Contract No. UMT-DPM-PLAN-3

Demand Models and Patronage Forecasts for the Los Angeles Downtown People Mover Program

Tasks 3, 4, and 5 Final Report Downtown People Mover Evaluation Program

November 1981

prepared for

Los Angeles Downtown People Mover Authority
Los Angeles, California

The Preparation of This Report has been Financed in Part Through a Grant from the U.S. Department of Transportation, Under the Urban Mass Transportation Act of 1964, as Amended.

prepared by

Peat, Marwick, Mitchell & Co.

in association with
DTM, Inc.

Peat, Marwick, Mitchell & Co.

Certified Public Accountants

1990 K Street, N.W.
Washington, D.C. 20006

November 12, 1981

Mr. Daniel T. Townsend
Executive Director
Los Angeles Downtown
People Mover Authority
354 South Spring Street
Los Angeles, CA 90013

Dear Mr. Townsend:

We are pleased to present our report entitled: "Demand Models and Patronage Forecasts for the Los Angeles Downtown People Mover Program."

This report describes the development of a revised set of forecasting procedures for estimating people mover ridership in the downtown Los Angeles area. These procedures update those previously used by the Los Angeles Downtown People Mover Authority (Authority) according to the results obtained from the Spring 1980 Work Place and On-Board surveys conducted by the study team.

The accompanying estimation of future year people mover ridership is based upon data, information, and assumptions supplied by the Authority, the Southern California Rapid Transit District, and the staff of the Los Angeles Regional Transportation Study (LARTS) branch of the California Department of Transportation (Caltrans). The sources of data, information, and assumptions used in the preparation of these ridership forecasts are shown in Appendix B.

The achievement of any projection is dependent upon the occurrence of future events that cannot be assured. Therefore, the actual results achieved may vary from the projections.

The terms of our engagement are such that we have no obligation to update this report or to revise the projected ridership results because of events and transactions occurring subsequent to May, 1981.

Very truly yours,

PEAT, MARWICK, MITCHELL & CO.

Peat, Marwick, Mitchell & Co.

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I. INTRODUCTION

OBJECTIVE

The ultimate goal of the DPM analysis is to estimate the expected ridership on the proposed DPM system for the forecast study years. Ridership estimates for the DPM system are needed to: (a) evaluate the need for the system; (b) compute the farebox revenues and therefore the anticipated subsidy; and (c) determine the capacity required to aid in station design and the numbers of cars provided.

This report is intended to present the ridership forecasts for the DPM system proposed for construction in Los Angeles and also to present the analytical tools developed to create these ridership forecasts.

ANALYSIS STRUCTURE

A key input to the development of DPM ridership projections and the establishment of a valid basis for before-and-after impact assessment is the careful identification of travel markets which may be served by the DPM system. Once these markets are identified, the most appropriate data collection methodologies can be selected to provide detailed information on the travel characteristics of each market. These data collection methodologies, in turn, provide major input into the structuring of the overall analysis procedure.

Two other design inputs to the analysis process are the assumed zone structure and the selection of forecast study years for which DPM ridership estimates must be determined. The DPM markets to be analyzed, the zone structure for the development of networks, and the selection of forecast study years are discussed in the following sections.

DPM Markets

A DPM system can and will serve a variety of travel markets which can be classified along a number of dimensions. Four classifications were investigated in setting up the study design for the analyses of the Los Angeles DPM system:

(1) trip type: a DPM system is generally considered to serve two major functions; distribution within the CBD of trips with one trip end outside the CBD, and circulation within the CBD of trips entirely contained in the CBD.

(2) trip purpose: while many trip purposes are possible, the DPM markets are classified as home-to-work trips and other (non-work) trips.

(3) trip-maker type: transportation analyses frequently separate travellers by age, sex, physical handicaps, etc. For DPM analysis, tripmakers are identified as CBD-workers and other travellers to the CBD.

(4) regional access mode: the likelihood of a person using the DPM system may be influenced by the mode used to reach the CBD, such as auto, bus, train, or other. In Los Angeles, nearly all travellers to the CBD can be classified as regional auto or regional transit users.

Each of these four dimensions has been divided into two classifications. Exhibit I-1 illustrates the sixteen market segments created by the combinations of these four dimensions.

Six of the market segments in Exhibit I-1 will not exist and can be eliminated. Home-to-work circulation trips for non CBD-workers are not possible. Home-to-work circulation trips are possible for CBD-workers but these trips will be considered as a special case of home-to-work distribution travel. Finally, home-to-work distribution trips for non CBD-workers is not possible.

EXHIBIT I-1

DPM Market Analysis Priorities

<table>
<tr><td colspan="4" rowspan="4"></td><td colspan="4">Trip-maker Type</td></tr>
<tr><td colspan="2">CBD Worker</td><td colspan="2">Non CBD-Worker</td></tr>
<tr><td colspan="2">Regional Access Mode</td><td colspan="2">Regional Access Mode</td></tr>
<tr><td>Auto</td><td>Transit</td><td>Auto</td><td>Transit</td></tr>
<tr><td rowspan="4">Function</td><td rowspan="2">Distribution</td><td rowspan="2">Trip Purpose</td><td>Home-Work</td><td>1</td><td>1</td><td>na</td><td>na</td></tr>
<tr><td>Non-Work</td><td>na</td><td>na</td><td>3</td><td>3</td></tr>
<tr><td rowspan="2">Circulation</td><td rowspan="2">Trip Purpose</td><td>Home-Work</td><td>na</td><td>na</td><td>na</td><td>na</td></tr>
<tr><td>Non-Work</td><td>2</td><td>2</td><td>3</td><td>3</td></tr>
</table>

This disregards the insignificant possibility of a reverse distribution commute by a person living in the CBD and working outside the study area.

Two additional market segments were eliminated because they represent unusual circumstances. Non-work distribution trips by CBD-workers could occur due to midday trips to areas outside the CBD, or due to evening trips to the CBD. Neither of these is considered a likely candidate for DPM service.

The remaining eight market segments are gathered into three groups for modelling purposes, indicated in Exhibit I-1 by the numbers 1, 2, or 3. The DPM analysis focuses on the CBD-worker as the primary market for the DPM system. CBD-workers may use the DPM system for the distribution portion of their regular trip to work (market 1). They may also use it for circulation travel within the CBD, such as noon hour trips (market 2). Travel by non CBD-workers for non-work purposes will be less regular and will occur throughout the day rather than during the noon hour and the AM and PM peak periods. The non CBD-worker trips will have less impact on system design and capacity, so both distribution and circulation travel are grouped together.

Zone Structure

The Los Angeles CBD was divided into 98 zones which correspond closely to the zones used in the 1979 Los Angeles CBD Parking Study, see Exhibit I-2. This permitted the parking capacity and cost data to be incorporated in the DPM study with very few adjustments.

The sizes of zones and the zone boundaries are established using the following criteria:

- zones take advantage of homogeneous land use activities whenever possible. For example, the garment district contains a number of blocks which will have similar employee characteristics;

EXHIBIT I-2

Study Area Boundaries and Analysis Zones

- larger zones (less detail) can be created at farther distances from the DPM alignment; and
- larger zones can be created for lower employment density areas.

The region outside the Los Angeles CBD was divided into 9 regional corridors of approach. The corridor of origin for a distribution trip will affect (a) the bus stop where a regional transit user exits the bus in the CBD, and (b) the parking lots selected by regional auto users.

Forecast Years

Ridership estimates for the DPM system were developed for the years 1985, 1990, and 2000. These forecast years were specified in the analysis agreement written by the Los Angeles Downtown People Mover Authority.

MODEL STRUCTURE

The DPM model system includes three distinct model procedures to estimate DPM ridership separately for each of the market segments. The three models address the following trip types:

1. Distribution trips for regional auto and bus travel to the CBD by CBD-workers.
2. Circulation trips for CBD-workers.
3. Distribution and circulation trips for non CBD-worker transit travel.

CBD-Worker Distribution Trips

This model estimates the DPM ridership for the distribution portion of regional trips to the CBD. It applies to regional auto and regional transit trips made by CBD-workers.

The trip tables input to the distribution trip model contain regional trips from regional corridors to CBD zones. The distribution trip at the end of these regional trips must be identified before a mode choice decision can be made. For regional auto trips, the distribution portion is defined as the connection from the parking lot to the traveller's destination.

For regional bus trips, the distribution portion is defined as the connection from the bus stop where the traveller first exits the bus in the CBD, to the traveller's destination. The point where a traveller first exits the bus in the CBD is determined by a program called BUSSTOP. BUSSTOP is a manual coding of exit points determined from inspection of bus route maps.

The distribution trips for auto and regional bus acccess to the CBD are input to a distribution mode choice model to determine the numbers of travellers who will (a) walk, (b) ride another regional bus, (c) ride the minibus, or (d) ride the DPM.

<u>CBD-Worker Circulation Trips</u>

This model estimates the midday circulation travel for all CBD-workers. Non CBD-worker circulation travel is treated as a 3rd market segment by a Fratar trip table approach. A CBD-worker circulation trip is defined as a midday trip which leaves the building where an employee works, but remains entirely within the CBD study area. Midday trips outside the study area are disregarded because they are not candidates to use the DPM system. The CBD-worker circulation trip model is a two-step process: the first step is a frequency/destination choice, and the second step is a mode choice.

The frequency/destination choice for a CBD-worker is between staying in his or her place of employment all day, or making a circulation trip within the CBD. Trip frequency is determined from how often the worker chooses not to make a midday trip, with frequency computed as the total number of employees minus the number of employees who choose to not leave their workplace. The trip destination is determined by a logit model based on the land use activities in each of the CBD zones.

The mode choice decision for CBD-worker midday trips is made by a second logit model, based on the level of service provided by each available mode between the traveller's workplace and the destination zone chosen in the preceding step. The mode choice decision is between the walk and auto modes, and any of the available transit modes: regional bus, minibus, and DPM service.

Non CBD-Worker Distribution and Circulation Trips

A Fratar trip table factoring approach was used to estimate DPM ridership by non CBD-workers. The Fratar approach is described as three major steps:

(1) create CBD transit trip tables for distribution and circulation trips;

(2) factor the transit trip tables to reflect growth in travel between the base and forecast years; and

(3) assign the non CBD-worker transit trips to the "best path" provided by the combined transit services between the origin and destination; including regional bus, minibus, and the automated DPM system.

ORGANIZATION OF REPORT

Following this Introduction, Section II describes the preparation of the network data for the base and forecast years. Section III documents the development and calibration of the individual models, and Section IV discusses the validation of the final models using base year data. Section V documents the assumptions and model adjustments made so the models could be applied to forecast patronage for the future DPM system. Section VI presents the future year patronage forecasts for the DPM system. Appendix A documents the data base used to calibrate the revised models. Appendix B contains a description of the data, information, and assumptions used to prepare the projections contained in this report. It also includes a listing of the source of each of these.

The accompanying estimation of future year people mover ridership is based upon data, information, and assumptions supplied by the LADPM Authority, the Southern California Rapid Transit District, and the staff of the LARTS branch of Caltrans. The sources of data, information, and assumptions used in the preparation of these ridership forecasts are shown in Appendix B. We have relied upon the data and information supplied by the sources noted above but have not verified such data and information. We have not evaluated the assumptions and have not determined whether they constitute reasonable basis for the preparation of the projections and do not assume any responsibility for their reasonableness.

The achievement of any projection may be affected by fluctuating economic conditions and is dependent upon the occurrence of future events that cannot be assured. Therefore, the actual results achieved may vary from the projections and the variations could be material.

II. PREPARATION OF NETWORK DATA

OVERVIEW

Networks are the means by which we represent the transportation services being studied. They define the characteristics of the various modes available to each traveller in terms of where the service is offered and how fast and frequently it operates. This network representation of service provides the means by which the separation or ease of movement between zones can be determined; the separation between zones being the key variable for estimating the ridership on a mode.

Generally, the separation between zones as incorporated in demand models is measured by the in-vehicle or run time, the out-of-vehicle or excess time, and the cost or fare. Such variables can be used either individually or in combination, an example being using total travel time (the sum of run and excess time) rather than run and excess time individually. The variables whose estimation must be supported by the various network processing steps are generally given by the structure of the demand models. As this study includes the calibration of the demand models, the base year networks must provide maximum flexibility so that potential model variables are not excluded from consideration because they cannot be developed. The requirements for future year networks will then be determined from the resulting demand models.

This chapter describes the network coding conventions employed throughout the study and the characteristics of the base and future year networks. It focuses on the key changes made each year which affect the ridership of the DPM. The use of parking supply and price information is also discussed, the development of this data having been documented elsewhere.

NETWORK CODING PROCEDURES

The coding conventions employed for the Los Angeles Circulation/Distribution Program 1/ were adopted for this study. These procedures provide consistency with both the regional travel modeling efforts and previous CBD planning, and also provide the flexibility required for the development of level of service variables for model calibration. These procedures also conform to the requirements of the Urban Transportation Planning System (UTPS), the package of software used for model calibration and ridership estimation.

Mode Designations

Exhibit II-1 shows the modes used in the network coding process. Each of the competing distribution/circulation transit modes is coded separately so that individual level of service variables can be developed. Essentially, two separate networks are coded. An auto network which includes the mode 2 auto links and the mode 3 zone centroid connectors; and a multimode network which includes all of the transit run modes (4-8), the mode 1 sidewalk links, and the mode 3 zone centroid connectors. This separation of networks is made to ease the processing of networks with the UTPS package.

Network Representation

The actual network coding is in the form of a series of nodes, links, and lines. Nodes reflect street intersections, transit stops or transfer points, and other interchanges such as at the escalator or stairs for a pedway. Links are the connections between nodes, each link having a distance and a time or speed associated with it. Note that there can be more than one link between

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1/Barton Aschman and Associates, Internal CBD Travel Demand Modeling, prepared for the Community Redevelopment Agency of the City of Los Angeles, February, 1977.

EXHIBIT II-1

Mode Designations

Mode No.	Description
1	Sidewalk, stairs, escalators, and pedways
2	Auto
3	Zone Centroid connectors
4	Mini-bus
5	DPM
6	Local Bus
7	Regional/Express Bus
8	Wilshire Rail Starter Line

two nodes, each having a different mode and usually a different time. For example, Flower between 7th and 8th streets would have coded a mode 1 walk link, a mode 2 auto link, and a separate transit link for each transit mode running on Flower Street. Lines meanwhile, define the routing of transit services in terms of the sequence of nodes which are stops. Each line has assigned to it a reference number, the mode of the transit service, and its headway or frequency of service.

The coded link speeds are those adopted for the Circulation Distribution Study and reflect traffic and congestion conditions in downtown Los Angeles. Individual link times reflecting geometry and acceleration/deceleration characteristics are coded for the DPM and rail lines. The other transit modes use average speeds in the 7-9 mile per hour range, the walk links are coded with 3 mph average speeds with the exception of uphill grades, and the auto links speeds vary according to roadway type.

Centroid connectors "tie" each zone into the network. The distance they represent can vary from the length of a blockface for zones which contain a single block to movements of several blocks for larger zones. For single block zones the assumed "average" connector time consists of the walk along a single blockface. For larger zones the connector time is the walk time to traverse the diagonal path from the zone centroid to a corner of the zone. In areas of high rise development they should also include average elevator time within the building.

BASE YEAR NETWORK CHARACTERISTICS

Base year (1980) networks include both auto and multimodal networks, and reflect the service offered at the time of the Spring 1980 Onboard and Workplace Surveys. Basically, the purpose of these networks is the preparation of level of service variables for the demand model calibration. Separate networks are coded for the PM peak and midday service periods.

The multimode network includes the minibus service and the downtown portion of regional bus services. Specification of the alignment and headways for each bus line was provided by the Southern California Rapid Transit District. The level of regional service provided and the extent of operations in the downtown is shown by Exhibit II-2. Exhibit II-3 shows the alignment of the minibus which, from the perspective of model calibration, is a key component of the service.

The base year transit fares reflect the fares in existence at the time of the Spring Onboard and Workplace surveys. These were twenty-five (25) cents for the minibus and fifty-five (55) cents for the regional bus service. Regional transit trips transferring in the downtown are assumed to pay an average of 6.8 cents transfer fare for their distribution trip in the CBD. This is based on the ten cent transfer fare and 32 percent of the regional transit riders being pass

EXHIBIT II-2

BASE YEAR SERVICE LEVELS

Corridor	Number of Bus Trips Crossing the CBD Cordon (PM Peak Hour) Total	Local	Express	PM Peak Hour Vehicle Miles of Service in the CBD
Harbor Freeway	73.4	40.0	33.4	125
Santa Monica Freeway	71.5	52.8	18.7	47
Wilshire/Olympic	89.2	89.2	0.0	141
Hollywood Freeway	100.4	70.4	30.0	222
Golden State Freeway	41.5	29.7	11.8	75
Pasadena Freeway	53.9	38.4	15.5	59
San Bernardino	105.5	33.2	72.3	187
Santa Ana Freeway	64.5	18.8	45.7	27
South Central	53.4	53.4	0.0	98

Source: Southern California Rapid Transit District, May, 1980 and UTPS program UNET output reports.

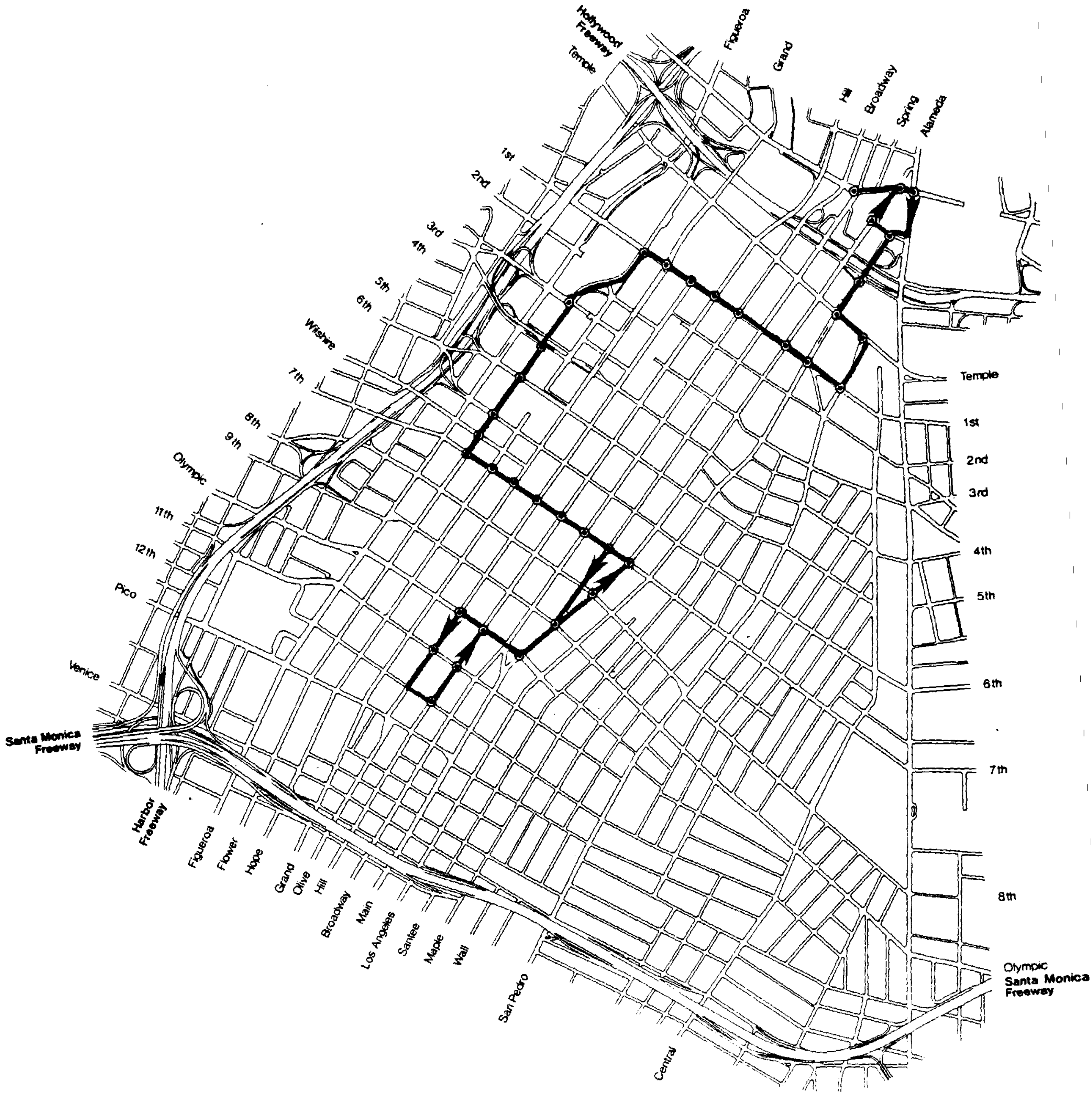
holders. The fares will be assumed to remain constant in 1980 dollars for forecasting purposes.

Accurate representation of the transit service is important to the estimate levels of service for model calibration. Therefore, the coded network was validated by comparing UTPS program UNET output reports to published SCRTD schedules of service. Such a validation determines whether the average network speeds used for network coding provide an adequate representation of the service.

The network validation was conducted by reviewing each line's schedule to determine the total time between each pair of time points in the CBD. (Note that many of the lines did not have time points in the downtown and had

EXHIBIT II-3

MINIBUS ALIGNMENT 1980



to be excluded from the validation.) As the scheduled time varies somewhat during the PM peak hour between runs on the same line, the range of times was noted unless a single value was clearly dominant. The coded line for this service was then reviewed to determine (a) the nodes closest to each time point and (b) the time between nodes shown in the UNET output reports noted. If a node was not within one-half block of the time point, interpolation between the time to reach each of the adjacent nodes was made. Exhibit II-4 shows the results of this analysis. Generally, the coded network times are lower than those given by the schedules. This is probably due to an inadequate allowance for boarding time and an underestimation of the effects of congestion on the downtown streets.

As we are dealing with short distances and times through the downtown, an attempt was made to adjust the coded speeds so that differences between the coded and scheduled times are less than two minutes. Generally this meant recoding various links with speeds one to two miles slower than originally intended, with some lines being varied on a directional basis. Exhibit II-4 includes a comparison between the scheduled times and the original and adjusted coded times. As many of the lines use common links, some of the adjustments have increased the time differences for lines previously considered acceptable, but overall there is a better comparison between coded and scheduled times for the adjusted network. It is this adjusted network which will be used to develop level of service data for the demand model calibration.

FORECAST YEAR NETWORK CHARACTERISTICS

Once the demand models are calibrated, DPM patronage will be estimated for years 1985, 1990, and 2000. Networks are required for each of these years to estimate the level of service to be available at that time. Key items to be included in these networks, in addition to the people mover, are the Wilshire

EXHIBIT II-4

COMPARISON OF SCHEDULE AND NETWORK
TIME POINTS FOR THE BASE YEAR NETWORK

SCRTD LINE NO.	UNET LINE #.	TIME POINT NODES	SCHEDULE TIME (minutes)	NETWORK TIME ORIGINAL (minutes)	NETWORK TIME ADJUSTED (minutes)
2	1	478-314	15	13.0	15.3
	2	314-478	13	13.9	15.8
4	5	422-214	11	4.0	4.8
5	7	424-326	8-11	8.3	9.5
		326-314	4	5.4	5.4
	8	314-326	7	5.4	5.4
		326-424	6	8.2	8.5
6	9	488-424	4-8	6.4	6.4
		424-310	12	8.8	9.0
	70	310-424	7	8.8	9.0
7	10	426-320	9	6.5	7.8
	71	320-426	9	6.7	7.7
8	11	493-312	15	13.8	15.6
9	13	304-424	5	6.5	6.9
	14	424-304	8	7.2	7.2
12	15	298-424	9	9.9	10.0
	16	424-298	13	8.5	10.4
25	19	270-310	16-18	14.9	16.8
	20	321-256	12-13	11.0	11.9
47	34	455-442	3	3.3	3.3
		442-390	7	5.8	6.2
	35	374-440	9	6.9	7.7
		440-455	4	4.0	4.2
49	36	298-222	7	6.4	6.9
		222-410	3	3.3	3.3
		410-498	10	8.2	9.4
	37	485-396	10-11	8.5	9.8
		396-298	12	10.7	11.9
56	38	478-320	9	10.3	11.8
	39	320-478	13-15	10.5	12.0
86	44	448-212	9-9	7.4	7.8
	45	212-448	10	7.5	8.7
92	48	455-442	3	3.3	3.3
		422-314	12-14	10.2	12.5
	49	314-426	11	10.1	11.4
		426-455	6	5.0	5.2

Starter line, planned SCRTD transit service changes, and planned downtown pedways. As plans for such items only exist through about 1990, the year 2000 service will be assumed to be the same as that offered in 1990; the same networks being used for both years. Similarly, the auto networks are assumed to be the same for all years. The characteristics of the 1985 and 1990 multimode networks are described below.

Year 1985 Multimode Network

The key element of the 1985 network is the addition of the DPM and the resulting changes to regional bus service in support of the people mover. Exhibit II-5 shows the alignment for the people mover and for the minibus. The minibus service area has been revised from 1980 to complement that of the DPM rather than overlapping with it. The DPM link times and distances are shown in Exhibit II-6. These were provided by the Los Angeles Downtown People Mover Authority and the times include vehicle dwell at each station. The DPM will be modeled with a headway of 1.9 minutes in the PM peak hour and 4.5 minutes in the noon hour.

Both the Union Station and Convention Center DPM stations incorporate intercept parking for auto users and bays for conveniently interfacing with bus transit services. Also added for 1985 is the 7th Street DPM Shopping concourse or pedway. It connects an evaluated walkway to the buildings between 7th and 8th streets from between Grand and Hope to west of Figueroa. This pedway is planned to eventually connect into the 7th Street Starter Line station as well as connecting to the DPM station.

SCRTD plans to revise the frequency of regional services, and also to incorporate revisions to the downtown routing of various bus lines to either interface or intercept 20 percent of the express bus trips which would have

EXHIBIT II-5

DPM AND 1990 MINIBUS ALIGNMENT

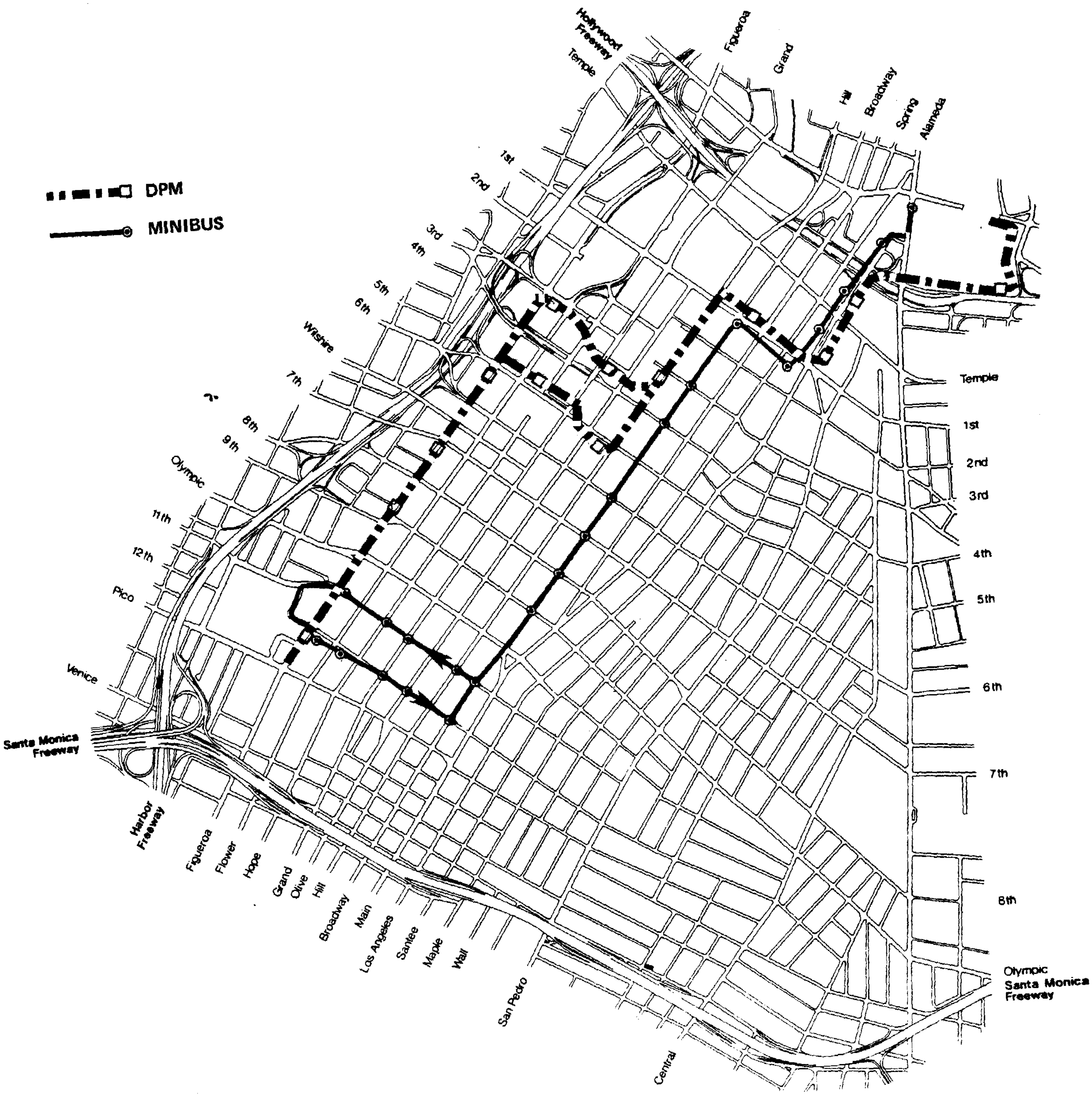


EXHIBIT II-6

DPM SERVICE CHARACTERISTICS

STATION	SOUTHBOUND			
	Distance (miles)	Cumulative Distance (miles)	Time (minutes)	Cumulative Time (minutes)
Union Station		0.0		0.0
	0.4		1.8	
Federal Building		0.4		1.8
	0.2		0.9	
Little Tokyo		0.6		2.7
	0.2		1.1	
Civic Center		0.8		3.8
	0.4		1.4	
Hill Street		1.2		5.2
	0.2		1.0	
Bunker Hill		1.4		6.2
	0.2		1.1	
World Trade Center		1.6		7.3
	0.3		1.2	
5th and Figueroa		1.9		8.5
	0.3		1.1	
7th and Figueroa		2.2		9.6
	0.2		1.1	
9th and Figueroa		2.4		10.7
	0.4		1.5	
Convention Center		2.8		12.2

NOTE: UTPS coding requires distances to be rounded to the nearest tenth of one mile and times to the nearest tenth of one minute. The above distance and time estimates reflect rounding the results of a Transit Operations Model, prepared by Kaiser Engineers.

EXHIBIT II-6 (continued)

DPM SERVICE CHARACTERISTICS

STATION	NORTHBOUND Distance (miles)	Cumulative Distance (miles)	Time (minutes)	Cumulative Time (minutes)
Convention Center		0.0		0.0
	0.4		1.7	
9th and Figueroa		0.4		1.7
	0.2		0.9	
7th and Figueroa		0.6		2.6
	0.2		1.1	
5th and Figueroa		0.8		3.7
	0.2		1.0	
Library		1.0		4.7
	0.2		1.1	
Pershing Square		1.2		5.8
	0.3		1.3	
Hill Street		1.5		7.1
	0.4		1.4	
Civic Center		1.9		8.5
	0.2		1.2	
Little Tokyo		2.1		9.7
	0.2		0.9	
Federal Building		2.3		10.6
	0.4		1.5	
Union Station		2.7		12.1

NOTE: UTPS coding requires distances to be rounded to the nearest tenth of one mile and times to the nearest tenth of one minute. The above distance and time estimates reflect rounding the results of a Transit Operations Model, prepared by Kaiser Engineers.

passed the Union Station and Convention Center DPM stations. In general, routes and stops remain unchanged between 1980 and 1985, with local service increasing approximately 5 percent and express service 15 percent over the 1980 level of service. Exhibit II-7 shows the 1985 level of service planned by SCRTD according to the corridor of approach.

Year 1990 Multimodal Network

In addition to the DPM which was included in the 1985 network, key elements for the 1990 network are the operation of the Wilshire Starter Line and the planned expansion to regional commuter rail service. The Starter Line provides for easy transfer to the DPM at both the 7th Street and Civic Center Stations as well as greatly increasing the accessibility of downtown to various portions of the region in terms of the available seats per hour. The Starter Line is coded to operate at 4 minute intervals in the PM peak hour with 6 minute service during the noon hour.

Bus service changes include new service provided by the planned Sector Improvement Plan as well as improvement in the frequency of existing services by 10 percent for local and 30 percent for express. The Bus on Freeway Program is also assumed to have been implemented and 20 percent of the total express lines passing the Convention Center station are intercepted with 45 percent of the express lines at Union Station intercepted. Exhibit II-8 shows the 1990 level of service by regional corridor. In addition to the service shown, the commuter rail service is assumed to operate in the corridors shown in Exhibit II-9.

PARKING SUPPLY AND PRICES

In addition to the network description of transportation service, data on the availability and cost of parking are needed by CBD zone for each study year.

EXHIBIT II-7

1985 SERVICE LEVELS

	Number of Bus Trips Crossing the CBD Cordon (PM Peak Hour)			
	Total	Local	Express	Intercept Trips
Harbor Freeway	79.1	52.4	26.7	5
Santa Monica Freeway	86.1	55.4	30.7	4
Wilshire/Olympic	93.6	93.6	0.0	0
Hollywood Freeway	108.2	61.9	46.3	0
Golden State Freeway	44.6	27.0	17.6	0
Pasadena Freeway	58.4	40.3	18.1	0
San Bernardino	137.8	64.3	73.5	18
Santa Ana Freeway	70.6	21.7	48.9	0
South Central	55.8	55.8	0.0	0

Source: Southern California Rapid Transit District, May, 1980.

The data must describe the number of spaces available, the cost per hour, and the cost per day for publicly available commercial lots. The cost data is used to determine the relative attraction of each zone for parking purposes, and the number of available spaces is used to compare the supply with the demand for parking.

Data Sources

The base for the collection of parking data was the "Central City Parking Study" conducted by Wilbur Smith between 1979-1980. The availability of parking spaces by zone was accepted for this study almost without change. A few adjustments were made to account for recent developments which were known to have added or removed parking spaces.

EXHIBIT II-8

1990 SERVICE LEVELS

	Number of Bus Trips Crossing the CBD Cordon (PM Peak Hour) Total	Local	Express	Intercept Trips
Harbor Freeway	78.7	56.1	22.6	3
Santa Monica Freeway	105.7	62.5	43.2	14
Wilshire/Olympic	99.1	99.1	0.0	0
Hollywood Freeway	115.5	97.6	7.9	0
Golden State Freeway	51.4	37.9	13.5	0
Pasadena Freeway	55.2	39.6	15.6	8
San Bernardino	182.8	115.3	67.5	23
Santa Ana Freeway	116.5	75.5	41.0	0
South Central	41.2	41.2	0.0	0

Source: Southern California Rapid Transit District, May, 1980.

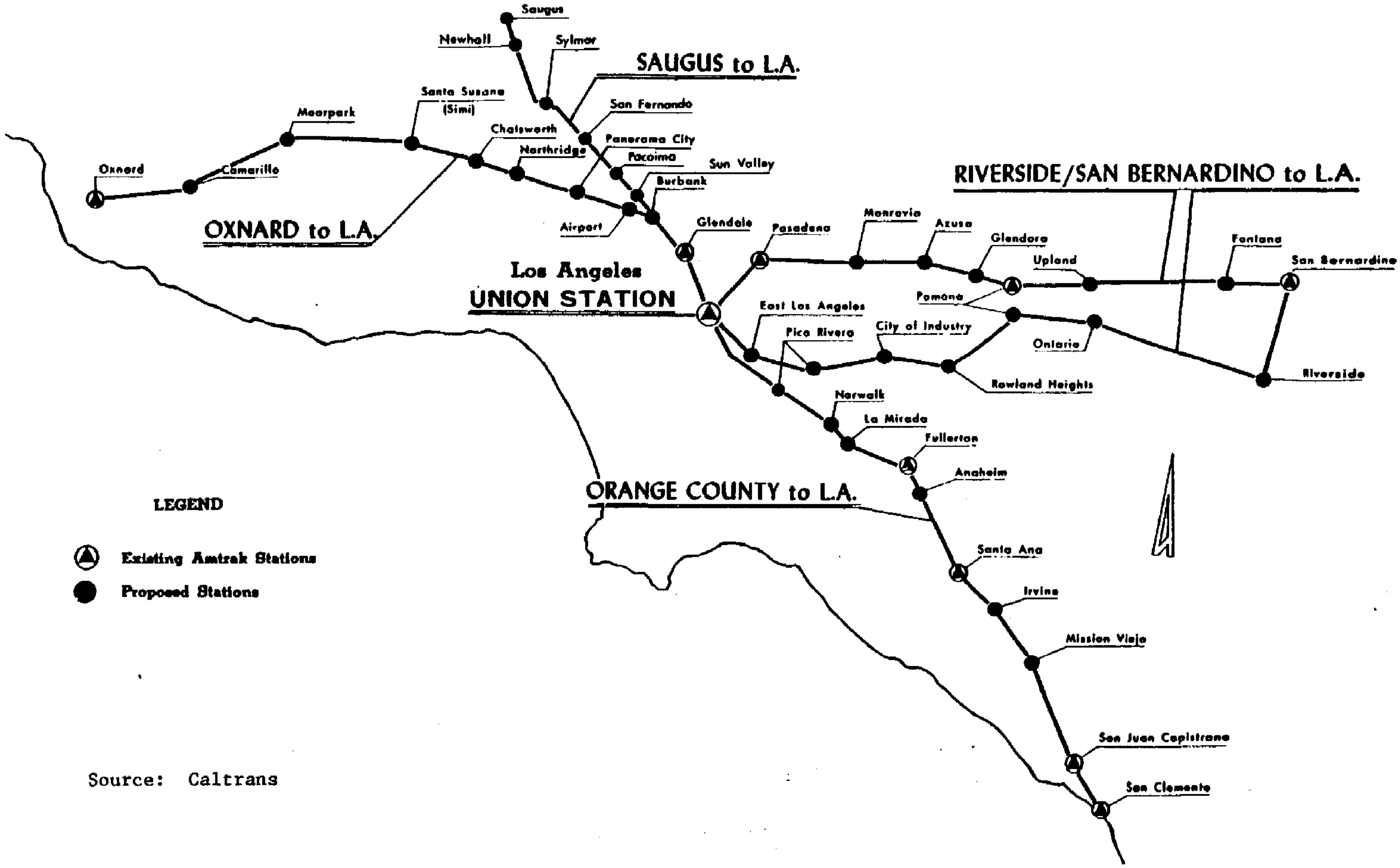
Parking prices have been changing quickly in recent years so a greater effort was undertaken to update the hourly and daily parking prices for the Los Angeles CBD. Two sources of data were used; the parking permit files at the Los Angeles Police Department, and a windshield survey of posted parking prices in the CBD study area.

Forecasting Method

Estimates of the number of parking spaces available in each of the forecast years are closely tied to the land use forecasts developed by Peak Marwick in Task 2. The forecast changes in CBD land use were used to adjust the 1980 base year parking inventory. A three step process was followed:

EXHIBIT II-9

COMMUTER RAIL SERVICES



Source: Caltrans

(1) one parking space was added to a zone for each 1000 square feet of future land use development. This is based on Los Angeles zoning requirements;

(2) parking spaces were removed from a zone if future development was expected to replace existing surface lots or parking structures; and

(3) parking spaces to be built in future years were shifted to adjacent zones if the adjacent zones could more easily accomodate construction of parking spaces.

Parking prices were developed for the forecast study years by changing the current price structure to reflect the pressures for development in each CBD zone in the forecast years. Maximum parking prices were set at $6 per day in 1980 dollars and $3 per hour in 1980 dollars. These ceilings were imposed because we feel as maximum development density is achieved, a maximum parking price will also be reached. These ceiling prices provide a standard against which the parking prices of less densely developed zones can be estimated. A four step process was followed to develop forecast year parking prices:

(1) the year 1980 and 2000 land use plans, and the imposed ceiling prices were used to estimate a year 2000 parking price structure;

(2) zone parking prices were smoothed across the CBD study area to prevent excessively abrupt price changes between adjacent zones;

(3) the 1985 and 1990 land use forecasts were used to determine the proportion of the growth between 1980 and 2000 which would be in place in a zone. These proportions were then used to interpolate between the year 1980 parking price inventory and the year 2000 ceiling price to determine each zones parking price in 1985 and 1990; and

(4) zone parking prices over the CBD in each study year were reviewed and abrupt price changes were smoothed as necessary.

III. CALIBRATION OF THE MODEL SYSTEM

OVERVIEW

The models developed for estimating ridership on the DPM system are disaggregate behavioral choice models known as logit models. Logit choice models determine the utility to a tripmaker of travelling by each of the available modes. These modal utilities are then used in an exponential relationship to compute the relative probabilities of the tripmaker choosing each of the modes. The concept of modal utilities and the exponential relationship will be explained in the following paragraphs. This section will then explain the process of calibrating choice models based on observed behavior and will present the final forms of the models developed for the Los Angeles DPM system.

A modal utility, U_c, is the relative value to a tripmaker of travelling by mode C. The factors affecting the utility of a given choice are assumed to be linear, with their relative importance determined by their estimated parameters, b_o, b_1, ... b_n:

$$U_c = b_o + b_1 X_{c1} + b_2 X_{c2} + \dots + b_n X_{cn}$$

where X_{ci} is a characteristic of the tripmaker making a choice, a characteristic of the choice being made, or a combined characteristic of both. Examples of these characteristics are the following:

- tripmaker characteristics: annual income, mode used to reach the downtown area;
- choice characteristics: for the choice of using a circulator system to travel between two downtown zones, the travel time and travel cost required to make this trip using the circulator system; and

- combined characteristics: for the same modal choice, the travel cost divided by the tripmaker's hourly wage.

Once the relevant variables (X's) have been chosen for a given choice situation, and their relative importances have been determined using a statistical estimation technique, then utilities, U_c, can be obtained for each available choice. Although it might be assumed that each tripmaker would make the choice having the highest utility, observed data always show that neither individuals nor groups of individuals behave quite that simply. Instead, higher utilities can be only be related, on the average, to higher fractions of choice. This relationship is captured in the mathematical form of the logit model:

$$P_c = \frac{e^{U_c}}{\displaystyle\sum_{\substack{\text{all available} \\ \text{choices, } i}} e^{U_i}}$$

where:

P_c is the probability, or fraction of tripmakers expected to make choice c; and

e is the base of natural logarithms, 2.718.

Logit models are calibrated using disaggregate data, data on the choices made by individual decision makers. The first step in model calibration is the formulation of a logical model structure. The model structure is determined by the variables used to express the utilities of the available choices or modes. The variables in the utility expressions should exert a causal influence on the value to the decision maker of choosing that alternative.

After a logical model structure is identified, coefficients are chosen to reflect the relative importance to the decision maker of the variables in the utility expression. These coefficients are chosen by a mathematical process which obtains the "best fit" of the choice model to the observed behavior.

Three logit models are used to estimate the ridership on the DPM system. The logit models are not independent of one another, two are applied as "chained" models. The chaining of two logit models in a sequence requires the introduction of a LOGSUM variable to preserve the behavior of the logit model over the two-step process. The LOGSUM variable is the natural logarithm of the denominator of the logit choice model.

$$\text{LOGSUM} = \ln \left(\sum_{i}^{\text{all choices}} e^{U_i} \right)$$

When two logit models are applied in sequence, the LOGSUM variable created from one of the logit models must be included in the utility expression for the second logit model. The joint probability of the two decisions then preserves the logit structure. 1/

The data for the model calibration include survey data, network characteristic data, and zonal data. The network data is discussed in Chapter 2 of this report. The survey data and zonal data are discussed in the Task 1 and Task 2 reports respectively. The appendix to this report describes the creation of calibration data sets from these various data sources.

DISTRIBUTION MODE CHOICE MODEL

Choice Set

The modes available for the CBD distribution trip during the calibration process were walk, regional bus, and minibus. Distribution trips were defined

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1/For a more mathematical explanation of the LOGSUM variable, see "Travel Model Development Project: Phase II Final Report Volume II Detailed Model Descriptions," Metropolitan Transportation Commission, San Francisco, California, prepared by Cambridge Systematics, Inc., June 1980.

from information on the individual workplace surveys. The origin of the distribution trip depends on the mode used to travel to the CBD. For people who drive downtown, the distribution trip begins where they park their car, and for people who arrive in the CBD by bus, the distribution trip begins where they first exit the bus in the CBD. The destination of the distribution trip is simply the traveller's workplace.

Two acceptance criteria were used to select workplace survey trip records for the calibration of the distribution trip mode choice model:

1. the survey trip record must have valid locations for the regional trip origin, the CBD distribution trip origin, and the workplace; and
2. all three mode alternatives must be available for the distribution trip.

Results

The UTPS computer program ULOGIT was used to determine the "best fit" coefficients to a number of model structures. The initial structure tested was based on the preliminary model developed for the Los Angeles Community Redevelopment Agency by CSI. 1/ The models were modified to reflect the observed behavior in an extensive data base collected in Task 1 of this study. The final structure of the modal utility expressions are presented in Exhibit III-1.

The coefficient of the regional bus and minibus fare variable was not freely determined by the calibration process. When left unconstrained in the calibration process, the coefficient of fare was unstable and increased seemingly without bound. This problem also occurred in the preliminary analysis for the Los Angeles DPM project conducted by CSI. The regional bus and minibus modes have flat fare structures. The only variation in cost is the use of a

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1/Models and Estimates of Los Angeles DPM Demand, Cambridge Systematics, Inc., prepared for the Los Angeles Community Redevelopment Agency, October, 1978.

EXHIBIT III-1

UTILITY EXPRESSION FOR THE DISTRIBUTION MODE CHOICE MODEL

Mode		Coefficient		Variable	t-statistic
U (walk)	=	- 0.5087	*	walk time	4.88 1/
		+ 5.0414			4.86
U (minibus)	=	- 0.4581	*	vehicle run time	1.86 1/
		- 0.5743	*	wait time	5.04 1/
		- 2.749	*	fare	- 2/
		+ 3.1928	*	regional bus dummy	3.39
U (regional bus)	=	- 0.4581	*	vehicle run time	1.86 1/
		- 0.5743	*	wait time	5.04 1/
		- 2.749	*	fare	- 2/
		+ 3.1928	*	regional bus dummy	3.39
		+ 0.6818			1.12

1/The three time coefficients were determined first. The fare coefficient was then computed based on a $10 per hour value of walk time, and the calibration program was run again to determine the modal bias and access mode dummy coefficients.

2/The fare coefficient is computed as a $10 per hour value of walk time.

10 cent transfer fee rather than 50 cents for the regional bus alternative when the traveller also uses the regional bus for the trip to the CBD. There is not sufficient variation in the cost data for the mathematical calibration to identify and estimate the relative importance of cost in the mode choice decision process.

Transit fare was accounted for in the mode choice process by equating it to a measure of time through an assumed value of walk time. Several values of time were tested and it was decided to use ten dollars per hour ($10/hour) to equate transit fare to walk time in the distribution mode choice model. Ten dollars per hour in 1980 is roughly equivalent to the seven dollars per hour ($7/hour) in 1975 dollars used in the preliminary study by CSI.

The analysis and development of the distribution mode choice model differs from the preliminary structure in five ways: (1) the walk grade variable was eliminated, (2) a trip length cutoff was not used, (3) three time coefficients were developed rather than one, (4) the magnitude of the time coefficient is many times larger than was discovered in preliminary development, and (5) a dummy variable was added to differentiate the distribution mode choice behavior of people who drove to the CBD from people who rode transit to the CBD.

The walk grade variable was dropped because its coefficient was not statistically significant.

CSI applied a trip length cutoff in their selection of records for calibration. All trips shorter than 0.3 miles were assumed to walk and all trips longer than 1.1 miles were assumed to take the bus. The CBD study area is fairly small and we did not find the walk trip length distribution to be appreciably shorter than the trip length distribution for bus trips. We tested several cutoff distances for walking but it did not improve the model, so the simpler form without restriction on the walk trip length was chosen.

Three time variables are used in the distribution mode choice model: walk time, transit vehicle run time, and transit vehicle wait time. The CSI model used a single coefficient for all three components of time which implicitly gives them all equal importance. The revised model developed by Peat Marwick assigns separate coefficients to a minute of time spent walking, riding on a bus, or waiting at a busstop.

The time variables in the final distribution mode choice model have roughly seven times the magnitude of influence on the choice process as did the time variable in the preliminary model. The preliminary model, however, was calibrated using midday travel data which is not as sensitive to travel time as is peak hour travel to work.

We discovered that people who travelled to the CBD by bus were more likely to use transit for their distribution trip than were people who travelled to the CBD by auto. A bus access dummy variable was created to recognize the greater tendency of regional bus users to use transit for their CBD distribution trip. We believe two factors contribute to the difference in auto and regional bus traveller behavior: (1) people who travel to the CBD by auto are not familiar with the bus system which deters them from using transit for distribution travel; and (2) stratifying CBD-workers as regional auto users or regional bus users may have already separated out the transit prone portion of the population.

MIDDAY MODE CHOICE MODEL

Choice Set

The information on mode choice behavior for midday circulation trips within the CBD is obtained from the midday travel diary in the workplace survey. The travel diary contains information on the modal characteristics and the traveller's choice of mode for each one-way trip leg made within the CBD. A leg refers to a one-way segment in the complete trip, starting at the workplace, making one or more stops, and returning to the workplace. The entire round trip is referred to as a tour.

It is generally assumed that individual observations of disaggregate behavioral choice data are independent. Unfortunately, the series of one-way trip legs made by an individual are not independent of one another. For example, for simple two-leg trips the decision process for the trip away from the workplace is very likely to resemble the decision process for the return trip. Also, the choice of the auto mode for all trip legs is clearly dictated by the choice of mode for the first leg in the tour.

The correlation of mode choice decisions between trip legs in a tour is avoided by using only one trip leg from each tour. Tours frequently contain one or more short legs created by multiple stops during a multipurpose trip. We assumed that the longest leg will exert the strongest effect on the mode choice decision. Therefore, the trip charactertistics and the mode choice decision for the longest trip segment or leg were used in the calibration process.

Three criteria were used to accept midday travel records to calibrate the midday mode choice model:

1. location codes must be reported for all the stops of a midday tour;
2. all the stops on a tour must be within the CBD study area; and
3. both the regional bus and the minibus must be viable modes for the leg chosen to represent the mode choice for the tour.

The midday trip or tour is constrained to remain in the CBD because the model is being designed to predict travel behavior involving the use of the DPM for CBD circulation travel. The two transit modes must be available for the trip to assure that the assumed choice set does in fact exist. The walk mode is always available and the auto mode is always available if the traveller drove to work. The effect of auto availability is recognized by creating two mode choice models, one for regional auto users and one for regional bus users.

Results

The UTPS computer program ULOGIT was used to calibrate "best fit" coefficients to the midday mode choice models for regional auto users and for regional transit users. The final structures of the utility expressions are depicted in Exhibit III-2.

There are several noteworthy differences between the final model and the preliminary structure developed by CSI. The most significant difference is the use of two chained logit models in the final form, one for trip generation and distribution, and a second for mode choice. The preliminary structure used a single model to perform all three functions: generation, distribution, and mode choice. In the final model, the distribution and mode choice functions were separated to reduce the number of alternatives in the decision process. ULOGIT limits the calibration process to ten alternatives, and the combination of 98 zones times four modes cannot reasonably be approximated as ten alternatives.

Two variables in the preliminary model structure were changed for the final midday mode choice model. A walk grade variable for the walk mode was not found to be significant and was eliminated, and a distance variable used in the utility expression for the walk and regional bus modes was removed. We felt that the time variable already included for each mode's utility could adequately represent both time and distance.

EXHIBIT III-2

UTILITY EXPRESSIONS FOR THE MIDDAY

MODE CHOICE MODEL

REGIONAL AUTO USERS

Mode		Coefficient		Variable 1/	t-statistic
U (walk)	=	- 0.1237	*	walk time	4.51
U (minibus)	=	- 0.1237	*	run time	4.51
		- 0.1237	*	wait time	4.51
		- 8.5401	*	fare	7.43
U (regional bus)	=	- 0.1237	*	run time	4.51
		- 0.1237	*	wait time	4.51
		- 8.5401	*	fare	7.43
U (auto)	=	- 0.1237	*	auto time 2/	4.51
		- 0.3093	*	walk time 3/	
		- 0.4679	*	park cost	1.79
		- 2.5924	*	purpose 4/	4.92
		+ 3.0669			4.51

REGIONAL TRANSIT USERS

Mode		Coefficient		Variable	t-statistic
U (walk)	=	- 0.1684	*	walk time	2.65
		+ 1.2433			3.06
U (minibus)	=	- 0.1684	*	run time	2.65
		- 0.1684	*	wait time	2.65
		- 3.3332	*	fare	2.84
U (regional bus)	=	- 0.1684	*	run time	2.65
		- 0.1684	*	wait time	2.65
		- 3.3332	*	fare	2.84

1/ The variables are in units of minutes and dollars.

2/ This is the travel time from the auto parking lot to the intended destination.

3/ This is the walk time from the workplace to the auto parking lot.

4/ This dummy variable is 0 for company business trips, and 1 otherwise.

FREQUENCY/DESTINATION CHOICE MODEL

Choice Set

Data for the generation and distribution of midday CBD-worker trips are obtained from the workplace survey midday travel diary. We discussed the concepts of midday tours (round trips) and trip legs (one-way trip segments) in the preceding section on the midday mode choice model. It is necessary once more to model the decision process with respect to tours rather than trip legs. However, while the preceding section used the longest leg to represent the mode choice for the tour, we will now use the stop on the tour farthest from the workplace location to represent the destination choice.

Two criteria were imposed to select records for the calibration of the frequency/destination choice model:

1. records were accepted for people who did not make a trip outside their workplace during the work day; or
2. records were accepted for people who did make a trip outside their workplace and whose complete trip or tour did not leave the CBD.

The trip frequency decision was characterized by two alternatives: no trip or one complete round trip. The possibility of more than one tour by an individual was not treated as a unique choice. It was instead accounted for by adjusting upwards the trip generation rate.

The destination choice was represented by the selection of a set of nine alternative destination zones. The nine destination zones plus the null decision (no trip) make up the ten alternatives permitted by ULOGIT. The nine destinations include the chosen destination, if a trip was made, and were chosen from the 98 CBD zones to emulate the distribution of trip distances from the workplace to the farthest destination observed in the survey results.

Results

The UTPS computer program ULOGIT was used to calibrate the "best fit" coefficients to a number of frequency/destination choice models. The final forms of the utility expressions are given in Exhibit III-3.

The final model includes two changes from the preliminary model form, in addition to the use of a two-stage process discussed in the presentation of the midday mode choice model. The final model uses the zone employment in the utility of the no-trip decision instead of the previously used employment density. The second variable change is the removal of the natural log of the zone area from the utilities of the destination zones. This variable was tested but was not found to be statistically significant.

The final model used the same variable to describe the attraction of the destination zone as was developed by CSI for the preliminary model. The activity in a zone is described by the natural logarithm of a linear weighting of the land uses in the zone. The expression for the activity variable follows:

$$\text{activity} = \ln \begin{bmatrix} & 0.17 & \text{government office area} \\ + & 0.17 & \text{private office area} \\ + & 0.81 & \text{retail floor area} \\ + & 0.21 & \text{service floor area} \\ + & 0.042 & \text{manufacturing floor area} \end{bmatrix}$$

The land use floor areas are expressed in thousands of square feet.

The LOGSUM variable is the denominator from the midday mode choice model evaluated between a specific workplace and a specific destination choice. It serves to preserve the logit characteristics of the choice probabilities when the frequency/destination choice model is run in sequence with the midday mode choice model.

EXHIBIT III-3

UTILITY EXPRESSIONS FOR THE MIDDAY

DESTINATION MODEL

Mode		Coefficient		Variable	t-statistic
U (no trip)	=	0.0933	*	origin employment 1/	2.38
		+ 4.7768			22.50
U ($zone_i$)	=	0.0095	*	$activity_i/area_i$ 2/	1.40
		+ 1.0	*	LOGSUM (work, $zone_i$) 3/	-

1/Employment is in 1000's of workers.

2/This variable is the CSI activity expression for a destination zone divided by the zone area in acres.

3/The LOGSUM variable was computed from the calibrated midday mode choice model. Its coefficient is fixed at 1.0.

IV. MODEL VALIDATION

Validation of a model system includes using the models in the base year in the manner that they will be applied for forecasting and judging the reasonableness of the results. The model validation effort was primarily concerned with ensuring that reasonable results are produced when the models are applied in an aggregate case.

To assist the process as a whole, internal trip tables were developed using the procedures developed for future year forecasting. This included adjustment of the LARTS 1979 regional trip tables to reflect the 1980 base and the running of program BUSSTOP. The level of service data developed for the model calibration was used for the application of the model. Model results were compared to the trip making characteristics shown by the 1980 on-board transit and employee workplace surveys and are presented in the following discussions.

REGIONAL TRANSIT DISTRIBUTION TRIPS

Exhibit IV-1 shows the comparison of the application of the transit distribution mode choice model for 1980 with information developed from the work-place survey. The survey results reflect an expansion of the one-way trips to work and an allocation of the "no-response" category to each of the modes in proportion to their reported usage. The model results were for the PM peak hour and if expanded to coincide with the survey, would reflect 60,740 trips. As can be seen from the exhibit, there was excellent agreement between the observed and estimated trips, especially if the minibus and regional bus trips are taken together.

Exhibits IV-2 and IV-3 compare the observed and estimated trip length distributions for the walk and regional bus distribution trips. The distances are based on the walk network for which each link is coded to the nearest 1/10

EXHIBIT IV-1

COMPARISON OF OBSERVED VS. ESTIMATED
TRANSIT DISTRIBUTION TRIPS

MODE	OBSERVED 1/	%	ESTIMATED 2/	%
WALK	52,523	86.8	16,995	84.8
MINIBUS	630	1.0	89	.4
REGIONAL BUS	7,416	12.3	2,962	14.8
	60,569	100.0	20,046	100.0

1/Workplace survey expanded trips to work. (6:00 AM to 8:00 PM)

2/PM peak hour model results, equivalent factor is 3.03.

mile. The observed walk distribution appears to show considerably shorter walk trips than those estimated by the model, the average observed trip length being .32 miles as compared to an estimated .44 miles.

Review of the survey coding procedures and the development of the program BUSSTOP inputs for 1980 provided an explanation for this result. The large number of observed walk trips at .1 miles reflects trips which exit their transit vehicle within their destination zone and which are intrazonal trips. As the identification of stop locations was based on the specification of street intersections in UNET, a stop at any of the four intersections bounding a one-block zone was usually coded to the zone of final destination regardless of the side of the street on which the actual stop was located.

In contrast, the inspection of bus routes for coding BUSSTOP inputs considered the direction of the bus line and the side of the street on which the stop was located. This coding results in an additional distance of at least

EXHIBIT IV-2

DISTRIBUTION TRIP LENGTHS BY MODE
FOR
REGIONAL TRANSIT USERS

WALK

Distance (miles)	Observed Trips	Observed %	Estimated Trips	Estimated %
.1	16,007	33.9	2,518	14.8
.2	7,583	16.1	2,437	14.3
.3	5,284	11.2	2,529	14.9
.4	4,311	9.1	2,204	13.0
.5	6,947	14.7	2,004	11.8
.6	2,328	4.9	1,623	9.5
.7	2,906	6.2	1,301	7.7
.8	639	1.4	926	5.4
.9	489	1.0	618	3.6
1.0	0	0.0	381	2.2
1.1	307	.8	197	1.2
1.2	103	.2	143	.8
1.3	46	.1	52	.3
1.4	0	0.0	23	.1
1.5	0	0.0	26	.2
1.6	0	0.0	5	0
1.7	57	.1	6	0.0
1.8	122	.3	0	0.0
1.9	0	0.0	0	0.0
≥2.0	0	0.0	2	0.0
Average =	.32 miles		.44 miles	

EXHIBIT IV-3

DISTRIBUTION TRIP LENGTHS BY MODE
FOR
REGIONAL TRANSIT USERS
REGIONAL BUS

Distance (miles)	Observed Trips	Observed %	Estimated Trips	Estimated %
.1	0	0	0	0
.2	0	0	0	0
.3	101	2.3	70	2.4
.4	244	5.5	159	5.4
.5	226	5.1	355	12.0
.6	544	12.2	200	6.8
.7	999	22.4	348	11.7
.8	312	7.0	374	12.6
.9	443	9.9	319	10.8
1.0	176	3.9	208	7.0
1.1	296	6.6	235	7.9
1.2	823	18.4	153	5.2
1.3	129	2.9	97	3.3
1.4	80	1.8	68	2.3
1.5	22	.5	63	2.1
1.6	21	.5	55	1.9
1.7	0	0	53	1.8
1.8	0	0	33	1.1
1.9	46	1.0	42	1.4
≥2.0	0	0	130	4.4

Average = .86 miles .94 miles

.2 miles (a minimum of .1 miles for each centroid connector) for a passenger disembarking on the opposite side of the street from their destination. The use of the BUSSTOP program to develop the walk distribution trip tables makes comparison of the trip length distributions very difficult. Note however, that if all trips of 0.1 miles or less are eliminated from both the observed and estimated columns, the average trip lengths compare more favorably.

MIDDAY CIRCULATION TRIPS

Validation of the midday circulation trip model focused on (a) the distribution of midday trips between modes and (b) the total number of midday trips generated. It can be seen in Exhibit IV-4 that the observed and estimated mode choice distributions compared favorably with the originally calibrated midday mode choice model.

The percentage distribution between modes is favorable, but the 37,093 total estimated trips was far from the 61,340 observed trips. The midday frequency/destination choice model was originally calibrated with a zero trip constant of 4.7768. We decided to adjust this coefficient to increase the probability of a traveler choosing to make a trip versus choosing the zero trip alternative. When the zero trip constant was adjusted down to 4.0268 the total number of trips increased to 61,275 which nearly equals the 61,340 observed trips. With this refinement, it was concluded that the midday model produced reasonable results.

EXHIBIT IV-4

COMPARISON OF OBSERVED AND ESTIMATED
MIDDAY CIRCULATION TRIPS

Mode	Observed	%	Initial Estimation 1/	%	Refined Estimation 2/	%
Walk	35,823	58.4	22,107	56.6	36,522	59.6
Minibus	2,086	3.4	964	2.6	1,609	2.6
Regional bus	981	1.6	816	2.2	1,322	2.2
Auto	22,450	30.6	13,205	35.6	21,822	35.6
	61,340		37,093		61,275	

1/The calibrated midday trip frequency model had a zero trip constant of 4.7768.

2/The zero trip constant was changed from 4.7768 to 4.0268 to more closely replicate the observed number of trips.

V. DEVELOPMENT OF FORECAST YEAR MODELS AND ASSUMPTIONS

This section describes the preparation of information needed to transform a calibrated base year model into a forecasting model. Three types of inputs are discussed: forecast year trips tables, trip peaking factors, and DPM mode bias constants.

DEVELOPMENT OF FORECAST YEAR TRIP TABLES

The estimation of future year DPM ridership requires the preparation of internal CBD trip tables from LARTS regional forecasts. As only the year 1995 LARTS forecast was available at the time of this project, a multistep process was used to adjust the LARTS regional trips to the CBD to reflect both the difference in forecast years and any differences in study area estimates of land use and employment. This process also incorporates the disaggregation of LARTS forecasts made using a regional zone system to the more detailed CBD study area zone system.

The year 1990 and 2000 study trip tables were developed from the 1995 LARTS forecast which includes the Wilshire Starter Line and the Commuter rail plan in the regional network. The 1985 DPM trip table, however, was based on the 1979 LARTS regional model run, as the Starter Line will not be available by 1985. The significant increase in regional transit mode split shown by the 1995 forecast makes it inappropriate to use it for 1985. As the 1979 regional network does not include a DPM system, there will be some underestimating of 1985 transit trips to the CBD, and therefore DPM trips, which should be taken into account when evaluating the 1985 results.

The process used to create the trip tables required to input to the models includes:

- adjusting LARTS forecasts to account for employment differences at the district level;
- fractioning to develop trip tables showing the regional corridor of approach to detailed CBD zones; and
- creating internal CBD distribution trips.

Adjustment of LARTS Forecasts

The LARTS forecasts include use of a regional zone system which does not coincide with the CBD study area zone system at the district level. This includes differences in boundaries within the study area and the extension of LARTS zones outside the study area. Exhibit V-1 shows the correspondence between study area dstricts and LARTS zones.

In addition to zone system differences, the difference in forecast years requires adjustment of the LARTS trip tables to account for variations in the land use and employment forecasts. Comparison of these forecasts was made at the district level, with study area employment being developed by aggregating CBD zone estimates after apportioning zones to districts according to the 1980 land use inventory. Exhibit V-2 shows this comparison of employment estimates and the resulting ratios needed to adjust the regional trip tables.

Also incorporated is an adjustment to the LARTS regional trip tables to reflect differences in the categorization of trip types. The DPM distribution models are applied to trips to or from work independent of the other end of the trip. For this reason, the number of employees in the downtown area serves as a control on the trips to the CBD. An adjustment was developed based on the relationship between estimated CBD employment less an assumed 3 percent absenteeism

EXHIBIT V-1

CORRESPONDENCE BETWEEN LARTS REGIONAL
ZONES AND CBD DISTRICTS

CBD DISTRICT	LARTS ZONE	LARTS CENTROID
10	14006	558
11	14007 (partial)	559
12	14008 (partial)	560
13	14016 (partial)	568
14	16005 (partial)	704
15	17029 (partial)	751
16	16008	707
17	16009	708
18	16010	709
19	16011	710
20	16014 (partial)	713
21	16015 (partial)	714
22	16016 (partial)	715
23	16017	716
24	16018	717
25	16019	718
26	16023	722
27	14001 (partial)	553

EXHIBIT V-2

COMPARISON OF LARTS AND DPM DISTRICT
EMPLOYMENT ESTIMATES

DISTRICT	(1) 1985 CBD	(2) 1979 LARTS	(3) RATIO (1)/(2)	(4) 1990 CBD	(5) 2000 CBD	(6) 1995 LARTS	(7) RATIO (4)/(6)	(8) RATIO (5)/(6)
10	12,832	15,260	.841	12,937	14,237	15,260	.848	.933
11*	2,565	4,650	.552	2,565	2,565	5,020	.511	.511
12*	5,131	12,350	.415	5,121	5,121	13,020	.394	.394
13*	7,105	8,050	.883	7,105	7,105	8,410	.845	.845
14*	7,310	19,808	.369	7,310	7,310	21,020	.348	.348
15*	920	8,000	.115	920	920	8,170	.113	.113
16	5,920	9,900	.598	6,895	6,895	10,310	.669	.669
17	6,368	5,850	1.089	6,368	6,368	6,410	.993	.993
18	1,155	200	5.775	3,335	3,445	8,570	.389	.402
19	30,020	15,900	1.888	38,640	40,825	24,270	1.592	1.682
20*	725	2,400	.302	940	1,375	3,710	.253	.371
21*	1,002	4,500	.223	1,002	33,975	5,010	.200	6.781
22*	3,288	5,650	.582	11,978	20,470	5,700	2.101	3.591
23	54,378	49,800	1.092	64,989	66,046	50,420	1.289	1.310
24	31,870	25,450	1.252	32,013	32,220	17,750	1.804	1.815
25	23,408	25,500	.918	23,624	23,624	23,190	1.019	1.019
26	23,117	24,900	.928	23,081	22,682	24,710	.934	.918
27*	2,235	18,350	.122	2,235	2,235	19,100	.117	.117

* Indicates zones of partial correspondence.

rate and the LARTS home-based work CBD cordon crossings. Exhibits V-3 thru V-5 show the resulting estimates of regional trips crossing the CBD cordon by corridor of approach.

Create Internal CBD Distribution Trips

An internal distribution trip, as required for input to the model, is defined as the trip to the CBD workplace from the bus stop or station where the CBD worker exits the transit vehicle used to cross the CBD cordon. The method used to determine the stop where trips exit from their regional mode is an inspection of the route maps and a coding of the exit points. This coding of exit points is done for each corridor of approach, with a determination made of the exit point which would be used to reach each individual CBD zone. This information, along with the proportion of trips entering along each line in a corridor, is input to the BUSSTOP program for converting the regional trip tables to internal distribution trip tables. (See DPM Travel Prediction System Users' Manual, CSI, 1978 or Peat Marwick, 1981.)

TRIP PEAKING FACTORS

The models estimate DPM distribution trip ridership during the PM peak hour. The trip tables resulting from the process described in the previous section reflect daily trips. Similarly, the worker circulation trips are estimated on a daily basis. Factors are required to convert between the daily and peak hour time periods, and to estimate the ridership during each hour of the day. Exhibit V-6 shows the factors used for each market segment.

The distribution trip factors were developed from the 1980 employee workplace survey. CBD cordon count data was not used as it also includes thru travel, making comparison with the survey results impossible. The number of trips reported as arriving at or departing from work in each half hour were

EXHIBIT V-3

1985 DAILY CBD CORDON CROSSINGS
(Home-based work trips, with through trips excluded)

Corridor	Transit Person Trips	Percent	Auto Person Trips	Percent	Total	Percent
Harbor Freeway	20,178	15.7	35,612	12.0	55,790	13.1
Santa Monica Freeway	14,796	11.5	37,376	12.6	52,172	12.3
Wilshire/Olympic	19,348	15.0	23,032	7.7	42,380	10.0
Hollywood Freeway	15,946	12.4	41,558	14.0	57,504	13.5
Golden State Freeway	9,024	7.0	33,519	11.3	42,543	10.0
Pasadena Freeway	10,238	8.0	24,995	8.4	35,233	8.3
San Bernardino Freeway	18,834	14.6	41,159	13.9	59,993	14.1
Santa Ana Freeway	16,095	12.5	55,404	18.7	71,499	16.7
South Central	4,269	3.3	4,156	1.4	8,425	2.0
Total	128,728	100.0	296,811	100.0	425,539	100.0
Mode Split		32.2		69.8		

EXHIBIT V-4

1990 DAILY CBD CORDON CROSSINGS
(Home-based work trips with through-trips excluded)

Corridor	Transit Person Trips	Percent	Auto Person Trips	Percent	Total	Percent
Harbor Freeway	35,030	14.8	26,844	11.6	61,874	13.2
Santa Monica Freeway	26,514	11.2	30,670	13.3	57,184	12.2
Wilshire/Olympic	36,219	15.3	20,599	8.9	56,818	12.1
Hollywood Freeway	29,183	12.3	33,095	14.4	62,278	13.3
Golden State Freeway	18,742	7.9	26,056	11.3	44,798	9.6
Pasadena Freeway	18,853	7.9	19,714	8.5	38,567	8.2
San Bernardino Freeway	31,594	13.3	29,628	12.8	61,222	13.1
Santa Ana Freeway	34,659	14.6	40,519	17.6	75,178	16.1
South Central Freeway	6,440	2.7	3,801	1.6	10,241	2.2
Total	237,234	100.0	230,926	100.0	468,160	100.0
Mode Split		50.7		49.3		

EXHIBIT V-5

2000 DAILY CBD CORDON CROSSINGS
(Home-based work trips with through trips excluded)

Corridor	Transit Person Trips	Percent	Auto Person Trips	Percent	Total	Percent
Harbor Freeway	41,415	14.8	31,737	11.6	73,152	13.2
Santa Monica Freeway	31,347	11.2	36,260	13.3	67,607	12.2
Wilshire/Olympic	42,821	15.3	24,354	8.9	67,175	12.1
Hollywood Freeway	34,503	12.3	39,128	14.4	73,631	13.3
Golden State Freeway	22,158	7.9	30,805	11.3	52,963	9.6
Pasadena Freeway	22,290	7.9	23,305	8.5	45,595	8.2
San Bernardino Freeway	37,353	13.3	35,028	12.8	72,381	13.1
Santa Ana Freeway	40,977	14.6	47,905	17.6	88,882	16.1
South Central	7,613	2.7	4,494	1.6	12,107	2.2
Total	280,477	100.0	273,016	100.0	553,493	100.0
Mode Split		50.7		49.3		

accummulated. (A "trips in motion" concept could not be used as the survey did not report the time the CBD cordon was crossed. The time reported for leaving and arriving at the non-work end of the trip would distort the use of the factors for DPM ridership due to the long duration of the regional trips relative to DPM trips.) In order to minimize the effect of inaccurate time reporting, "smoothed" frequency distributions were created from the half-hourly data. A moving average was computed for each half-hour based on itself and the half-hour period before and after it. The resulting frequencies were then aggregated to hours as reported by Exhibit V-6.

A similar technique was used for worker circulation trips, the trip diary portion of the survey serving as the basis for the information. The model estimates daily round trips so separate frequency distributions were developed for the time reported leaving the workplace and the time reported for returning to the workplace. As expected, these distributions are highly concentrated about the noon hour.

The nonwork market hourly factors were developed by a similar process but with the 1980 Transit On-board survey used as the source of information. The only trips included in the analysis were riders who indicated they did not work in the downtown area. As this market segment includes trips made for both circulation and distribution, the resulting frequencies are more evenly spread throught the day.

DPM MODE CONSTANTS

The model calibration and validation described in Sections III and IV is based on observed traveller decision making given the existing set of alternative transportation services or modes. The calibration process computes coefficients to represent the relative importance of abstract travel characteristics such as

EXHIBIT V-6

HOURLY TRIP FACTORS
(Percent of Daily Trips)

		CBD Worker Distribution Trips 1/		CBD Worker Circulation Trips 2/		3/
	Time Period	Transit Users	Auto Users	Depart Workplace	Return to Workplace	Non-work Transit
AM	6:00- 7:00	8.46	7.07	0.33	0.0	1.65
	7:00- 8:00	17.11	18.83	2.50	1.16	1.90
	8:00- 9:00	17.03	16.37	2.18	1.08	3.69
	9:00-10:00	6.59	7.58	2.81	.99	8.29
	10:00-11:00	1.98	1.15	5.76	1.66	11.84
	11:00-12:00	.71	.65	29.57	10.37	8.39
PM	12:00- 1:00	.47	.36	35.16	37.53	11.72
	1:00- 2:00	.38	.41	13.54	25.88	19.47
	2:00- 3:00	1.64	.88	5.18	10.23	7.49
	3:00- 4:00	9.24	5.56	1.85	6.33	8.03
	4:00- 5:00	16.11	18.07	.90	2.58	5.96
	5:00- 6:00	14.56	14.40	.21	1.40	5.39
	6:00- 7:00	4.32	5.86	0.0	.50	3.42
	7:00- 8:00	.82	1.50	0.0	.22	2.75
	8:00- 9:00	.32	.79	0.0	0.06	0.0
	9:00-10:00	.15	.26	0.0	0.0	0.0
	10:00-11:00	.07	.13	0.0	0.0	0.0
	11:00-12:00	.04	.15	0.0	0.0	0.0
	4:30- 5:30	16.50	18.54	0.42	1.30	5.40

1/ Source: 1980 Employee Workplace Survey

2/ Source: 1980 Employee Workplace Survey

3/ Source: 1980 Transit Onboard Survey

travel time and cost. It also estimates constants to represent the net effect on the mode choice decision process of the unique and non-quantifiable aspects of a mode.

The abstract level of service characteristics, time and cost, enable the calibrated models to estimate the impact on modal riderships of a change in service for an existing mode. However, a DPM system is a new service. It will have unique characteristics which require the estimation of a new modal constant. The following sections describe how DPM constants were developed for the distribution and midday mode choice models. Since the DPM does not yet exist, the constant terms are estimated from existing traveller behavior on similar services.

Distribution Mode Choice

Two mode specific constants are needed to forecast the DPM ridership for distribution travel: a DPM mode constant and a DPM station integration constant.

The DPM constant was computed from observed behavior on San Francisco's BART system. It was determined for people who have a choice between BART or parallel bus service that under similar circumstances of time and cost 73 percent choose to ride BART and only 27 percent choose the bus service. It is assumed that people in Los Angeles will have a similar preference for an automated rail service as compared to bus service. A DPM constant of +0.995 produces such a 73/27 percent DPM/bus mode split for equal travel times and costs.

The DPM station integration constant was created using the calibrated regional mode of access dummy variable. The station integration constant is not intended to reflect a shorter walk time or wait time for an integrated parking lot/DPM station. These parameters are additional factors accounted for by the time coefficients. The station integration constant represents non-quantifiable influences on the traveller's decision process; such as convenience, ease of access, and readily available information on the route and scheduled service.

It is assumed that an integrated parking structure in a DPM station will favor choosing the DPM for distribution travel, just as travelling to the CBD by bus rather than auto increases the probability that a traveller will choose transit for their CBD distribution travel. The station integration variable is therefore +3.1928 in favor of choosing the DPM.

Midday Mode Choice

A DPM modal constant is needed for the midday mode choice models for both the regional auto and regional transit access modes. The midday model does not have a station integration variable. Auto and DPM compete for midday circulation travel. They do not support one another in the midday as they do to accomodate the sequence of trip segments in a traveller's regional access and distribution trips.

It is assumed that the DPM system will be preferred to bus transit to the order of 9 minutes of travel time. This produces DPM constants of +1.1133 and +1.5156 for regional auto and regional transit users respectively. This is considered to be a conservative DPM constant. Nine (9) minutes is roughly 4.5 times the travel time equivalent of the DPM constant in the distribution mode choice model. If travel time can be shown to be 4.5 times as important for distribution travel as for circulation travel, it can be argued the constants have roughly equivalent impacts. Dividing the $10 per hour value of time for distribution travel by 4.5 gives a $2.22 per hour value of time. This falls between the roughly $1 and $3 per hour values of time for midday travel by regional auto and regional transit users respectively.

The estimated values for the DPM modal and station integration constants provide the necessary information to use the model system to forecast future travel on the proposed DPM circulator system in the Los Angeles CBD.

VI. PATRONAGE ANALYSIS

The previous chapters have discussed the development and validation of the revised DPM patronage models as well as presenting the various alternatives to be analyzed. This chapter presents the results of the application of the models for each of these alternatives. The results are summarized by the following table, the remainder of the chapter providing a detailed breakdown of this summary.

	ALTERNATIVES				
	1985	1990		2000	
DPM Trips	With Commuter Rail	With Commuter Rail	Without Commuter Rail	With Commuter Rail	Without Commuter Rail
Daily	45,516	79,092	66,542	94,440	79,155
PM Peak	5,392	9,865	8,040	11,852	9,681
Noon	4,460	6,600	6,291	7,470	7,042
Max one-way link volume					
PM Peak	2,022	4,990	3,204	6,095	4,049
Noon	1,678	2,465	2,392	2,791	2,670

YEAR 1990 RESULTS

The models were applied for 1990 under two alternative scenarios. Both scenarios are based on the number of distribution transit trips entering the downtown being the same, with the first assuming regional bus service rather than the expanded Commuter rail service included in the LARTS regional forecasts and the second assuming the expanded commuter rail service previously described. Each of these alternatives includes the DPM identically as well as the Wilshire Starter Line. The first alternative attracts 66,542 daily DPM riders, 8,040 or 12.1 percent in the PM peak hour. Noon hour trips meanwhile, represent 9.5 percent of the daily total or 6,291 trips.

Worker distribution trips account for 65.4 percent of the daily DPM ridership, or 43,458 trips. The share of the regional transit user distribution trips attracted by each mode in the PM peak hour is:

MODE	TRIPS	%
DPM	5,235	12.7
BUS	8,522	20.7
MINIBUS	236	0.6
WALK	27,169	66.0
	41,162	100.0

84,765 worker circulation roundtrips are estimated to be made within the study area each day, the 6,913 roundtrips made using the DPM accounting for 20.8 percent of the daily DPM ridership. The share of the worker circulation trips attracted to each mode would be:

MODE	TRIPS	%
DPM	6,913	8.2
WALK	60,379	71.2
MINIBUS	1,573	1.8
BUS	2,763	3.3
AUTO	13,137	15.5
	84,765	100.0

Assuming that the same development were to occur in the downtown area but without the DPM being available, it is estimated that 80,250 worker circulation roundtrips will be made each workday in 1990. This would be a 30.9 percent increase in circulation trips as compared to 1980 versus a 30.7 percent increase in downtown employment. An additional 4,515 daily roundtrips are induced by the availability of the DPW, a 38.3 percent increase in the level of downtown circulation trips when compared to 1980.

Exhibit VI-1 presents the demand profile for this alternative, showing the trips by hour of the day for each market segment. Exhibit VI-2 summarizes the transfers made by DPM riders between the DPM and the various regional transit modes during the PM peak hour. The mode of access to each of the regional transit modes is further detailed in Exhibits VI-3 - VI-5 for this alternative.

The year 1990 commuter rail alternative meanwhile would result in 79,092 daily DPM riders. Of these 9,865 or 12.4 percent would occur in the PM peak hour with 6,600 or 8.3 percent occurring in the noon hour. Worker distribution trips account for 68.1 percent of the DPM riders, or 53,888 daily trips. Exhibit VI-6 shows these results by market segment and by hour of the day. The increase in DPM ridership shown by the commuter rail scenario reflects the higher number of regional transit trips which would terminate at Union Station. Rather than being able to take a bus within walking distance of their office location, the commuter rail alternative would force people to change modes at a location which is more distant from their office and is also well served by the DPM.

Exhibits VI-7 thru VI-18 show the results of assigning the trip tables to the DPM network. These show the PM peak hour, noon hour, and daily passenger loadings and link volumes for each of the 1990 scenarios. The exhibits are presented in pairs for each time period for each scenario. The first shows the passenger loadings at each station, the Southbound and Northbound alignments shown separately. Transfer volumes between the two alignments are also shown.

EXHIBIT VI - 1

DPM DEMAND PROFILE

YEAR 1990
(NO COMMUTER RAIL)

	CBD Worker Distribution Trips		CBD Worker Circulation Trips			
Time Period	Transit Users	Auto Users	Depart Workplace	Return to Workplace	Non Work Transit	Total
AM 6:00- 7:00	2,684	836	23	0	151	3,694
7:00- 8:00	5,429	2,223	173	80	174	8,079
8:00- 9:00	5,403	1,935	151	75	338	7,902
9:00-10:00	2,091	896	194	68	760	4,009
10:00-11:00	628	136	398	115	1,085	2,362
11:00-12:00	225	77	2,044	717	769	3,832
PM 12:00- 1:00	149	43	2,431	2,594	1,074	6,291
1:00- 2:00	121	48	936	1,790	1,788	4,683
2:00- 3:00	520	104	358	707	687	2,376
3:00- 4:00	2,932	657	128	438	736	4,891
4:00- 5:00	5,111	2,136	62	178	546	8,033
5:00- 6:00	4,619	1,702	15	97	494	6,927
6:00- 7:00	1,371	693	0	35	314	2,413
7:00- 8:00	260	177	0	15	252	704
8:00- 9:00	102	93	0	4	0	199
9:00-10:00	48	31	0	0	0	79
10:00-11:00	22	15	0	0	0	37
11:00-12:00	13	18	0	0	0	31
TOTAL	31,728	11,820	6,913	6,913	9,168	66,542
4:30- 5:30	5,235	2,191	29	90	495	8,040

This exhibit is based upon data and information from the sources indicated in Appendix B and assumptions provided by management of the Los Angeles Downtown People Mover Authority. The achievement of any projection is dependent upon the occurrence of future events that cannot be assured. Therefore, actual results achieved may vary from the projections. This exhibit is for the information of the Los Angeles Downtown People Mover Authority and the Urban Mass Transportation Administration. This information was not prepared for use in connection with any offering of securities.

EXHIBIT VI-2

DPM DISTRIBUTION TRIPS, REGIONAL TRANSIT USERS
PM PEAK HOUR, 1990

	No. of Trips	%
Transfers to/from buses at intercept station		
Convention Center	924	17.7
Union Station	1,401	26.8
Transfers to/from AMTRAK	725	13.8
Transfers to/from Starter Line		
at 7th Street	605	11.6
at Civic Center	46	.8
Transfers to/from buses at non-intercept DPM Stations	1,534	29.3
TOTAL	5,235	100.0

EXHIBIT VI-3

ESTIMATED NUMBER OF PASSENGERS BOARDING OUTBOUND BUSES
DURING PM PEAK HOURS AT INTERCEPT STATIONS
BY MODE OF ACCESS, 1990

Intercept Buses

Mode of Access	Convention Center	%	Union Station	%
Walk	163	15.9	34	2.9
Minibus	20	1.9	53	4.6
DPM	335	32.6	945	81.5
RTD Bus/Rail	510	49.6	128	11.0
TOTAL	1,028	100.0	1,160	100.0

All Buses

Mode of Access	Convention Center	%	Union Station	%
Walk	506	24.4	44	2.9
Minibus	29	1.4	53	3.5
DPM	704	34.2	1,296	84.5
RTD Bus/Rail	832	40.0	141	9.1
TOTAL	2,076	100.0	1,534	100.0

This exhibit is based upon data and information from the sources indicated in Appendix B and assumptions provided by management of the Los Angeles Downtown People Mover Authority. The achievement of any projection is dependent upon the occurrence of future events that cannot be assured. Therefore, actual results achieved may vary from the projections. This exhibit is for the information of the Los Angeles Downtown People Mover Authority and the Urban Mass Transportation Administration. This information was not prepared for use in connection with any offering of securities.

EXHIBIT VI-4

ESTIMATED NUMBER OF PASSENGERS BOARDING AMTRAK TRAINS
DURING PM PEAK HOUR AT UNION STATION
BY MODE OF ACCESS, 1990

Mode of Access	AMTRAK	%
Walk	148	12.7
Minibus	62	5.3
DPM	674	58.0
RTD Bus/Rail	279	24.0
TOTAL	1,163	100.0

ESTIMATED NUMBER OF PASSENGERS BOARDING STARTER LINE
AT 7TH STREET DURING PM PEAK HOUR, 1990
BY MODE OF ACCESS

Mode of Access	7th Street Starter Line	%
Walk	3,027	65.9
Minibus	0	0.0
DPM	582	12.7
RTD Bus	981	21.4
TOTAL	4,590	100.0

ESTIMATED NUMBER OF PASSENGERS BOARDING STARTER LINE
AT CIVIC CENTER DURING PM PEAK HOUR, 1990
BY MODE OF ACCESS

Mode of Access	7th Street Starter Line	%
Walk	1,111	92.5
Minibus	8	0.7
DPM	42	3.4
RTD Bus	40	3.4
TOTAL	1,201	100.0

This exhibit is based upon data and information from the sources indicated in Appendix B and assumptions provided by management of the Los Angeles Downtown People Mover Authority. The achievement of any projection is dependent upon the occurrence of future events that cannot be assured. Therefore, actual results achieved may vary from the projections. This exhibit is for the information of the Los Angeles Downtown People Mover Authority and the Urban Mass Transportation Administration. This information was not prepared for use in connection with any offering of securities.

EXHIBIT VI-5

NUMBER OF DPM TRIPS TO/FROM REGIONAL TRANSIT INTERCEPT STATIONS
DURING PM PEAK HOUR, 1990

	OFF	ON	TOTAL
Union Station			
Intercept Buses			
Express	829	67	896
Local	116	9	125
Subtotal	945	76	1021
Interface Buses			
Express	351	29	380
Local	0	0	0
Subtotal	351	29	380
AMTRAK	674	51	725
TOTAL	1970	156	2126
Convention Center			
Intercept Buses			
Express	215	19	234
Local	120	10	130
Subtotal	335	29	364
Interface Buses			
Express	229	18	247
Local	145	168	313
Subtotal	374	186	560
TOTAL	709	215	924

This exhibit is based upon data and information from the sources indicated in Appendix B and assumptions provided by management of the Los Angeles Downtown People Mover Authority. The achievement of any projection is dependent upon the occurrence of future events that cannot be assured. Therefore, actual results achieved may vary from the projections. This exhibit is for the information of the Los Angeles Downtown People Mover Authority and the Urban Mass Transportation Administration. This information was not prepared for use in connection with any offering of securities.

EXHIBIT VI - 6

DPM DEMAND PROFILE

YEAR 1990
(COMMUTER RAIL)

Time Period	CBD Worker Distribution Trips		CBD Worker Circulation Trips			
	Transit Users	Auto Users	Depart Workplace	Return to Workplace	Non Work Transit	Total
AM 6:00- 7:00	3,559	836	23	0	188	4,606
7:00- 8:00	7,198	2,223	173	80	216	9,890
8:00- 9:00	7,164	1,935	151	75	420	9,745
9:00-10:00	2,772	896	194	68	943	4,873
10:00-11:00	833	136	398	115	1,347	2,829
11:00-12:00	299	77	2,044	717	955	4,092
PM 12:00- 1:00	198	43	2,431	2,594	1,334	6,600
1:00- 2:00	160	48	936	1,790	2,216	5,150
2:00- 3:00	690	104	358	707	852	2,711
3:00- 4:00	3,887	657	128	438	914	6,024
4:00- 5:00	6,777	2,136	62	178	678	9,831
5:00- 6:00	6,125	1,702	15	97	613	8,552
6:00- 7:00	1,817	693	0	35	389	2,934
7:00- 8:00	345	177	0	15	313	850
8:00- 9:00	135	93	0	4	0	232
9:00-10:00	63	31	0	0	0	94
10:00-11:00	29	15	0	0	0	44
11:00-12:00	17	18	0	0	0	35
TOTAL	42,068	11,820	6,913	6,913	11,378	79,092
4:30- 5:30	6,941	2,191	29	90	614	9,865

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EXHIBIT VI - 7

DPM PASSENGER LOADINGS

YEAR 1990 - PM PEAK HOUR
(NO COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	278	0
Federal Building	278	269	5
Little Tokyo	542	132	9
Civil Center	665	150	87
Hill Street	728	641 (1)	85
Bunker Hill	1,284	935	104
World Trade Center	2,115	1,062	255
5th & Figueroa	2,922	208	693 (2)
7th & Figueroa	2,437	445	979
9th & Figueroa	1,903	61	191
Convention Center	1,773	0	1,773

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	275	0
9th & Figueroa	275	436	4
7th & Figueroa	707	605	72
5th & Figueroa	1,240	1,144 (2)	28
Library	2,356	459	83
Pershing Square	2,732	631	286
Hill Street	3,077	344	725 (1)
Civil Center	2,696	129	89
Little Tokyo	2,736	353	69
Federal Building	3,020	255	71
Union Station	3,204 (3)	0	3,204

Notes:
(1) Includes 163 transfers from Northbound to Southbound alignment
(2) Includes 576 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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EXHIBIT VI-8

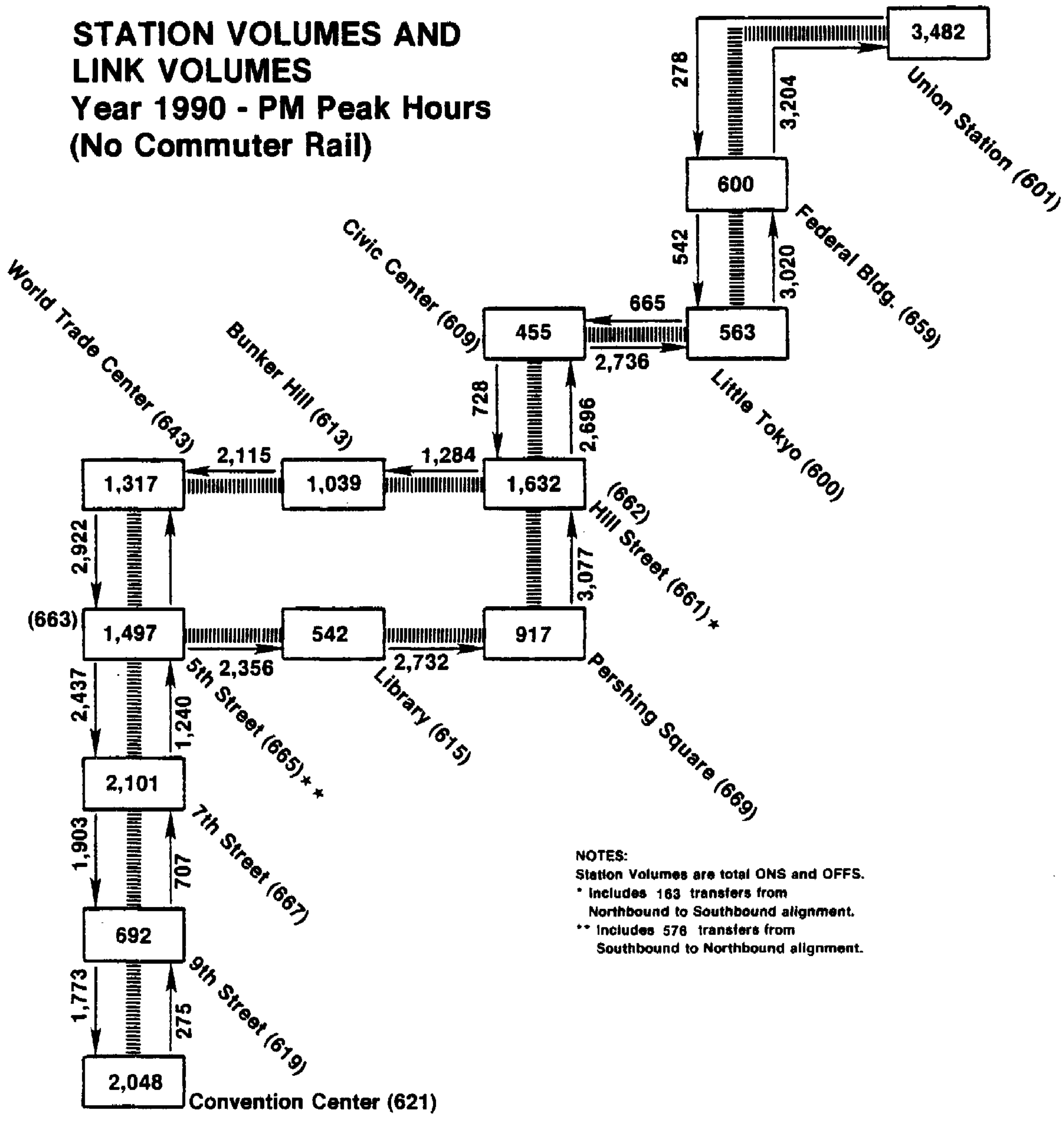

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EXHIBIT VI - 9

DPM PASSENGER LOADINGS

YEAR 1990 - NOON
(NO COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	278	0
Federal Building	278	345	6
Little Tokyo	617	280	8
Civil Center	889	486	64
Hill Street	1,311	1,219 (1)	166
Bunker Hill	2,364	443	415
World Trade Center	2,392 (3)	587	600
5th & Figueroa	2,379	212	944 (2)
7th & Figueroa	1,647	83	887
9th & Figueroa	843	12	503
Convention Center	352	0	352

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	339	0
9th & Figueroa	339	516	12
7th & Figueroa	843	771	70
5th & Figueroa	1,544	886 (2)	201
Library	2,229	219	257
Pershing Square	2,191	554	542
Hill Street	2,203	84	1,081 (1)
Civil Center	1,206	41	385
Little Tokyo	862	15	349
Federal Building	528	14	334
Union Station	208	0	208

Notes:
(1) Includes 636 transfers from Northbound to Southbound alignment
(2) Includes 453 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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EXHIBIT VI-10

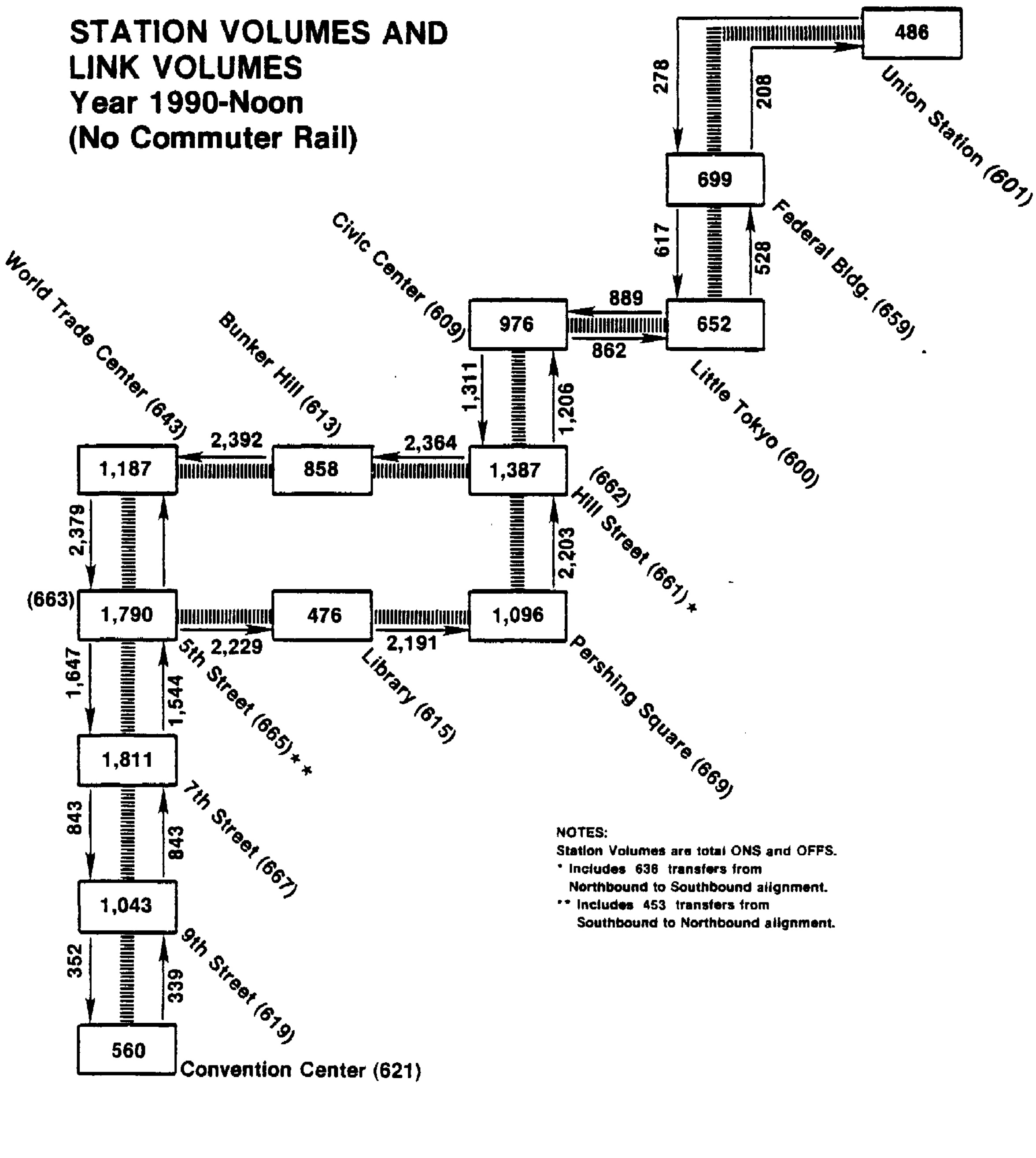

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EXHIBIT VI - 11

DPM PASSENGER LOADINGS

YEAR 1990 - DAILY
(NO COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	12,172	0
Federal Building	12,172	2,099	754
Little Tokyo	13,517	1,342	1,062
Civil Center	13,797	2,397	972
Hill Street	15,222	12,498 (1)	2,539
Bunker Hill	25,181 (3)	4,123	4,871
World Trade Center	24,433	5,437	5,932
5th & Figueroa	23,938	1,085	8,484 (2)
7th & Figueroa	16,539	1,656	8,158
9th & Figueroa	10,037	213	3,441
Convention Center	6,809	0	6,809

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	7,250	0
9th & Figueroa	7,250	3,302	218
7th & Figueroa	10,334	7,774	1,706
5th & Figueroa	16,402	8,143 (2)	1,257
Library	23,288	2,284	2,551
Pershing Square	23,021	4,932	3,570
Hill Street	24,383	1,337	11,881 (1)
Civil Center	13,839	761	2,004
Little Tokyo	12,596	1,091	1,659
Federal Building	11,956	733	2,129
Union Station	10,560	0	10,560

Notes:

(1) Includes 7,545 transfers from Northbound to Southbound alignment
(2) Includes 5,005 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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EXHIBIT VI-12

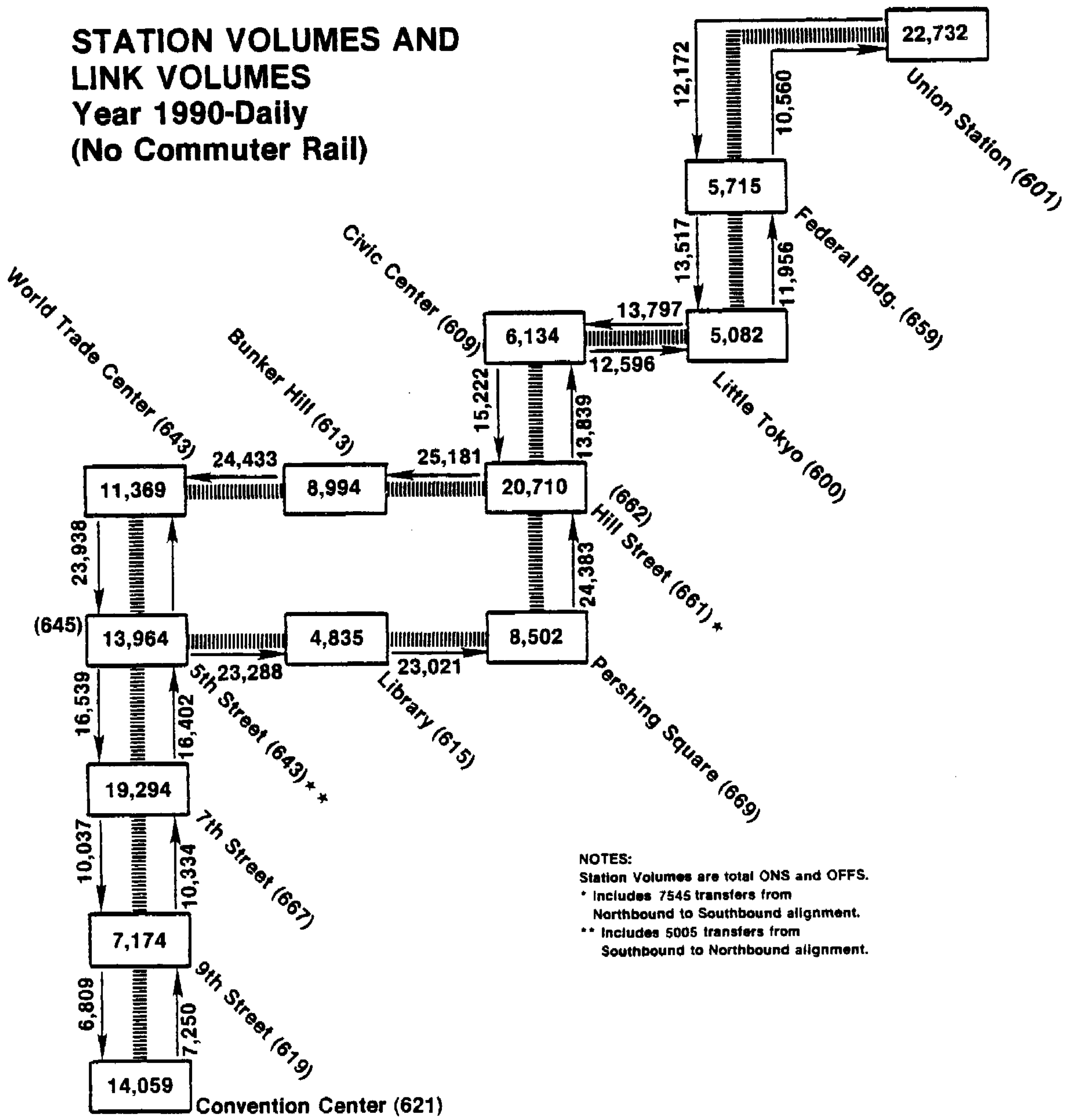

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EXHIBIT VI - 13

DPM PASSENGER LOADINGS

YEAR 1990 - PM PEAK HOUR
(COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	445	0
Federal Building	445	253	9
Little Tokyo	689	129	13
Civil Center	805	151	81
Hill Street	875	623 (1)	99
Bunker Hill	1,399	1,001	124
World Trade Center	2,276	1,213	280
5th & Figueroa	3,209	211	962 (2)
7th & Figueroa	2,458	443	983
9th & Figueroa	1,918	60	208
Convention Center	1,770	0	1,770

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	310	0
9th & Figueroa	310	561	4
7th & Figueroa	867	784	72
5th & Figueroa	1,579	1,672 (2)	30
Library	3,221	677	80
Pershing Square	3,818	977	250
Hill Street	4,545	447	619 (1)
Civil Center	4,373	185	82
Little Tokyo	4,476	378	62
Federal Building	4,792	273	75
Union Station	4,990 (3)	0	4,990

Notes:
(1) Includes 168 transfers from Northbound to Southbound alignment
(2) Includes 816 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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EXHIBIT VI-14

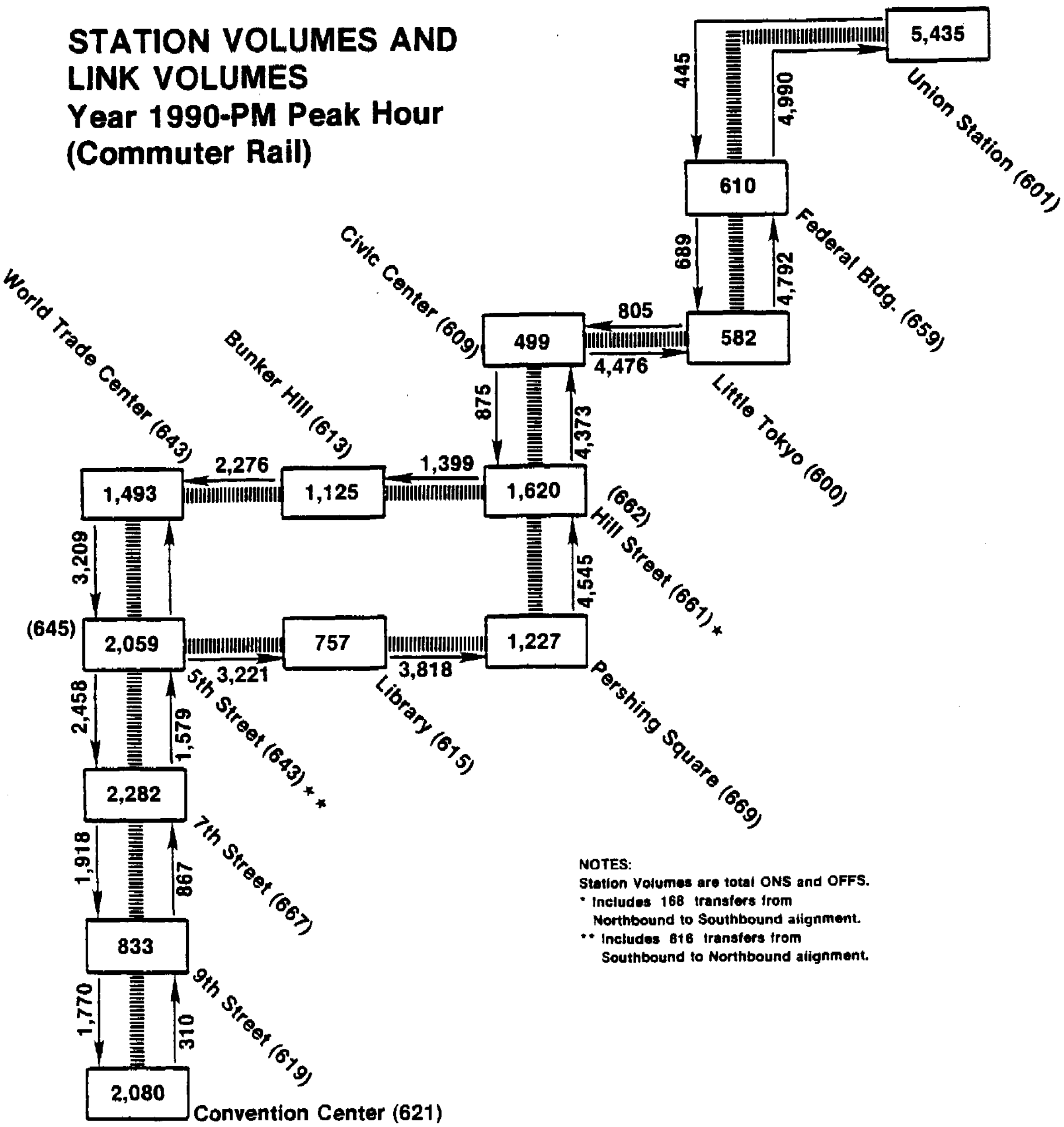

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EXHIBIT VI - 15

DPM PASSENGER LOADINGS

YEAR 1990 - NOON
(COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	383	0
Federal Building	383	333	10
Little Tokyo	706	279	14
Civil Center	971	487	55
Hill Street	1,403	1,200 (1)	165
Bunker Hill	2,438	454	427
World Trade Center	2,465 (3)	599	605
5th & Figueroa	2,459	212	977 (2)
7th & Figueroa	1,694	83	908
9th & Figueroa	869	11	532
Convention Center	348	0	348

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	350	0
9th & Figueroa	350	541	10
7th & Figueroa	881	782	68
5th & Figueroa	1,595	917 (2)	198
Library	2,314	229	251
Pershing Square	2,292	590	531
Hill Street	2,351	105	1,088 (1)
Civil Center	1,368	73	386
Little Tokyo	1,055	16	339
Federal Building	732	23	336
Union Station	419	0	419

Notes:
(1) Includes 638 transfers from Northbound to Southbound alignment
(2) Includes 466 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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EXHIBIT VI-16

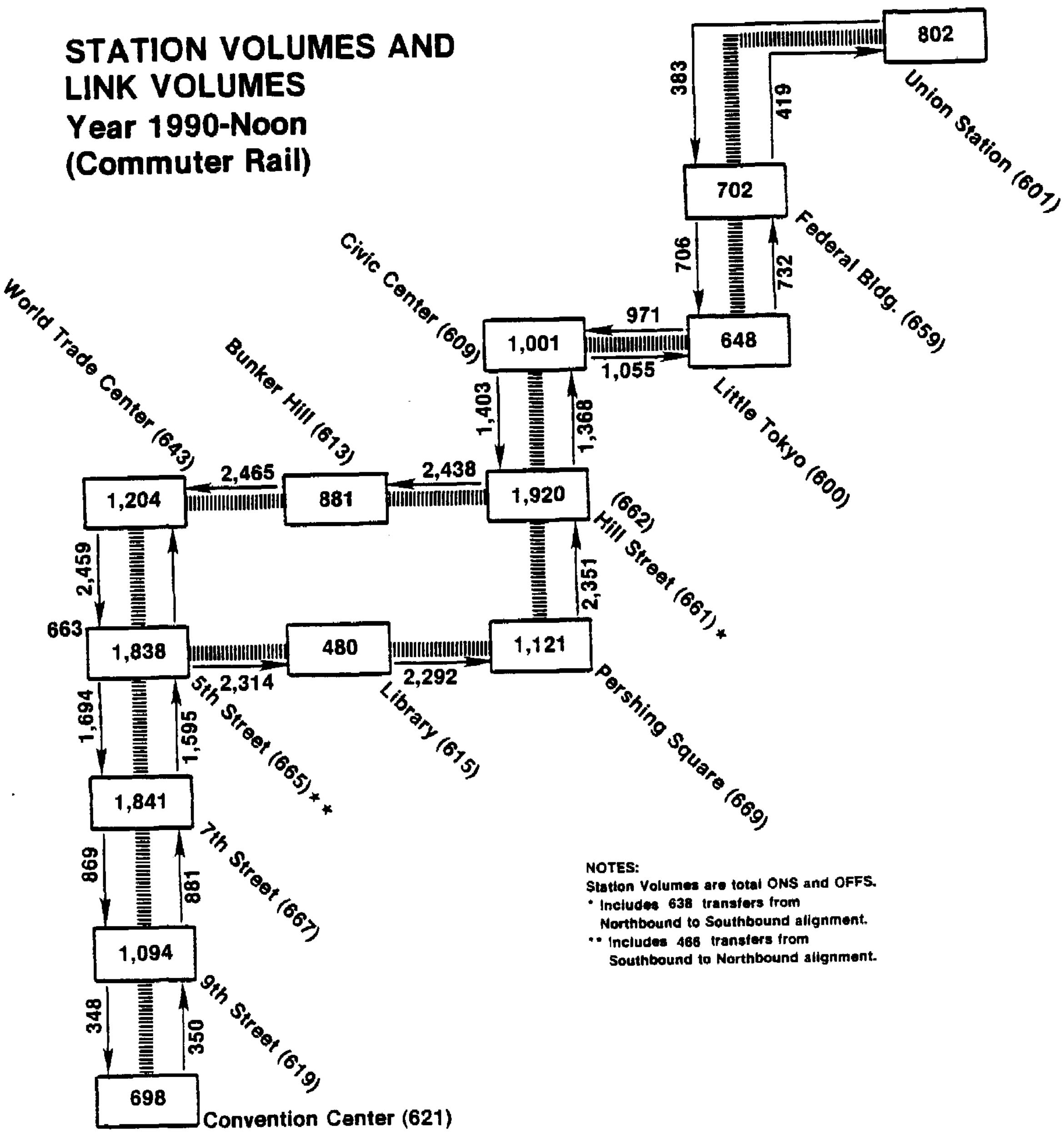

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EXHIBIT VI - 17

DPM PASSENGER LOADINGS

YEAR 1990 - DAILY
(COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	18,785	0
Federal Building	18,785	1,970	841
Little Tokyo	19,914	1,326	1,193
Civil Center	20,047	2,406	1,026
Hill Street	21,427	11,739 (1)	3,197
Bunker Hill	29,969 (3)	4,417	5,457
World Trade Center	28,929	6,003	6,497
5th & Figueroa	28,435	1,088	11,660 (2)
7th & Figueroa	17,863	1,647	8,840
9th & Figueroa	10,670	210	4,018
Convention Center	6,862	0	6,862

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	7,424	0
9th & Figueroa	7,424	3,851	214
7th & Figueroa	11,061	8,257	1,699
5th & Figueroa	17,619	11,230 (2)	1,253
Library	27,596	3,000	3,042
Pershing Square	27,554	6,108	3,963
Hill Street	29,699	1,784	11,289 (1)
Civil Center	20,194	1,153	2,012
Little Tokyo	19,335	1,088	1,645
Federal Building	18,778	850	2,079
Union Station	17,549	0	17,549

Notes:
(1) Includes 7,353 transfers from Northbound to Southbound alignment
(2) Includes 7,058 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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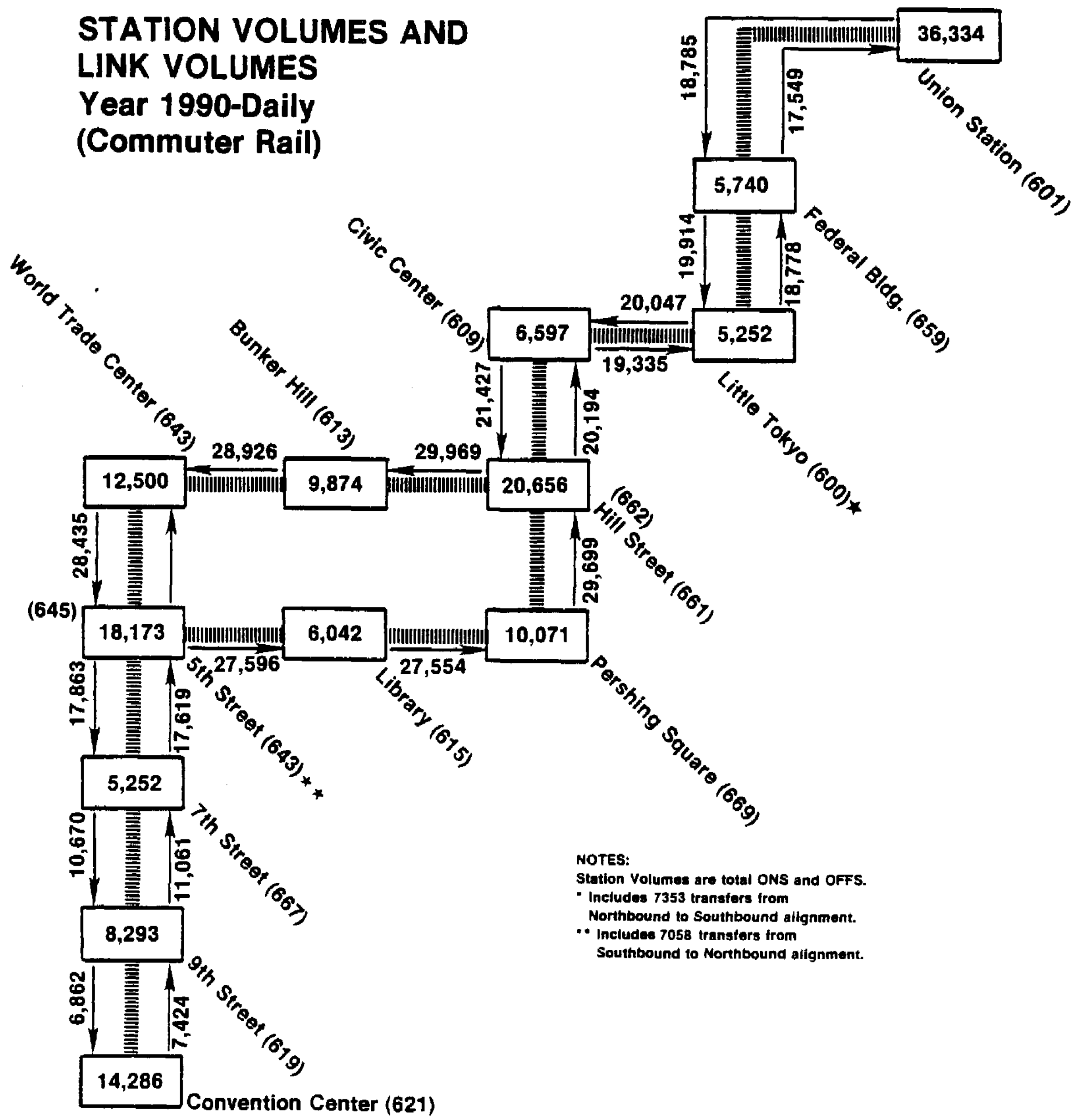
EXHIBIT VI-18



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The second meanwhile shows the link volumes by direction and the total activity at each station.

YEAR 1985 RESULTS

The models were applied for 1985 for the alternative previously described. This includes the DPM, a revised minibus alignment and the forecasts of year 1985 land use, employment, and parking. Exhibit VI-19 summarizes the results for 1985. Daily DPM ridership is expected to be 45,516 trips. Of these 5,392 or 11.8 percent are expected to occur in the PM peak hour with 4,460 or 9.8 percent occurring in the noon hour. Worker distribution trips account for 61.4 percent or 27,934 of the daily trips, the DPM attracting 10.5 percent of the regional transit distribution trips. 67,271 worker circulation roundtrips are estimated to be made, the 4,628 attracted to the DPM representing a 6.9 percent share of the market. Exhibit VI-19 presents the 1985 DPM demand profile summarizing the results by market segment and time of day. Exhibits VI-20 thru VI-25 meanwhile, show the DPM passenger loadings and link volumes for the PM peak hour, the noon hour, and daily.

YEAR 2000 RESULTS

As for year 2000, the models were applied to both regional bus transit and expanded commuter rail service scenarios. Both scenarios use the 1990 networks without modification, but do incorporate updated estimates of land use, employment, and parking which reflect the expected conditions in year 2000. Exhibits VI-26 and VI-27 summarize the model results for each of the scenarios.

For the all bus scenarios, daily DPM ridership is expected to be 79,155 trips. Of these, 9,681 or 12.2 percent are expected to occur in the PM peak hour with 7,042 or 8.9 percent occurring in the noon hour. Worker distribution trips account for 66.5 percent or 52,634 of the daily riders, the DPM attracting

EXHIBIT VI - 19

DPM DEMAND PROFILE

YEAR 1985
(NO COMMUTER RAIL)

	CBD Worker Distribution Trips		CBD Worker Circulation Trips			
Time Period	Transit Users	Auto Users	Depart Workplace	Return to Workplace	Non Work Transit	Total
AM 6:00- 7:00	1,310	880	15	0	137	2,342
7:00- 8:00	2,650	2,343	116	54	158	5,321
8:00- 9:00	2,638	2,037	101	50	307	5,133
9:00-10:00	1,021	943	130	46	690	2,830
10:00-11:00	307	143	267	77	986	1,780
11:00-12:00	110	81	1,368	480	699	2,738
PM 12:00- 1:00	73	45	1,626	1,740	976	4,460
1:00- 2:00	59	51	627	1,198	1,621	3,556
2:00- 3:00	254	110	240	473	624	1,701
3:00- 4:00	1,431	692	86	293	669	3,171
4:00- 5:00	2,496	2,248	42	119	496	5,401
5:00- 6:00	2,255	1,792	10	65	449	4,571
6:00- 7:00	669	729	0	23	285	1,706
7:00- 8:00	127	187	0	10	229	553
8:00- 9:00	50	98	0	0	0	148
9:00-10:00	23	32	0	0	0	55
10:00-11:00	11	16	0	0	0	27
11:00-12:00	6	17	0	0	0	23
TOTAL	15,490	12,444	4,628	4,628	8,326	45,516
4:30- 5:30	2,556	2,307	19	60	450	5,392

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EXHIBIT VI - 20

DPM PASSENGER LOADINGS

YEAR 1985 - PM PEAK HOUR
(NO COMMUTER RAIL)

STATION	SOUTHBOUND In the Vehicle	SOUTHBOUND Enter the Vehicle	SOUTHBOUND Exit the Vehicle
Union Station	0	162	0
Federal Building	162	246	3
Little Tokyo	405	113	4
Civil Center	514	124	19
Hill Street	619	369 (1)	63
Bunker Hill	925	449	37
World Trade Center	1,337	789	194
5th & Figúeroa	1,932	244	504 (2)
7th & Figueroa	1,672	415	244
9th & Figueroa	1,843	49	176
Convention Center	1,716	0	1,716

STATION	NORTHBOUND In the Vehicle	NORTHBOUND Enter the Vehicle	NORTHBOUND Exit the Vehicle
Convention Center	0	192	0
9th & Figueroa	192	149	6
7th & Figueroa	335	324	20
5th & Figueroa	639	810 (2)	46
Library	1,403	336	93
Pershing Square	1,646	399	339
Hill Street	1,706	249	294 (1)
Civil Center	1,661	44	95
Little Tokyo	1,610	292	55
Federal Building	1,847	220	45
Union Station	2,022 (3)	0	2,022

Notes:
(1) Includes 166 transfers from Northbound to Southbound alignment
(2) Includes 387 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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EXHIBIT VI-21

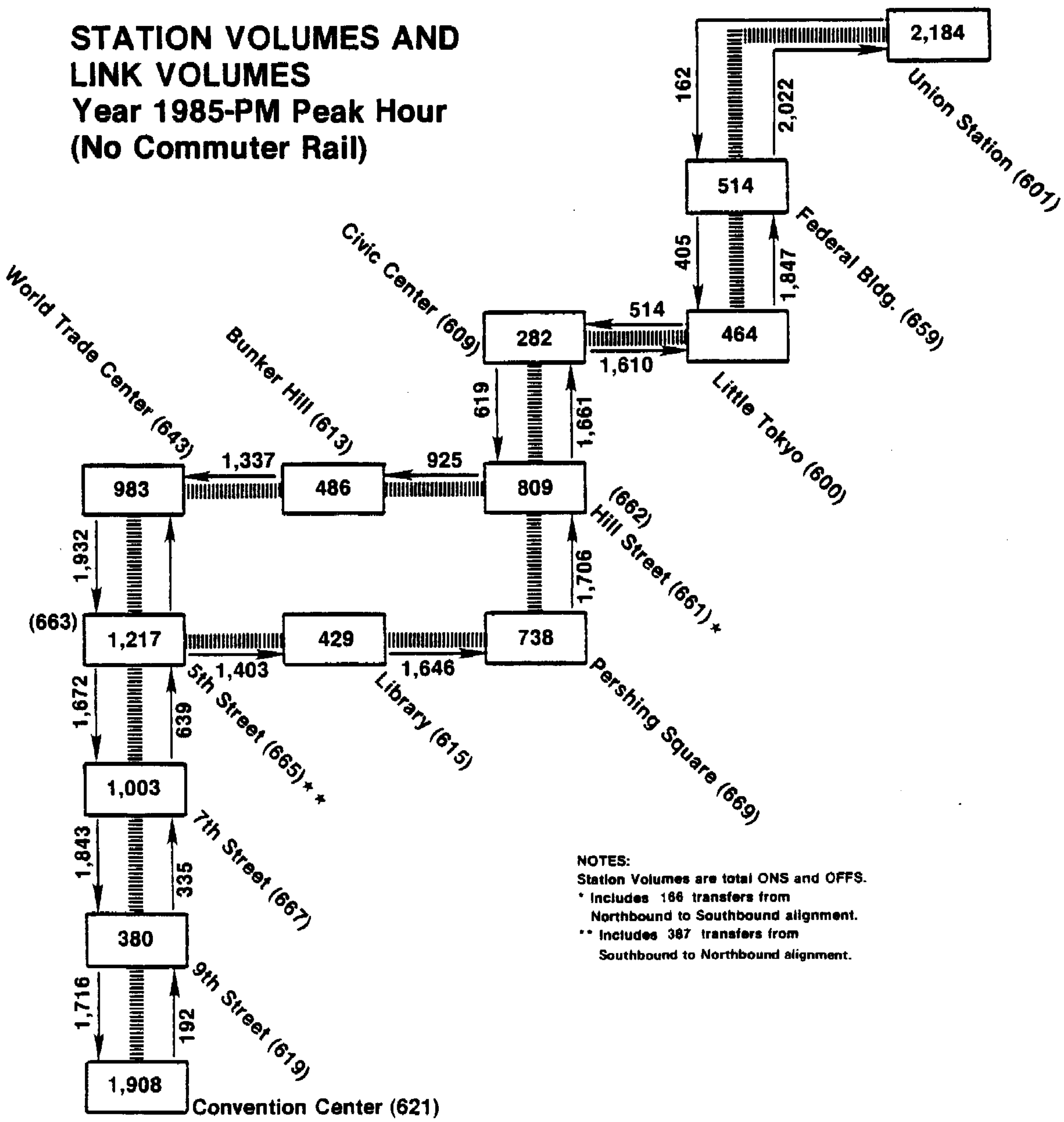

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EXHIBIT VI - 22

DPM PASSENGER LOADINGS

YEAR 1985 - NOON
(NO COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	212	0
Federal Building	212	250	7
Little Tokyo	455	211	4
Civil Center	662	333	37
Hill Street	958	791 (1)	119
Bunker Hill	1,630	232	198
World Trade Center	1,664	467	453
5th & Figueroa	1,678 (3)	173	712 (2)
7th & Figueroa	1,139	70	563
9th & Figueroa	646	11	338
Convention Center	319	0	319

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	325	0
9th & Figueroa	325	329	16
7th & Figueroa	638	507	54
5th & Figueroa	1,091	678 (2)	168
Library	1,601	169	178
Pershing Square	1,592	435	502
Hill Street	1,525	49	684 (1)
Civil Center	890	25	306
Little Tokyo	609	12	261
Federal Building	360	10	246
Union Station	124	0	124

Notes:
(1) Includes 401 transfers from Northbound to Southbound alignment
(2) Includes 329 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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EXHIBIT VI-23

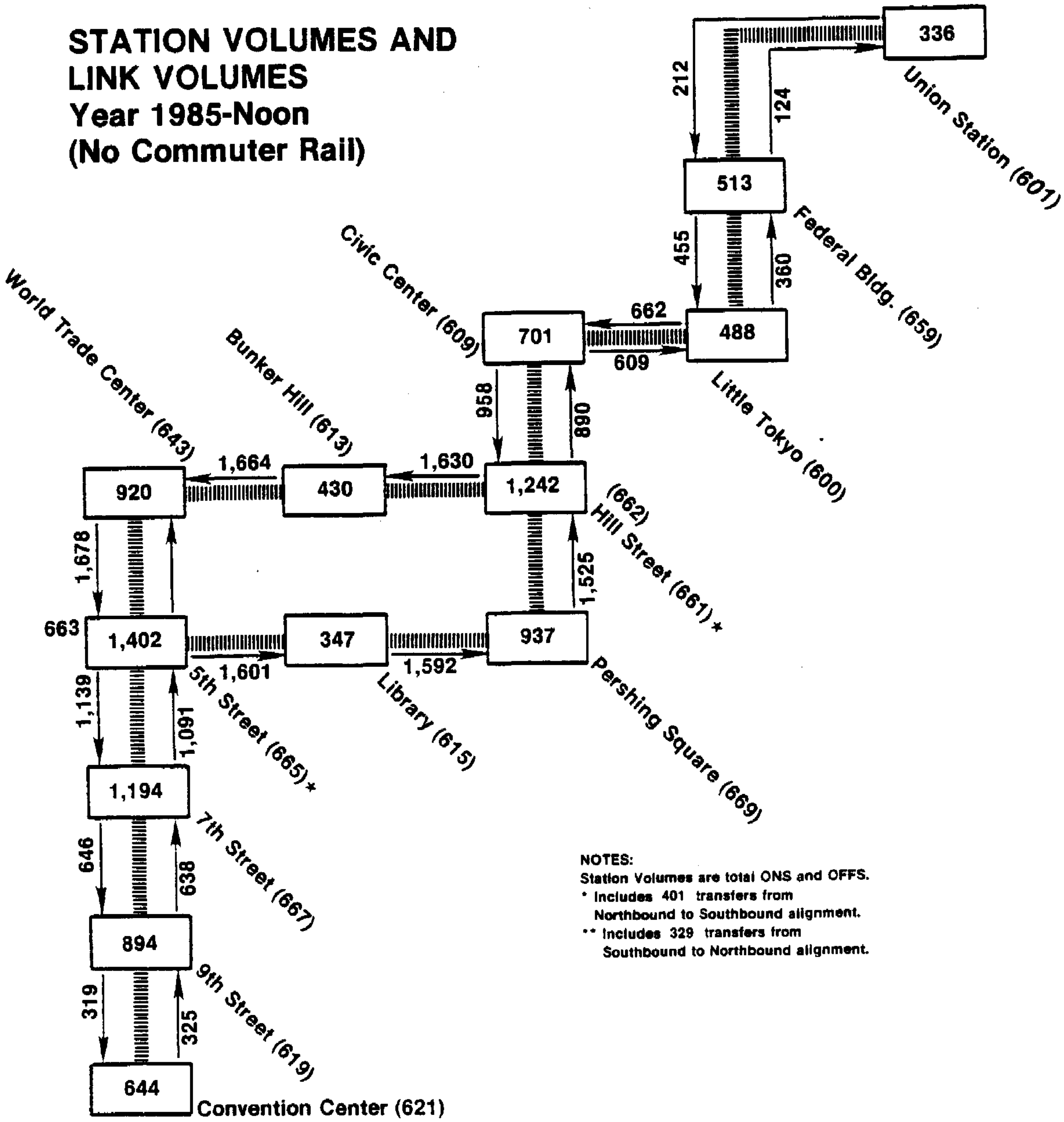

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EXHIBIT VI - 24

DPM PASSENGER LOADINGS

YEAR 1985 - DAILY
(NO COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	7,703	0
Federal Building	7,703	1,560	644
Little Tokyo	8,619	1,004	830
Civil Center	8,793	1,849	363
Hill Street	10,279	7,410 (1)	1,809
Bunker Hill	15,880 (3)	1,871	2,208
World Trade Center	15,543	4,191	4,365
5th & Figueroa	15,369	1,176	5,829 (2)
7th & Figueroa	10,716	1,406	3,888
9th & Figueroa	8,234	175	2,012
Convention Center	6,397	0	6,397

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	6,905	0
9th & Figueroa	6,905	1,893	252
7th & Figueroa	8,546	3,682	1,399
5th & Figueroa	10,829	5,711 (2)	1,405
Library	15,135	1,982	2,013
Pershing Square	15,104	3,788	3,579
Hill Street	15,313	899	6,920 (1)
Civil Center	9,292	243	1,693
Little Tokyo	7,842	813	1,350
Federal Building	7,305	599	1,587
Union Station	6,317	0	6,317

Notes:
(1) Includes 5,108 transfers from Northbound to Southbound alignment
(2) Includes 3,070 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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EXHIBIT VI-25

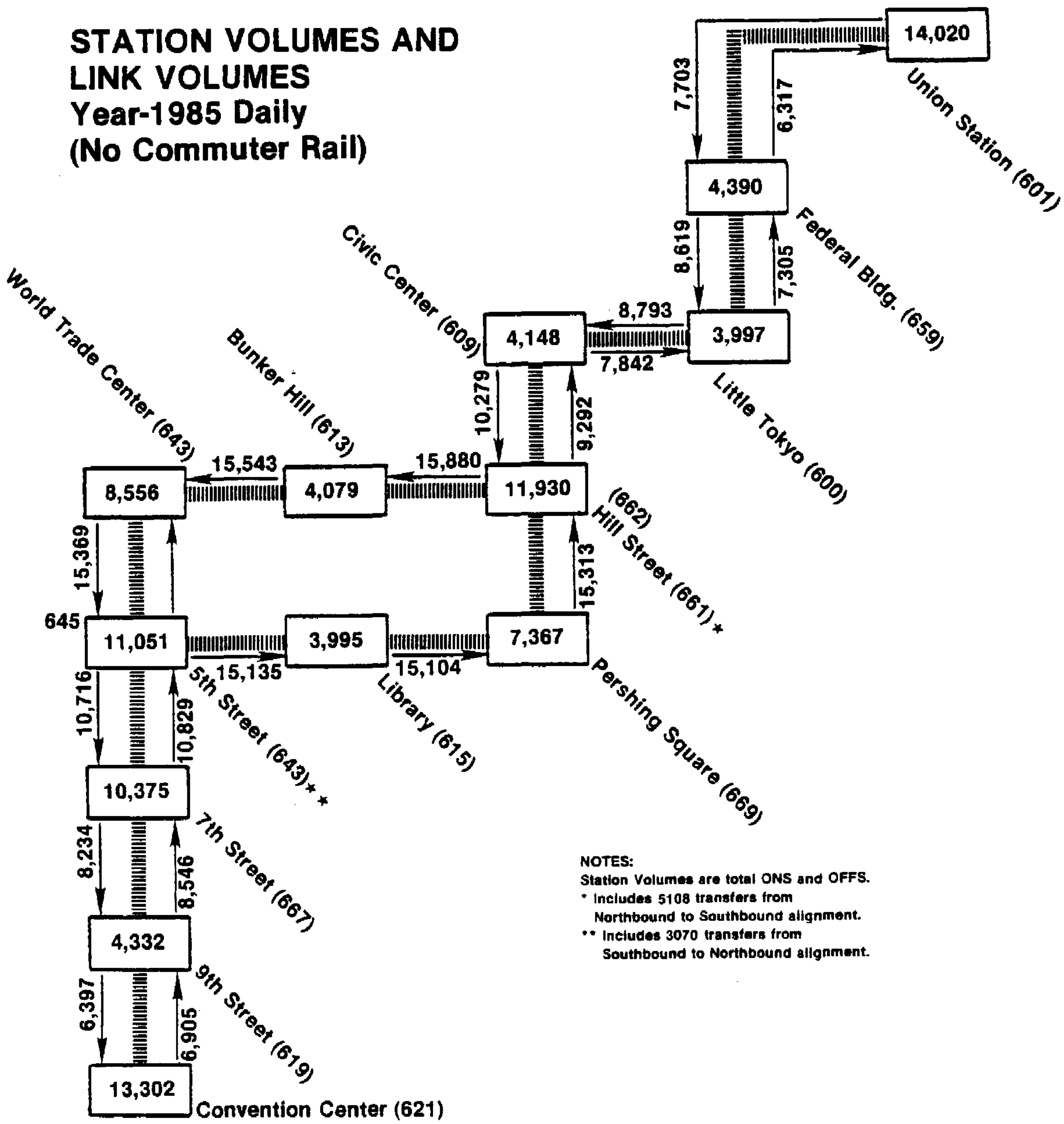

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EXHIBIT VI - 26

DPM DEMAND PROFILE

YEAR 2000
(NO COMMUTER RAIL)

Time Period	CBD Worker Distribution Trips		CBD Worker Circulation Trips			
	Transit Users	Auto Users	Depart Workplace	Return to Workplace	Non Work Transit	Total
AM 6:00- 7:00	3,435	851	25	0	190	4,501
7:00- 8:00	6,967	2,264	188	87	218	9,704
8:00- 9:00	6,914	1,970	164	81	424	9,553
9:00-10:00	2,676	912	211	74	953	4,826
10:00-11:00	804	138	433	125	1,361	2,861
11:00-12:00	288	78	2,222	779	964	4,331
PM 12:00- 1:00	191	43	2,642	2,819	1,347	7,042
1:00- 2:00	154	49	1,017	1,945	2,239	5,404
2:00- 3:00	666	106	389	769	861	2,791
3:00- 4:00	3,751	669	139	476	923	5,958
4:00- 5:00	6,541	2,175	68	194	685	9,663
5:00- 6:00	5,911	1,733	16	105	619	8,384
6:00- 7:00	1,754	705	0	38	393	2,890
7:00- 8:00	333	181	0	17	316	847
8:00- 9:00	130	95	0	5	0	230
9:00-10:00	61	31	0	0	0	92
10:00-11:00	28	16	0	0	0	44
11:00-12:00	16	18	0	0	0	34
TOTAL	40,600	12,034	7,514	7,514	11,493	79,155
4:30- 5:30	6,699	2,231	32	98	621	9,681

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EXHIBIT VI - 27

DPM DEMAND PROFILE

YEAR 2000
(COMMUTER RAIL)

Time Period	CBD Worker Distribution Trips		CBD Worker Circulation Trips			
	Transit Users	Auto Users	Depart Workplace	Return to Workplace	Non Work Transit	Total
AM 6:00- 7:00	4,460	851	25	0	242	5,578
7:00- 8:00	9,020	2,264	188	87	279	11,838
8:00- 9:00	8,978	1,970	164	81	541	11,734
9:00-10:00	3,474	912	211	74	1,215	5,886
10:00-11:00	1,044	138	433	125	1,736	3,476
11:00-12:00	374	78	2,222	779	1,230	4,683
PM 12:00- 1:00	248	43	2,642	2,819	1,718	7,470
1:00- 2:00	200	49	1,017	1,945	2,855	6,066
2:00- 3:00	865	106	389	769	1,098	3,227
3:00- 4:00	4,871	669	139	476	1,177	7,332
4:00- 5:00	8,493	2,175	68	194	874	11,804
5:00- 6:00	7,676	1,733	16	105	790	10,320
6:00- 7:00	2,278	705	0	38	501	3,522
7:00- 8:00	432	181	0	17	403	1,033
8:00- 9:00	169	95	0	5	0	269
9:00-10:00	79	31	0	0	0	110
10:00-11:00	37	16	0	0	0	53
11:00-12:00	21	18	0	0	0	39
TOTAL	52,719	12,034	7,514	7,514	14,659	94,440
4:30- 5:30	8,699	2,231	32	98	792	11,852

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12.9 percent of the regional transit distribution trips. 89,634 midday worker circulation roundtrips are estimated to be made, the 7,514 using the DPM representing an 8.4 percent share of the market.

The commuter rail scenario, meanwhile is expected to result in 94,440 daily trips. Of these, 11,852 or 12.5 percent occur in the PM peak hour and 7,470 or 7.9 percent occur in the noon hour. Worker distribution trips account for 68.6 percent of the daily trips, the transfer at Union Station resulting in the DPM attracting 16.8 percent of the regional transit distribution trips. Worker circulation and auto distribution trips are the same for both scenarios. Nonwork trips meanwhile would increase from 11,493 for the regional transit scenario to 14,659, reflecting the effect of the commuter rail system and forced transfer. Exhibits VI-28 thru VI-39 show the DPM passenger loadings and link volumes for the PM peak hour, the noon hour, and daily.

EXHIBIT VI - 28

DPM PASSENGER LOADINGS

YEAR 2000 - PM PEAK HOUR
(NO COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	352	0
Federal Building	352	297	9
Little Tokyo	640	188	14
Civil Center	814	169	86
Hill Street	897	724 (1)	104
Bunker Hill	1,517	973	125
World Trade Center	2,365	1107	279
5th & Figueroa	3,193	230	700 (2)
7th & Figueroa	2,723	479	980
9th & Figueroa	2,222	104	476
Convention Center	1,850	0	1850

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	306	0
9th & Figueroa	306	1,569	7
7th & Figueroa	1,868	619	94
5th & Figueroa	2,393	1,156 (2)	50
Library	3,499	464	133
Pershing Square	3,830	671	452
Hill Street	4,049 (3)	346	1,082 (1)
Civic Center	3,313	125	78
Little Tokyo	3,360	372	111
Federal Building	3,621	253	83
Union Station	3,791	0	3,791

Notes:

(1) Includes 588 transfers from Northbound to Southbound alignment
(2) Includes 204 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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EXHIBIT VI-29

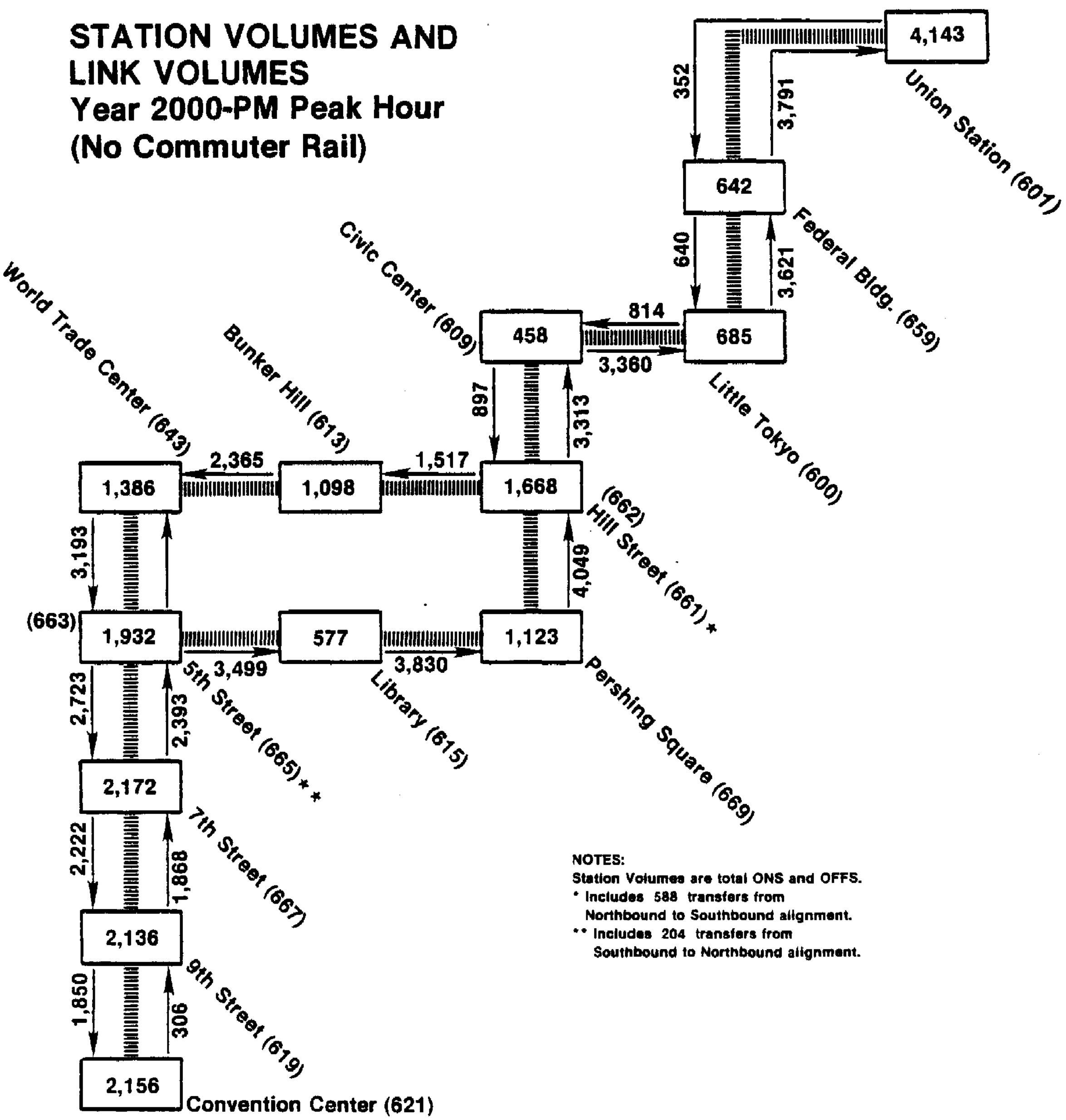

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EXHIBIT VI - 30

DPM PASSENGER LOADINGS

YEAR 2000 - NOON
(NO COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	370	0
Federal Building	370	365	6
Little Tokyo	729	324	10
Civil Center	1,043	494	63
Hill Street	1,474	1,316 (1)	183
Bunker Hill	2,607	486	423
World Trade Center	2,670 (3)	614	643
5th & Figueroa	2,641	260	957 (2)
7th & Figueroa	1,944	146	899
9th & Figueroa	1,191	22	846
Convention Center	367	0	367

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	369	0
9th & Figueroa	369	741	19
7th & Figueroa	1,091	794	79
5th & Figueroa	1,806	892 (2)	241
Library	2,457	225	286
Pershing Square	2,396	580	574
Hill Street	2,402	87	1,170 (1)
Civil Center	1,319	44	385
Little Tokyo	978	17	404
Federal Building	591	14	357
Union Station	248	0	248

Notes:

(1) Includes 701 transfers from Northbound to Southbound alignment
(2) Includes 446 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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EXHIBIT VI-31

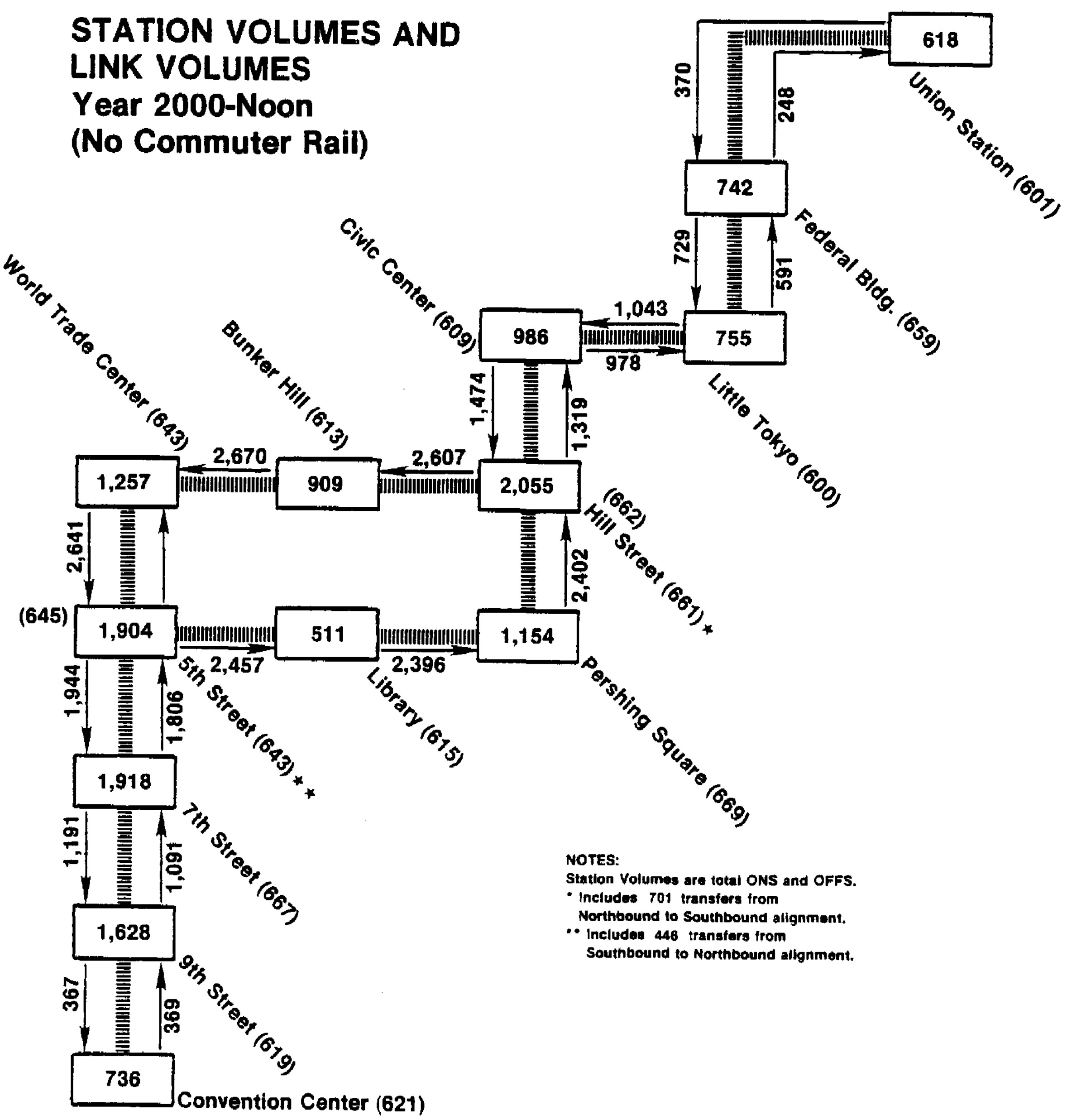

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EXHIBIT VI - 32

DPM PASSENGER LOADINGS

YEAR 2000 - DAILY
(NO COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	14,861	0
Federal Building	14,861	2,271	755
Little Tokyo	16,377	1,729	1,154
Civil Center	16,952	2,521	941
Hill Street	18,532	14,928 (1)	2,726
Bunker Hill	30,734 (3)	4,358	5,120
World Trade Center	29,972	5,715	6,207
5th & Figueroa	29,480	1,306	8,556 (2)
7th & Figueroa	22,230	2,243	8,250
9th & Figueroa	16,223	366	9,414
Convention Center	7,175	0	7,175

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	7,690	0
9th & Figueroa	7,690	8,190	386
7th & Figueroa	15,494	7,907	1,846
5th & Figueroa	21,555	8,213 (2)	1,498
Library	28,270	2,481	2,838
Pershing Square	27,913	5,719	4,193
Hill Street	29,439	1,366	14,222 (1)
Civil Center	16,583	738	2,098
Little Tokyo	15,223	1,094	2,137
Federal Building	14,180	735	2,282
Union Station	12,633	0	12,633

Notes:
(1) Includes 8,751 transfers from Northbound to Southbound alignment
(2) Includes 5,054 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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EXHIBIT VI-33

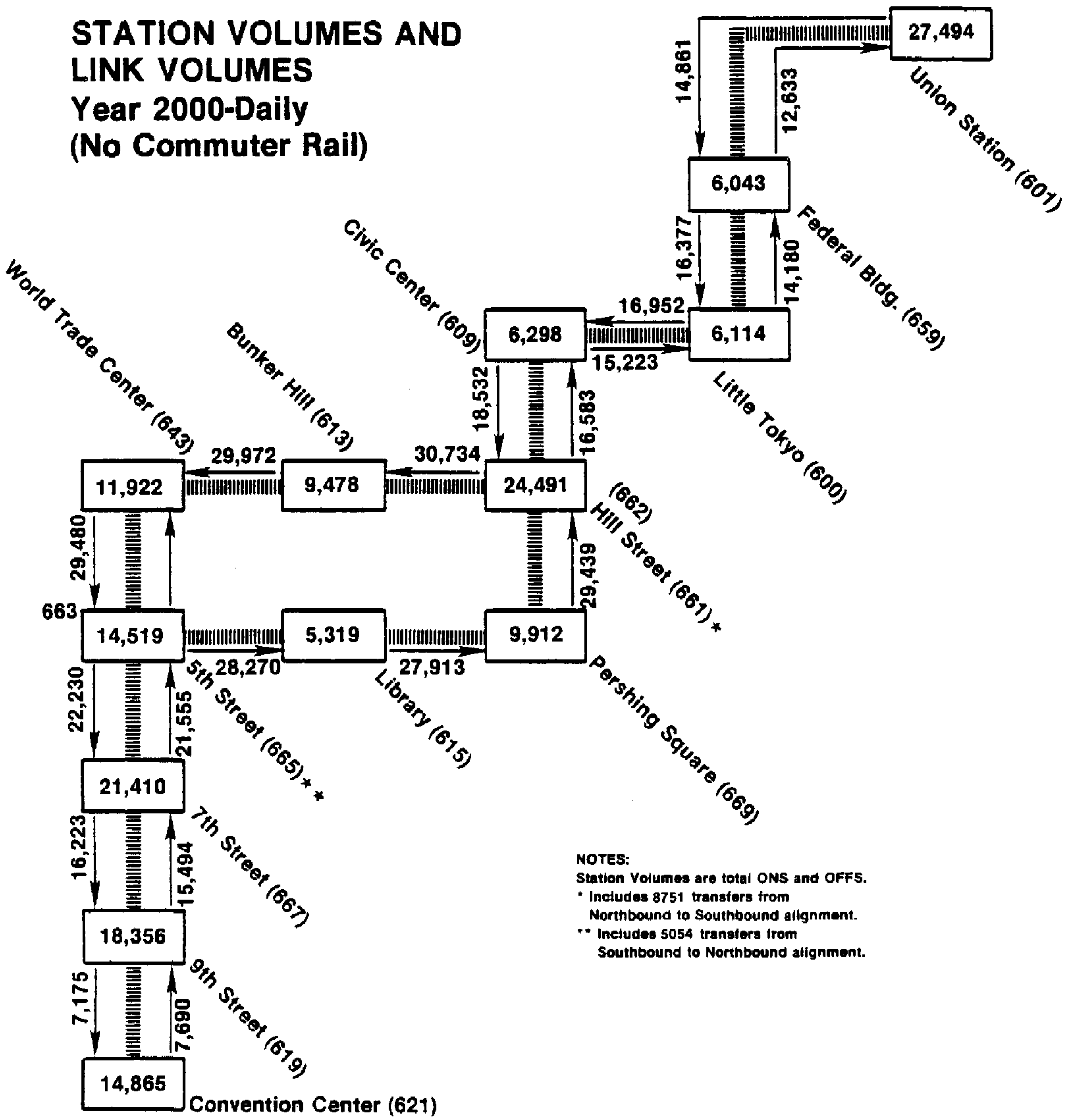

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EXHIBIT VI - 34

DPM PASSENGER LOADINGS

YEAR 2000 - PM PEAK HOUR
(COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	566	0
Federal Building	566	277	9
Little Tokyo	834	183	15
Civil Center	1,002	173	80
Hill Street	1,095	678 (1)	116
Bunker Hill	1,657	1,038	147
World Trade Center	2,548	1,256	291
5th & Figueroa	3,513	233	966 (2)
7th & Figueroa	2,780	478	977
9th & Figueroa	2,281	104	539
Convention Center	1,846	0	1,846

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	341	0
9th & Figueroa	341	2,047	8
7th & Figueroa	2,380	812	92
5th & Figueroa	3,100	1,678 (2)	51
Library	4,727	681	127
Pershing Square	5,281	1,042	380
Hill Street	5,943	453	877 (1)
Civil Center	5,519	181	82
Little Tokyo	5,618	399	104
Federal Building	5,913	272	90
Union Station	6,095 (3)	0	6,095

Notes:
(1) Includes 191 transfers from Northbound to Southbound alignment
(2) Includes 819 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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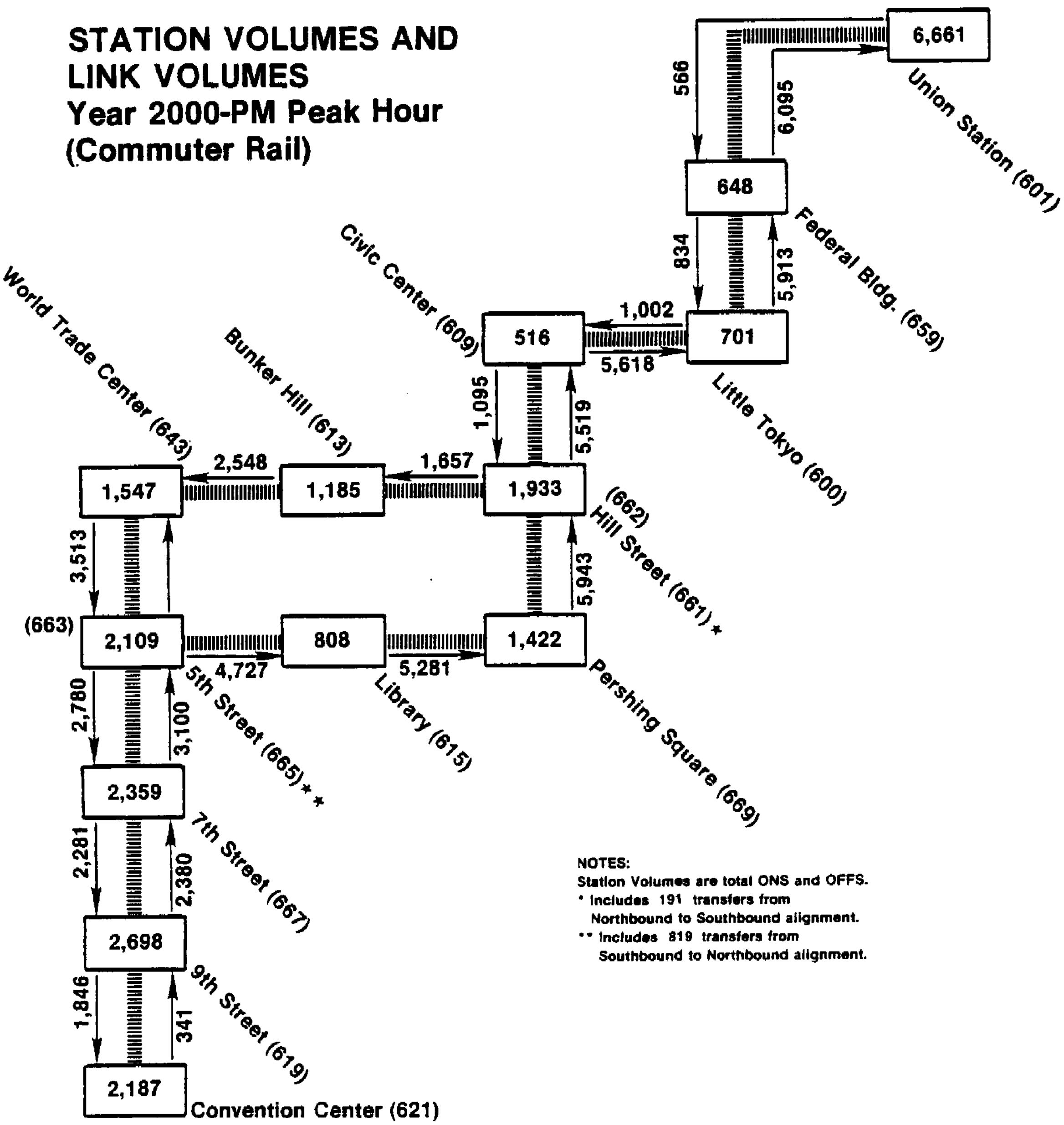

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EXHIBIT VI - 36

DPM PASSENGER LOADINGS

YEAR 2000 - NOON
(COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	553	0
Federal Building	553	354	10
Little Tokyo	897	324	16
Civil Center	1,205	497	53
Hill Street	1,649	1,278 (1)	183
Bunker Hill	2,744	493	446
World Trade Center	2,791 (3)	626	630
5th & Figueroa	2,787	262	992 (2)
7th & Figueroa	2,057	145	916
9th & Figueroa	1,286	21	938
Convention Center	369	0	369

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	381	0
9th & Figueroa	381	806	19
7th & Figueroa	1,168	806	80
5th & Figueroa	1,894	926 (2)	236
Library	2,584	237	281
Pershing Square	2,540	611	566
Hill Street	2,585	110	1,152 (1)
Civil Center	1,543	75	388
Little Tokyo	1,230	17	405
Federal Building	842	22	363
Union Station	501	0	501

Notes:
(1) Includes 688 transfers from Northbound to Southbound alignment
(2) Includes 463 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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EXHIBIT VI-37

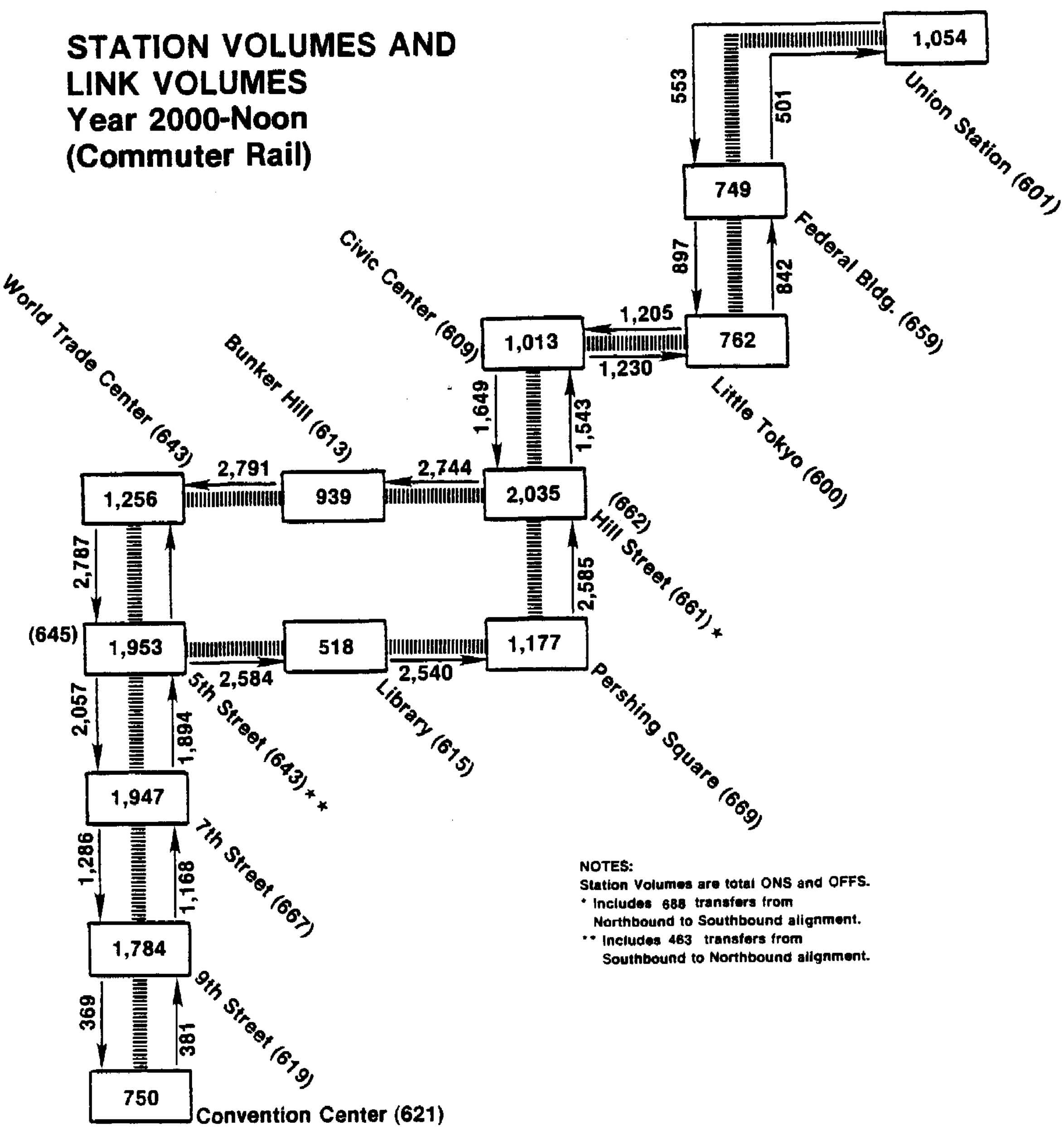

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EXHIBIT VI - 38

DPM PASSENGER LOADINGS

YEAR 2000 - DAILY
(COMMUTER RAIL)

STATION	SOUTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Union Station	0	23,767	0
Federal Building	23,767	2,170	836
Little Tokyo	25,101	1,699	1,282
Civil Center	25,518	2,511	1,009
Hill Street	27,020	13,777 (1)	3,483
Bunker Hill	37,314 (3)	4,639	5,714
World Trade Center	36,239	6,266	6,753
5th & Figueroa	35,752	1,301	11,731 (2)
7th & Figueroa	25,322	2,215	8,969
9th & Figueroa	18,568	368	11,711
Convention Center	7,225	0	7,225

STATION	NORTHBOUND		
	In the Vehicle	Enter the Vehicle	Exit the Vehicle
Convention Center	0	7,855	0
9th & Figueroa	7,855	10,039	385
7th & Figueroa	17,509	8,422	1,839
5th & Figueroa	24,092	11,280 (2)	1,499
Library	33,873	3,201	3,323
Pershing Square	33,751	6,890	4,470
Hill Street	36,171	1,815	13,260 (1)
Civil Center	24,726	1,123	2,103
Little Tokyo	23,746	1,158	2,090
Federal Building	22,814	846	2,251
Union Station	21,409	0	21,409

Notes:
(1) Includes 8,451 transfers from Northbound to Southbound alignment
(2) Includes 7,078 transfers from Southbound to Northbound alignment
(3) Maximum one-way link volume

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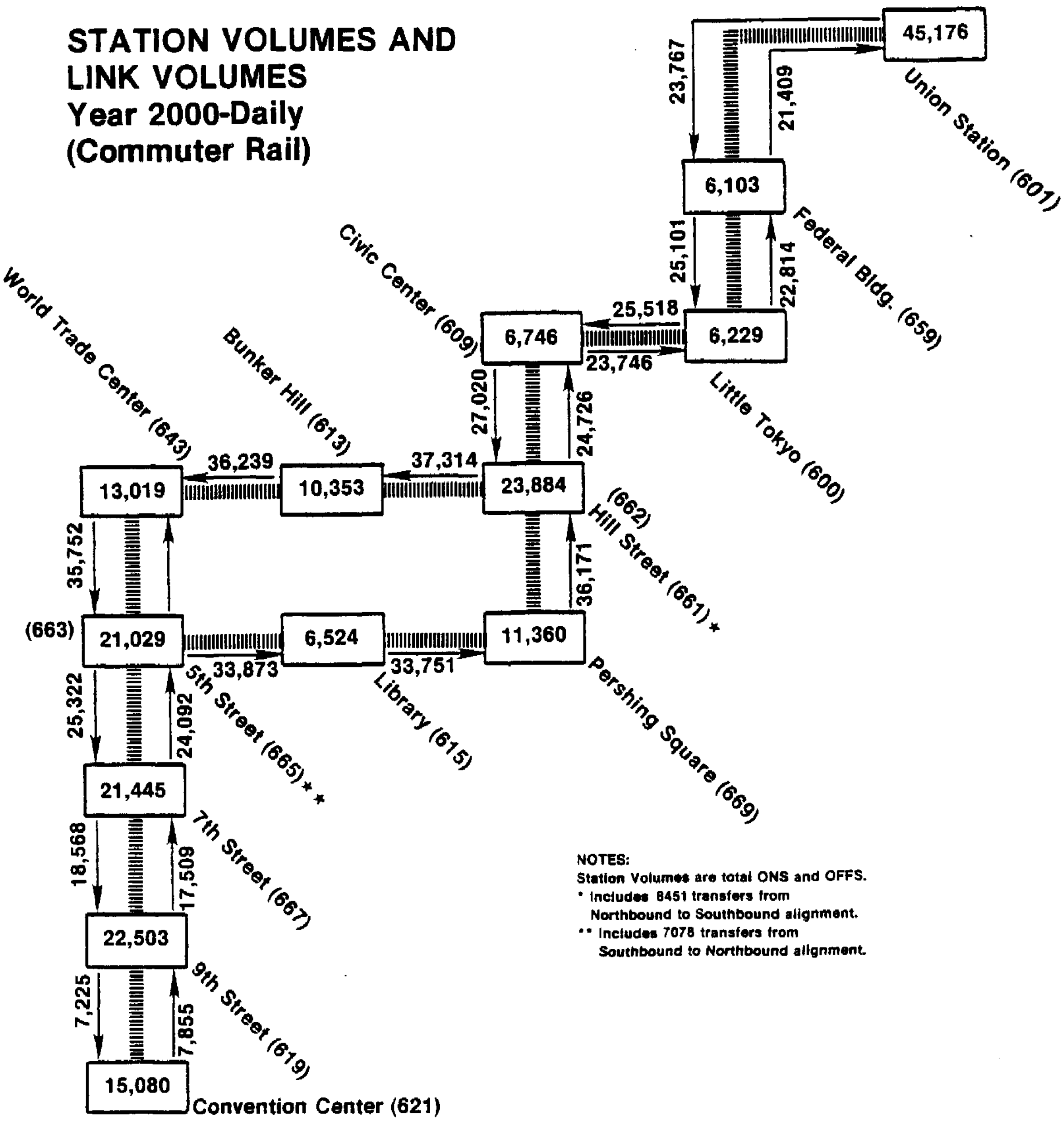
EXHIBIT VI-39



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APPENDIX A

CALIBRATION DATA BASE

This appendix presents the formats and contents of the data files used to calibrate the DPM ridership estimation model system. Each record on one of these files contains information on the traveller characteristics, modal characteristics, and mode choice decision for an individual trip. This type of information is called disaggregate data.

Three final calibration data bases are discussed, one for each of the logit models in the DPM ridership estimation model system:

1. distribution mode choice data;
2. midday mode choice data; and
3. frequency/destination choice data.

The data on these final calibration data bases are obtained from the following sources:

- workplace survey (task 1);
- on board survey (task 1);
- zonal characteristics (task 2);
- parking supply and prices (task 2); and
- network characteristics (task 3).

DISTRIBUTION MODE CHOICE DATA

The contents of the calibration data file for the distribution mode choice model are presented in Exhibit A-1. The file contains the locations of the CBD origin and destination, the travel characteristics for the distribution trip by each mode, such as travel time and cost, and a dummy variable to indicate the use of auto or transit for the regional access trip to the CBD.

The distribution trip is from the CBD parking lot to the workplace for regional auto drivers, and from the bus stop where the traveller first exits the bus after entering the CBD to the workplace for regional transit users. Information on the trip origin, destination, and regional access mode are determined from the individual workplace survey records. Modal level of service characteristics were obtained from the network charactertistic matrices and added to these individual trip records.

EXHIBIT A-1

DISTRIBUTION MODE CHOICE CALIBRATION DATA BASE

Position	Variable	Source	Columns	Format
1	Survey identification number	workplace survey	1-8	F8.1
2	Dummy variable - 1 if travel to CBD by bus	workplace survey	9-16	F8.4
3	Distribution trip origin 1/	workplace survey	17-24	F8.4
4	Distribution trip destination	workplace survey	25-32	F8.4
5	Walk user - 1 if walk	workplace survey	33-40	F8.4
6	Minibus user - 1 if use minibus	workplace survey	41-48	F8.4
7	Regional bus user - 1 if use regional bus	workplace survey	49-56	F8.4
8	Walk distance (miles)	PM walk network	57-64	F8.4
9	Walk grade: 1 for grade, 0 otherwise	PM walk network	65-72	F8.4
10	Walk time (10 minutes)	PM walk network	73-80	F8.4
11	Minibus run time (10 minutes)	PM minibus network	81-88	F8.4
12	Minibus wait time (10 minutes)	PM minibus network	89-96	F8.4
13	Minibus fare ($6/hour) 2/	June 1980 fare	97-104	F8.4
14	Regional bus run time (10 minutes)	PM regional bus network	105-112	F8.4
15	Regional bus wait time (10 minutes)	PM regional bus network	113-120	F8.4
16	Regional bus fare ($6/hour) 2/	June 1980 fare	121-128	F8.4
17	Minibus fare ($9/hour) 2/	June 1980 fare	129-136	F8.4
18	Minibus fare ($10/hour) 2/	June 1980 fare	137-144	F8.4
19	Minibus fare ($12/hour) 2/	June 1980 fare	145-152	F8.4
20	Regional bus fare ($9/hour) 2/	June 1980 fare	153-160	F8.4
21	Regional bus fare ($10/hour) 2/	June 1980 fare	161-168	F8.4
22	Regional buse fare ($12/hour) 2/	June 1980 fare	169-176	F8.4

EXHIBIT A-1 (Cont'd)

1/For auto users, the origin is where the car is parked or where a passenger is reportedly dropped off in the CBD. For transit users, the origin is the bus stop where the traveller first exits the bus after having entered the CBD.

2/The regional bus and minibus fares were fixed relative to the time variables through an assumed value of time; such as \$6, \$9, \$10, or \$12 per hour. The following calculation demonstrates the conversion of a \$.50 fare to a unit comparable to 10 minutes of wait time for an assumed \$6/hour value of time:

$$\$.50 \;*\; \frac{60 \text{ min.}}{\$6.00} \;*\; \frac{1 \text{ unit}}{10 \text{ min.}} = 0.5 \text{ units}$$

MIDDAY MODE CHOICE DATA

The contents of the calibration file for the midday mode choice model are presented in Exhibit A-2. This file contains the origins and destinations of trips made within the CBD by CBD workers, the travel characteristics for travel between each two stops in a midday trip by all modes (walk, auto, regional bus, and minibus), and regional trip data, such as the regional mode of access to the CBD and the location where the person parked their car.

Individual workplace survey records define the basis on which the behavioral decision process is calibrated. The basic unit is a round trip or a "tour". CBD workers who make more than one midday tour are represented by one survey record for each complete round trip.

The stopping points on a midday intra-CBD tour are obtained from the workplace survey midday travel diary. The origin and destination of the longest one-way trip segment in the tour is used to model the mode choice decision process. Network characteristic data for travel by each mode between these two points is added to the trip record.

EXHIBIT A-2

MIDDAY MODE CHOICE CALIBRATION DATA BASE 1/

Position	Variable	Source	Columns	Format
1	Survey identification number	workplace survey	1-6	F6.0
2	Trip leg number	workplace survey	7-9	F3.0
3	CBD zone of origin	workplace survey	10-13	F4.0
4	CBD zone of destination	workplace survey	14-17	F4.0
5	CBD zone where boarded bus	workplace survey	18-21	F4.0
6	CBD zone where exited bus	workplace survey	22-25	F4.0
7	Purpose at trip origin	workplace survey	26-27	F2.0
8	Purpose at trip destination	workplace survey	28-29	F2.0
9	Employment type	workplace survey	30-31	F2.0
10	Regional mode of access	workplace survey	32-33	F2.0
11	Walk user	workplace survey	34-35	F2.0
12	Bus user	workplace survey	36-37	F2.0
13	Minibus user	workplace survey	38-39	F2.0
14	Auto user	workplace survey	40-41	F2.0
15	Walk distance 2/ (miles)	MD3/walk network	42-45	F4.2
16	Walk grade	MD walk network	46-47	F2.0
17	Walk time 4/ (10 minutes)	MD walk network	48-51	F4.2
18	Minibus run time (10 minutes)	MD minibus network	52-55	F4.2
19	Minibus wait time (10 minutes)	MD minibus network	56-59	F4.2
20	Minibus transfers	MD minibus network	60-61	F2.0
21	Minibus fare 5/ (dollars)	June 1980 fare	62-65	F4.2
22	Regional bus run time (10 minutes)	MD regional bus network	66-69	F4.2

EXHIBIT A-2 (Cont'd)

Position	Variable	Source	Columns	Format
23	Regional bus wait time (10 minutes)	MD regional bus network	70-73	F4.2
24	Regional bus transfers	MD regional bus network	74-75	F2.0
25	Regional bus fare (dollars)	June 1980 fare	76-79	F4.2
26	Auto distance (miles)	MD auto network	80-83	F4.2
27	Auto run time	MD auto network	84-87	F4.2
28	Time this one-way trip leg began	workplace survey	88-92	F5.0
29	Time this one-way trip leg ended	workplace survey	93-97	F5.0
30	Parking cost paid for this trip	workplace survey	98-101	F4.2
31	Hourly parking cost at destination	parking supply and prices	102-105	F4.2
32	Person has SCRTD pass: 1-yes, 0-no	workplace survey	106-107	F2.0
33	Parking zone for AM home to work trip	workplace survey	108-111	F4.0
34	Parking cost for AM home to work trip	workplace survey	112-115	F4.2
35	Walk time from workplace to AM parking zone (10 minutes)	AM walk network	116-119	F4.2
36	Auto time from AM parking zone to midday destination	MD auto network	120-123	F4.2
37	Auto distance from AM parking zone to midday destination	MD auto network	124-127	F4.2
38	Minibus fare ($9/hour)	June 1980 fare	128-131	F4.2
39	Minibus fare ($10/hour)	June 1980 fare	132-135	F4.2
40	Minibus fare ($12/hour)	June 1980 fare	136-139	F4.2
41	Regional bus fare ($9/hour)	June 1980 fare	140-143	F4.2
42	Regional bus fare ($10/hour)	June 1980 fare	144-147	F4.2
43	Regional bus fare ($12/hour)	June 1980 fare	148-151	F4.2

EXHIBIT A-2 (Cont'd)

Position	Variable	Source	Columns	Format
44	Dummy = 1 if neither trip end is company business	workplace survey	152-153	F2.0
45	Dummy = 1 if person did not drive to work	workplace survey	154-155	F2.0
46	Dummy = 1 if person drove to work and if midday trip origin is their workplace	workplace survey	156-157	F2.0
47	Dummy = 1 if midday trip origin is their workplace and either the person drove to work or the trip purpose is company business	workplace survey	158-159	F2.0
48	Walk time* 1.5	MD walk network	160-164	F5.2
49	Walk time* 2.0	MD walk network	165-169	F5.2
50	Walk time* 2.5	MD walk network	170-174	F5.2
51	Walk time* 3.0	MD walk network	175-179	F5.2
52	Walk time from workplace to AM parking zone* 2.5	MD walk network	180-184	F5.2
53	Total tour: walk distance 7/	MD walk network and workplace survey	185-189	F5.2
54	Total tour: walk time	MD walk network and workplace survey	190-194	F5.2
55	Total tour: minibus run time	MD minibus network and workplace survey	195-199	F5.2
56	Total tour: minibus wait time	MD minibus network and workplace survey	200-204	F5.2
57	Total tour: minibus fare	June 1980 fare	205-209	F5.2
58	Total tour: regional bus run time	MD regional bus network and workplace survey	210-214	F5.2
59	Total tour: regional bus wait time	MD regional bus network and workplace survey	215-219	F5.2

EXHIBIT A-2 (Cont'd)

Position	Variable	Source	Columns	Format
60	Total tour: regional bus fare	June 1980 fare	220-224	F5.2
61	Total tour: auto distance	MD auto network and workplace survey	225-229	F5.2
62	Total tour: auto time	MD auto network and workplace survey	230-234	F5.2

1/The variable codes can be interpreted by using the Workplace Survey Coding Form.

2/All distances are in miles.

3/MD stands for midday.

4/All times are in tens of minutes.

5/All costs are in dollars.

6/The minibus and regional bus fares were fixed relative to the time variables through an assumed value of time; such as \$6, \$9, \$10, or \$12 per hour. The following calculation demonstrates the conversion of a \$.50 fare to a unit comparable to 10 minutes of wait time for an assumed \$9/hour value of time.

$$\$.50 \;*\; \frac{60 \text{ minutes}}{\$9.00} \;*\; \frac{1 \text{ unit}}{10 \text{ minutes}} = 0.333 \text{ units}$$

7/These variables are the totals for all the legs in the entire round trip tour.

FREQUENCY/DESTINATION CHOICE DATA

The contents of the calibration file for the frequency/destination choice model are presented in Exhibit A-3. This file contains several purpose and auto availability dummy variables, the workplace and chosen destination if a trip was made, nine alternative destinations (ten if no trip was made) to which the chosen destination or no-trip decision is compared, and land use data to describe the activity at each of the ten alternative destinations.

Individual workplace survey records define the basic decision unit to which the decision process is calibrated. Each CBD worker who does not make a trip is a valid observation, and each complete round trip or tour for a CBD employee who does make one or more midday trips is also a valid observation. Each round trip from the workplace survey midday travel diary is condensed to a single trip record between the workplace and the farthest destination on the tour from the workplace. CBD destinations are chosen at random to provide nine alternative destinations in addition to the no-trip alternative. The alternative destinations are chosen from the CBD to replicate the distribution of trip distances observed from the survey data. Zonal employment and land use data are then added to the record for the workplace zone and each of the nine alternative destination zones. The LOGSUM variable from the midday mode choice model is added to the record for the service provided by all modes available between the workplace and each of the nine destination zones.

EXHIBIT A-3

MIDDAY DESTINATION CHOICE CALIBRATION DATA BASE

Position	Variable	Source	Columns	Format
1	Survey identification number	workplace survey	1-5	I5
2	Trip leg number	workplace survey	6-7	I2
3	Purpose at trip origin	workplace survey	8-8	I1
4	Purpose at trip destination	workplace survey	9-9	I1
5	Mode used for this trip leg	workplace survey	10-10	I1
6	Time this trip leg began	workplace survey	11-14	I4
7	Time this trip leg ended	workplace survey	15-18	I4
8	Parking cost paid at destination zone	workplace survey	19-21	I3
9	Employment type	workplace survey	22-22	I1
10	CBD zone of origin	workplace survey	23-25	I3
11	CBD zone of destination	workplace survey	26-28	I3
12	CBD zone where boarded bus	workplace survey	29-31	I3
13	CBD zone where exited bus	workplace survey	32-34	I3
14	Dummy = 1 if person has an SCRTD pass	workplace survey	35-35	I1
15	Mode used for AM home to work trip	workplace survey	36-36	I1
16	Dummy = 1 if person <u>did</u> <u>not</u> drive to work	workplace survey	37-37	I1
17	Dummy = 1 if person drove to work and the trip origin is the workplace	workplace survey	38-38	I1
18	Dummy = 1 if the trip origin is the workplace and either the person drove to work or the trip purpose is company business	workplace survey	39-39	I1
19	Dummy = 1 if the trip purpose at the origin or the destination is company business	workplace survey	40-40	I1

EXHIBIT A-3 (Cont'd)

Position	Variable	Source	Columns	Format
20	Dummy = 1 if neither trip end purpose is company business	workplace survey	41-41	I1
21	Workplace CBD zone	workplace survey	42-44	I3
22	USER1 = 1 if the person did not make a midday trip	workplace survey	45-45	I1
23	USER2 = 1 if the person made a trip to alternative destination 1	workplace survey	46-46	I1
•				
•				
•				
31	USER10 = 1 if the person made a trip to alternative destination 9	workplace survey	54-54	I1
32	CBD zone for alternative destination 1	workplace survey	55-56	I2
•				
•				
•				
40	CBD zone for alternative destination 9	workplace survey	71-72	I2
41	Employment in workplace zone (1000's)	zonal characteristics	75-80	F6.3
42	Land use activity at workplace zone 1/	zonal characteristics	81-86	F6.3
43	Natural log of activity at workplace zone	zonal characteristics	87-92	F6.3
44	Natural log of area (acres) at workplace zone	zonal characteristics	93-98	F6.3
45	Employment density $\frac{\text{1000's}}{\text{acres}}$ at workplace zone	zonal characteristics	99-104	F6.3
46	Distance to alternative destination 1	AM walk network	105-110	F6.3
47	LOGSUM between workplace and alternative destination 1 2/	Midday mode choice model	111-116	F6.3
48	Land use activity at alternative destination 1	zonal characteristics	117-122	F6.3

EXHIBIT A-3 (Cont'd)

Position	Variable	Source	Columns	Format
49	Activity/area (acres) at alternative destination 1	zonal characteristics	123-128	F6.3
50	Natural log of activity at alternative destination 1	zonal characteristics	129-134	F6.3 (18x)3/
51	Distance to alternative destination 2	AM walk network	153-158	F6.3
.			.	.
.			.	.
.			.	.
90	Natural log of activity at alternative destination 9	zonal characteristics	495-500	F6.3

1/The activity variable is a function of the land use in the zone as defined by CSI. The function is described in Section 3.

2/The LOGSUM variabale is defined in Section 3.

3/There are 18 blank spaces between the five variables given for each of the alternative destinations.

APPENDIX B

SOURCES OF INPUTS AND ASSUMPTIONS

The projections are based upon assumptions provided by management concerning future events and circumstances. The assumptions disclosed herein are those which management believes are significant to the projections or are key factors upon which the future results of the Los Angeles Downtown People Mover (LADPM) Authority depend. Some assumptions inevitably will not materialize and unanticipated events and circumstances may occur subsequent to May, 1981, the date of these projections. Therefore the actual results achieved during the projection period may vary from the projections.

Source of input include:

- Forecasts of regional travel by mode, provided by the Los Angeles Regional Transportation Study (LARTS) branch of the California Department of Transportation (CALTRANS);
- Forecasts of regional employment, provided by the LARTS branch of Caltrans;
- Estimates of the year 1985 and 1990 routings and levels of regional bus service, provided by the Southern California Rapid Transit District (SCRTD);
- Estimates of the year 1985 and 1990 levels of commuter rail service, provided by LARTS;
- Alignment and operating characteristics for the proposed Wilshire rail line, provided by SCRTD;

- Alignment and operating characteristics for the DPM, provided by the LADPM Authority; and
- Location and capacity of the DPM parking facilities, provided by the LADPM Authority.

Assumptions provided by the LADPM Authority key to these results include:

- Implementation of the regional commuter rail plan by 1990;
- Operation of the Wilshire rail line by 1990;
- Operation of regional bus service as defined by SCRTD for each of the forecast years 1985 and 1990;
- Operation of regional bus service in year 2000 identical to year 1990;
- Allocation of DPM parking spaces by market segments; and
- Constant relationship between DPM and bus fares as given in 1980.