hollywood with Century City. The San Vicente portion was replaced by extending line 26 west of Rimpau creating a San Vicente line.

Line 91 branches into two lines in Hollywood (lines S and W) at Hollywood and La Brea. The line splits, meets again at Sunset and Fairfax, splits and then intersects at Santa Monica and Beverly Drive with the Sunset portion terminating at Pico and the Santa Monica portion at Century City. Sunset was served by lines 42, 91W and 91S between Hollywood and UCLA. This branching and

splitting of 91, the number of transfers to travel from Hollywood to UCLA, and the fact that one could not use a single line to travel along Sunset or Hollywood or Santa Monica indicated that a line should be extended along Sunset to UCLA from Hollywood and that the number of turning movements should be reduced.

There are a number of possible route adjustments to eliminate or reduce the branching. The following two were evaluated:

1. Split 91 at Sunset at Hollywood with 91S onto Sunset Boulevard to UCLA.
2. The elimination of 42 and 91S and the rerouting of 91W to continue west on Hollywood, Fairfax and Santa Monica to Century City and the extension of 42 west to UCLA.

With the rerouting of line 3 and line 4 in the Westlake area, line 42 was relocated onto Sunset to improve the level of service on Sunset between downtown and Hollywood, making it logical to extend this line west to UCLA and Westwood. The portion of 91S along Beverly Drive was redundant as line 18 had been extended west via Robertson, Olympic and Beverly Drive to provide direct service between South Central Los Angeles and Beverly Hills. Therefore, lines 91S and 91W were eliminated and replaced by 91 from Los Angeles to Century City and 42 was extended to Westwood via Sunset, creating a Sunset line from Los Angeles to Westwood. Line 94 was not used for this as it was extended to Santa Monica to create the Santa Monica line and replace a leg of line 4 as discussed previously.

The branching of line 89 at Franklin and Beachwood Drive was also analyzed. The alternative solutions were limited to those lines terminating in the general vicinity of Franklin

and Beachwood Drive, which were lines 21 and 436. Line 436 was not desirable in that it should operate on Hollywood Boulevard and into West Hollywood. The rerouting of the line north along Beachwood would remove this line from Hollywood before reaching the major activity centers along the Hollywood corridor.

Line 21 has been replaced by line 877 as part of the South Bay Transit Improvement Plan. The service levels were comparable to the existing 89 on Beachwood and was the alternative selected. The extension of line 877 to replace this leg of 89 would require only a minor increase in route mileage while at the same time having it operate over a portion of the Hollywood corridor rather than terminating adjacent to the center of activity.

The branching of line 81 was related to another deficiency - that of the need for a major north-south trunk line through the study area that would provide frequent all-day service. La Brea Avenue is the most centrally located north-south arterial in the study area and the selected corridor along which this line should be operated. The La Brea line was extended north to Glendale-Burbank Airport both replacing the Hollywood Way portion of 81 and providing a northern terminal for the line as well as a major travel generator.

In order to establish a southern terminal for this line operating on La Brea, the alternatives were Inglewood and LAX. By extending the line to LAX via the route of the existing 105 between Inglewood and LAX, line 105 could be eliminated creating a through line for downtown Inglewood and providing service from the Hollywood and Wilshire corridors to a much greater travel generator than Inglewood.

The extension of La Brea north left the Crenshaw portion of line 85 without a western leg. The alternatives available were Fairfax and La Cienega. The origin-destination patterns show that the demand for travel between Hollywood and Fairfax is much greater than Hollywood to La Cienega. Additionally, the link with line 27 would require indirect routing as La Cienega does not intersect Hollywood. There were few travel desires along Franklin on line 89 from Fairfax. The passengers to this area boarded in the Hollywood area and the elimination of the Franklin portion of 89 could be served as well be extending line 78 rather than have it operating via Talmadge. There is also an intuitive similarity of travel characteristics between Crenshaw and Fairfax that does not exist between Crenshaw and La Cienega. The Fairfax line was therefore linked to Crenshaw.

This plan was the most practical in terms of being implemented as it outlined the solutions to the major deficiencies of the existing transit system in West Los Angeles. This plan made no major expansions of service or service levels as it was geared toward immediate implementation.

Alternative 3 - A Long-Range Transit Improvement Plan - A major long-range plan is a further extension of the previous alternative, including new service areas along with major route adjustments. This plan also includes preferential facilities to be implemented in the West Los Angeles area. Additionally, under this plan long range transit improvement alternatives for the West Los Angeles area were reviewed subjectively. Therefore, any of these recommendations lack in-depth investigation and are presented only for further study.

1. Preferential lanes on Wilshire Boulevard, Hollywood Boulevard, La Brea Avenue and Santa Monica Boulevard to expedite travel times along congested travel corridors.

2. A San Diego Freeway line utilizing a preferential facility with stations similar to the Cal-State L.A. station on the El Monte Busway at major trip attractors such as UCLA and LAX.

3. An El Monte type terminal in the San Fernando Valley to provide a center for transfers to lines to West Los Angeles and downtown.

4. The extension of the Pico, Olympic, and Washington lines to the coast which would require legislative changes as well as a substantial increase in equipment.

5. There should be a substantial increase in passenger capacity along Wilshire Boulevard from downtown Los Angeles to Westwood as a minimum which may be possible with the implementation of preferential facilities along Wilshire.

6. There should be a consolidation of transit services in West Los Angeles as well as the region that would facilitate transfers and make possible the implementation of more direct routes that will be more convenient to the transit riding public.

7. There should be a policy base period headway that is compatible with the peak periods similar to the grid services at much smaller headways of ten minutes or less on all of the major north-south and east-west arterials.

Summary

As stated at the beginning of this chapter, three alternative concepts were considered in this study. However, only two of these were viewed in the context of being practical for immediate implementation because of economic and political constraints. The second alternative, the Short-Range Limited Improvement Plan was selected as the most feasible and as detailed statistics as could be developed at this time were developed. The following chapter will discuss the selected alternatives in detail.

Chapter 7

THE SELECTED ALTERNATIVE

The transit improvement plan for West Los Angeles provides an improved level of transit service for the residents and employees of the area. This plan is the consolidation of a series of solutions to alleviate the deficiencies of the existing transit system and is therefore termed the "Selected Alternative." The plan is a rationalization of the existing transit system in West Los Angeles that will facilitate the operation and use of transit services. The Selected Alternative Transit Improvement Plan is presented in this chapter. Development and evaluation of alternative plans was not undertaken because of the criteria used in the development of this plan. Following a summary of the plan and its major features is a detailed account of the individual recommendations and a discussion of the owl services recommended in the plan.

Summary of the Plan

The selected alternative is the outgrowth of the evaluation of deficiencies of the existing transit service in West Los Angeles tempered by the economic constraints of the real world. The over-riding constraint was that no new transit vehicles nor any funds for capital expenditures were available for the improvement of peak hour service. The results of the evaluation of the existing transit system led to development of objectives for improved transit service in West Los Angeles. These objectives reflect this analysis in addition to the comments received from the public during community meetings and letters. The objectives are summarized below:

1. Improved travel times through facilitated transfer capabilities and more direct routing,

2. Expanded owl services,
3. Linkage of the major travel generators in the study area,
4. Improved and more direct service from the San Fernando Valley to the major employment centers along the Wilshire Boulevard and Santa Monica Boulevard Corridors,
5. Provide service that would facilitate north-south transit travel in the western portion of the study area,
6. Make no improvements that would have an impact on the other transit operators that would violate SB. 325 and therefore necessitate negotiations that would delay implementation, and
7. Incorporation of the Downtown Transit Improvement Plan.

The selected alternative is shown in Figure 32. There have been no new corridors opened except of the extension 85 line down La Brea to eventually terminate at LAX and Line 26 on San Vicente between Burton Way and Sunset Boulevard. There were two primary reasons for this. First, all major arterials in the eastern half of the study area already have transit service and, secondly, changes in the western half would have to be negotiated with the other municipal bus lines in the area. However, one change was made that would have an impact of Culver City Municipal Bus Lines along Higuera Street. It is part of the recommended plan to take over a section of Culver City Line No. 5 in order to connect Rodeo Road and Robertson Boulevard to create the proposed 18 Line. Since this is only a spur off the main line, and because of the attitude of CCMBL toward reducing services, there should be no major problems in negotiating an agreement between them and SCRTD.

SELECTED ALTERNATIVE

WSA

FIGURE 32

It was necessary to expand the number of bus lines involved in the study. These lines were providing services duplicating that provided by lines involved in the study, could be modi- with lines involved in the study. These lines were 47,49, 105, 157,303,304,356,871, and 877. This increase brought the total number of lines involved in the study to 68 lines. However, because of the relinkages and elimination of duplicated services the total number of lines in the selected alternative is still 58 lines.

The operating statistics of the selected alternative are shown in Table 43. The frequency of service shown is based on cordon counts at peak load points of lines entering the CBD, on and off counts conducted by WSA, and policy headways established as planning criteria to improve reliability and transfer connections.

Generally, peak period frequencies have been maintained since all available transit vehicles are in operation during this period. Improvements in the frequency of service during the base period has been significantly improved and the number of bus runs cut back from the peak period runs have been reduced. Evening and night service has also been increased on the magnitude of approximately 30 per cent. The base period is approximately a 10 per cent increase. However, upon the completion of the line-by-line patronage profile data currently being analyzed by SCRTD, these service headways can be evaluated with a greater degree of reliability and modifications may be warranted.

The criteria used to estimate the daily bus trips, vehicle miles and vehicle hours are based on the past experience of WSA

Table 43

OPERATING STATISTICS OF SELECTED ALTERNATIVES

West Los Angeles Transit Planning Study

in developing operating statistics with SCRTD. The morning and afternoon peak periods were considered to consist of a 3 - hour period each, the base period being the 6 hour period from 9 a.m. to 3 p.m., evening from 6 p.m. to 9 p.m. and night service from 9 p.m. to midnight. Owl service is from midnight to 6 a.m. The comparison of the operating statistics of the selected alternative versus the existing transit system are shown in Table 44. The coverage of the proposed system was not analyzed in detail as no new corridors were added to the system with the exception of those discussed earlier. The increase is minimal as the only areas not covered by either the existing or proposed system is within the service area of other transit operators or in the mountainous area in the northern portion of the study area. Additionally, coverage data is not indicative of the changes made in the transit system that improve the frequency of service and directness of routing.

The route mileage statistics shown represent those of the entire route within and without the study area in order to more readily recognize the changes made in the route structure. The number of route miles remained at approximately 1,100. Actually, there was a slight decrease in the actual number of miles due to elimination of duplicated service. The total number of weekday one-way bus trips has been increased from 7,962 to 8,342. The majority of this increase is during the base, evening, and night periods. The number of base period bus trips is increased from 2,518 to 2,522. Evening trips were decreased from 1,143 to 1,056. There is a major expansion in owl service that will be discussed in a separate section. The total number of transit vehicles required to operate the proposed

Table 44

COMPARISON OF EXISTING VERSUS PROPOSED SYSTEMS

West Los Angeles Transit Study

Item	Existing[1]	Proposed
Number of Routes	65	58
One Way Route Miles	1,123	1,066
Daily Bus Miles	133,880	153,200
Daily Bus Trips	7,962	8,342
Peak Period	3,625	4,284
Base	2,518	2,522
Evening	1,143	1,056
Night	408	300
Owl	268	180
Buses	1,096[2]	1,118

(1) Includes additional lines affected by improvements and less old lines 21 and 150.

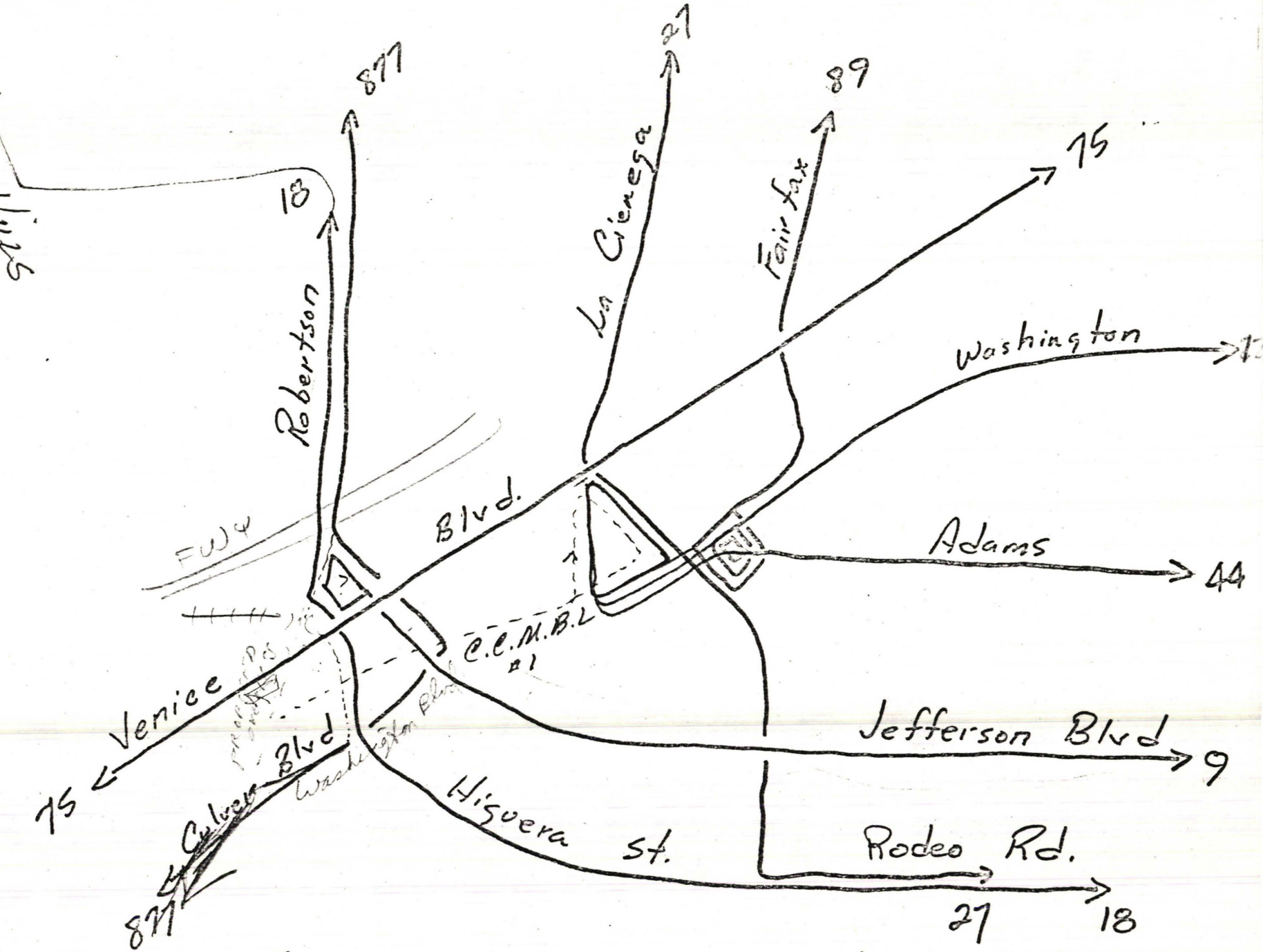
(2) Assigned to West Los Angeles lines.

system as the existing system has been maintained as this was one of the major criteria used in the development of the plan in order to improve the efficiency of existing transit facilities and cost-effectiveness of the present system. Specific major features of the plan, in addition to the improvement of transit service levels during the off-peak periods are the following:

1. A centralized transfer location similar to the old Culver Junction has been established by extending several lines to a central point in the northeastern portion of Culver City. The analysis of transit travel times show that there is as much as a 10-minute delay in this area caused by substantial walking distances to transfer between lines. In some cases even having to use another intermediary bus line. This improvement will involve lines 12 (Washington Boulevard), 27 (La Cienega), 44 (Adams Boulevard), and 89 (Fairfax Avenue). This area is presently used as a layover area by line 27, 44, and 89 and facilities are adequate. Additionally, since these vehicles use this area now, extension of the lines can be accomplished without additional equipment. The layout for this area is shown schematically in Figure 33.

2. New service has been added along Sepulveda Boulevard parallel to the San Diego Freeway by rerouting the 88 Line. The 88F will replace the flyer service between Van Nuys and LAX during the peak hours.

3. The restructured 85 (La Brea) Line will operate 24 hours a day between LAX and Glendale-Burbank Airport intersecting all of the east-west lines in west Los Angeles. Not only will this provide all day service



SKEMATIC OF "CULVER JUNCTION"

Figure 22

for employees of these employment centers, but will also facilitate travel of air passengers by transit to and from the airport. This will also serve as a major north-south trunk line through the study area.

4. A major change has been made in the structure of the Santa Monica Boulevard Line (Line 94) and the portion of the 4 Line presently operating on Santa Monica Boulevard. The portion of the 4 along San Vicente, Burton Way, and Santa Monica has been eliminated and the 94 line extended from San Vicente to Santa Monica via Santa Monica Boulevard creating a Santa Monica Boulevard bus. A flyer is to operate along the western portion to replace the fast service between Santa Monica and downtown Los Angeles. Also the equipment used matches so that cutbacks along Santa Monica and Olympic have been eliminated. The San Vicente portion of Line 4 has been replaced by extending Line 26 and Burton Way by extending the 3 to Century City.

5. Santa Monica Diamond Lane lines have not been changed pending the future of the project both in the courts and Caltrans. These lines are under evaluation by Caltrans and should not be modified until the evaluation period has ended. With this in mind no recommendations were developed for these lines.

6. The Sunset Boulevard Line was extended to UCLA and Westwood connecting Hollywood with UCLA.

7. The 18 Line was routed and extended to operate between Beverly Hills and Vernon via Culver City and the Wilshire District. This change will allow the residents of the lower income areas to travel where employment centers are located.

The above are the general highlights of the proposed transit improvement plan for West Los Angeles. A detailed discussion of each improvement is discussed in the next section.

Detailed Description of Selected Alternative

The following section is a line-by-line discussion of the selected alternative and its operation during the period from 6 a.m. to midnight. Justification for the changes as well as the recommended level of service is also presented in this discussion. Bearing in mind that the service levels may be modified pending the analysis of SCRTD line profile data, the frequency discussion is general and recommendation are based on cordon counts, on-off counts, policy headways, and existing service levels. The expanded owl service is not discussed in this section but is presently in the following.

Line 3 Central Avenue was extended south from Manchester along Central Avenue and then via Compton to Tamarind. This would realize a vehicle savings by eliminating a duplication of service from Manchester Avenue south to Broadway at Manchester. One of the major reasons for riding to 304 is to transfer onto the 7 Line at Broadway. However, counts were conducted showing that the load factor for Line 7 in this area is approximately 0.5. This change would allow people to travel north-south on Central Avenue without having to transfer and would allow the improvement of the frequency of service. The result is a line on Central with good service. Cordon counts show that the average bus load factor is approximately 0.5 during the peak hour justifying

a reduction in the level of both base and peak hour services. The peak hour service has been reduced from 12 to 10 buses per hour and base hour service from 8 to 6 buses per hour. Night, Saturday, and Sunday service has been maintained at the existing frequency of service.

Fig?

Line 3 West Third Street has been rerouted from Sixth Street and Wilton to operate via Bixel, West Third Street, Burton Way and Santa Monica Boulevard from Los Angeles to Century City. This restructuring accomplishes several of the major goals of any transit plan revisions. First, it connects two major generators, LACBD and Century City, via an area of high density employment and residential development. Secondly, it is now possible to travel from LA to Beverly Hills via Third Street without having to transfer. Currently, Third Street has three lines operating along separate sections. It is not possible to transfer between two of these sections (Line 4 to Line 28).

NO x BPH 4
x " 29
x " 3
x " 45

Peak hour service along West Third Street requires 20 buses per hour based on SCRTD counts at the peak point along this section of Line 3. However, there are presently only 12 buses per hour assigned to the 4 Line along Third Street. These buses should run on out to Beverly Hills and Century City. Base hour service is to be 6 buses per hour, ~~which is a reduction in the service level from Bixel to Virgil but is not required to accomodate the base period travel as the present riders along this portion is destined for Melrose Blvd.~~ Evening service has been ~~increased from~~ maintained at 3 to ~~6~~ buses per hour and night service maintained at 2 buses per hour.

Line 4 - Melrose Avenue has been extended to Century City to provide an interface with Line 94 to Santa Monica and the 91 to Hollywood and has been rerouted from Third Street to Temple which will eliminate the "stair-stepping" that exists in some of the West LA lines. This extension also provides access for residents along Melrose to travel by transit to Century City.

That portion of the existing line along Third has been replaced by the rerouted Line 3 and the existing 42 along Temple has been relocated onto Sunset Boulevard. The peak hour service has been maintained at 20 buses per hour and the base hour service ~~increased~~ remained from 6 to ~~10~~ 8 buses per hour. Evening service ~~was increased~~ remains at from 3 to 5 buses per hour with night service remaining at the existing level.

* 4L via Fwy? NO. BUSES SAVED?

Line 4 Olympic Boulevard has been restructured by eliminating the San Vicente and Santa Monica Boulevard portions. The 4B operating from Santa Monica through Beverly Hills and back onto Olympic Boulevard is going to downtown Los Angeles indirectly creating excessively long travel times. Counts show that people riding the 4B are going to Beverly Hills, Century City, and Hollywood. Counts conducted at Beverly Hills station show that more people transfer from 4B to 91 (Sunset) or 44 (Beverly) than travel to downtown on the 4. This shows that there would be no significantly adverse effects upon transit riders using the 4B if it were eliminated and replaced by the 94 (See Line 94). Peak hour service of 20 buses per hour has been maintained. This will significantly improve the level of service along Olympic Boulevard from San Vicente to Century City. Base hour service is maintained at ~~10~~ 6 buses per hour. Evening service is

improved from 3 to ~~5~~ 4 buses per hour and night service retained at 2 buses per hour.

Lines 5 and 5F South Bay changed to Main, Spring have not been changed.

Lines 6 Vermont Avenue has not been changed.

Line 6 York Boulevard has been rerouted from York Boulevard to San Pasqual Avenue, terminating in Highland Park. This will replace a portion of existing 25. The frequency of service has been retained as existing. and rerouted in Lincoln Park area to replace portion of 25 line along Pasadena Avenue.

Line 8 North Main has been eliminated as part of the north LA plan and replaced by the 426 which presently operates over Mission into downtown LA. This will eliminate the service on Lincoln Park between Mission and Broadway. However, residents are still within walking distance of a bus line to downtown. According to peak load counts conducted by SCRTD for lines 8 and 426 north of the CBD, there is adequate capacity on the 426 line to accomodate peak hour passengers on the 426 Line. The buses saved by this can then be used elsewhere.

Line 8 - Inglewood has not been changed. extended to La Cienega. SC + connection to Airport The line will continue to operate between Los Angeles and Inglewood via South Main, Broadway, and 54th to La Brea Avenue. The northern terminus is Union Station. Existing service levels should be retained.

portion #10 Mr. Fairview

Line 9 Jefferson Blvd. has been extended west along National Boulevard to Venice to connect with Line 877 and 75. People can now move along Jefferson and Venice and people can travel from the Venice area to USC. Cordon counts conducted by SCRTD shows approximately 300 persons cross the peak point during the peak hour. Accordingly, the number of buses per hour was reduced from 9 to 6. The base hour service has been increased from ~~5~~ 4 to 6 buses per hour. This would create a strong line with regular service during the day. The increase in base hour service would

accomodate expected increases in patronage traveling between Culver City and USC. The 10 minute service frequency would also facilitate transfers to the 75 on Venice which also has 10 minute service all day. Evening and night service has been increased to 20 minute service which is currently 30 minutes. This is primarily to improve the service to the USC area allowing them connection to 75 to Venice, 85 and 877 to LAX or Hollywood and the other north-south transit lines.

Line 9 South Gate has not been changed.

Line 10 Prairie has been rerouted to eliminate the duplication of service along Adams, Normandie, Slauson and Crenshaw. The eastern portion of the line has been left uncovered, however, everyone is still within one-quarter mile of another bus line. The Prairie Avenue portion of the line is actually a separate line with the people along Prairie Avenue having little in common with the residents along Adams Boulevard. The new line will operate between Fox Hills Mall and Torrance via Green Valley Circle, Centinela Avenue, Beach Avenue, Manchester Boulevard and Prairie Avenue. This change means that people can move across to Fox Hill Mall. There is heavy development along Centinela and no buses presently operate over this section of it nor Green Valley Circle. By transferring, people will also be able to travel ~~over~~ to the Forum and Hollywood Park. The present service on the 10 is 2 buses per hour during the peak and base. However, this frequency has been increased to 3 buses per hour during the peak, base and evening periods. There will be no night service. nite and FORUM EVENTS?

Should be renumbered in 800 series

Line 12 Washington Boulevard has been extended west to La Cienega to connect with Lines 44 (Adams), 89 (Fairfax) and 27 (La Cienega). The eastern portion north of the CBD has been replaced by the 7 Line as proposed in the downtown transit plan and connected with the East 4th Street portion of the 47. This is then extended to take over that portion of the 26 Line that presently runs up Floral Avenue to ELA College. This creates a through line eliminating several branches. Service on Floral has been reduced from 10 minutes under the present 26 to 15 minutes under the proposed 12 Line.

Passenger counts indicate that 15 minute service will provide more than adequate capacity. West Washington presently operates 20 minute service, however, 15 minute service will improve ridership and match with the proposed East 4th Street portion. Observations show that the people along 4th Street are walking over to First Street and taking the 26 line because of frequent service even though the trip destinations are between 1st and 4th streets in East LA. This revision of the routes and the improved service would eliminate the need for these transfers. ~~Base hour service is retained at 15 minutes as is evening service. Night service is hourly~~

Line 18 Coliseum Street has been extended east via Central, 41st Street and Santa Fe to Vernon and extended west via Rodeo, Higuera, Robertson, Olympic, and Beverly Drive to Beverly Hills Hotel on Sunset. The eastward extension will connect with Line 9 and 95 at Santa Fe. The westward extension will allow domestic employees residing in the Exposition Park, Santa Barbara and Vernon areas to travel to the Beverly Hills area in addition to improved service between Culver City and Beverly Hills. This will replace portion of existing 21 and 91.

Service on the 21 is 30 minutes during the peak and hourly during the base. The existing 18 has 20 minutes service all day. Based on these service levels, the recommended plan will have 20 minute service all day improving the frequency on Robertson, ~~and~~ ~~slightly reducing the frequency on Beverly Drive.~~ There will be ~~no~~ 30 MIN evening ~~or night~~ service, ~~No~~ and no nite driving

Line 23 Griffith Park Zoo has not been changed.

Line 25 Griffin Avenue will operate via North Main Street, Griffin Avenue and 43rd Street terminating at Figueroa Street. The portion of the 25 along Figueroa has been linked to South Figueroa portion of the existing 49 Line to create a through line on Figueroa, as suggested in the downtown transit improvement plan. The portion of the existing 25 on Pasadena Avenue ~~is now~~ will be served by the proposed 6 Line and the N. Figueroa portion by the proposed 49 Line. The existing 25 operates 4 buses per hour during the peak and 2 buses per hour during the base period.

Line 25 West Ninth has been replaced by the recommendation of 47

The West 9th Street portion has been discontinued and replaced by extending Line 47 west along W. 8th to Crenshaw Wilshire, from Olympic Boulevard and 9th Street. The new line will operating on West 8th Street. ~~This~~ eliminates the turns that existed at Vermont and 8th Street, ~~and~~ 7th and 9th Streets. This creates a line through the southern portion of downtown. The 25 along Griffin has been extended south via Spring ~~Main~~, Maple, Main, and San Pedro to Manchester replacing the eastern portion of the existing 49 line. The recommended plan calls for ~~15~~ 10 minute service during the peak and ~~30~~ 10 minute during the base, 15 evening, and 30 night.

Make east 8 + 9, Olympic one way to Central Ave Alameda?

Line 26 Pico Boulevard has been extended west of Rimpau via San Vicente to Sunset acting as a radial crosstown intersecting all of the east-west radials from downtown. Peak hour headways between Los Angeles and Rimpau is maintained at the existing frequency of 5 minutes, ~~with a base hour frequency of 10 minutes~~. Frequency between Rimpau and Sunset is 10 minutes peak and base. Evening service is maintained at 10 minutes and night service has been expanded from 30 minutes to 20 minute service. The ~~eastern~~ leg of Line 26 has been changed ~~slightly~~ as part of the North LA Plan. The section along Floral is replaced by the new 12 Line which is an extension of the existing 47. The 26A which operates on E. First is now the 26.

Line 27 La Cienega has been rerouted to eliminate the Santa Barbara service between Crenshaw and Compton, which is also served by the 5 Line and extended east to Atlantic Boulevard via Vernon replacing the 95 east of Santa Fe Boulevard. The portion along Santa Rosalia has been rerouted to operate direct via Santa Barbara. This move would speed up travel speeds because ~~the street~~ is narrow and crowded and is strictly residential. The residents are still within a reasonable walking distance of Santa Barbara and this would improve the travel times for the through riders. Additionally, buses could be saved by the elimination of this duplicated service on Santa Barbara.

Peak hour service has been maintained at the present level. Base hour service has been increased from 3 buses per hour to 4 buses per hour. Evening and night service remains at 2 buses per hour.

Line 28 Whittier Boulevard has been changed to operate via Fifth/Sixth Streets across the Whittier Bridge. Service levels have not been changed.

Line 28 West Sixth Street is the relocation of the existing western leg of 28 to West Sixth Street to replace the 3 Line which has been relocated to Third Street. The line will operate via Sixth Street to Wilton and then Wilton to Third Street. The frequency of service will be compatable with the Whittier Blvd Service, 5 MIN Peak and Base. The frequency of service has been reduced along Sixth Street from a 5 minute to a 12 minute headway during the peak period. ~~The present peak hour service cuts back 6 buses indicating that the remaining buses are carrying persons from the CBD to West Third Street and have been moved to the 3 Line on Third Street. Base hour service has been reduced from 8 to 6 buses per hour because there will not be the Third Street passengers utilizing Sixth Street any longer. The 6 buses per hour will provide a continuity of service all day.~~ 10 MIN WILTON/SIXTH 5 MIN BASE+PEAK The evening level of service is maintained at 3 buses per hour and the night service ~~increased from 2 to~~ 3 buses per hour.

Line 29 ~~San Pedro~~ Avalon Boulevard has been ~~extended to eliminate the~~ integrated into line 303 along Avalon and Compton to Tamarind. This would will eliminate duplication of service along Avalon between Manchester and Compton and on Compton to Tarmarind. This would also save buses from the 303 without a ~~significant~~ reduction in the level of service. The cut backs loop along Grape + Central would be discontinued.

Line 29

~~The~~ West 8th Street ~~portion~~ has been rerouted to continue along West Seventh to Catalina and Wilshire. The ~~West~~ Eighth Street section is now served by the proposed 47 of the downtown plan (See Line 47).

The existing peak hour and base service levels have been maintained at 12 and 6 buses per hour respectively. Evening and night service has been increased to 3 buses per hour.

Line 35 West Valley has not been ~~rerouted~~ Alessandro. However, the base hour frequency has been increased from 3 to 4 buses per hour. Peak hour service remains at the present level.

Line 41 Alvarado has been extended north to ~~Verdugo Road~~ Highland Park via Glendale Boulevard, Alesandro, Riverside, Fletcher, Eagle Rock and York ~~into Highland Park~~ Boulevards. This extension will give access to the West Los Angeles lines and the Highland Park, Eagle Rock, and Glendale areas without requiring people to be routed through the CBD. The existing peak and base service levels have been retained. Evening service has been increased from 2 to 3 buses per hour to improve transit service from USC to these areas. Night service is maintained at 2 buses per hour.

Line 42 Sunset presently operates from Los Angeles via Temple, Virgil, and Sunset terminating at ~~Fairfax Avenue~~ Laurel Canyon. The Temple, Virgil, Fountain portion has been abandoned with the Temple Street service replaced by the proposed 4 (Melrose) Line. There are only a few stops along Virgil and these people are still within a short walking distance of a bus line. The Fountain Avenue portion is no longer necessary since the hospital has closed. The 42 has been relocated onto Sunset and will operate between the CBD and Westwood via Sunset. This is the principle of operating the Sunset bus on Sunset in addition to now providing direct service from the Hollywood area to UCLA.

During the peak and base service periods the level of service along Sunset from Westwood to LA is 6 buses per hour. During the peak there will be an additional ~~12~~ 6 buses per hour between West Hollywood and the CBD making peak hour service along this portion of Sunset ~~18~~ 12 buses per hour. Evening service has been increased from 3 to ~~6~~ 4 buses per hour and night service from 2 to 3. The base and evening service will match with the number of vehicles operating during the peaks providing a continuity of service frequencies. This is the same level of service as presently operates along the Sunset portion of the 42. The additional vehicles were required only along the Temple Street section.

Line 44 Beverly Boulevard has been extended to Century City via Santa Monica Boulevard. This will also connect with the Wilshire corridor allowing people along the Beverly Boulevard corridor to also travel to Santa Monica and VCLA, WESTWOOD. Peak hour and base hour service levels of 15 and 6 buses per hour are maintained. These volumes are adequate to carry peak hour passengers from downtown to destinations along Beverly Boulevard. However, increased patronage can be expected because of the new service into Century City. Evening service has been increased from 2 to 3 buses per hour and ½ ~~hourly~~ night service has been maintained.

~~Route 44 Fairfax eliminated, rather 441 placed in service!~~ operate every 10 min

Line 44 Adams Boulevard has been extended to La Cienega and the transfer new facilities to be located there. This extension will allow persons from along Adams Boulevard to be able to transfer to the Venice line enabling them to travel all the way to the coast. ~~They will also be able to transfer to the 89 along Fairfax and the 37 along La Cienega~~. The frequencies used for the Beverly Boulevard portion of the line should also be used along Adams because patro-

nage and ridership are comparable. Also this will eliminate the need for the cutback of runs which are a major complaint of transit riders. Additionally, this service frequency matches with that of the 75 to Venice which will facilitate transfers.

Line 47 East Olympic has been connected with the Eighth/Ninth Street portion of the existing 25 Line, ~~which now operates via Maple and South Main as recommended in the downtown transit plan.~~ This will create a new east-west CBD route along Eighth/Ninth Street. Extending this line to Crenshaw + WILSHIRE will give people direct connections to several major north-south trunk lines ~~conceivably removing some of the load from the Wilshire Line~~ and providing a direct transfer to Wilshire corridor line. The service levels have been ~~maintained at their existing levels primarily not to reduce the level of service across Eighth/Ninth Streets and Olympic in order~~ improved to attract new ridership, and make the 8/9 corridor an attractive alternate route across town. Modification of the level of service may be justified after a period to evaluate ridership along this new line.

Line 50 ~~is not a major line~~ FLORENCE Avenue has only a small portion within the West Los Angeles study area, ~~since such a small fraction of its line is within the study area boundary~~. However, the ~~south end was~~ line was extended north to Burbank via Avenue 26, Riverside, Griffith Park, Victory and Olive to replace portions of lines 65 and 86 on Riverside Drive. These recommendations are discussed in the North Los Angeles Plan. The existing service levels of 8 peak hour buses, 6 base, 3 evening, and 2 night were maintained. The Florence Avenue portion of the line was extended into the Inglewood CBD to provide service from Florence Avenue into downtown Inglewood.

Cut at H.P. — headways not compatible

Line 65 Silver Lake has been rerouted to link up with the 78 Line and extended via Rowena and Franklin into Hollywood over

line onto Broadway, people will be able to easily transfer to the North LA lines at Sunset and Broadway. The existing service levels have been maintained.

Line 76 Palisades has been cutback at Westwood Boulevard and linked to the Brentwood portion of the 83 (83B). Passenger counts show standing loads from the Palisades area into Westwood but few riding between Beverly Hills and UCLA. This would eliminate the branching on the 83 line and would improve the distribution of transit travel westward out of Westwood and UCLA. Peak, base, and evening service is 2 buses per hour. This is a decrease in peak hour service but an increase for base period service primarily to improve service to UCLA during this period in addition to evening and night.

Line 78 Hyperion has been rerouted to operate via Silver Lake Boulevard replacing the existing 65 Line between Virgil and Rowena. The northern leg connects with the existing portion of 78 operating on St. George Street and has been extended via Franklin Avenue to Hollywood. This direct connection will provide service along portions of Franklin which are not presently served. St. George is a better street than Tracy and should improve running times. The fact that ABC studios are located along Talmadge may necessitate rerouting down Talmadge and up Hillhurst even though people are still within walking distance of a bus line.

The frequency of service along this line has been improved to 4 buses per hour during the peak and 2 buses per hour during the base. This is the frequency of the existing 65 on Silver Lake and should be maintained. Presently there is no evening or

the 89 Line. The portion of the 65 Line which presently operates via Riverside Drive has been replaced by the rerouting of Line 50.

Line 73 Van Ness has been extended north and east to Glendale via Wilshire, Vermont, Fountain, Hyperion, Glendale and ~~Brand~~ Central Avenue replacing part of the 78 on Hyperion. This extension will give direct access from Glendale to the Wilshire ~~corridor~~ District and will also permit people from Southwest LA to travel direct to Glendale without having to travel through downtown LA. ~~This~~ THE ~~will~~ improve distribution along Wilshire Boulevard ~~and~~ should attract ridership from the Southwest LA grid lines, and Glendale-Silver Lake areas.

~~Because of~~ The new plan would increased indication ~~that the~~ ridership on this line and ~~in anticipation will increase~~ the peak and base service frequency has been increased from 20 to 15 minutes. Evening service has been increased from one bus per hour to 2 buses per hour. There will be no night service.

Line 75 Venice Boulevard has not been changed and will continue to operate 6 buses per hour during peak and base. Evening service has been increased from 2 to 3 buses per hour to accomodate travel late in the day and Night service ~~is to remain at one bus per hour~~. increased to 2 buses / hour.

Line 75 Echo Park has been rerouted to operate via Temple, Edgeware, Bellevue, and Echo Pk Avenues. ~~In addition to now~~ This new route will supplement ~~the 4~~ Line 4 along Temple. ~~it is no longer needed along~~ Sunset since ~~there is~~ will be adequate service ~~being provided~~ by Lines 42, 91, and 94. As part of the downtown transit improve plan, this line has been relocated to Broadway which is the shopping district where the residents wish to go to downtown. Additionally, by rerouting this

4 on Hill ?

night service. However, it is recommended that there should be half-hourly and hourly service during the evening and night periods, respectively.

Line 81 ~~Woodland Hills~~ VENTURA BLVD has been ~~maintained with~~ an extended ~~sion~~ into Los Angeles via La Brea and Wilshire as a limited type service. There will be an increase in service from 3 buses per hour to 4 during the peak and base periods. from 1 to 3 BPH Evening and night service ~~has~~ been increased from 1 to 2 buses per hour. The spur that presently runs north to ~~Glendale~~-Burbank Airport has been ~~removed~~ and replaced by extending the 85 line north to provide a regional cross-town (See Line 85). Highland

~~Line 81 = No. Hollywood?~~

Line 83 Wilshire Boulevard is ~~one of~~ the most heavily traveled ~~transit~~ two lines in ~~the~~ Los Angeles. The 83B branch along San Vicente has been replaced by Line 76. ~~There is~~ No other rerouting of the line is planned; however, because of the heavy passenger volumes ~~and the fact that this line carries~~ (standing loads all day,) there should be a substantial increase in the frequency of base period service. The 83 locals will all terminate at UCLA and will have a 5 minute headway between Westwood and downtown. The 83 limited will operate between Santa Monica and downtown with stops only at intersecting bus lines west of ~~Santa Monica~~ Boulevard. The limited should also have a 5 minute headway which will mean a 2.5 minute headway between Westwood and downtown. This is the same frequency as the existing peak hour service and is nearly a doubling of the base hour service. Evening service should be 15 minutes each for the local and limited and night service should be 30 minutes ~~each~~. ? will all buses operating local and ~~a~~ to Santa Monica and a shuttle operating between Westwood and UCLA

Line 84 Western has not been changed.

UPGRADE BASE SERVICE TO 6 BPH

Line 85 Crenshaw has been replaced by the 89 Line. See Line 89.

Line 85 La Brea Avenue has been extended south to LAX and the Vicksburg Terminal via Arbor Vitae, Airport and Century. To the north the line has been extended to Glendale-Burbank AIRPORT replacing the existing 81 operating via Hollywood Way.

The existing frequency of service on the 85 is 8 buses per hour. This has been maintained and base hour service has been increased from 3 to 4 buses per hour. Evening and night service will remain at 1 and 2 buses per hour, respectively. The night service is justifiable in that it will maintain all day service between the two major generators in addition to a steady and reliable regional crosstown connecting all of the east-west transit lines in West Los Angeles, and San Fernando Valley.

Line 86 to Burbank has been rerouted to operate between downtown Los Angeles and Burbank via the Golden State Freeway rather than Riverside Drive as recommended in the North LA Plan.

Line 88 Sepulveda has been split to become two lines: 88 local and 88 flyer. The Flyer will operate only during the morning and afternoon peak periods between ~~Van Nuys~~ SAN FERNANDO and LAX direct with 4 ~~2~~ bus per hour, ~~which is the present level of service~~. A local has been placed on Sepulveda and will operate via the San Diego Freeway between the San Fernando Valley and UCLA before beginning local operation on Sepulveda. This bus line should operate 4 buses per hour during the peak and base period. Evening service should be half hourly.

The local has been extended to replace 15

between San Fernando and Ventura Boulevards eliminating a duplication of service along Sepulveda Boulevard. The line will therefore operate via Brand, Sepulveda, San Diego Freeway, Sunset, UCLA, Westwood, Wilshire, and Sepulveda to the Airport. That portion of 157 northeast of San Fernando is linked to 155 (Rinaldi St.-White Oak Avenue). Line 160 will terminate in San Fernando and the Van Nuys portion of 157 will terminate at Sepulveda and Ventura Boulevards.

Line 89 Fairfax Avenue has been linked to the portion of the 85 presently operating on Crenshaw. This realignment will provide more direct service to and along Hollywood Boulevard. The Beachwood Drive branch has been eliminated and replaced by the extension of 877. The southern leg of Fairfax has been extended to the proposed transfer area in Culver City; ~~where the 89 presently lays over~~. ~~Therefore, this will~~ not ~~require~~ additional vehicles will be required. The straightening of the line up to Hollywood and linking it with the Vine and Crenshaw portion of the 85 will improve running time and be more direct.

By relinking these lines the base service along Crenshaw can be increased from 5 to 8 buses. Peak service on both lines is 8 buses per hour presently and should be maintained. This increase in base service is desirable since present load factors exceed 1.0 during the base period. Peak period load factors range from 0.6 to 0.8. The 8 buses per hour will make for reliable and frequent service along this route all day. Evening service has been increased from 3 to 4 buses per hour and night service remains at 2.

Line 91 Hollywood Boulevard has been rerouted to operate via Hollywood Boulevard, Fairfax and Santa Monica Boulevard. The 91S presently operating on Sunset has been replaced by Line 42 to UCLA. The 91F has also been removed since the 93 will provide all day ~~service~~ Freeway service between LA and Hollywood Boulevard. (See Line 93).

The peak and base service for the 91 line from LA to Century City is 6 buses per hour with 3 buses per hour during the evening and night. ~~However, to provide adequate capacity for the peak period 12 additional buses should operate between West Hollywood and LA during this period.~~

Line 93 has been rerouted in the Hollywood area to operate via Hollywood Boulevard rather than Santa Monica Boulevard. This will provide all day express service between Los Angeles and Hollywood Boulevard. The portion of the line that operates north of Hollywood Boulevard will continue to operate as ~~the existing~~ at present. The flyer and limited routes remain ~~are~~ unchanged.

Analysis of counts at peak points shows an average load of 30 to 40 passengers during the peak hour. Therefore no new peak hour service has been provided. Base hour service has been improved from 15 to ~~12~~ 10 minute service. Evening and night has also been improved from 30 to 20 minutes. This increase in transit service is ~~in order~~ to provide improved transit between the entertainment centers along Hollywood Boulevard ~~and~~, the Civic Center where there is ~~lots~~ night employment ~~as well as~~ and entertainment ~~and to~~ the central center of the San Fernando Valley, ~~area~~..

Line 94 has been extended west of its present terminal at Robertson Boulevard and Santa Monica to Ocean Boulevard in Santa Monica. This will replace the existing 4 line between Beverly Hills and Santa Monica and the existing 91W between Hollywood and Century City. The change will provide a simple line along the entire length of Santa Monica Boulevard. ~~for its entire length and create a more rational routing of the Santa Monica line. there is~~ Also a limited flyer service ~~from Santa Monica to LA that would replace the fast service from downtown LA to Santa Monica for downtown commuters~~ would operate along the Hollywood Freeway to S.M. Blv and Western Ave.

Both line counts and the on-board survey show that ~~there is~~ only a minor percentage of the transit riders using the 4 Line to travel between the Olympic corridor and the western section of the Santa Monica corridor. Therefore, this restructuring of the route will not adversely affect a significant number of existing transit riders.

This routing will also create a better balance ~~of vehicles~~ since of the 20 vehicles on Olympic which leave downtown LA during the peak hour only 7 travel through to Santa Monica on the 4 Line. On the existing 94 there are 8 vehicles that begin in LA and travel along Santa Monica Boulevard. This will eliminate the need for the many cutbacks on the 4 Line by allowing all the buses on the proposed 94 to travel the entire length of Santa Monica Boulevard from LA to Santa Monica. Base hour service should also be increased as well as the evening and night service. Base hour service is 6 buses per hour, which is the same as the peak. Evening and night service will be 3 buses per hour. ~~or 15 minute headways.~~ The A limited will ~~run only~~ operate 8 round trips ~~inbound~~ in the morning and 8 round trips ~~outbound during~~ in the evening, ~~Flyer service in both directions will be spread~~ over a two hour period.

Line 95 has been extended north along Vermont to maintain the connection with the rerouted 436 at Los Feliz Boulevard. The eastern portion has been cut back at Santa Fe Boulevard and the portion east of ~~this~~ line has been replaced by the extension of ~~the proposed~~ Line 27 (See Line 27).

On-off counts were conducted along Vermont at Third Street, Wilshire, Santa Barbara, and Vernon. These counts show that during the peak period, the buses have an average load factor of approximately 1.0. Based on this the peak frequency was ~~main-~~ improved ~~tained at~~ 15 buses per hour. Base hour on-off counts show that the load factors vary from day-to-day with a range of 0.5 to 1.0. Therefore the existing base hour service has ~~also~~ been maintained. Counts conducted during the evening show a load factor of 0.60 to 0.80 indicating a need for more evening and nite service. Accordingly, evening service was increased from 3 buses per hour to 4 buses per hour and night service from 2 to 3 buses per hour.

Line 96 has been extended north on Normandie to Franklin Avenue in order to connect with the rerouted 78 line as well as maintaining the connection with Sunset (42) and Hollywood (91), and reroute 436 lines. A count was conducted at the intersection of Hollywood and Normandie to ensure that no significant number of transit riders who transfer between line 436 and 96 would be adversely affected. Over the two hour period only 68 persons got on or off the 436 at the intersection of Hollywood and Normandie indicating that the maximum number of transfers possible would be approximately 70. On and off counts show a peak hour load factor of 0.3 to 0.7 indicating adequate peak hour capacity at 4 buses per hour.

The base hour frequency was increased from 20 to 15 minutes making a constant headway during the day. Evening and night service was maintained at the present level.

Line 144 was rerouted to operate via La Brea rather than Vine as it presently does. The employee survey shows that of the persons residing in the San Fernando Valley most are employed along the Wilshire corridor. This realignment is the same as the 81 and will serve more of the Wilshire corridor than the present alignment obtaining better distribution. Running timehas also been reduced between the San Fernando Valley and Wilshire through more direct routing. No changes have been made in the frequency of service. There will continue to be 11 inbound trips during the morning peak and 10 outbound during the evening peak.

Line 150 from Long Beach to Santa Monica has been replaced by Line 873 as part of the South Bay Transit Improvement Plan and has not been changed, except it would be faster to use Lincolnwood to Sepulveda?

Line 157 Sepulveda Boulevard and Van Nuys Boulevard has been modified as part of the new 88 and 88F Lines. (See Line 88).

Line 175 Trancas has not been changed. This line presently operates hoursly between Malibu and Santa Monica providing 14 round trips daily.

Line 176 from Pacific Palisades to South Central Los Angeles has not been changed. This line will continue to operate 6 one-way trips during each peak period.

Lines 303 and 304 have been linked to the proposed lines 29 (Avalon) and 3 (Central Avenue), respectively, in order to improve service and to more efficiently utilize equipment. See Line 29 for 303 and Line 3 for Line 304.

Line 353 Vermont Avenue has not been changed. Line will continue to operate between 120th and Wilshire at 20 minute headways during the peak, base, and evening service periods.

Line 354 54th Street has not been changed. This line operates at 20 minute headways during base, peak and evening periods between Crenshaw and Long Beach Avenue via 54th.

Line 356 Gage Avenue has been extended to Inglewood via Hyde Park, Centinella, Prairie, and Regent. The eastern terminals will remain at Pacific Boulevard in Huntington Park. The extension replaces part of the service that had been removed by the rerouted 10 Line. Frequency of service will remain at 20 minutes for peak, base, and evening service periods.

Line 436 Pasadena has been rerouted to operate via Los Feliz, Western, and Hollywood with the terminals to remain at their existing locations. The extension of this line across Los Feliz will open up new service for residents in this area providing them with the ability to travel to Glendale and Pasadena. This line presently operates at 15 minute headways during peak and base service periods. Evening service has been increased to 4 buses per hour and night service is to remain at the present level.

Lines 601 through 608, 708, 746, and 774 Santa Monica Diamond Lane lines have not been changed as they were under evaluation as an experimental project by Caltrans.

Line 871 Redondo Beach has not been changed. Line will continue to operate half hourly during peak, base, evening and night service periods.

Line 873 Santa Monica to Long Beach is a new line replacing the old 150 implemented as part of the South Bay Transit Improvement Plan. There are no changes.

Line 877 Culver Boulevard has been rerouted and extended to Hollywoodland via Fairfax, Hollywood, Argyle, Franklin, and Beachwood. This extension is to replace the existing branch of the 89 which was rerouted to link the 89 Fairfax with the existing 85 along Vine and Crenshaw. This change will also eliminate the branching of the 89 line without adding significant length to the line. The 877 presently operates half-hourly as does the Beachwood branch of the 89. Therefore, there has been no change in the level of service along Beachwood and cutbacks will not be necessary.

Expansion of Owl Service

The selected alternative recommends a major expansion of owl service. The recommended plan for this owl service is shown in Figure7-3. There are presently 14 lines operating all night. The new plan will have 15. The one-hour frequency has been maintained for this plan. The operating statistics of recommended owl service is shown in Table 45. Since these lines all operate at 60 minute frequencies, the total number of one-way trips is not reflective of the degree which owl service has been expanded. The one-way route miles have been increased from 133 to 240 miles for a 75 per cent increase in route miles. Daily bus hours have been doubled to 220 hours and daily bus miles have been increased by nearly 80 per cent to 2,940 miles. It is estimated that it will require approximately 50 vehicles to operate this expanded owl service plan. The individual owl routes are summarized as follows:

Line 3 presently operates southeast of the L.A. CBD from Broadway via Fifth/Sixth Street and S.Central Avenue to Manchester. Under the recommended plan the 3 will be extended westward along Fifth/Sixth, Bixel, Third Street, Burton Way and Santa Monica Boulevard to Century City. This will replace the service along Third Street and Fifth/Sixth Streets presently provided by lines 4 and 28 and will provide new service between Los Angeles, Beverly Hills and Century City via Third Street, Burton Way and Century City.

Line 4 presently operates from the CBD to Melrose at Western via Fifth/Sixth Streets, Bixel, Third, Virgil and Melrose. The proposed owl service for the 4 line will operate via Temple, Virgil and Melrose to San Vicente Boulevard at Melrose. The portion of the existing 4 on Bixel and Third Street has been

PROPOSED OWL SERVICE

WSA

FIGURE 34

Table 45

OPERATING STATISTICS OF OWL SERVICE
West Los Angeles Transit Study

Route No	Route Identification	O-W Rt Miles	Estimated O-W Run Time	Buses Per Hour	O-W Trips	Daily Bus Hrs	Daily Bus Miles	Buses Req'd
3	Century City - Manchester	17.8	82'	1	12	16.4	220	3
4	Century City - LA - Rev Hills	20.2	91'	1	12	18.2	250	4
5	Centinela Valley - LA	16.5	74'	1	12	14.8	200	3
6	120th & Vermont - LA	10.0	46'	1	12	9.0	120	2
9	Culver City - Huntington Park	16.0	76'	1	12	15.2	200	3
26	Beverly Hills - LA	10.0	50'	1	12	10.0	120	2
42	UCLA - LA	16.2	78'	1	12	19.6	200	4
44	Culver City - LA	6.3	39'	1	12	7.8	80	2
75	Santa Monica - LA	17.8	72'	1	12	14.4	220	3
81	Hollywood - Woodland Hills	20.0	69'	1	12	16.8	240	3
83	Santa Monica - LA	16.6	81'	1	12	16.2	200	4
84	South LA - Hollywood	13.5	64'	1	12	12.8	170	3
85	LAX - Glendale - Burbank Airport	22.2	114'	1	12	22.8	270	5
93	Panorama City - LA	25.7	100'	1	12	20.0	310	4
95	Vernon - Hollywood	11.6	56'	1	12	11.2	140	3
	Totals	240.4	—	—	180	222.2	2,940	48
	Existing Statistics	133.5	—	—	168	105.4	1,602	—

replaced by the proposed 3. This will provide new service along Melrose west of Western Avenue. This extension will link with and therefore will make it possible to transfer to the proposed 26 or 85 making north-south travel possible which is not possible now. New service has been put on Olympic Boulevard from downtown to Century City. This allows travel between these two generators along a fast corridor lined by many multi-family housing units. This line also intersects lines 26, 84, 85, and 95 which will facilitate north-south service.

Line 5 has not been changed significantly from the present route alignment.

Line 6 presently operates between Los Angeles and Eagle Rock via Lincoln Heights and Highland Park during the owl hours. Under the recommendations of the Downtown Transit Plan, this northern portion of the existing line 6 was modified to operate via North Broadway which is more direct than the existing route alignment. The line has been extended south along South Broadway and South Vermont to 120th Street. This will provide owl service north and south along Vermont south of Vernon from the CBD.

Line 9 presently operates between Palm Place Loop in South Gate to Jefferson Boulevard at 10th Avenue via Seventh Street, Grand Avenue and Jefferson Boulevard during the owl service period. This line has been extended west on Jefferson to Washington Boulevard. This will provide new service west of 10th Avenue. By extending this line westward, people can now transfer to line 75 to travel to Santa Monica or line 85 to travel to LAX or to Hollywood from the West Jefferson corridor.

Line 26 presently terminates at Rimpau and Pico. The line has been extended to its base hour terminals at Sunset and San Vicente. This opens up new service to the west of Rimpau intersecting the Olympic, Wilshire, Third Street and Melrose Avenue lines.

Line 42 has been rerouted from Temple, Virgil and Fountain to operate along Sunset between downtown LA and UCLA. This will provide all night service from the LA Civic Center to UCLA through Hollywood and West Hollywood where there is all night entertainment activities. This will also provide late service between the Civic Center and Westwood. This line will also replace the all night service of the existing 91 line along portions of Sunset Boulevard.

Line 44 has been extended west along West Adams to Venice Boulevard. This line was extended for the same reasons as the 9 line. No service is proposed for the Beverly Boulevard portion of this line.

Line 75 presently does not operate at all during the owl period. The proposed plan will have this line operate all night to provide service between downtown and Santa Monica via Culver City, Mar Vista and Venice. Transit riders can transfer between the 75 and lines 9 and 44 as mentioned before. This will also provide an east-west truck line between downtown and Santa Monica complementing the 83 line which has also been extended to the coast.

Line 81 also does not presently provide owl service. This line will run between Hollywood and Woodland Hills via the

Hollywood and Ventura freeways. This would provide service between West Los Angeles and the San Fernando Valley where there is none presently. This line will terminate at the intersection of La Brea and Hollywood.

Line 83 presently operates between Los Angeles and Century City via Wilshire and Santa Monica Boulevards. Under the proposed plan this line will be extended along Wilshire Boulevard to Santa Monica. As with line 75 this will serve as a trunk line between downtown and Santa Monica intersecting all of the north-south lines providing owl service.

Line 84 does not presently operate during the owl hours. It is proposed that this line operate all night so as it does during the base hours between Hollywood and So. Central Los Angeles via Western Avenue. This line and line 85 will provide north-south service across the study area intersecting all of the east-west lines.

Line 85 should also operate all night. Under the selected alternative this line will operate between the Glendale-Burbank Airport and the LAX via Hollywood + La Brea Avenue. Since these are activity centers that operate 24 hours a day, they should also be provided with transit service all day since employees of the airport will be going to and from work at all times. This will allow the employees who go to or from work during the owl service period to utilize transit. They will most likely have to transfer to one of the east-west lines to complete their journey. This new 85 line will operate through the study area linking several all night travel generators and intersecting all of the east west transit lines.

Line 93 presently does not operate all night. The proposed plan will have this line operate between Panorama City and downtown Los Angeles all night. This new service would provide all night service from Los Angeles to the San Fernando Valley area.

Line 95 provides owl service from Vernon to LA City College via Vernon and Vermont Avenues. It is proposed that this line be extended north along Vermont to Los Feliz Boulevard. This would eliminate a cutback from the base hour service and would provide service along Vermont north making possible transit travel from the South Vermont and Exposition Park areas to Hollywood. There is also now the capability of transferring to or from the Sunset line to travel to the activity centers along that corridor.

Summary of Expanded Owl Service - The major feature of the expanded owl service plan is that it is an integrated system that will allow transit travel between the major activity centers in and adjacent to the study area. The existing system is a series of lines spreading out radially from the CBD and terminating before they reach a major generator, with the exception of Beverly Hills and Century City, nor do they extend out far enough to intersect a trunk line. The proposed owl service plan remedies these deficiencies in addition to extending lines 75 and 83 west to the coast to provide trunk lines across the entire width of the study area. The proposed plan will also establish transit service from the San Fernando Valley to Hollywood and downtown Los Angeles. Transit riders can also travel from downtown to Santa Monica, Culver City, Westwood, UCLA and LAX whereas previously they could not.

The proposed plan also will operate crosstown lines north-south through the study area. Previously the only north-south service was along Vermont from LA City College south to Vernon Avenue. Now transit riders can travel from Hollywood south to 120th Street along Vermont, from Hollywood to South Central Los Angeles along Western Avenue, and most importantly, between LAX and the Glendale-Burbank Airport via La Brea Avenue intersecting all the east-west transit lines.

This expansion of transit service in West Los Angeles establishes a system that can be utilized by existing and potential transit patrons all day. The result will be substantial transit patronage increases primarily because the west Los Angeles area is now served by an all day transit system rather than a series of severely cut back lines that terminate at no travel generators nor allowing transfers between lines to link travel origins and destinations.

Saturday and Sunday

As there were no counts or surveys conducted for the weekends, there were no major recommendations regarding improvements in the level of transit service for these periods. However, there are certain recommendations for service during this period based primarily on policy.

In terms of rationalization of the transit system, a major improvement will result in the establishment of a level of service that is comparable to the base period service on the lines that serve a high proportion of non-work oriented travel. On the less traveled lines the level of service recommended is the evening service level.

With these policy guidelines, Saturday and Sunday service levels were improved. The present hours of operation were used to determine the number of daily bus trips and this data is shown in the table of operating statistics for the proposed improvement plan. A 100 per cent increase in Saturday bus trips is recommended for the number of trips to be increased from 2,697 trips to 5,520 trips. Sunday bus trips were increased from 1,938 to 5,096 trips.

Equipment Requirements

The size of the bus fleet required to operate the system as described in the selected alternative was estimated to be 1,096 vehicles as compared to the 1,108 presently assigned the lines considered in the study. The method used to determine the vehicle requirements assumes a minimum 15 minute layover every two hours during the peak service periods. If the round-trip run time for the peak period exceeded the 3-hour peak period, a preliminary schedule was drawn to determine the number of buses needed unless the peak and base periods had the same frequency of service.

WEST LOS ANGELES

APPENDICES

APPENDIX A

EMPLOYEE TRAVEL SURVEY MANUAL

APPENDIX A

WEST LOS ANGELES EMPLOYEE TRAVEL SURVEY

An employee survey is to be conducted in the West Los Angeles and Wilshire - Hollywood areas of the Los Angeles area. The major purpose of this survey is to obtain information relative to the travel patterns and trip characteristics of the three-quarter of a million employees in this area. This data will be used to develop work trip origin-destination patterns and identify potential transit riders within the study area and the adjacent areas. The study area is that area roughly bounded by the Harbor Freeway on the east, Mulholland Drive to the north, the Los Angeles International Airport to the south, and the Pacific Ocean to the west. The governmental organizations contained within this area are Beverly Hills, Culver City, Los Angeles, and Santa Monica.

The survey is divided into four major phases:

1. Development of survey form,
2. Development of sampling plan,
3. Distribution of survey forms,
4. Development of office controls, and
5. Coding and editing of survey returns.

This manual will discuss each of these phases individually in the following pages.

Development of Survey Form - The survey form has been developed to determine all pertinent social and travel characteristics of the study area employees relevant to the development of an improved transit system. The survey form will be printed in Spanish and

English on cream colored card stock. The cards are sufficiently stiff to survive the proposed collection procedures. The colors have been chosen to contrast with the colors of ink or graphite pens and pencils, most commonly used in filling out questionnaires.

The questionnaire shown in Figure 1 has been designed so that answers to all questions can be coded into boxes provided at the right margin. The boxes have been printed in green and code numbers should be marked with red Venus "col-erase" pencils. The red code numbers will contrast well with most writing materials used in answering questionnaires. The contrast is helpful to the coding supervisors and editors who check the coded reports.

The questionnaire contains ten questions or sets of questions which will provide information on the travel modes used by persons who work in the West Los Angeles area. Except for Question 2, "Place of Residence," all answers are of the "check-off" variety which are self-coding. Since Place of Residence will be coded to the Post Office Zip-Code for that place, many of these answers should also be self-coding. An area is reserved in the right margin of the form for use by the office coding staff. Answers checked on the form will be edited and corresponding code numbers place in appropriate coding boxes, from which they will be reproduced on IBM punched cards for data processing.

Development of Sampling Plan - The sampling plan is a sampling procedure developed to obtain a representative sample of the entire population so that sampling bias is minimized. An attempt is made to get a representative sample by disaggregating specific employee types in the study areas, and dividing the

TRANSIT IMPROVEMENT PROGRAM
EMPLOYEE TRAVEL STUDY

Nº 103751

TO LOS ANGELES EMPLOYEES:
A los empleados de Los Angeles

We would appreciate your cooperation in completing and returning this questionaire for analysis. Your time and courtesy in providing information concerning your daily trip to work will allow us to plan for future transportation improvements in the Los Angeles Area.

PLEASE CHECK ONE:
(Marque uno)

Ud. puede ayudar a mejorar nuestro servicio respondiendo a todas las preguntas siguientes. Muchas gracias.

1. Sex and age group
Sexo y edad

male ☐	hombre	16-24	☐	16-24
female ☐	mujer	25-44	☐	25-44
		45-64	☐	45-64
		65 and over	☐	65 o mas

2. Place of residence
Residencia

_____
Community name and zip code
nombre de comunidad y zip

3. What are your working hours?
¿Cuales son sus horas de trabajo?

start work	A.M.
empezar _____	P.M.
finish work	A.M.
terminar _____	P.M.

4. What is your occupation?
¿Cual es su ocupacion?

Professional or technical	☐ profesional o técnico
Secretarial or clerical	☐ secretarial u oficinista
Retail sales	☐ ventas
Service or maintenance	☐ servicio o mantenimiento
Crafts & trades	☐ arte o comercio

5. How long does it take you to get from home to work?
¿Cuanto tiempo le dura a Ud. llegar a su casa de su trabajo?

5 to 10 minutes	☐ 5 a 10 minutos
10 to 15 minutes	☐ 10 a 15 minutos
15 to 30 minutes	☐ 15 a 30 minutos
30 to 60 minutes	☐ 30 a 60 minutos
Longer than 1 hour	☐ mas de 1 hora

6. Approximately how many miles do you live from work?
¿Aproximadamente cuantas millas viaja Ud. desde su casa a su trabajo?

Less than 3 miles	☐ menos de 3 millas
3 to 5 miles	☐ 3 a 5 millas
6 to 10 miles	☐ 6 a 10 millas
11 to 15 miles	☐ 11 a 15 millas
16 to 20 miles	☐ 16 a 20 millas
More than 20 miles	☐ mas de 20 millas

7. How do you usually come to work?
¿Como llega a su trabajo usualmente?

Bus	☐ autobus
Car Driver	☐ conductor de auto
Carpool (organized)	☐ Carpool (organizado por computador)
Car Passenger (Share-a-ride)	☐ pasajero participando en un carro
Taxi passenger	☐ taxi
Walk	☐ caminando
Other _____	☐ otro _____

8. If you usually come to work by bus:
Si ud viene a su trabajo en autobus:

a. How do you most often get to the place where you board the bus on your trip from home? (Check one)
¿Como llega a la parada en su viaje al trabajo la mayoria del tiempo? (Marque uno)

Walk	☐ caminando
Drive and park near bus stop	☐ manejo y estaciono cerca de la parada
Dropped off at bus stop	☐ alguien me deja en la parada

b. Why do you ride the bus because (Check one)
Usa Ud. el autobus porque: (Marque uno)

No cars available	☐ no hay carros disponibles
Cannot do auto-ride	☐ no puedo participar en un carro con otro
Prefer bus	☐ prefiero autobus
Parking problem	☐ problema de estacionamiento con carro

9. If you participate in a carpool:
Si participa en un carpool:

a. How often do you drive?
Cuantas veces maneja ud?

____ days a week	____ dias la semana
Every other week	cada dos semanas
Other _____	otro _____

b. How many persons participate in your carpool? _____
Cuantas personas participan en su carpool? _____

10. If you usually come to work in a car driver:
Si siempre viene a su trabajo como conductor de carro:

a. Where do you park? (Check one)
Donde se estaciona? (Marque uno)

Public lot	☐ lote publico
Public garage	☐ garaje publico
Private lot	☐ lote privado
Private garage	☐ garaje privado

b. Average cost per month
Costo ordinario por mes.

[illegible]	☐ Gratis
[illegible]	☐ 0 - $10
[illegible]	☐ $11 - $20
[illegible]	☐ $21 - $30
[illegible]	☐ $31 - $40
[illegible]	☐ mas de $40

c. Location of lot or garage _____
(nearest cross street)
Localidad del lote o garaje _____
(calle traviesa cercana)

d. Why do you drive instead of taking the bus?
(Check one reason)
Porque manejo Ud. en vez de tomar autobus?
(Marque uno)

[illegible]	☐ necesito el carro en mi trabajo
[illegible]	☐ prefiero la comodidad e intimidad
[illegible]	☐ vivo lejos de la parada
[illegible]	☐ viaje por autobus toma mucho tiempo
Other _____	☐ otro _____

[illegible]

Este estudio es conducido en nombre de SCRTD por [illegible]

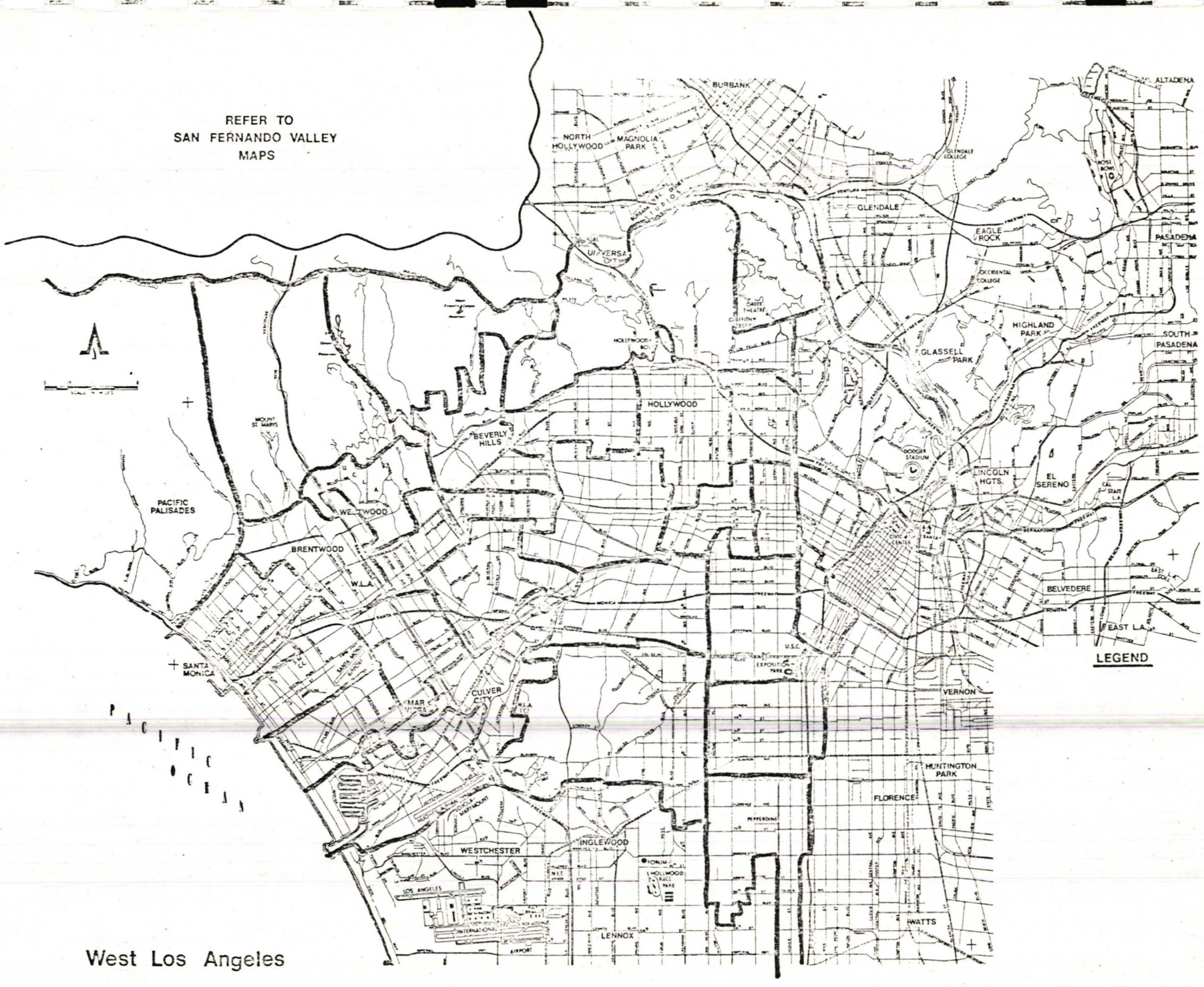
Sample

study areas into specific workplace locations. These divisions were made using existing employee data and land use characteristics in each study area.

Employee travel patterns are dependent upon salary, occupation, job type, etc. These types of data related to workplace are not currently available from existing data sources. The most accurate source of data is the LARTS 1974 employee data by traffic zone of workplace. This data separates only retail and non-retail employment. This data was used to divide sample population along with a listing of high rise office buildings and to separate non-retail employment into high-rise office and other. Thus, three general employment categories were used to divide sample employment: retail, high-rise office, and other.

The employment statistics are tabulated on the basis of traffic zones. These traffic zones are groups of census tracts. There are approximately 150 traffic zones within the proposed study area. This is far too many units to survey as the logistic's of defining the units to the field crews would be difficult if not impossible to develop. Therefore, the traffic zones were grouped into units that represent groups of traffic zones that relate to governmental and community areas. These areas are shown in Figure 2. Data was obtained that would provide the number of employees for various categories of employment. In this case, these categories were:

1. Retail employment,
2. High-rise non-retail employment, and
3. Other non-retail employment.



West Los Angeles

Wilbur Smith & Associates

Figure 2

The retail category was identified from updated LARTS employment data, and the high rise office data was obtained from a list of major office buildings supplied by Western Economic Research to 1970 and average occupancy factors (85 per cent net square feet x 85 per cent occupancy x 1 person per 250 square feet). Both of these estimates are probably conservative, in that LARTS data was expanded from old data and the high rise office does not include all new buildings; however, the travel characteristics of these two groups are homogeneous for any one area in comparison to the "other" category, so that these two categories do not require as large a sample as the "other" category. It is important to note; however, that included in the inventory phase of the project, a determination of the actual population in these two categories must be made for expansion of the sample.

The population in high rise office buildings can be determined relatively easily when managers are contacted for permission to conduct the survey. Retail sales employee population is a more difficult number to determine, especially those persons working in small shops or in strip commercial areas. It is proposed to correlate available information on retail employees with information concerning retail sales volumes in each area. Specific areas would be inventoried as completely as possible to obtain sales/employee correlation factors and these factors would be applied to each area to check LARTS employee numbers. A large discrepancy in numbers would require a more complete field survey of the analysis area.

The "other" category contains the largest number of employees to survey; it also is the least well defined employment category. The survey of this employment category must be the most carefully controlled to minimize survey bias. Procedures to minimize bias will be used both during the survey and in the survey sampling plan.

It is assumed initially that the number of employees in each work category in the entire study area is proportional to the number of employees in each work category residing in Los Angeles (1970 census data). Thus, the sampling procedure will be to generally survey employment categories in proportion to categories in the 1970 census.

The survey area contains approximately 750,000 employees. This is much too large of a sample population to consider a complete survey of the entire population within a reasonable amount of time and cost. Thus, a sample of the entire population was chosen for the survey which will later be expanded to the entire employee population size. A sampling plan was developed that would assure a survey of 5 per cent of the study area employee population. As shown in Table 1, this will require a return of 36,761 forms. Assuming a 30 per cent return, 122,536 forms will have to be distributed as a minimum; this is a sample of 16.6 per cent of the total West Los Angeles and Wilshire-Hollywood employee population.

Table 1

DEVELOPMENT OF SURVEY SAMPLE SIZE

West Los Angeles Employee Survey

Total Employee Population	745,799
Per cent Sample	x 0.05
Returns	37,290
Per cent Returns	÷ 0.30
Distribution	124,300
Per cent Sample	16.6

Table 2 lists each of the various subzones within the study area and the number of employees for each of the categories listed above and the number of employees in each area to be interviewed. The number of forms has been rounded upward to the next largest multiple of 250 since this is the size of the pads which the forms

are to be printed. This facilitates the assignment of the number of pads allotted to each study unit. In this way, ranges of form numbers can be assigned to each area. Once the allotted forms have been distributed, the survey sample will have been obtained and the survey crews can proceed to the next area.

Table 2

SAMPLE SIZES PER STUDY AREA

West Los Angeles Employee Survey

AREA NO.	STUDY AREA NAME	NO. EMPLOYEES	SURVEY SAMPLE
01	Culver City	22,292	3,750
02	Marina Del Rey	32,050 ✓	5,500
03	Santa Monica South	20,412	3,500
04	Santa Monica North	38,978 ✓	6,500
05	West Los Angeles	32,035 ✓	5,500
06	Palms	22,884	4,000
07	Westwood	34,744 ✓	6,000
08	Century City	22,405	3,750
09	Beverly Hills South	19,701	3,500
10	Beverly Hills North	32,549 ✓	5,500
11	Pacific Palisades	25,332	4,250
12	Miracle Mile	50,157 ✓	8,500
13	Mid-Wilshire	31,434 ✓	5,250
14	Wilshire Center	38,601 ✓	6,500
15	Sunset Strip	22,098	3,750
16	Hollywood	56,597 ✓	9,500
17	Echo Park	27,735	4,750
18	Westlake	63,386 ✓	10,750
19	University	28,011	4,750
20	Santa Barbara	26,647	4,500
21	Exposition Park	20,546	3,500
22	West Adams	20,825	3,500
23	Baldwin Hills	23,944	4,000
24	Silver Lake	3,453	750
25	Griffith Park	28,983	5,000
		745,799	126,750

Distribution of Survey Forms - The distribution of the survey forms is the most critical phase of the employee survey in that adequate controls and bookkeeping procedures must be implemented in order to obtain results that can be used with confidence. In order to obtain this control, the employee survey is to be divided into two phases; 1. The major office building survey, and 2. The field employee survey.

The major office building survey is the easiest part of the survey to undertake. A list of the major office buildings in the West Los Angeles study area has been compiled and data relative to the survey has been filed on index cards. The building managers will be contacted and information concerning the major tenants and the number of employees can be obtained along with permission to conduct the survey on their premises. Once permission has been received, the major tenants in the building will be contacted and given questionnaires for distribution to their employees. At this time the following information will be recorded.

1. Day and Date
2. Building Name
3. Company Name
4. Company Address
5. Type of Business
6. Number of Employees
7. Beginning and Ending Questionnaire Numbers
8. Follow-up to be undertaken

This information will be coded on the forms shown in Figure 3, as input for development of expansion factors and final tabulation of the survey results. These forms have been designated as the 07 cards.

SURVEYOR'S RECORD

	First	Last	
Questionnaire	_____	_____ (3&9)	1 □□ 3 □□□□□□ 9
Numbers	_____	_____ (15&21)	15 □□□□□□ 21
Area	_____ (27)		27 □□

Business Name _____

Building Name _____ (29) 29 □□□□

Address _____ 33 □□□□□

_____ Zip Code _____ (33)

Type of Business _____ (38) 38 □

Number of Employees _____ (39) 39 □□□

Floor Area _____ (43) 43 □□□□□

Follow Up: □ Mail Back □ Pick Up

Date _____

Number Forms Returned _____

Surveyor's Name _____ Date _____

CARD 07

Figure 3

Since the major buildings represent only about 10 per cent of the employee population, the remaining employee questionnaires will have to be distributed randomly in the field. Specific form numbers have been assigned for distribution in the various study areas. In this manner, those forms remaining after the major building survey can be distributed until the supply has been exhausted. When the field surveyors distribute the forms, they will also fill out the Surveyor Record shown in Figure 3. This form will provide the information to develop control totals for determining the proper expansion factors for the various survey areas and the categories of employees.

Development of Office Controls - The survey will be controlled by assigning particular survey numbers to particular analysis areas and particular employment categories. A first breakdown of form numbers will be made to assign a range of card numbers to a particular area. Secondly, each range of numbers is broken down into the three major employment categories. Third, as a part of the survey, the range of cards handed out to each employment location will be written down on surveyor control forms along with the company or building name, address, and type of business. Additional correlation will be obtained from the questionnaire form from question No. 5 which asks type of occupation.

A continuous record will be kept and updated each day of the total number of forms handed out in each area to each employment category. When the appropriate number of forms have been distributed to a particular category of employee, surveyors will be instructed not to survey this type of employment. When all forms are distributed a check will be made of the proportion of forms handed out in each category as compared to the proportion in the 1970 census. Expansion factors for each category will be developed from this comparison.

Coding and Editing of Survey Returns - The coding of the survey forms (Card 06) will be done within the office. The coding process will be undertaken in two steps. The internal edit and the coding of the questionnaire.

All of the questions on Card 06 are designed to be self-explanatory, and it is anticipated that most persons who receive a card will have no difficulty supplying the desired answers. The coding supervisor (or other designated person) will review all questionnaires before assigning them to coding clerks. If the questionnaire is to have any value to the study, it must contain at least a codable origin address. The initial edit should take place as cards are received at the office each day before they are placed in a sequence file.

The editor will first look at answers to questions 2 and 3 to see if the basic purpose of the questionnaire has been fulfilled. In order to use any card, it must have a "codable" address--i.e., an address that can be identified with a zip-code number. If only a community name is given, the zip code (or codes) for that community will have to be determined (if it cannot be identified, the questionnaire will be rejected). If the community contains two or more zip-coded areas, all addresses for that community will arbitrarily be allocated to the first (lowest) zip code area, unless street names etc. are given which will permit an exact definition of the place of residence.

Generally, if addresses are sufficient to pass this test, the questionnaire can be retained, even if some other questions have not been completed. If the editor has reason to believe that the questionnaire has been faked or has been deliberately prepared with misleading information, it will of course be discarded.

Editing and coding of survey questionnaires will begin as soon as completed survey forms are received in the office. Since completed questionnaires will be returned to the office daily, after the survey begins, a continuous coding procedure is anticipated.

As completed questionnaires are returned to the office, they will be filed in serial number sequence relating to the survey area in which the form was distributed. Header cards will be inserted into the file, listing the areas in which the following cards were handed out, showing the first and last serial numbers and noting the number of cards distributed. The number of cards returned will also be listed with plenty of space for frequent updating as late returns are filed. The header cards will be made up as soon as the completed surveyor's records are returned to the office each morning. A cross check card file will also be prepared from the surveyor's records with a card (Card 07) for each building listing the range of serially numbered questionnaires distributed in that building or area.

Instructions for coding and key-punching are as follows:

Field "1" - The two coding boxes opposite the digit "1" at the top of the form contain the card number ("03").

Field "3" - Space for a six-digit code in this field will be punched with the card serial number (printed at the top of

of the card). This will be the first material to be manually punched (the "03" code for card number will be set for automatic punching).

Field "9" - Three coding boxes here will contain the survey area number from the first line of the "Surveyor's Daily Record" form.

Field "12" - Four coding block will be provided in order to code a particular office building. This data will be useful for buildings which are occupied by a major firm and data can be developed for a more finite area than the traffic zones.

Q.1 - Field "16" - The answer to the first part of Question 1, "sex" (male coded "1"; female coded "2") will be coded into this field.

Field "17" - The answer to the second part of Question 1, "age" (16-24 coded "1"; 25-44 coded "2"; 45-64 coded "3"; 65 and over coded "4") will be placed in this field.

Q.2 - "18" - The Post Office Zip Code (5-digits) for "Place of Residence" will be placed in this field.

Q.3 - "Field "23" - A 4 digit code for "time start work" will be placed in this field. All answers on the interview form should be supplied by respondents in "conventional" time. These answers will be re-coded into "military time" (the 24-hour clock) by adding 12 hours to all P.M. entries. Two prefix "0"s will be used for time from midnight to one minute before 1:00 A.M. (e.g., 0024). Place the 4-digit code for scheduled starting time in the boxes opposite Field "23"

Field "27" - The "Quit work" time will be placed in this field. All answers will be treated as explained for Field "23". (Note that the Field numbers in front of the coding boxes are intended to identify the first column in that field on the punched card used to record the coded data. Since the numbers are printed on the card, they are useful for indexing the several entries, and that is the way they have been used in this manual.)

Q.4 - Field "30" - The answers to Question 4 will be coded into this field. Codes will be used as follows:

Professional or Technical .....Code 1
Secretarial or Clerical .....Code 2
Retail Sales .....Code 3
Service or Maintenance .....Code 4
Crafts and Trades .....Code 5
Blank .....Code 9

Q.5 - Field "29" - The answers to Question 5 will be coded into this field. Codes will be used as follows:

5 to 10 minutes ..... Code 1
10 to 15 minutes ..... Code 2
15 to 30 minutes ..... Code 3
30 to 60 minutes ..... Code 4
Longer than 1 hour ..... Code 5
Blank ..... Code 9

Q.6 - Field "30" - The answers to Question 6 will be coded into this field. Codes will be as follows:

Less than 3 miles..... Code 1
3 to 5 miles ..... Code 2

6 to 10 miles ..... Code 3
11 to 15 miles..... Code 4
16 to 20 miles..... Code 5
More than 20 miles ..... Code 6
Blank..... Code 9

Q.7 - Field "31" - The answers to Question 7 will be coded into this field. Codes will be as follows:

Bus..... Code 1
Car Driver ..... Code 2
Car Passenger..... Code 3
Taxi Passenger..... Code 4
Walk ..... Code 5
Other ..... Code 6

Note that if "other" is indicated, the interview form asks that the mode be specified. Only if a considerable number of respondents indicate that they use a mode different from those listed, and if two or three modes are used with about equal frequency, will it be necessary to re-code this item into two or more categories.

Q.8a - Field "32" - The answers to Question 8a will be coded into this field. The codes will be as follows and will be coded into the first box:

Walk..... 1__
Drive and park near bus stop.....20
Dropped off at bus stop 30

The second digit of the walk category will be the number of block written in the blank provided. If no number is in the blank

and the walk category is checked, then the code would read "19".

Q.8b - Field "34" - The answers to the second part of Question 6 will be coded into this field, as follows: If you usually come to work by bus, do you ride the bus because? (Check one)

No car available 1
Cannot share auto-ride (carpool).....2
Prefer bus.....3
Parking problem.....4

This question is asked to find if the transit passenger is a "captive" or "choice" transit passenger. If he is identified as a "choice" transit passenger, specific analysis of transit service to his district can be undertaken. It will be important to determine the comparative service levels of automobile versus transit for those indicating they chose to come by transit.

Q.9a - Field "35" - The answers to Question 9a will be coded into this field. The codes are as follows:

The number of days a week.....1-5
Every other day 6
Other..... 7

Q.9b - Field "36" - The number of persons will be placed in this field directly as answered.

Q.10a - Field "37" - The answer to part of Question 7 will be coded into this field. The codes are as follows:

Public lot.....Code 1
Public garage.....Code 2

Private lot ..... Code 3

Private garage ..... Code 4

Q.10b - Field "38" - The final portion of the answer to Q.10 will be coded into this field, as follows:

Free ..... Code 1

$10.00 or less per month ..... Code 2

$10.01 to $20.00/month..... Code 3

$20.01 to $30.00/month ..... Code 4

$30.01 to $40.00/month ..... Code 5

$40.01 to $50.00/month ..... Code 6

$50.01 or more per month ..... Code 7

While only one coding block has been provided for the answers to this question, it may be desirable to determine the monthly cost (translate daily or weekly costs to monthly, if the respondent does not supply a monthly figure) and key-punch the exact amount. This would require four coding spaces (good for costs up to $89.00; a "9" in the first box will indicate "no response". After all returns are examined, it will probably be practical to establish several classes or ranges of monthly cost for use in later analyses. The breakdown shown below is an example of how the data might be treated, but the intervals should be set so that 10 per cent or more of all responses fall in each class.

Q.10c - Code numbers will be assigned to the various lots and garages in the area based on the nearest intersection. These numbers will have to be looked up and coded. Those individuals who need their auto while at work or prefer the privacy and comfort of the automobile will be identified as particularly

difficult to attract to transit. Particular origin location and employee concentration of these individuals will be carefully identified. They perhaps are concentrated in certain areas of the city which would indicate minimum bus service to both the origin and destination area because of lack of potential to attract employees.

Those indicating the bus line is not conveniently located will be carefully reviewed to determine the type of service and service difficulties in the areas where these respondents work.

Q.10d. - Field "39" - Answers to Question 10d will be coded as follows:

Need car at work.....Code 1
Prefer comfort and privacy of car .....Code 2
Live too far from bus stop to walk .....Code 3
Bus trips take too long .....Code 4
Other (specify) .....Code 5

The Surveyor's Daily Record (Card No. 07)

The 06 survey card (Surveyor's Building Record) is shown in Figure 3. This is a "control form" used to maintain records on the Employee Travel Study Questionnaires (Figure 1) issued to employees who work in selected areas in the West Los Angeles area. It is intended that one of these forms be filled out for each employer or building in the study area where a series of interview cards are issued. In general, an attempt will be made to issue cards to all employees who work in particular buildings; however, in certain cases, selected employers in buildings with more than one tenant may be issued cards, and a separate Surveyor's Record will be completed for each organization receiving a group of cards.

At large buildings with one or a few tenants, contact will be made with administrative people requesting that their staff personnel cooperate in issuing and collecting the questionnaires, which will be turned over to the Consultant.

The Surveyor's Building Record will be completed by a field representative of Wilbur Smith and Associates when he completes the distribution of questionnaires to each recipient firm or building. The form will be completed and coded as follows:

Instructions for coding the Surveyor's Record (Card 07) are as follows:

Field "1" - This space is for the card number. In all cases the number will be 07.

Field "3" and "9" - These spaces will be the range of card numbers distributed to the employer written in the space for the Business Name. Fields "15" and "21" are additional spaces in case the cards get out of sequence and cards from another stack must be used.

Field "27" - This is the study area code number as listed in Table 2.

Field "29" - is a code number to be assigned to the major office building or a major employer. As yet these numbers have not been assigned.

Field "33" - This field will be the zip code of the business address.

Field "38" - This field will be a code number assigned to the various categories of employers. These codes are as follows:

Retail 1
Non-Retail 2

Field "39" - This field is to be filled in by the number of employees working at the office at which this form has been filled out.

Field "43" - This space is to be filled out by the floor space occupied by that business in thousands of square feet. For instance 10,000 square feet will be coded as 10. If this information is not available, its space should be left blank.

APPENDIX B

RESULTS OF EMPLOYEE TRAVEL SURVEY

RESULTS OF EMPLOYEE TRAVEL SURVEY

Table	TITLE
B-2	Control Summary by Study Zone
B-3	Sex and Age by Study Zone
B-4	Employee Residence Zip Code by Employment Study Zone
B-5	Employee City of Residence by Employment Study Area
B-6A	Employee Work Hours by Study Zone
B-6B	Employees by Work Hours
B-7	Occupation by Study Zone and Sez
B-8A	Travel Time for Bus Riders
B-8B	Travel Time for Auto Drivers Plus Passengers and Carpool
B-8C	Travel Time for Bus Riders, Auto Drivers, Passengers and Carpool
B-9A	Travel Time by Occupation by Study Zone
B-9B	Travel Time versus Occupation
B-10A	Travel Distance for Bus Riders
B-10B	Travel Distance for Auto Drivers Plus Passengers and Carpool
B-10C	Travel Distance for Bus Riders, Auto Drivers, Passengers and Carpool
B-11	Travel Mode by Study Zone
B-12	Travel Mode versus Occupation
B-13A	Travel Mode versus Sex and Age by Zone
B-13B	Summary Travel Mode by Sex and Age
B-14	Travel Mode versus Travel Time
B-15	Travel Mode versus Travel Distance

Table	TITLE
B-16	Travel Mode by Community of Residence and Analysis Zone
B-17	Travel Mode to Bus Stop by Study Zone Bus Riders Only
B-18	Reason for Riding Bus by Study Zone Bus Riders Only
B-19	Carpool Driving Frequency By Study Zone (Carpool Mode Only)
B-20	Number in Carpool By Study Zone (Carpool Mode Only)
B-21A	Carpool Size versus Frequency and Study Zone (Carpool Mode Only)
B-21B	Summary Carpool Size versus Driving Frequency (Carpool Mode Only)
B-22	Parking Location by Study Zone (Car Driver Mode Only)
B-23	Average Monthly Parking Cost by Study Zone (Car Driver Mode Only)
B-24A	Parking Cost versus Location by Study Zone (Car Driver Mode Only)
B-24B	Summary Parking Cost versus Location (Car Driver Mode Only)
B-25	Reason for Driving By Study Zone (Car Driver Mode Only)
B-26A	Frequency of Driving versus Trip Length By Study Zone (Carpool Mode Only)
B-26B	Summary Frequency of Driving versus Trip Length (Carpool Mode Only)

See West Los Angeles Employee

Survey Tabulations

APPENDIX C

ON-BOARD TRAVEL SURVEY MANUAL

APPENDIX C

WEST LOS ANGELES ON-BOARD TRAVEL SURVEY
And Coding Manual

Public transit in Los Angeles, as elsewhere in the United States, is heavily dominated by commuters traveling between their homes and their work places. Because of traditional working practices, most employed persons spend 10 or more hours a day at work and going to and from work. Most of these people begin and end their workdays at about the same hours, causing daily peak-hour surges of traffic at morning and evening. The size of the bus fleet is directly related to these peak-hour demands, with most buses in storage or underutilized at other times of the day.

The improvement of transit services within an area should consider the sources of bus riders and means which might be taken to make use of the bus more attractive to the commuting residents of suburban communities. The proportion of residents who use buses to jobs is a partial measure of the relative quality and cost of car and bus transportation. Where bus use is very low, this is often a reflection of inadequate service or indirect routings that produce line-haul times which enable car drivers to achieve appreciable time savings over transit patrons. The total number of workers who drive to their jobs is a useful indication of the potential for increased transit patronage if major improvements can be made in the level of transit service and/or the cost differential can be increased in favor of bus travel.

Study Area

West Los Angeles is defined roughly as the area west of the Los Angeles Central Business District to the Pacific Ocean. The

Study area is bounded by Mulholland Drive and Riverside Drive on the north, the Los Angeles River and the Harbor Freeway on the east, and Slauson Avenue on the south, and includes the incorporated cities of Santa Monica, Beverly Hills, and Culver City. The remainder of the study area is largely within the City of Los Angeles as shown in Figure 1.

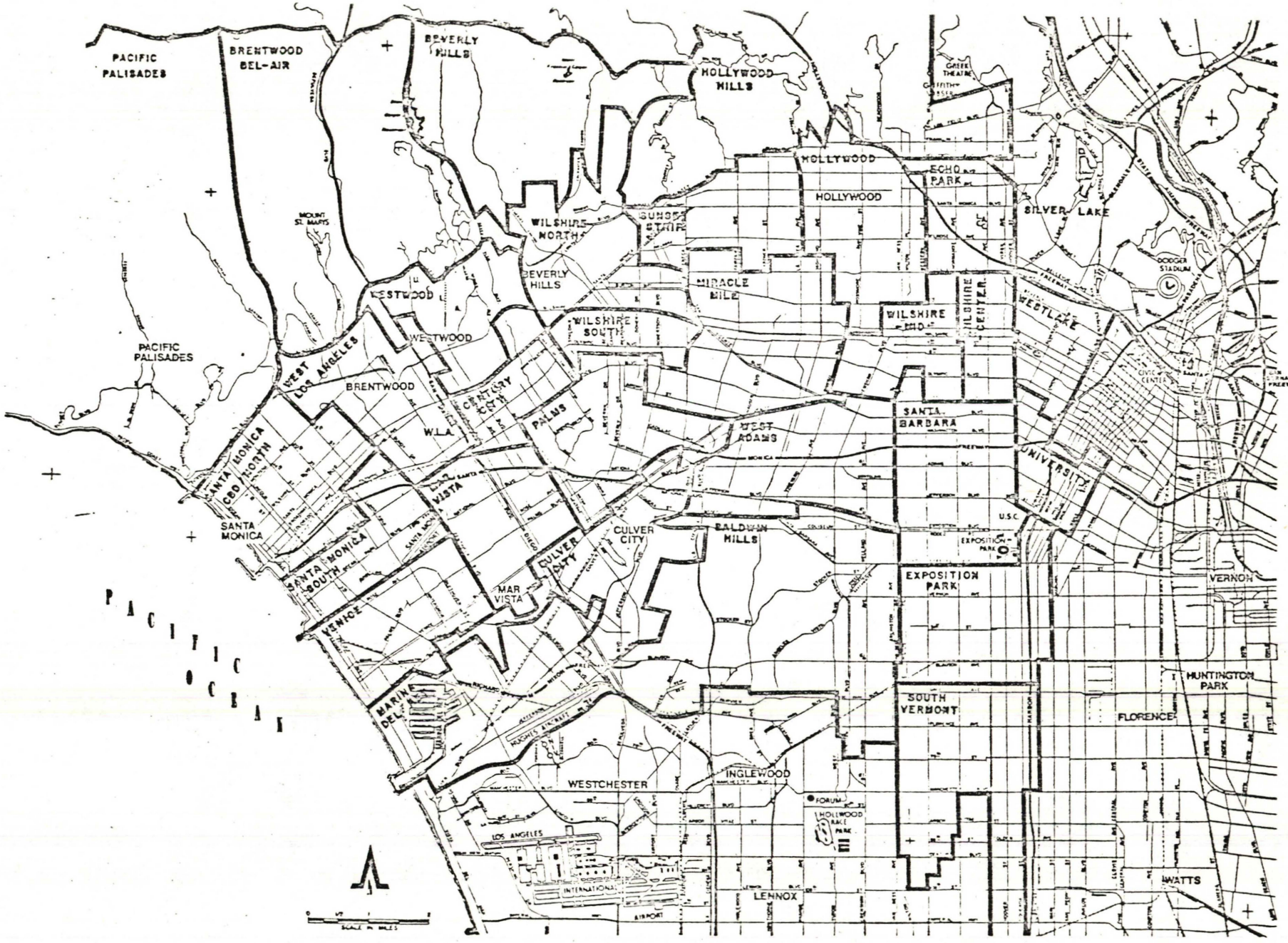
It is proposed that the numbers and travel habits of persons riding buses within the area should be determined by survey as a step towards understanding and evaluating the service provided by buses. This information, together with data on the numbers of employed persons in West Los Angeles and the residential patterns of workers as determined in earlier comprehensive origin-destination surveys and from a special worker survey, will provide the insights needed in developing a bus routing plan that is more suitable than the present service for passengers with downtown origins and destinations.

Surveys

Two major surveys will be conducted within the West Los Angeles Study Area. One survey would be an "On-Board Transit Survey" to identify origin-destination patterns and travel characteristics of existing bus riders within West L.A. The second survey would be an "Employee Travel Study" directed to identifying potential transit patrons who work in West L.A.

On-Board Transit Survey

An on-board transit survey will be made of selected bus lines in the West Los Angeles study area. A one-day survey will be



STUDY AREAS

Wilbur Smith and Associates

Figure 1

February 197

conducted on each of the selected bus line between the hours of 9 A.M. and 5 P.M. These hours were selected for the following reasons:

1. Peak hour usage of buses was at capacity, therefore, no new equipment would be available even if the results of the survey indicated their need;
2. The travel patterns of the commuters that would be using the bus immediately prior to and following the above time period would have already been determined by the employee travel survey;
3. The primary purpose of the on-board survey is to determine the travel patterns of non-worker bus riders.

The surveyors will be assigned to bus trip by the senior supervisor (Chris Vlisides). The surveyor will then hand out questionnaires (B-1 Forms) to all boarding passengers. When a boarding passenger refuses a questionnaire, the surveyor will discard that form. This will insure an accurate count of the number of passengers.

The surveyor will maintain a careful record of the serial numbers on cards handed to boarding passengers on each bus trip. (Very few passengers are expected to refuse to take a survey questionnaire; cards refused by passengers will be discarded, in order to maintain an accurate count of the number of boarding passengers). Questionnaires completed before a passenger leaves the bus may be dropped into a clearly marked container on the bus; passengers who do not complete the forms on the bus can mail them

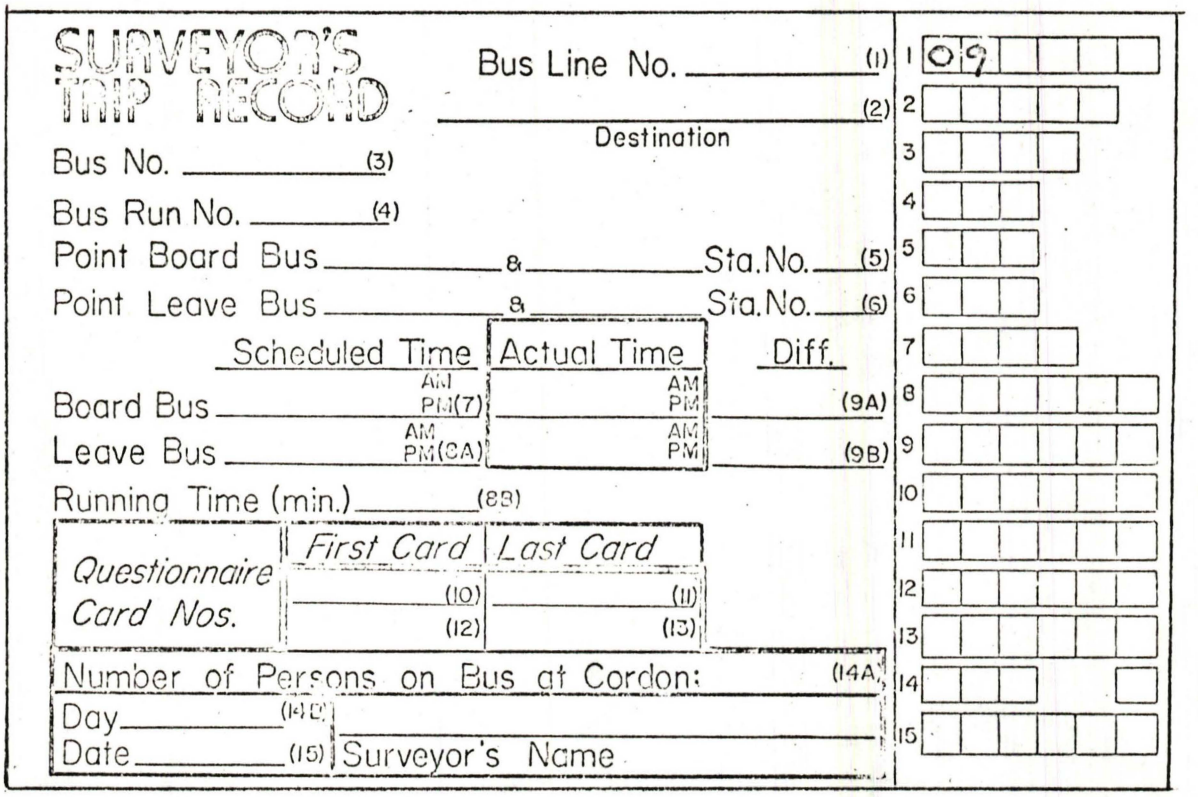
back without cost (cards will carry the Consultant's address and a "business reply mail" permit; postage will be paid by the Consultant when the cards are delivered to him by the Post Office).

Since questionnaires will be handed only to persons who board a bus in the study area passengers who are on the bus when it enters West Los Angeles will not get them; those who stay on the bus until it leaves the study area will not be interviewed. Therefore, the surveyor will count the total number of persons on the outbound bus when he boards the bus and the difference between this count and the number of questionnaires handed to boarding passengers will provide a "preliminary estimate" of the number of thru-riders.

Inventory and Central (B-2 Card)

A "Surveyor's Trip Record" card will be completed for the bus boarded by surveyors. The form will be completed by the field supervisor and given to the surveyor. The information on the card will tell the surveyor when and where to debark from the bus and when and where he is to board the bus for his return trip. The card is the same as that developed for the downtown survey and is shown in Figure 2. The Surveyor's Trip Record (illustrated in Figure 2) will contain the following information:

Bus Line Number and Destination
Bus Number
Bus Run Number
Point Board Bus (intersection and station number)
Point Leave Bus (intersection and station number)
Time Board Bus - Scheduled time (entered in office)
and Actual time (entered in field)



"SURVEYOR'S TRIP RECORD"

(09 Card)

Figure 2

Time Leave Bus - Scheduled time and actual time
Questionnaire serial numbers (first card and last card)
Count of passengers on bus at outbound station
Day and date
Surveyor's signature.

Much of the information contained in the Surveyor's Record Card will be coded and key-punched as part of the material to be merged with the trip reports made up from questionnaires that are obtained from the passengers on each bus. Space has been left on the Record Card for calculating and/or coding the essential information into boxes in the right margin. Those items of information which identify the bus line, bus and run numbers, and CBD cordon stations where the surveyor boards and leaves the bus, together with scheduled time at those boarding and alighting points, will be filled out in the office.

The surveyor will complete portions of the form when he boards the bus. The items to be completed are boxed in heavy lines on the lower portion of the card; the surveyor will note the actual times of boarding and leaving the bus, the serial numbers of the first and last questionnaire cards given out on the bus, the count of persons on the outbound bus where it crossed the cordon, the day of the week and date of the survey. The surveyor's signature is also required.

Space has been left on the card for office use in noting the differences (plus or minus) between the time a bus is scheduled to arrive at the cordon line stations and the time it actually arrives;

this will provide information on schedule adherence, and the difference will be coded and punched into the card (with indication whether the bus was early or late by the amount shown).

The running time between terminals will be found by subtracting actual time entering from actual time leaving, thus providing data which may show correlation with number of riders and street traffic congestion by time of day.

The Surveyor's Trip Record has also been provided with space to record two sets of Questionnaire Card Numbers. The Questionnaires (B-1 Cards) will be printed and bound into books of 250 serially-numbered cards; serial numbers will run continuously from 100,001 to 170,000. During heavy periods, the surveyor may hand out cards to more than 250 boarding passengers, using portions of two pads on a single trip (or the surveyor may be supplied with two partially-used pads). It is not feasible to maintain continuity of serial numbers from one pad to the next, so the surveyor will record the first and last serial numbers given out from each pad used.

Each bus route will be worked by a crew consisting of several surveyors and a supervisor. The crew supervisors will dispatch surveyors to ride a bus as it crosses a control station. Each surveyor will carry a supply of mail-back questionnaires and each person boarding the bus in the CBD will be given one (except infants or very small children accompained by an older person). The surveyor will not give questionnaires to passengers already on the bus.

When the surveyor boards the bus, an entry will be made of the actual time the bus arrived at the control point in the space

provided on the Surveyor's Trip Record (B-2 Card), as described above. The surveyor will also note the number of the first questionnaire given to a boarding passenger. When the bus reaches the terminal at the opposite end of the line, the surveyor will leave the bus and will record the actual time the bus arrived at the cordon station and the number of the last questionnaire distributed on the bus. Before leaving the bus, a careful headcount will be made of persons on the bus (excluding infants and very young children who were not given cards); this number will be recorded in the space provided. Day, date, and signature must also be added to the form, which will then be surrendered to the supervisor at the cordon station where the surveyor got off the bus. The surveyor is then ready for assignment to another inbound bus.

SCRTD will cooperate with the consultant in making sure that all bus operators on the lines being surveyed each day are issued special instructions to pick up surveyors at the control stations. as they enter the CBD.

Survey crew supervisors at the (control stations and terminals) will be responsible for placing a surveyor on the bus runs scheduled to be surveyed each day, for keeping an adequate supply of interview cards available to surveyors and for seeing that the Surveyor's Trip Records (B-2 Cards) are properly completed. The supervisor will be responsible for alerting his crew to the following day's assignment and to seeing that the crew reports to work properly equipped with identification badge, survey materials, and full instructions on the day's operations.

The size of each survey crew will be carefully planned to meet the requirements of the scheduled bus services on the routes to be surveyed each day.

Coding The Surveyor's Trip Record (B-2 Card)

Data contained in the B-2 cards will be punched on data processing cards, to be matched with the survey questionnaires; each questionnaire report will thus be expanded to include information on the bus run, time of day, and other identifying characteristics of the trip on which the bus passenger received the survey questionnaire.

The B-2 card is largely self-coding. The card is printed in green ink on white or cream-colored stock and coders will use red Venus colerase pencils for the code numbers they put in the coding boxes. Each item to be coded is marked with an item number; the lines of code boxes are marked with corresponding numbers to help the coding clerks identify them. The coding procedures for each item are discussed below:

Card No. - The first two code boxes are reserved for the card number; the B-2 card is numbered "09." (The data processing section of Wilbur Smith & Associates usually places additional identifying information in the card, such as the project number; this will modify the card layout, but for purposes of this manual, the numbering system shown is sufficient.

Item 1 - Bus Line No. - This requires a 4-digit code. Flyers, limiteds, and expresses should be differentiated by an F, L, or X in the first column. Example: line 34F will be coded F034.

Item 2 - Destination - The destination is the name of place or street shown on the destination blind of the bus. A list of all

destinations was compiled and assigned code numbers as shown in Table 1 and Figure 3. Five coding boxes are supplied on line 2.

Item 3 - Bus No. - Code the 4-digit number in this entry in the boxes on line 3.

Item 4 - Bus Run No. - Code a 3-digit number for this entry in the boxes on line 4. Add one (or two) "O's" as prefixes if the run number shown contains only two (or one) digits.

Item 5 - (Control Cordon) Station No. where surveyor boards the bus - Code a 3-digit number into the boxes on line 5. If the station number shown on the card consists of only 2 (or 1) digist, prefix the number with one (or two) "O's." List on stations and numbers are shown in Table 2 and Figure 4.

Item 6 - (Control Cordon) Station No. where surveyor leaves the bus - Same as Item 5. Put a three-digit code in the boxes on line 6.

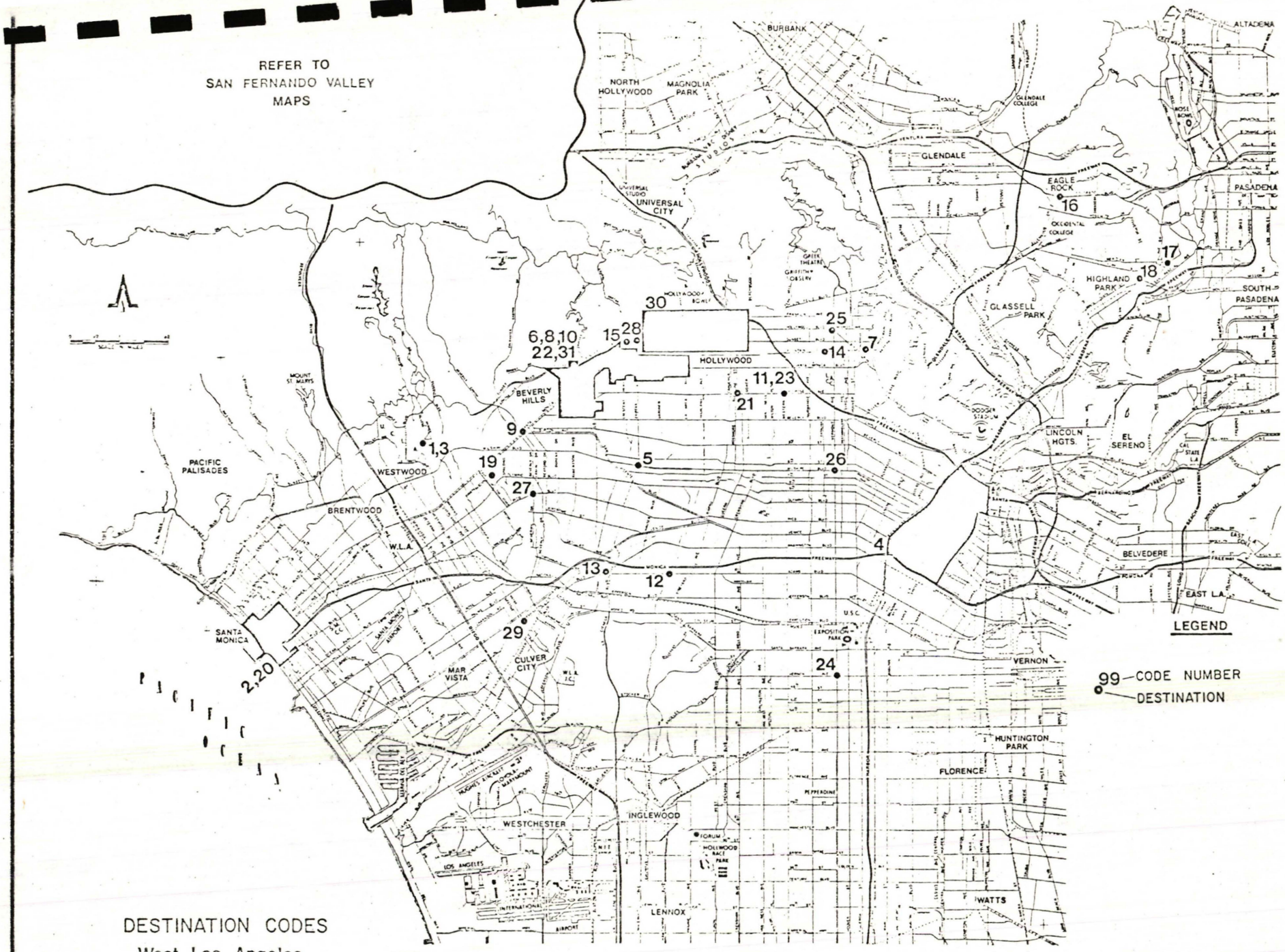
Item 7 - Scheduled time to board bus - The entry shown is the time that the bus is scheduled to cross the control point, (or the time the bus is scheduled to leave station if the bus trip originates in the study area). Times are listed on the card according to the conventional 12-hour clock, with AM or PM indicated. A 4-digit code will be used, based on the 24-hour clock (12 hours will be added to all PM entries). Two prefix "O's" will be used for times from midnight to one minute before 1:00 A.M. (e.g., 0024 =

Table C-1

DESTINATION CODES

West Los Angeles On-Board Travel Survey

Code No.	Destination
1	Westwood
2	Ocean at Colorado
3	UCLA
4	Los Angeles (LACBD)
5	Fairfax at Wilshire
6	West Hollywood
7	Sanborn at Sunset
8	Division 7
9	Beverly Hills Station
10	La Cienega at Holloway (w/HUD)
11	Western at Melrose
12	La Brea at Adams
13	Adams at Washington
14	Fountain at Edgemont
15	Sunset at Laurel Canyon
16	Eagle Rock
17	Avenue 66
18	Figueroa at York
19	Century City
20	Santa Monica
21	Melrose at Vine
22	Melrose at San Vicente
23	Melrose at Western
24	Vermont at Vernon
25	Hollywood at Vermont
26	Vermont at Wilshire
27	Beverly Dr. at Pico
28	Fairfax at Sunset
29	Culver City
30	Hollywood
31	West Hollywood



Wilbur Smith & Associates

Figure 3

Table C-2

STATION NUMBERS

West Los Angeles On-Board Travel Survey

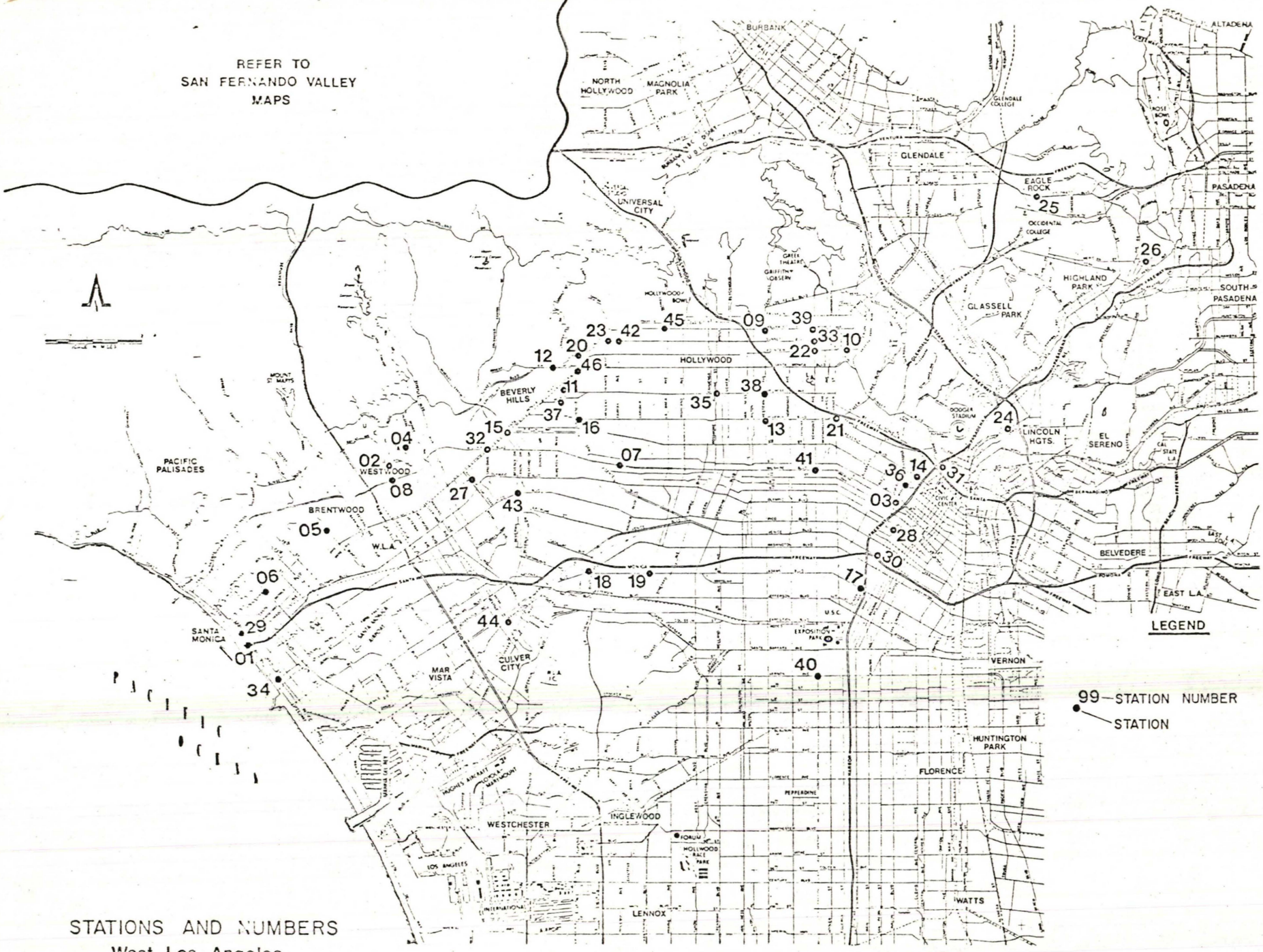
Code No.	Location
001	Ocean at Colorado
002	Westwood
003	Bixel at Wilshire
004	UCLA
005	Bundy at Wilshire
006	Wilshire at 14th
007	Fairfax at Wilshire
008	Westwood at Wilshire
009	Western at Hollywood
010	Sunset at Sanborn
011	Division 7
012	Santa Monica at Sunset
013	Beverly at Western
014	Beaudry at First
015	Beverly Hills Station
016	Beverly at La Cienega
017	Adams at Figueroa
018	Adams at Washington
019	Adams at La Brea
020	La Cienega at Sunset
021	Beverly at Temple
022	Vermont at Fountain
023	Laurel Canyon at Sunset
024	Ave. 18 at N. Broadway
025	Eagle Rock
026	Ave. 66
027	Century City
028	Figueroa at Olympic
029	Santa Monica at 2nd
030	Figueroa at Venice

Table C-2 (continued)

STATION NUMBERS

West Los Angeles On-Board Travel Survey

Code No.	Location
031	Figueroa at Sunset
032	Santa Monica at Wilshire
033	Sunset at Vermont
034	Ocean at Ocean Park
035	Melrose at Vine
036	Bixel at Third
037	Melrose at San Vicente
038	Melrose at Western
039	Hollywood at Vermont
040	Vermont at Vernon
041	Vermont at Wilshire
042	Fairfax at Sunset
043	Beverly Dr. at Pico
044	Culver City
045	Hollywood at La Brea
046	La Cienega at Santa Monica



STATIONS AND NUMBERS
West Los Angeles

Figure 4

minutes after midnight). One prefix "0" will be used for times from 1:00 A.M. to 9:59 A.M. (e.g., 0635). Place the four-digit code for scheduled starting time in the boxes on line 7.

Item 8 - Scheduled time to leave bus - Same as Item 7. Place 4-digit time code in the first four boxes on line 8.

Item 8b - Running time from place of boarding to place of leaving - The actual running time will be found by subtracting the actual boarding time from actual leaving time. The answer should be shown on the card in whole minutes. The answer should then be transferred to the last two code boxes on line 8, unless the running time exceeds 80 minutes; all times 80 minutes or more will be coded "80".

Item 9a - Difference between Scheduled boarding time and actual boarding time - Compute the difference by subtracting scheduled time from actual time recorded in the field and show the difference in the space marked "9a". This number should be in whole minutes. If any bus is late by more than 80 minutes, use the number "80" as the maximum entry. Prefix the time difference with a plus or minus sign to indicate whether the bus was early (plus) or late (minus). The computed time difference should be coded into the first three code boxes on line 9. The first box should be coded "1" if a plus sign shows that the bus was early; the first box should be coded "2" if the bus was running late, as indicated by a minus sign. If the time difference was 9 minutes or less, place a "0" in the second code box. If actual time and scheduled time were the same, (actual time within 30 seconds of scheduled time) the code should read "000".

Item 9b - Difference between scheduled leaving time and actual leaving time - Same as Item 9a. The computed time difference should be coded into the last three code boxes on line 9.

Item 10 - First Questionnaire issued on bus (Pad No. 1). The surveyor has entered the serial number of the first card handed to a boarding passenger after he got on the bus. This is a 6-digit number and should be transferred exactly to the six coding boxes on line 10.

Item 11 - Last Questionnaire issued on bus (Pade No. 1). The surveyor has noted the 6-digit serial number of the last card issued from the first pad of questionnaires used in the bus. Transcribe to the code boxes on line 11.

Item 12 - First Questionnaire issued on bus (Pad No. 2). The surveyor will always take two pads of B-1 Questionnaires with him when he boards a bus. If the first pad is completely used up before he gets off the bus, he will issue cards from the second pad. Since the serial numbers are not likely to continue directly from the first pad to the second, the surveyor is required to record the last number issued from the first pad and the first from the second pad. Transcribe the number in Item 12 to code boxes on line 12.

Item 13 - Last Questionnaire issued on bus (Pad No. 2). Same as Item 11. Transcribe the number in Item 13 to code boxes on line 13.

Item 14a - Number of Persons on Bus at Cordon - As the surveyor debarks from the bus at a control station, he will make a careful count of the number of passengers in the bus and will record

this number in the space marked "14a". A three-digit code will be used in transcribing this information into the first three code boxes on line 14. Prefix "0"s will be used if the number of passengers is more than 10.

Item 14b - Day of Week. The Los Angeles On-Board Survey will be conducted over a period of three weeks. Questionnaires will be distributed to riders only on working days, Monday through Friday; work will not be carried out on weekends (Sat. and Sun.), holidays, or in stormy weather. The surveyor will note the day of the week when each Trip Record card was completed. Days will be coded as follows: Mon. = 1; Tues. = 2; Wed. = 3; Thurs. = 4; Fri. = 5. Enter the appropriate code in the fourth box on line 14.

Item 15 - Date. A six-digit code will be used to indicate the date, as follows: "Day of month" = 2 digits (use "0" in first position for less than tenth day of month); "Month" = 2 digits (use "0" in first position for less than tenth month of year); "Year" = 2 digits (74 or 75, as appropriate). Enter 6-digit code in the boxes on line 15.

The Questionnaire (B-1 Card)

The questionnaire developed for distribution to bus riders in the West Los Angeles area is shown in Figure 5. The questionnaire consists of a postage-paid mail-back card with a list of seven questions that bus passengers are asked to answer. All questions are in English and Spanish in the colors of green and brown, respectively. An area is reserved in the right margin of the form for use by the office coding staff. All answers on the form will be coded into appropriate boxes in the right margin by the Consultant's office staff.

Four questions are asked to identify the places where trips begin and end and where the passenger boards and alights from the bus; each of these requires the bus rider to supply an intersection and zip code. Only the community name and zip code number are needed for origin or destinations outside the study area.

Except for origin and destination addresses all of the answers on the questionnaire are self-coding. Since it is planned to code O-D's outside the study area by post-office zip code areas, respondents who use zip code numbers will automatically provide code numbers.

Editing and coding of survey questionnaires will begin as soon as completed survey forms are received in the office. Since some passengers will complete their questionnaires and deposit them in a marked receptacle before they get off the bus, these forms will be available for processing when the collection boxes are emptied and transferred to other buses each day. Mail-backs

LOS ANGELES AREA
TRANSIT IMPROVEMENT PROGRAM
ON-BOARD TRANSIT SURVEY

YOU CAN HELP IMPROVE OUR SERVICE BY ANSWERING ALL OF THE FOLLOWING QUESTIONS. PLEASE ANSWER AGAIN, EVEN IF YOU HAVE ALREADY FILLED OUT THIS FORM TODAY. DROP IN ANY MAILBOX. NO POSTAGE REQUIRED. THANK YOU FOR YOUR HELP.

USTED PUEDE AYUDAR DE MEJORAR NUESTRO SERVICIO RESPONIENDO A TODOS LOS CUESTIONES SIGUIENTES. FAVOR DE CONTESTARLAS OTRA VEZ AUNQUE YA LO HAYA ANTERIORMENTE. ECHALO AL CORREO ADONDE QUIERA. FRANQUEO NO ES NECESARIO. Y MUCHAS GRACIAS.

1 [0][8]

3 [ ][ ][ ][ ][ ][ ]

PLEASE CHECK ONE:
Marque uno

1. A. Where did this trip begin? / ¿Donde comenzo este viaje?

9 [ ]

Home	☐	Casa
Work	☐	Trabajo
Shopping area	☐	Centro mercantil
School	☐	Escuela
Medical bldg.	☐	Edificio medico
Other _____	☐	Otro _____

10 [ ][ ][ ][ ]

B. Please give the nearest intersection and zip code of that location.
Favor de indicar la interseccion y ZIP donde empezo este viaje.

14 [ ][ ][ ][ ]

_____ north/south norte/sur _____ east/west este/oeste _____ ZIP code

18 [ ][ ][ ][ ][ ]

2. A. How did you get to the bus stop where you boarded this bus?
¿Como llego a esta parada de autobus?

23 [ ][ ]

Walked (Number of blocks) _____		Caminado (Numero de cuadras)
Another bus	☐	Otro autobus
Drove	☐	Manejando
Auto passenger	☐	Pasajero en carro
Other _____	☐	Otro _____

B. How many buses do you ride to complete this trip? _____
¿Cuantos autobuses toma Ud. para este viaje? _____

25 [ ]

3. A. Is the place you are going?
¿A donde va?

26 [ ]

Home	☐	Casa
Work	☐	Trabajo
Shopping area	☐	Centro mercantil
School	☐	Escuela
Medical bldg.	☐	Edificio medico
Other _____	☐	Otro _____

27 [ ][ ][ ][ ]

B. Please give the nearest intersection and zip code of that location.
Favor de indicar la interseccion mas cerca de su destinacion y ZIP.

31 [ ][ ][ ][ ]

_____ north/south norte/sur _____ east/west este/oeste _____ ZIP code

35 [ ][ ][ ][ ][ ]

4. How will you get to your final destination after leaving this bus?
¿Como llegara Ud. a su destinacion final a bajarse de este autobus?

40 [ ][ ]

Walk (Number of blocks) _____		Caminando (Numero de cuadras)
Another bus	☐	Otro autobus
Drove	☐	Manejando
Auto passenger	☐	Pasajero en carro
Other _____	☐	Otro _____

5. Are you? / ¿Es Ud.

42 [ ]

Male	☐	Hombre
Female	☐	Mujer

6. To what age group do you belong? / ¿A Cual grupo de edades pertenece Ud?

43 [ ]

Under 15	☐	15 o menos
16-24	☐	16-24
25-44	☐	25-44
45-64	☐	45-64
Over 65	☐	65 o mas

7. Please indicate the total annual income of all persons in your household.
Favor de indicar los ingresos anual de todos que viven en su casa.

44 [ ]

Under $6,000	☐	$6,000 o menos
$6,000–10,000	☐	$6,000–10,000
$10,000–15,000	☐	$10,000–15,000
Over $15,000	☐	$15,000 o mas

45 [ ][ ]

47 [ ][ ][ ][ ]

This survey is being conducted for the Southern California Rapid Transit District by:
Este estudio es conducido en nombre de SCRTD por:

Wilbur Smith and Associates
3900 Wilshire Blvd., Suite 2950
Los Angeles, California 90036

SURVEY FORM

Figure 5

will arrive a few days later. At the end of the survey, mail-back returns will be accepted for not more than two weeks and the file then closed.

As completed questionnaires are returned to the office, they will be filed in serial-number sequence. Header Cards will be inserted in the file (contrasting color card stock) listing the bus line and bus run number on which the following cards were handed out, showing the first and last serial numbers, and noting the number of different cards distributed. The number of cards returned will also be listed, with plenty of space for frequent up-dating as late returns are filed. The Header Cards will be made up as soon as completed Surveyor's Trip Records (B-2 Cards) are returned to the office each morning (for the previous day's work). A cross-check card file will also be prepared from the Surveyor's Trip Records, in bus-line sequence, with a card for each numbered bus run on which questionnaires were distributed, listing the serial numbers distributed on that run. (If the surveyor issued questionnaires from two different pads, the range of numbers from each pad will be shown.)

The questionnaire is printed in green and brown inks on creamcolored card stock. The cards are sufficiently stiff to survive mail-back treatment. Each of the 16 questions on the card is stated in English (green) and Spanish (brown). The colors have been chosen to contrast with the colors of ink or graphite pens and pencils most commonly used in filling out questionnnaires.

The questionnaire form has been designed so that answers to all questions can be coded into boxes provided in the right margin.

The boxes have been printed in green and code numbers should be marked with red "Venus" col-erase pencils or black ink; the code numbers will contrast well with most writing materials used in answering questionnaires; the contrast is helpful to the coding crew supervisors and editors who check the coded reports.

Initial Edit - The coding supervisor (or other designated person) will review all questionnaires before assigning them to coding clerks. If a questionnaire is to have any value to the study, it must contain at least two codable addresses, one at either end of the trip (it is desired, of course, that all addresses called for have been completed and can be coded).

The initial edit should take place as cards are received at the office each day, before they are placed in the sequence file.

Generally, if addresses are sufficient to pass this test, the questionnaire can be retained, even if some other questions have not been completed. If the editor has reason to believe that a questionnaire has been faked or has deliberately been prepared with misleading information, it will, of course be discarded.

Any voluntary comments on the questionnaire will also be examined in the initial edit and a photocopy made of those that appear to be useful. These comments will be compiled in a special file.

Each of the questions on the survey form and the coding instructions are discussed briefly below:

Field "1" - The two coding blocks opposite the digit "1" at the top of the form is to contain the card number ("08").

Field "3" - This field will contain the six-digit card number that appears in the upper right-hand corner in red.

Question 1A - Field "9" - "Where did this trip begin?" The answer to this question will provide the origin of the trip. The answers are specific locations which will yield the origin of the trip and not that particular bus trip. This is the most logical beginning of any trip and will lead into question 1B. The answer to this question will be coded as follows:

ANSWER	CODE NUMBER
Home	1
Work	2
Shopping Area	3
School	4
Medical Bldg.	5
Other _____	6
No Response	9

Question 1B - Fields "10, 14, and 18" - Intersection of origin and zip code. The answer to this question will provide the exact location of the beginning of the bus trip. An schematic diagram

of each bus line will be made with a 4-digit number assigned to the major intersections along its route. This number will be coded into field "10." The zip code will be used in two ways. First, it will help the coders localize the area in which the intersection to be coded into field "10" is located. Secondly, the zip code number will be used to identify trip origins outside the West Los Angeles study area. Field "14" will be left blank. When the form was originally designed, it was planned to code the north-south and east-west streets separately, but programming and coding problems have eliminated the need for this field. The zip code will be coded into field "18" as it appears in the answer space.

Question 2A - Field "23" - "How did you get to the bus stop where you boarded this bus?" The answers to this question will provide data concerning the mode of travel to the bus stop. The answer "walked" will be coded by the number "1" followed by the number of blocks walked up to "8" blocks. Any number of 8 will be coded as "9." Therefore, the answer to this question will be a two-digit number from "10" to "18." The answers will be coded as follows:

ANSWER	CODE
Walked (No. of Blocks)	1 (0-8 Blocks)
Another Bus	20
Drove	30
Auto Passenger	40
Other	50
No Response	90

Question 2B - Field "25" - "How many buses do you ride to complete this trip?" The answers to this question will provide the number of buses that are required to complete a transit trip and will be an indicator of the directness of bus routing and the inconvenience that will be tolerated by a bus rider. The number shown in this space will be coded directly.

Question 3A - Field "26" - "Is the place you are going?" The answer to this question will provide the destination of the trip and not the bus trip itself. The answers will be coded as question 1A.

Question 3B - Fields "27, 31, and 35" - Trip destination data. The answer to this question will provide data comparable to the origin data from questions 1A and 1B. The answers will be coded as questions 1A and 1B.

Question 4 - Field "40" - "How will you get to your final destination?" The answers to this question will be coded the same as the answers to question 2A.

Question 5 - Field "42" - The answer to this question will provide the sex of the transit rider. The answer will be coded as follows:

ANSWER	CODE
Male	1
Female.	2
No Response	9

Question 6 - Field "43" - The answer to this question will provide the age group of the transit rider. The answers will be coded as follows:

ANSWER	CODE
Under 15.	1
16-24	2
25-44	3
45-64	4
Over 65	5
No Response	9

Question 7 - Field "44" - Annual family income. The answer to this question will provide data that will be an indicator of the income of those who use public transportation. This indicates whether the transit rider is transit dependent or not. The answer will be coded as follows:

ANSWER	CODE
Under $6,000	1
$ 6,000-10,000	2
$10,000-15,000	3
Over $15,000	4
No Response	9

Field "45" - Line Number - The line number will be coded into this field. Only two digits have been provided. If this field is blank, the data can be taken from the "Surveyor Trip Record."

Surveyor's Trip Record (B-3 Card)

In addition to obtaining the origin-destination of transit trips, a schedule adherence check is to also be conducted of the transit lines to be surveyed. In order to obtain this data while conducting the on-board travel survey, the B-3 card shown in Figure 6 was developed. Information obtained from the form is the line number and run, intersection, B-1 form number, and the time off schedule.

The B-3 card will be completed by the surveyor while riding the bus and has been designed such that it is self-coding. The form will have the intersections at which the card numbers and the actual time are to be recorded tabulated prior to distribution to the field crews.

The coding instructions for the form are as follows:

Field "1" - Card Number - This is the number of the form and will be "10" for all cards.

Field "3" - Bus Line Number - This field is for the bus line number. Flyers, limiteds, and expresses should be differentiated by an F, L, or X in the first column. Example: line 34F will be coded F034.

Field "7" - Bus Run Number - This four-digit field will contain the bus run number directly as it appears on the bus.

Field "11" - Time - The time at which the bus is boarded will be recorded in military time in this space. The data will be used to separate the schedule adherence checks into time categories.

SURVEYOR'S

TRIP RECORD

(B-3 CARD)

CARD NUMBER 10 (1)

BUS LINE NO. (3)

BUS RUN NO. (7)

TIME (11)

INTERSECTION	INT. NO.	B/I CARD NO.	DEPARTURE TIME ACTUAL	SCHEDULED	DIFFERENCE
	(15)	(19)			(25)
	(28)	(32)			(38)
	(41)	(45)			(51)
	(54)	(58)			(64)
	(67)	(71)			(77)

B-3 CARD

Figure 6

Fields "15, 28, 41, 54, and 67" - Intersection Number - These will be the assigned code numbers for the major intersections along each route to be surveyed. The intersection number will be the same as those used to code questions 1B and 3B.

Fields "19, 23, 45, 58, and 71" - B-1 Card Numbers - The number of the B-1 card at the approach to the intersections listed in column 1 will be written directly into these blocks. This column will then already be coded.

Fields "25, 38, 51, 64, and 77" - Time Difference - The difference between the scheduled and actual time will be recorded into this field. This will be coded into this field as it is computed in the office. The first column in this field should be either, and or - to indicate whether the bus run is ahead of the schedule or late. Example: If the scheduled time is 10:25 and the bus departs at 10:28, the bus has departed three (3) minutes late and the field should be coded "-03."

Schedule

There are a total of sixteen lines to be surveyed in a 14-day period beginning April 19, 1976. The results of the survey are to be presented to SCRTD on or about June 7, 1976. The following is the tentative schedule for conducting the on-board survey:

Monday, April 19, 1976 - Line 39
Tuesday, April 20, 1976 - Lines 12 and 25
Wednesday, April 21, 1976 - Lines 8, 20, and 56
Thursday April 22, 1976 - - Line 4 (Olympic)
Friday, April 23, 1976 - Line 4 (Melrose)

Monday, April 26, 1976 - Line 44 (Adams)
Tuesday, April 27, 1976 - Line 44 (Beverly)
Wednesday, April 28, 1976 - Line 95
Thursday, April 29, 1976 - Line 91
Friday, April 30, 1976 - Lines 21 and 27

Monday, May 3, 1976 - Line 75 (Venice)
Tuesday, May 4, 1976 - Line 42
Wednesday, May 5, 1976 - Line 94
Thursday, May 6, 1976 - Line 83

One additional week will be allowed for the forms to be returned before the cards will be sent out for keypunching and tabulation. Three weeks (May 10 thru June 4) will be allowed for data processing. This schedule will allow the forms to be returned to Los Angeles before June 7, 1976.

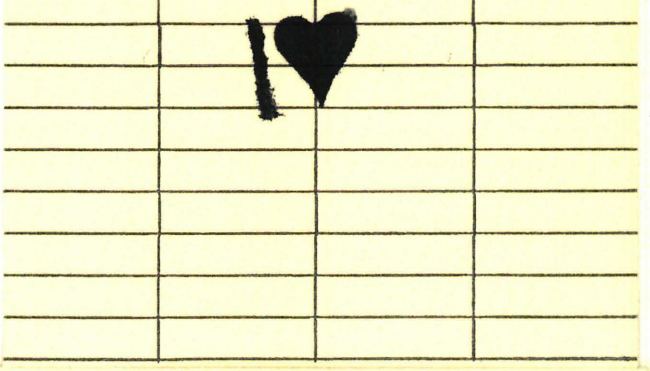
APPENDIX D

RESULTS OF THE ON-BOARD SURVEY

LIST OF ON-BOARD TABULATIONS

TABLE	LIST OF SUPERVISOR RECORD CARDS - By Line No.
D-1	O-D by Purpose
D-2	Mode to vs. Mode From by O-D
D-3	Mode to vs. Mode From by Line
D-4	Total Mode to vs. Mode From
D-5 1	Destination vs. Purpose by Line
D-6	O-D Age & Sex vs. Trip Purpose
D-7	O-D Income vs. Purpose
D-8	O-D No. of Buses to Complete Trip

SCRTD 1976 .W47 c.2
08262
West Los Anseles transit
Plannins study



SCRTD LIBRARY
425 SOUTH MAIN
LOS ANGELES, CA. 90013

S.C.R.T.D. LIBRARY