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FOR  
DOWNTOWN PEOPLE MOVER

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CBD BUS PLAN  
FOR  
DOWNTOWN PEOPLE MOVER

NOTE: This copy contains following corrected pages:  
Section II-1, 6, 7, 43, 46, 47, 48, 49, 52;  
Section III - 33 removed (actually is 58); and  
Section IV - 46. Sept. '81

PLANNING DEPARTMENT  
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT  
APRIL, 1981

CBD BUS PLAN FOR DPM

CHAPTER I  
INTRODUCTION

Planning Department  
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT  
April, 1981

LOS ANGELES CENTRAL BUSINESS DISTRICT (CBD)  
BUS PLAN FOR DOWNTOWN PEOPLE MOVER (DPM)

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III	DPM-BUS INTERCEPT Operating Cost Assessment
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V	DPM BACKGROUND INFORMATION

SCRTD Planning Department  
April 1981

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## DESCRIPTION OF REPORT

- Work Program

The present planning cycle by the SCRTD for the Downtown People Mover (DPM) started with the U.S. Urban Mass Transportation Administration (UMTA) Section 9 Funding approval of the bus planning tasks for the DPM outlined in the Uniform Work Program (UWP) for FY 77-78. Since this time, UMTA work program funding, now called Overall Work Program (OWP), under UMTA Section 8 Funding, have continued through FY 80-81.

- Report Outline

Following through on the UWP work program, three major technical task reports evolved, which comprise the three major chapters to this technical report as follows:

- Chapter II
  - DPM Patronage Assessment: Bus Transfers to DPM
- Chapter III
  - DPM-Bus Intercept Operating
  - Cost Assessment
- Chapter IV
  - Bus Operation Concepts and Specific Service at DPM
  - Terminal Stations and Vicinities

In addition, Chapter I, herein, provides background information on the bus planning effort for the DPM. Chapter V concludes with supporting data related to the rest of the chapters.

- Report Findings

Summary report findings are included at the start of each of the three major chapters. Brief summary statements are listed for each major chapter.

- Patronage Assessment

With respect to bus transfers to the DPM, the Planning staff developed a study approach which employed three district methodologies each with several different sets of assumptions. This is intended to give all parties varying perspectives on the interdependency and ridership impacts between the DPM and the bus system. The Planning staff estimates of bus transfer volume ranged from a low of 37% to a high of 108% of the UMTA approved DPM patronage modelling projections. Rather than choose between the 37% and 108%, the Planning staff involved in this technical analysis believes the number of bus riders transferring to the DPM may be about 50% of the UMTA modelling projections, using a set of assumptions the planning staff believes are probable or likely to occur.

These manual calculations are not intended as a substitute for the computerized patronage modelling techniques. Indeed these modelling techniques are a prerequisite to obtaining funding approval from the U.S. Department of Transportation. On the other hand, the District Planning staff believes these manual calculations can and do result in a helpful frame of reference in the evaluation of the computerized ridership modelling projections for the DPM project.

- Bus Operating Costs

This technical study showed that bus operating cost savings as a result of operation of the DPM would be \$300,000 per year in 1978 dollars. This cost-savings analysis was based on a 20% bus intercept at the Convention Center and the Union Station DPM terminal stations of all express service passing through the two DPM corridors. Higher bus operating cost savings would accrue from higher volumes of buses intercepted (meaning terminated at the DPM terminal).

- Bus Planning for the DPM Terminals

This technical report describes the present and proposed services passing through, terminating and intercepted (meaning also terminating) at the Convention Center and Union Station DPM Terminal Stations.

Detailed alternative route configurations are shown for each DPM terminal station with recommendations for further study.

#### ORIGINS OF DPM PROJECT

The transportation concept of the Los Angeles Downtown People Mover (DPM) involves a small car aerial guideway system serving internal circulation trips and regional auto and transit trips transferring (intercepted by) to the DPM.

This concept was first proposed by the Los Angeles Community Redevelopment Agency (CRA) in 1970 primarily as a means of alleviating projected traffic congestion in the rapidly developing CRA Bunker Hill Redevelopment Project located on the west side of the Los Angeles Central Business District (CBD). At that time, the DPM was proposed to be constructed in an east-west alignment connecting two large peripheral parking garages with the Bunker Hill Project. The proposed sites for the garages were located at First Street and Glendale Boulevard on the west and in the vicinity of Third and Los Angeles Streets on the east side of the CBD.

Restudy of the entire concept started in 1975. All corridors or portions of the CBD were reviewed with respect to the suitability of DPM technology to meet transportation needs in these areas of the CBD. Alternatives analysis resulted in narrowing route alternatives to three routes considered viable: 1) a horseshoe shaped route serving the mid-CBD area, with the two route terminals on the west side; 2) Union Station to Convention Center via the east side; 3) Union Station to Convention Center via the west side. This third alternative route configuration became the final recommended DPM alignment, with the exception that a one-way configuration modification was made in

1978 in order to obtain additional route coverage in the heart of the Bunker Hill Project.

A major planning milestone occurred in September 1976 with the formal incorporation of the DPM into the coordinated regional transportation planning program, referred to as the Regional Transit Development Program (RTDP). A major political milestone occurred in December 1976 when the U.S. Secretary of Transportation, William Coleman, issued a letter of authorization to proceed on the Four Point Program, one element of which was the LA DPM. These two milestones are outlined in Chart A. The SCRTD Board of Directors also formally adopted a resolution in support of the DPM project in 1977. District involvement in and planning for the DPM is discussed in the section below on DPM bus planning policy.

CHART A

ORIGINS OF

REGIONAL TRANSIT DEVELOPMENT PROGRAM (RTDP)

"Summit Meeting" Consensus September 1976

Under aegis of California Secretary of Business and Transportation Donald Burns Agreement reach on combined program, including

- Caltrans preference for greater use of buses on freeways
- City of Los Angeles desire for a downtown circulation distribution system and greater use of buses
- SCRTD's concept of expanded bus service with a small segment of rapid transit line (in corridor not adequately penetrated by freeways for express bus service)

US Secretary of Transportation William Coleman, December 22, 1976 letter authorizing to proceed on four point program

Elements

- I. Improved Bus Service using transportation systems management (TSM) techniques;
- II. Freeway Transit System, including bus/ carpool exclusive lanes to provide free-flow service;
- III. A Los Angeles CBD Circulation/Distribution System; and
- IV. A Regional Core Rapid Transit Element

## DESCRIPTION OF DPM PROJECT

- Project Description

The route of the DPM, as modified in 1978, is shown in Map 1. The terminal stations at Union Station and Convention Center provide for parking garages of 2,000 and 1,750 cars, respectively. Eleven intermediate stations provide maximum access to all activity centers along the route. The overhead or aerial guideway structure must be high enough to clear the intermediate or mezzanine level at each station. The unmanned stations are approximately 100 feet in length. The unmanned automated cars are planned to be between 20-40 feet in length, using either steel wheel on steel rail or some form of rubber tire guideway technology.

The costs of the DPM project, including the two terminal station complexes, was originally projected at \$175 million, which estimate included all escalation dollars due to inflation. The primary source of funding was UMTA demonstration funds (Section 6). The source of the local share of approximately 20% was projected to be a combination of Los Angeles City and State funds - the latter from State Gas Tax Monies.

- System Selection

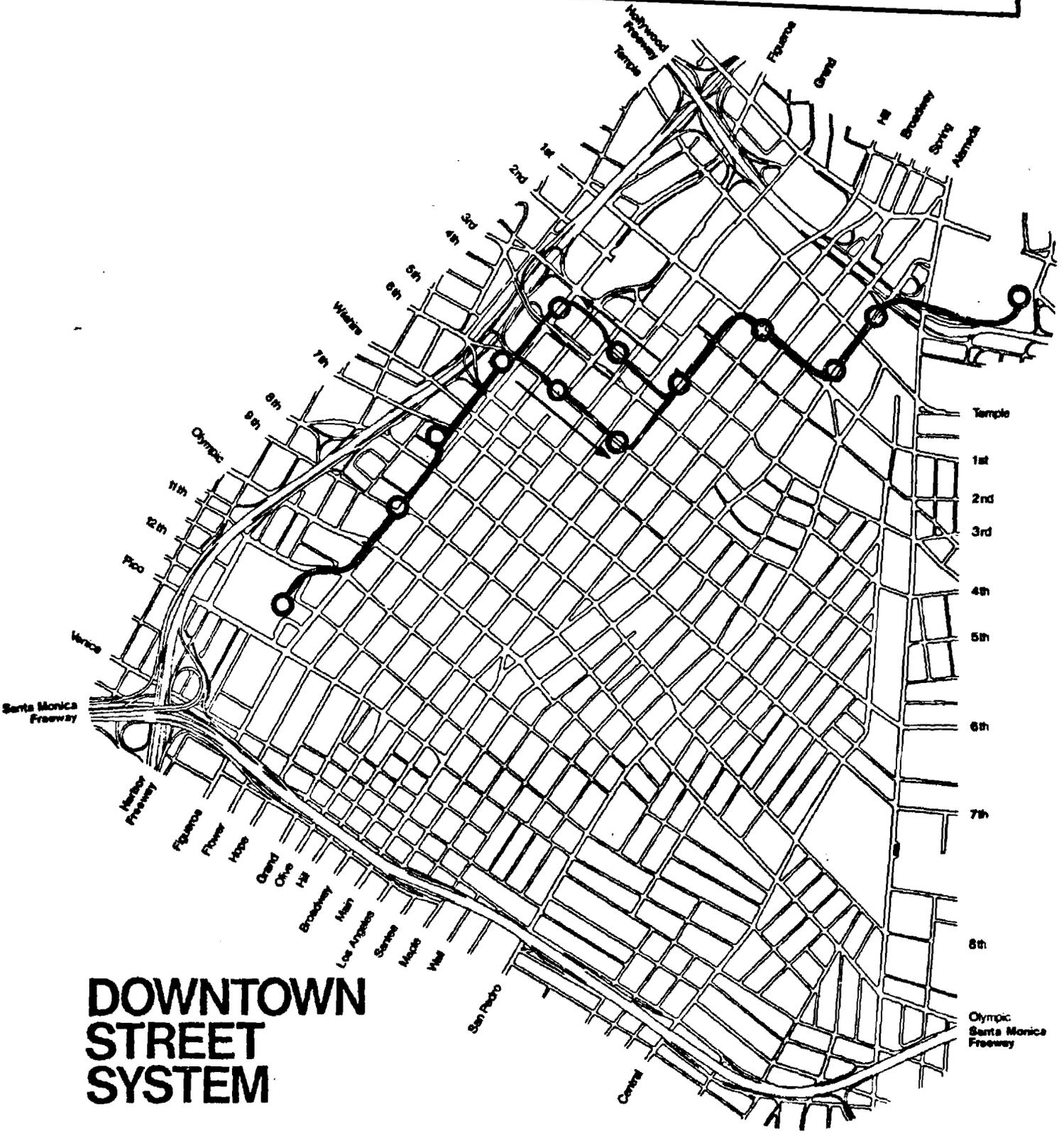
In December 1980, the Downtown People Mover Authority (DPMA) selected the DPM system developed by the Urban Transportation Development Corporation (UTDC) of Toronto, Canada. (This selection was necessarily tentative pending final funding commitments from the Urban Mass Transportation Administration (UMTA)). The

UTDC system technology consists of 40 foot automated cars of steel wheels on steel rails using a linear induction motor (a stretched out version of the standard electric traction motor). The forty-foot car is the same size as the standard transit bus. This medium capacity system (compared to small capacity systems also considered for the DPM) has similarities to the UTDC light rail car in production and in operation in several cities.

- System Modification (To Reduce Costs)

In January 1981, as a result of a revised upward project cost estimate, a revised DPM project was developed in order to reduce the costs of the project. The most significant features of this revision involve reduction in parking spaces at the terminal stations and reductions in the number of stations. The parking garages are proposed to be deferred in favor of initial surface parking only, providing about a total of 1,000 parking spaces between the two terminal stations. The Ninth Street Station is proposed to be deferred and the Little Tokyo and Federal Building Stations are proposed to be consolidated into one station (at Los Angeles and Temple Streets). The mezzanine level is proposed to be eliminated at most stations. This will result in significant lowering of the height of the guideway structure above the street level.

**RECOMMENDED  
PEOPLE-MOVER ROUTE**



**DOWNTOWN  
STREET  
SYSTEM**

## DPM BUS PLANNING POLICY

- Documentation

District planning policy positions and concerns in regard to the DPM are discussed in this section. Documentation of District support for the DPM and related correspondence is included in Chapter V, Background Information. During the last three years the District Board of Directors has received several oral and written reports on District planning efforts in behalf of the DPM.

- Planning Policy

Some of the early (1978) planning policy discussions, both oral and written, have been in the context of District support of the DPM by "delivery" or providing for transfer of an estimated number of passengers. At one point, the figure of 30,000 weekday boardings or transfers to and from the DPM was used. However, if the District starts from an initial low bus intercept policy, using the rationale of emphasis on voluntary transfers to the DPM, then bus-DPM transfer projections are simply that. There can be no guarantee that a certain number of bus passengers will in fact transfer to the DPM.

Bus planning for the DPM has proceeded in accord with several staff-developed guidelines and priorities. These policies and approaches have been reviewed with the District Board of Directors on several occasions.

- Planning decisions should be based on maximum rider benefit (balancing short versus long term benefits) for users of all modes of public transportation to include local bus, express bus, and DPM rider and Metro rail rider.
  
- Some termination of routes (defined as bus intercept) at the two DPM terminals will be planned for the start of DPM operations.
  
- The number of bus lines that are intercepted at the two DPM terminals will depend upon further analysis, but it is expected to be low initially (20-40% of express lines in DPM corridors). Additional buses may be intercepted after the DPM starts operation. This would be based on rider preference between making a transfer to the DPM compared to remaining on board the arriving CBD destined bus. The rationale for this phased approach to bus intercept by the DPM is to emphasize voluntary transfer and to minimize forced transfers between buses and the DPM.
  
- Since 1978 the District planning staff has advised the CRA/DPMA that it believed 20% of all the express buses passing by each of the DPM corridors serving the two DPM terminals was a reasonable starting percentage for the number of buses intercepted. The remaining 80% would operate on a self distribution basis through the central business district (CBD) the same as they do now.
  
- Opportunity for bus operating cost savings from intercept of buses by the DPM will be studied further and weighed against possible passenger inconvenience from forced transfers. The

greater the amount of bus intercept, the greater the bus operating cost savings.

- Consequences of Patronage Estimates

- The DPM patronage projections, obtained from the current UMTA ridership forecasting methodology designed especially for DPM projects, indicate bus-DPM transfer volumes higher than what the District planning staff believes will occur, at least initially, on the DPM.
- The findings and conclusions from these manual calculations are not intended as a substitute for the UMTA required and approved ridership modelling techniques. The bus planning staff does however believe they result in a useful frame of reference with which to evaluate the ridership modelling projections.
- The District planning staff believes the DPM design capacity is probably a reasonable one from the standpoint of providing for maximum reasonable ridership in future years.
- However, it is also recommended that the DPM financial plan include one or more user (fare box) revenue projections based on possible or probable lower DPM ridership from bus transfers. In previous communications with the CRA/DPMA staff (see Chapter V), the District planning staff has suggested that with respect to rider revenues, one alternative should consider a forecast revenue level based on only one half of the forecasted DPM ridership from bus transfers. (The District staff has also commented about the possibility that projections of DPM ridership from internal circulation and parking intercept trips may also be high. However, the District has less responsibility, to evaluate these sources of DPM ridership).

- DPM Operational Planning

District staff involvement in operational planning for the DPM has been minimal, despite the stated preference of some Los Angeles City officials, to include the Mayor, that the District be selected as the operator of the DPM.\* On its own initiative, District planning staff has considered DPM operational areas involving interface between the regional bus system and the DPM. Most particularly, to date the District staff has looked into the cost and revenue impacts of possible transfer alternatives between buses and the DPM. The District staff has also considered criteria for selection of the fare collection system for the DPM, since the system selected directly involves the regional bus system. Memoranda concerning these two subject areas are included in Chapter V.

With respect to various alternative DPM-bus transfer arrangements, trade off analysis is necessary to determine projected revenue gains and losses to both the regional bus system and to the DPM from each alternative. As a suggested guideline, the staff recommends that DPM-bus transfer arrangements not result in significant net revenue losses to the regional bus system. In any case, it is further recommended that revenue gains and losses be systematically accounted for and charged to each mode in order to maintain separate cost accounting and budget control of each mode.

\* In regard to responsibility for operation of the DPM, the Downtown People Mover Authority (DPMA) was created in 1980 through a joint powers agreement of the City of Los Angeles and the Los Angeles Community Redevelopment Agency (CRA) for the express purpose of constructing the DPMA. The agreement provides for a decision to be made on selection of an operator for the DPM prior to start of regular revenue service.

## NEXT STEPS

With the start of the new Administration of President Ronald Reagan, the funding for the DPM is uncertain at the moment. The District planning staff stands ready to provide its planning expertise wherever is is needed for the DPM project. In the meantime, this report documents District bus planning efforts for the DPM to date.

ACKNOWLEDGEMENTS  
for  
LOS ANGELES CENTRAL BUSINESS DISTRICT (CBD)  
BUS PLAN FOR THE LOS ANGELES DPM

PROJECT DURATION

Since July 1977 through March 1981, a number of the staff of the RTD Planning Department have worked on this planning assignment under the overall direction of Dan Miller, Senior Planner responsible for, among other things, bus planning for the rapid transit starter line and for the Downtown People Mover (DPM) project.

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SCRTD Planning Department  
Paul Taylor Director

SCRTD Planning  
April, 1981

CBD BUS PLAN FOR DPM

CHAPTER II

DPM PATRONAGE ASSESSMENT:  
BUS TRANSFERS TO DPM

Planning Department  
SCRTD

April, 1981

LOS ANGELES CENTRAL BUSINESS DISTRICT (CBD)  
BUS PLAN FOR DOWNTOWN PEOPLE MOVER (DPM)

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SCRTD Planning Department  
April 1981

PART I  
SUMMARY

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## INTRODUCTION AND SUMMARY OF FINDINGS

As part of the District's portion of the Inter-agency Regional Transit Development Program (RTDP), the RTD Planning Department has the responsibility to prepare an initial Downtown People Mover (DPM) Bus Support Plan.

DPM ridership forecasts are an important part of the necessary bus planning component of the total DPM program. Ridership projections, under varying assumptions, are an indication of the extent and manner in which District bus services need to be modified to best serve both the DPM and the balance of the Los Angeles Central Business District (CBD).

The manual calculations used in this report are not a substitute for the computerized patronage modelling techniques which are firmly established as the standard ridership estimating tool for major transit guideway projects.

The 1978 DPM patronage projections show a total of 72,400 trips or boardings for the DPM, of which 34,200 represent boardings to or from the regional bus system. Using three different manual calculation methodologies instead of the computerized travel model developed specifically for DPM patronage forecasting, District staff has obtained bus transfer volumes to and from the DPM ranging from 35 to 108% of the 1978 DPM patronage forecast. The District Bus Planning staff finds that the manual calculations indicate a significantly lower DPM ridership from bus transfers. If a single percentage is to be used, perhaps about half of the transfers to and from the bus and the DPM projected by CRA in 1978 is likely to occur under the stated assumptions.

## PREVIOUS PATRONAGE ESTIMATES

The Downtown People Mover Authority (DPMA) and prior to June 1980, the Community Redevelopment Agency (CRA), the agency responsible for the

planning and construction of the DPM has conducted several DPM patronage forecasts. Its work, developed with the aid of the latest computer modeling packages developed by UMTA, has resulted in estimates of three categories of trips:

- Transfers from regional bus trips (distribution)
- Automobile trips (distribution)
- Wholly internal CBD trips (circulation)

The CRA conducted initial ridership forecasts in 1976 and in 1978. RTD has provided CRA with revised bus input data for an update which has been under preparation in 1980. Revised patronage estimates are expected to be completed early in 1981.

Results of the 1978 CRA work are summarized below. The figures represent projected levels of trips for the year 1990.

TABLE 1: CRA ESTIMATES OF 1990 DAILY DPM TRIPS

<u>TRIP TYPE</u>	<u># Daily Trips*</u>
Regional Bus Transfer	34,200
Automobile	12,000
Internal Circulation	<u>25,700</u>
	72,400

IMPORTANCE OF PATRONAGE PROJECTIONS

Accuracy of ridership forecasts are important in determining the required passenger carrying capacity of the DPM, projected passenger revenues and the transfer volumes between the DPM and the regional bus system. This ridership assessment report deals only with the regional bus component of the total DPM ridership forecast. The number of intercept parkers and

\*Source: Cambridge Systematics, "Models & Estimates of Los Angeles DPM Demand", Oct. 1978, P E-4.

internal circulation trip makers using the DPM are of course equally important in determining the total DPM ridership. But from the standpoint of developing a plan for interface between the DPM and the regional bus system and eventual rail system, the most important component of the DPM ridership forecast is the number of people who will transfer between the bus system and the DPM, under various assumptions.

#### REASON FOR MANUAL PATRONAGE ASSESSMENT

The computerized mathematical models used to forecast DPM ridership are the best that can be obtained from the state of the art. These manual calculations are not a substitute for the standard travel model projections. Indeed under present project development procedures, these modelling techniques are a prerequisite to obtaining funding approval from the U.S. Department of Transportation. On the otherhand, in the opinion of District Bus Planning staff it is helpful to review these forecasts of the model against other available pertinent data. District Bus Planning staff is convinced that wherever practical, interns of time and availability of pertinent data, manual calculations should be used to develop another form of reference in the evaluation of computerized ridership modelling projections. This is what has been done for the DPM project. For this analysis, present and projected CBD employment and present bus ridership volumes are used as a basis for estimating DPM ridership as a point of comparison with the computerized DPM ridership forecasts.

#### SUMMARY OF ALTERNATIVE PATRONAGE METHODS AND FINDINGS

Three different methods have been employed to estimate transfer volumes between the bus system and the DPM. They are described in a simplified manner here, followed by a more detailed description with accompanying tables in the second part of this report.

- Method A\* - Bus Passengers Boarding and Alighting Near DPM Stations.

Bus passengers boarding and alighting near DPM stations from the present express bus routes at the Convention Center and Union Station DPM corridors were tabulated. More specifically, boardings and alightings were tabulated from bus routes passing close to Convention Center from the Santa Monica

Freeway and Harbor Freeway corridors. The same tabulations were made from El Monte Busway bus routes, all of which pass by Union Station.

The number of bus passengers boarding and alighting near DPM stations from the above bus corridor was then expanded by 30% to account for expected growth in the CBD employment population by 1990.

Varying percentages of these bus passengers boarding and alighting near the DPM stations have been projected to transfer to the DPM based on comparative travel times between the bus system and the DPM. The assumptions used for the development of comparative travel times and the independent assumptions of the passengers' reactions to these comparative times are outlined in a separate section.

\*For Method A, only express lines were included in the DPM corridor tabulations.

● Method B - Employment near DPM Stations.

Present and projected 1990 employment near DPM stations was tabulated.

The number of transit CBD trip ends near each DPM station was projected on the basis of allocation of present and 1990 DPM corridor transit ridership (express and local) to each DPM station passenger shed area (convenient walking distance) as a proportion of the employment distribution within the entire DPM passenger shed area.

Given the distribution of transit trip ends which are derived from the

distribution of employment, the number of bus riders estimated to transfer to the DPM was then based on the same travel time and studied rider reactions to travel time analyses, as performed for Method A.

- Comparative Travel Time Assumptions

The potential DPM ridership pool as estimated from bus boardings and alightings (Method A) and employment (Method B) uses the same travel time assumptions to estimate the number of present and future bus riders attracted to the DPM. When the total trip is perceived to be shorter on the DPM, the bus rider is shown to transfer to the DPM compared to remaining on-board his arriving bus. This analysis concept is explained in detail in Part II.

- Method C - Bus Passengers On-Board Bus Routes Near DPM Stations.

The number of current bus passengers on-board at the closest bus stop to each DPM station were tabulated for both local and express bus routes which pass near each DPM station.

These numbers of bus passengers were then expanded 30% for express lines and 10% for local lines to account for expected growth in CBD employment by 1990.

Subjective estimate was made of the number of bus passengers on-board each bus route adjacent to each DPM station who might transfer to the DPM. This transfer percentage estimate was made on an individual bus line basis by direction. Ideally, origin and destination information of the bus riders on board the buses adjacent to the DPM stations would

have been the basis for these transfer estimates. However, this information is not currently available.

#### FINDINGS AND CONCLUSIONS

It is assumed that for Methods A and B, the most reasonable combination of comparable bus running time and rider reaction options is as follows:

Bus Speed -- between 6 mph and 9 mph

Option -- III (75% of the regional bus riders take the mode having the shorter running time)

As outlined in Table 2, this results in a projection of between 9,000 and 12,000 bus transfers at the two terminal stations, compared to 24,000 projected by CRA/DPMA.

Comparing the transfer figures obtained for this combination of variables against that projected for the CRA, and comparing Method C's transfers, the following results have been obtained:

TABLE 2. SUMMARY OF COMPARISONS OF METHODS A,B,C WITH THAT OF CRA, 1990

<u>METHOD</u>	<u>BUS LINES ANALYZED</u>	<u>CRA ESTIMATE</u>	<u>RTD PROJECTION</u>	<u>% OF CRA</u>
A	Express	23,805	8,401 <sup>**</sup> -12,048 <sup>*</sup>	35-51%
B	Local, Express	23,805	18,044 <sup>**</sup> -25,649 <sup>*</sup>	76-108%
C	Local, Express	34,200	23,349	68%

\* OPTION III; bus speed 6 mph

\*\*OPTION III; bus speed 9 mph

Because the first two methods involve only lines passing the two terminal stations, the CRA estimate represents projected transfer totals for only the Union Station and Convention Center DPM stations. Method C, because it looks at the transfer potential at every DPM station, has been compared to the CRA estimate for the entire system.

TABLE 3. SUMMARY OF COMPARISON OF DPM INTERMEDIATE STATION  
BUS TRANSFER VOLUMES

Method	RTDP Projections						CRA/DPMA Projections			
	Bus Speed 9 mph			Bus Speed 6 mph			Terminal Station	Other Station	Total	
	Terminal Stations	Other Stations	Total	Terminal Stations	Other Stations	Total				
A	8,401	?	?	12,048	?	?	{	23,805	10,395	34,200
B	18,044	?	?	23,649	?	?				
C	8,235	15,114	23,349	8,235	15,114	23,349				

It is noteworthy that Method C shows significantly higher bus transfer volumes at the intermediate stations than the CRA/DPM projections. Some of this higher intermediate transfer volume is due to the assumption of transfers occurring downstream the DPM line from the terminal stations, most particularly the Civic Center Station instead of the Union Station transfer point. Another iteration of Method C is probably advisable in order to compare further the reasonableness of intermediate station bus transfer projections.

As shown in Table 2, Method B approaches the CRA/DPM projections. The other scenarios result in much lower transfer volumes, amounting to between half and two thirds of CRA numbers.

Methods A and C are most closely tied to the present transit ridership distribution since they use as bases, actual bus ridership information within DPM passenger shed areas. Method A uses boardings and alighting near each DPM station. Method C looks at both local and express trips and assumes a 20% intercept of those express trips passing the two terminal DPM stations.

Method B, which is close to the CRA estimate is probably on the optimistic side. Its assumption that transit trips are distributed, for the total day, in the same proportion as employee distribution overstates ridership estimates for the following reasons.

- employee work trips, although sizable, do not describe the total trip types made; shopping, school, recreation, social and other trips combine to form a significant portion of total daily trips; these other trips have distribution patterns not necessarily directed at the DPM routing.
- the bulk of current transit trips are being made by lower-income, transit-dependent segments of the population; these trip-ends are presently disproportionately in the eastern portions of the CBD (in comparison to employee distribution within the CBD)

PART II  
ANALYSIS

## INTRODUCTION

As mentioned in Part I, the CRA/DP'IA has developed forecasts of DPM ridership involving regional bus transfers that total 34,200 trips per day. The District staff has conducted an assessment of this ridership projection from two standpoints:

- determine a "reasonable" transfer level which could occur between the DPM and the regional bus system, under varying assumptions for 1990
- determine how the assumptions have to be manipulated in order to produce a bus-DPM transfer volume equal to or approaching that shown in the CRA/DPMA ridership projection.

Three different methods were used to estimate the number of bus riders who will transfer to the DPM. The three methods involve manual calculation using present bus ridership volumes, factored to represent projected 1990 ridership growth, and travel time comparisons between the DPM and present or modified present bus lines in the vicinity of the DPM. The basic elements of these methods are outlined below.

### METHOD A: BUS BOARDINGS AND ALIGHTINGS (B&A)

- This method involves two basic steps.
  - Assignment of DPM Corridor Express Bus Riders to DPM station passenger shed areas, on basis of present bus boarding and alighting (B&A) patterns
  - Assignment of portion of B&A volumes to DPM on basis of comparative travel time analysis between the bus and the DPM

- The procedures for the assignment of express bus riders from the Union Station and Convention Center DPM Corridor to the DPM station passenger shed areas is graphically illustrated in Maps 1, 2, 3 and Chart 1.

CHART 1

METHOD A BUS BOARDINGS & ALIGHTINGS (B & A)  
ASSIGNMENTS TO DPM STATION SHED AREAS

No. of B & A Within Each Square (600 ft. from Station) = Potential Bus Transfers to DPM

Percent of Busway Riders Within DPM Station Sheds:

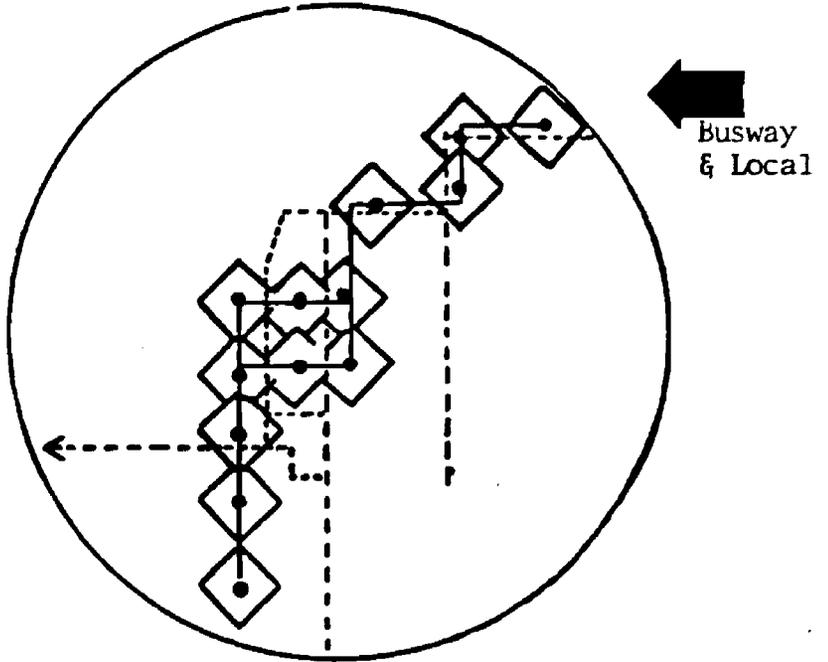
1978

$$\frac{\text{Sheds}}{\text{Busway}} = \frac{11909}{16313} = .73\%$$

1978 x 1.30 = 1990

1990

$$\frac{\text{Sheds}}{\text{Busway}} = \frac{15482}{21207} = .73\%$$



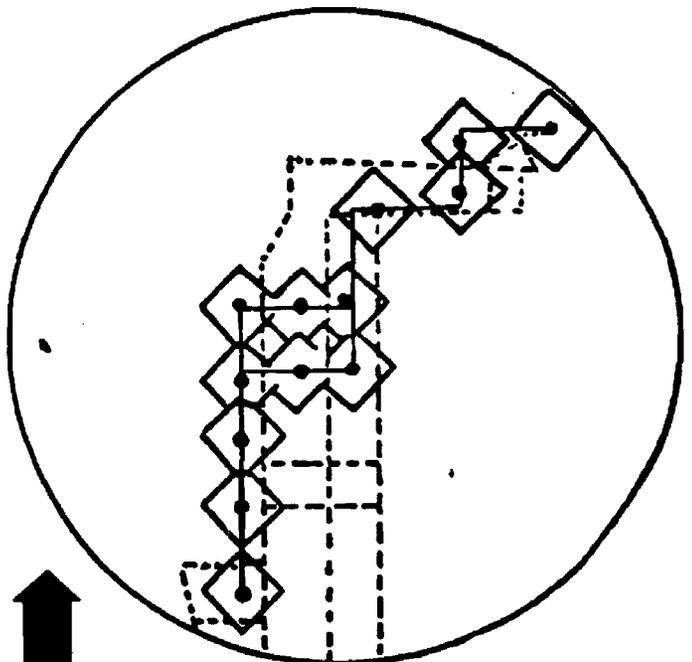
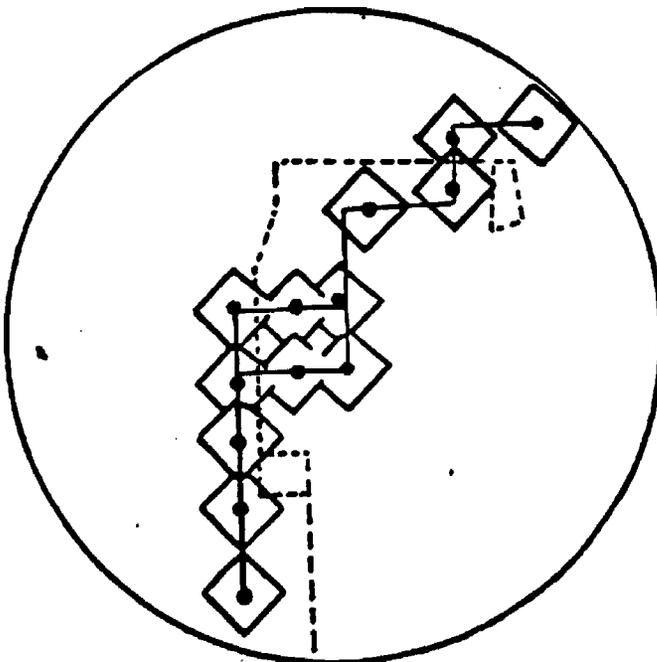
Percent of Santa Monica and Harbor Riders Within DPM Station Sheds:

1978

$$\frac{\text{Sheds}}{\text{Fwy. Exp.}} = \frac{2388}{5927} = .40\%$$

1978 x 1.30 = 1990

$$\frac{\text{Sheds}}{\text{Fwy. Exp.}} = \frac{3104}{7705} = .40\%$$



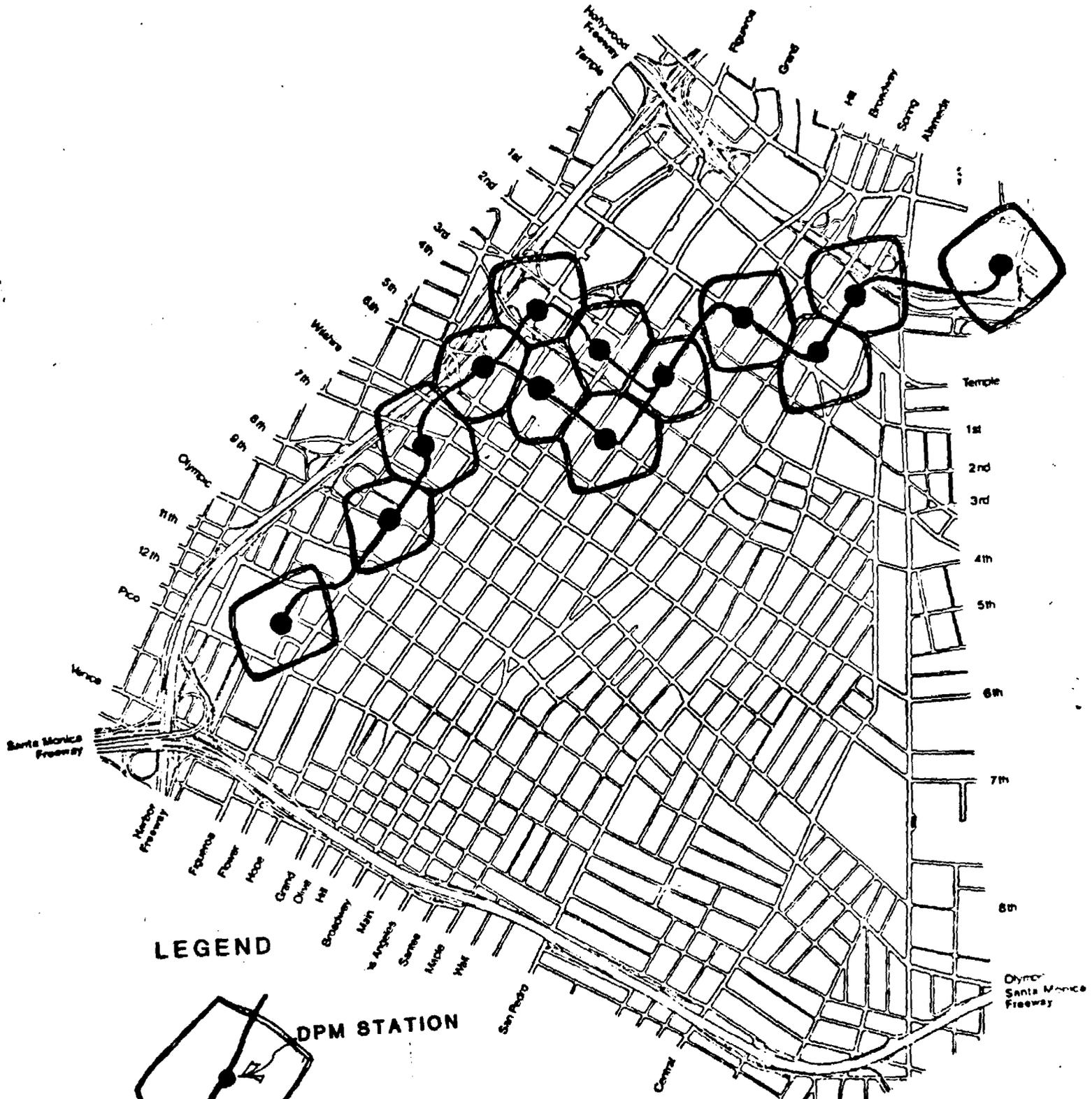
Santa Monica Fwy. Exp. Lines

Harbor Fwy. Express Lines

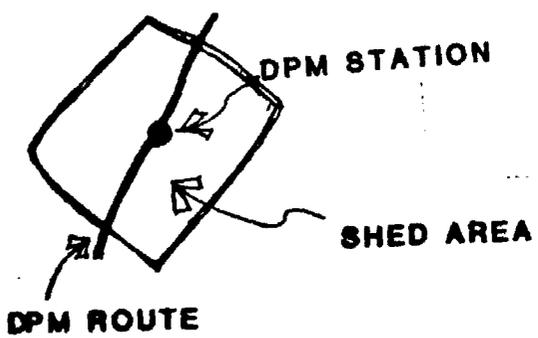
Planning Dept.  
MJB:3/81

# DPM STATION LOCATIONS AND SHED AREAS

MAP 1

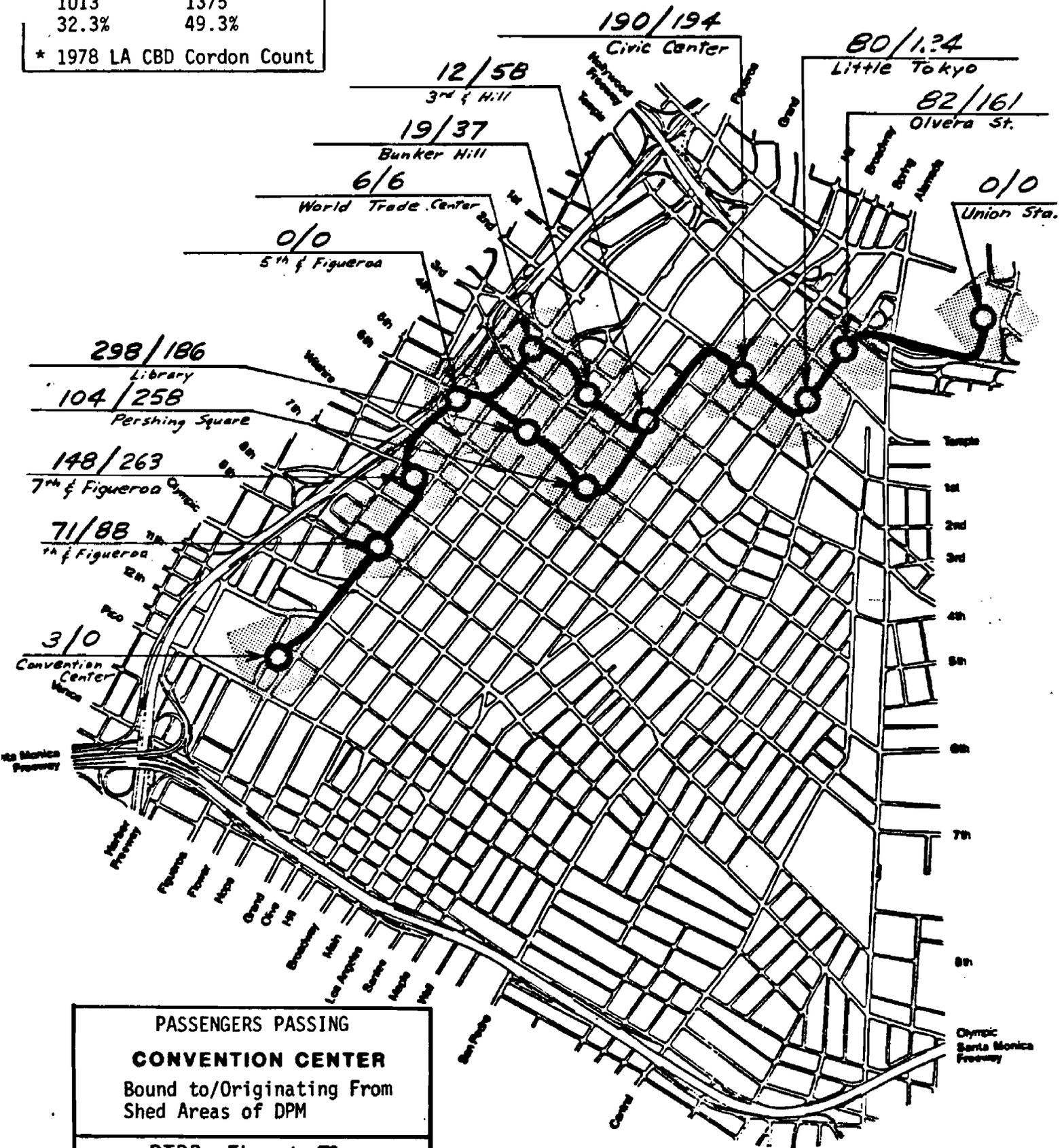


## LEGEND



PASSENGERS ON BOARD*	
Inbound	Outbound
3138	2789
Alightings	Boardings
1013	1375
32.3%	49.3%
* 1978 LA CBD Cordon Count	

MAP 2



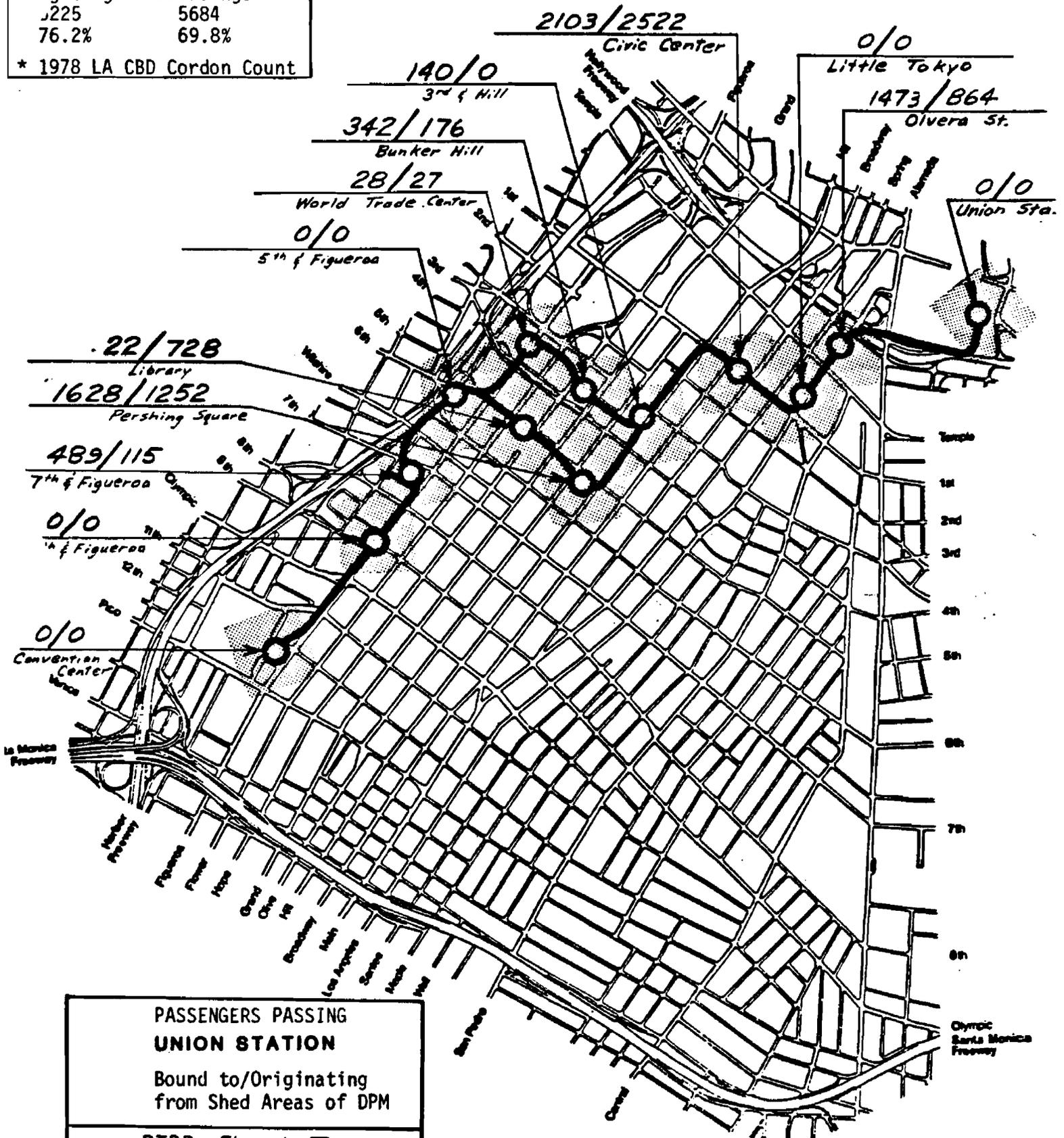
PASSENGERS PASSING	
<b>CONVENTION CENTER</b>	
Bound to/Originating From Shed Areas of DPM	
RTDP Element III	
L. A. CBD Bus Planning	
By SCRTPD Planning Dept.	
Date: 2/81	Scale:

**PASSENGERS ON BOARD\***

Inbound	Outbound
8167	8146
Lightings	Boardings
225	5684
76.2%	69.8%

\* 1978 LA CBD Cordon Count

**MAP 3**



**PASSENGERS PASSING  
UNION STATION**

Bound to/Oriinating  
from Shed Areas of DPM

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTO Planning Dept.

Date: 2/81  
Rev:

Scale:

Planning Department  
MJB/vdh

- Data Sources

- Total bus passengers entering and leaving downtown Los Angeles--referred to as the Los Angeles CBD Cordon Count--were gathered for those express lines which passed by either one of the DPM terminal points (Convention Center or Union Station) and which also passed close to one of the other DPM stations. The passenger shed area for each DPM station was defined as approximately any bus stop 600 feet from a DPM station. Only those express lines traveling on the El Monte Busway, the Harbor Freeway or the Santa Monica Freeway were counted. Totals for each DPM passenger shed area represent all boardings and alightings of these DPM corridor lines within approximately 600 feet of each station, i.e., the shed area.
- Boarding and alighting projections for 1990 were derived by factoring up the 1978 figures by 30%. This increase in express ridership is based on an assumption of a 15% growth in CBD employment with transit ridership increases projected as follows: local ridership--10%, express ridership--30%.

- Results

Tables 4 and 5 show express bus boardings and alightings occurring within 600 feet of each DPM station from the DPM corridors, defined as the El Monte Busway, Santa Monica Freeway Express Lines and Harbor Freeway Express Lines. Table 6 summarizes the express bus alightings within the shed areas.

TABLE 4. EXPRESS BUS ALIGHTINGS  
WITHIN SHED AREAS--PRESENT\*

<u>TO/FROM</u>	<u>FROM CONV. CNTR.</u>	<u>TO CONV. CNTR.</u>	<u>FROM UNION STA.</u>	<u>TO UNION STA.</u>
Convention Center	3	0	0	0
9th St. Sta.	71	88	0	0
7th St. Sta.	148	263	489	115
5th St. Sta.	0	0	0	0
Library	298	186	22	728
Pershing Square	104	258	1,628	1,252
Hill St.	12	58	140	0
Bunker Hill	19	37	342	176
World Trade Center	6	6	28	27
Civic Center	190	194	2,103	2,522
Little Tokyo	90	124	0	0
Federal Building	82	161	1,473	864
Union Sta.	0	0	0	0
TOTAL	1,013	1,375	6,225	5,684

\*Source--1978 Corridor Count

TABLE 5. EXPRESS BUS ALIGHTINGS  
WITHIN SHED AREAS--1990\*

<u>TO/FROM</u>	<u>FROM CONV. CNTR.</u>	<u>TO CONV. CNTR.</u>	<u>FROM UNION STA.</u>	<u>TO UNION STA.</u>
Convention Center	4	0	0	0
9th St. Sta.	92	114	0	0
7th St. Sta.	192	342	636	150
5th St. Sta.	0	0	0	0
Library	387	242	29	946
Pershing Square	135	335	2,116	1,628
Hill Street	16	75	182	0
Bunker Hill	25	48	445	229
World Trade Cntr.	8	8	36	35
Civic Center	247	252	2,734	3,279
Little Tokyo	104	161	0	0
Federal Building	107	209	1,915	1,123
Union Sta.	0	0	0	0
TOTAL	1,317	1,786	8,093	7,390

\*30% Increase over present

TABLE 6  
METHOD A  
SUMMARY

Express Bus Alightings  
Within Shed Areas

Present (1978)

	<u>Convention Center</u>	<u>Union Station</u>	<u>Total</u>
FROM	1,013	6,225	7,238
TO	<u>1,375</u>	<u>5,684</u>	<u>7,059</u>
TOTAL	2,388	11,909	14,297

1990

FROM	1,317	8,093	9,410
TO	<u>1,786</u>	<u>7,390</u>	<u>9,176</u>
TOTAL	3,103	15,483	18,586

NOTE: See pp. II-45, Resultant Bus-DPM Transfer Volumes, for application of the comparative travel times (Options I, II, III, IV) to the above table.

METHOD B: Bus Ridership Assignment to DPM Station Shed Areas By Employment Distribution

- This method involves two basic steps:
  - Assignment of DPM Corridor express and local bus riders to DPM station passenger shed areas, on basis of 1978 and 1990 employment distribution
  - Assignment of portion of above bus riders (already distributed to station areas by employment proportions) on basis of comparative travel time analysis between the bus and the DPM

- The procedure for the assignment of express and local bus riders from the Union Station and Convention Center DPM Corridors to the DPM station passenger shed areas is graphically illustrated in Chart 2 and Maps 4 and 5.

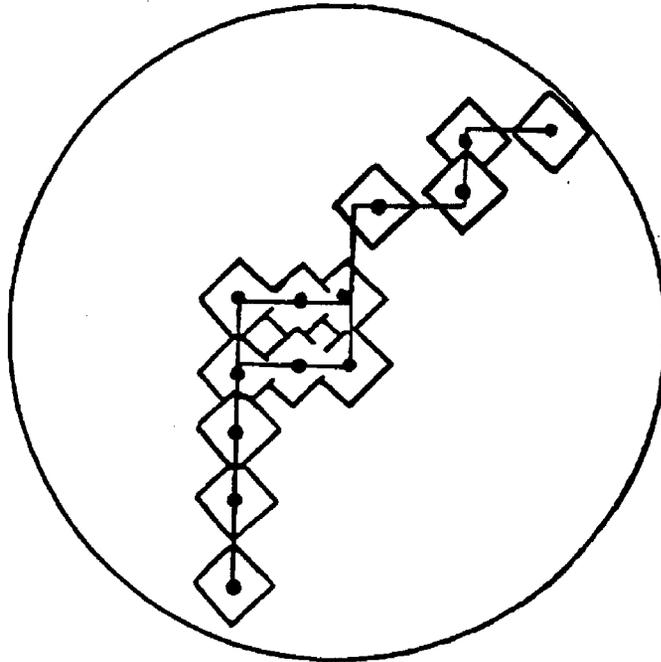
CHART 2

METHOD B BUS RIDERSHIP ASSIGNMENT TO DPM STATION SHED  
AREAS BY EMPLOYMENT DISTRIBUTION

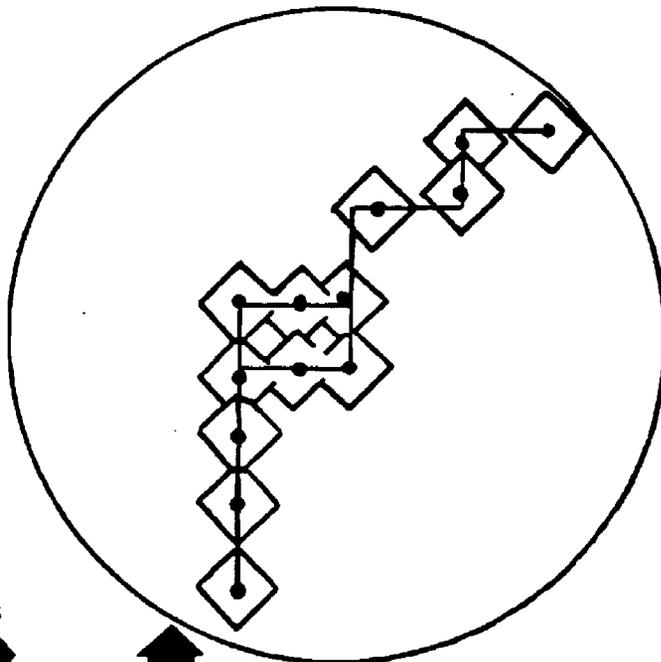
Percent of CBD employees within each square  
(600 ft. from each station) x Express + Local  
DPM Corridor Ridership = Potential Bus Transfers  
to DPM

Percent of CBD Employment  
within DPM Station Sheds  
1978 = 25.91% x Corridor  
Ridership = DPM Sheds  
41,104 x 25.91% =  
10,650

1990 = 33.29% x Corridor  
Ridership = DPM Sheds  
47,822 x 33.29% =  
15,919



← Busway & Local



Percent of CBD Employment  
within DPM Station  
Sheds

1978 = 25.91% x Corridor  
Ridership = DPM Sheds  
56,549 x 25.91% =  
14,651

1990 = 33.29% x Corridor  
Ridership = DPM Sheds  
64,039 x 33.29% =  
21,318

Santa Monica Fwy. Express  
Lines & Local Lines →

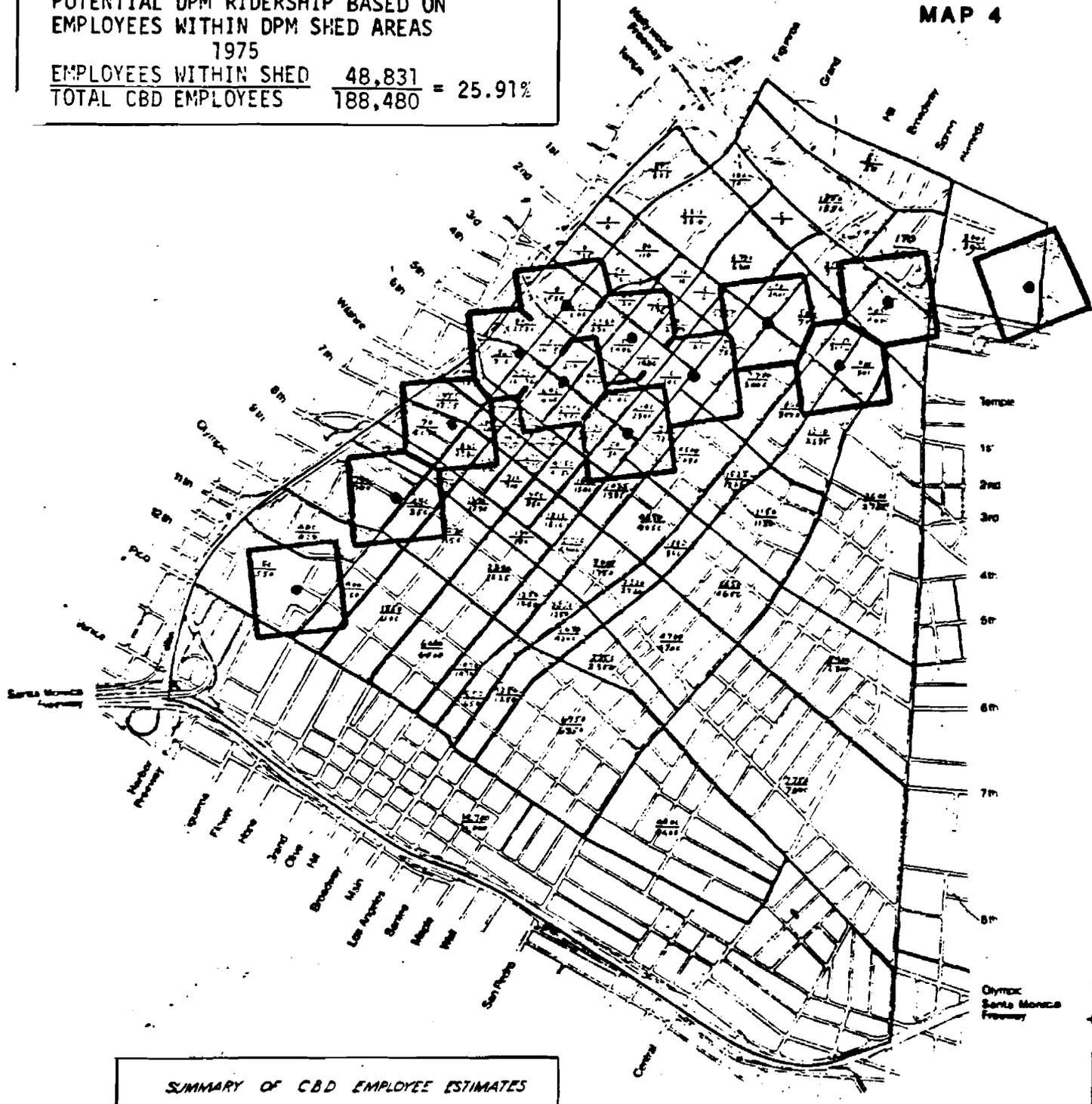
↑ Harbor Fwy. Express Lines  
& Local Lines

**POTENTIAL DPM RIDERSHIP BASED ON  
EMPLOYEES WITHIN DPM SHED AREAS**

1975

$$\frac{\text{EMPLOYEES WITHIN SHED}}{\text{TOTAL CBD EMPLOYEES}} = \frac{48,831}{188,480} = 25.91\%$$

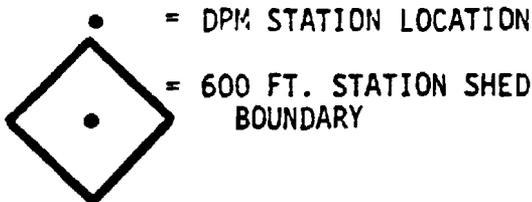
**MAP 4**



**SUMMARY OF CBD EMPLOYEE ESTIMATES**

	EMPLOYEES	
	1975	1990
Study Area (Zones 1-101)	188,480	221,180
So. of Pico Bl. (Zone 102)	14,700	14,060
<b>CBD Totals</b>	<b>203,180</b>	<b>235,240</b>

**CALCULATION OF EMPLOYEES WITHIN  
DPM STATION SHED AREAS**



**LOS ANGELES CBD EMPLOYEES  
BY ZONE**

1975  
1990  
ENVIRONMENTAL OVERLAP DATA UPDATE  
PREPARED BY NHA (TRM) FOR LOS ANGELES CDM  
MAY 18, 1978

Regional Transit Development Program (RTDP)  
Element III Los Angeles CBD Bus Planning  
By SCRTP Planning Dept.

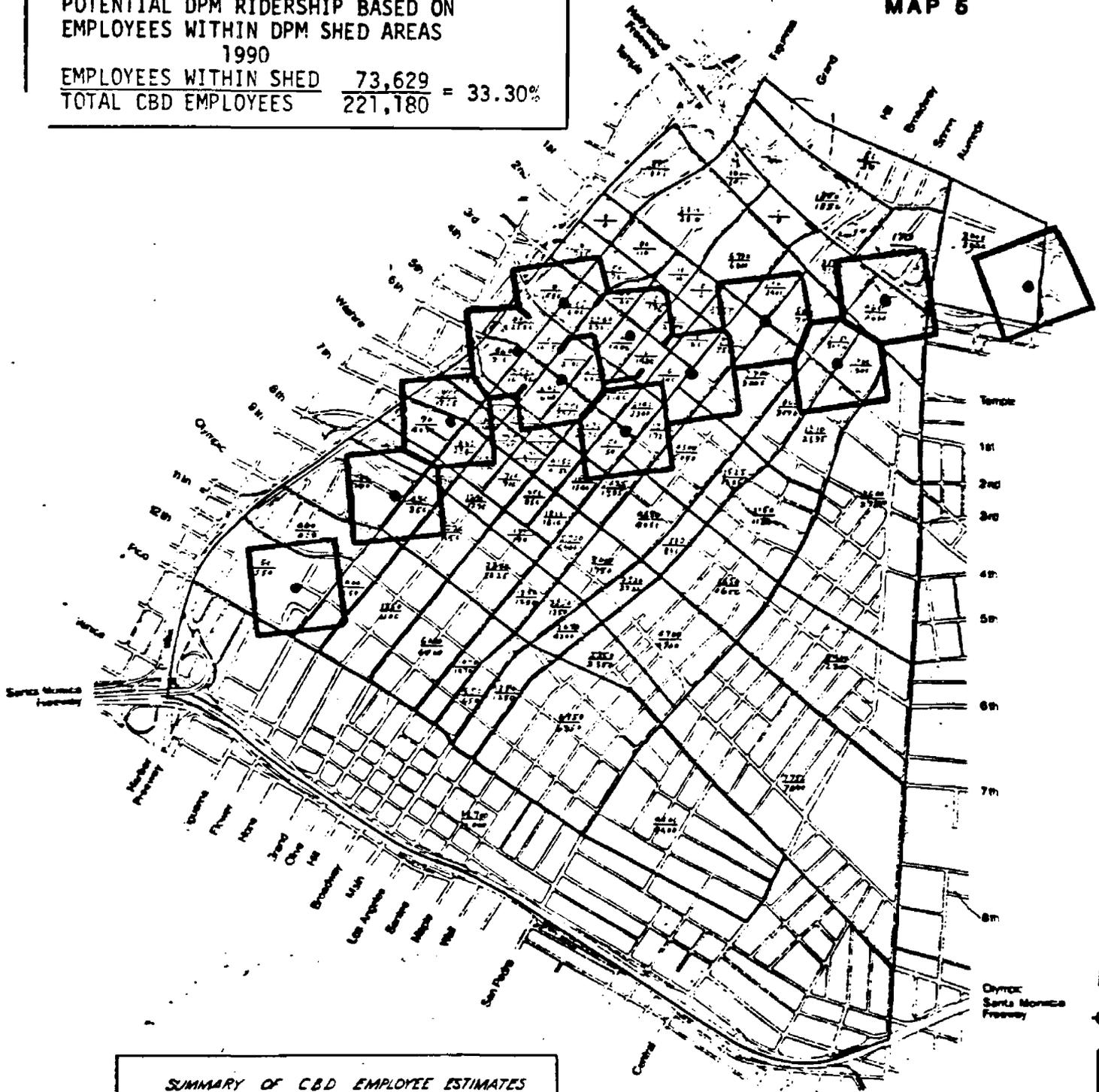
Date: \_\_\_\_\_  
Rev: \_\_\_\_\_

**POTENTIAL DPM RIDERSHIP BASED ON  
EMPLOYEES WITHIN DPM SHED AREAS**

1990

$$\frac{\text{EMPLOYEES WITHIN SHED}}{\text{TOTAL CBD EMPLOYEES}} = \frac{73,629}{221,180} = 33.30\%$$

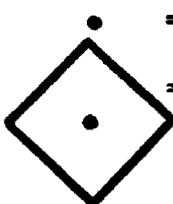
**MAP 5**



**SUMMARY OF CBD EMPLOYEE ESTIMATES**

	EMPLOYEES	
	1975	1990
Study Area (Zones 1-101)	188,480	221,180
So. of Pico Bl. (Zone 102)	16,700	14,060
<b>CBD Totals</b>	<b>205,180</b>	<b>235,240</b>

**CALCULATION OF EMPLOYEES WITHIN  
DPM STATION SHED AREAS**



- = DPM STATION LOCATION
- ◇ = 600 FT. STATION SHED BOUNDARY

**LOS ANGELES CBD EMPLOYEES  
BY ZONE**

1975  
1990

ENVIRONMENTAL BASELINE DATA UPDATE  
TRAC 607 By WSA (Phase) for Los Angeles CMA  
May 18, 1978

Regional Transit Development Program (RTDP)  
Element III Los Angeles CBD Bus Planning  
By SCRTD Planning Dept.

Date:  
Rev:

Scale:

- Data Sources

- Total bus passengers entering and leaving downtown Los Angeles--referred to as the L.A. CBD Cordon Count--were tabulated for both express and local lines by the nine CBD corridors used for the DPM patronage modelling work. Three of these nine corridors were considered DPM patronage corridors:
  - Corridor 1 - Includes Harbor Freeway
  - Corridor 2 - Includes Santa Monica Freeway
  - Corridor 3 - Includes San Bernardino Freeway (Busway)
- Passengers entering and leaving downtown Los Angeles for the present (1978) were factored up, 30% for express service and 10% for local lines, to represent 1990 ridership projections.
- The number of CBD employees within 600 feet of a DPM station--referred to as the DPM station shed area--was calculated for 1978 and 1990 using CRA data plotted by CBD zones. (See following map.) This number of employees as a percent of total CBD employees was then multiplied by the total DPM corridor bus ridership to obtain the total potential DPM ridership. This was further broken down to the 13 DPM stations as a percentage of all the CBD employees within all the station shed areas. (= 48,831).
- DPM shed employees as a percentage of CBD employees equals  $48,831 \div 188,480$  or 25.91%. This percent multiplied by the DPM corridor trips of 97,553 for present (1978) yields 25,276 present bus riders from the DPM corridors (of Convention Center and Union Station). These 25,276

bus riders were then allocated to the DPM station shed areas on the basis of employment distribution.

- Results

Tables 7 and 8 show allocation of entering and leaving bus riders in the three DPM corridors to the DPM station shed areas (within 600 feet of each station). This allocation was made on the basis of proportional CBD employment distributions for 1978 and 1990. The three corridors were defined as Corridors 1, 2 and 7 of Charts 3 and 4.

Tables 9A, 9B, 9C show a combination of present and projected bus ridership in the DPM corridors and the percent of this ridership assumed to be within the DPM passenger shed areas (i.e., 600 feet of each station). Tables 10 and 11 relate to the distribution of CBD employees as it pertains to DPM passenger shed areas. Table 12 summarizes the allocation of corridor trips between station areas for Method B.

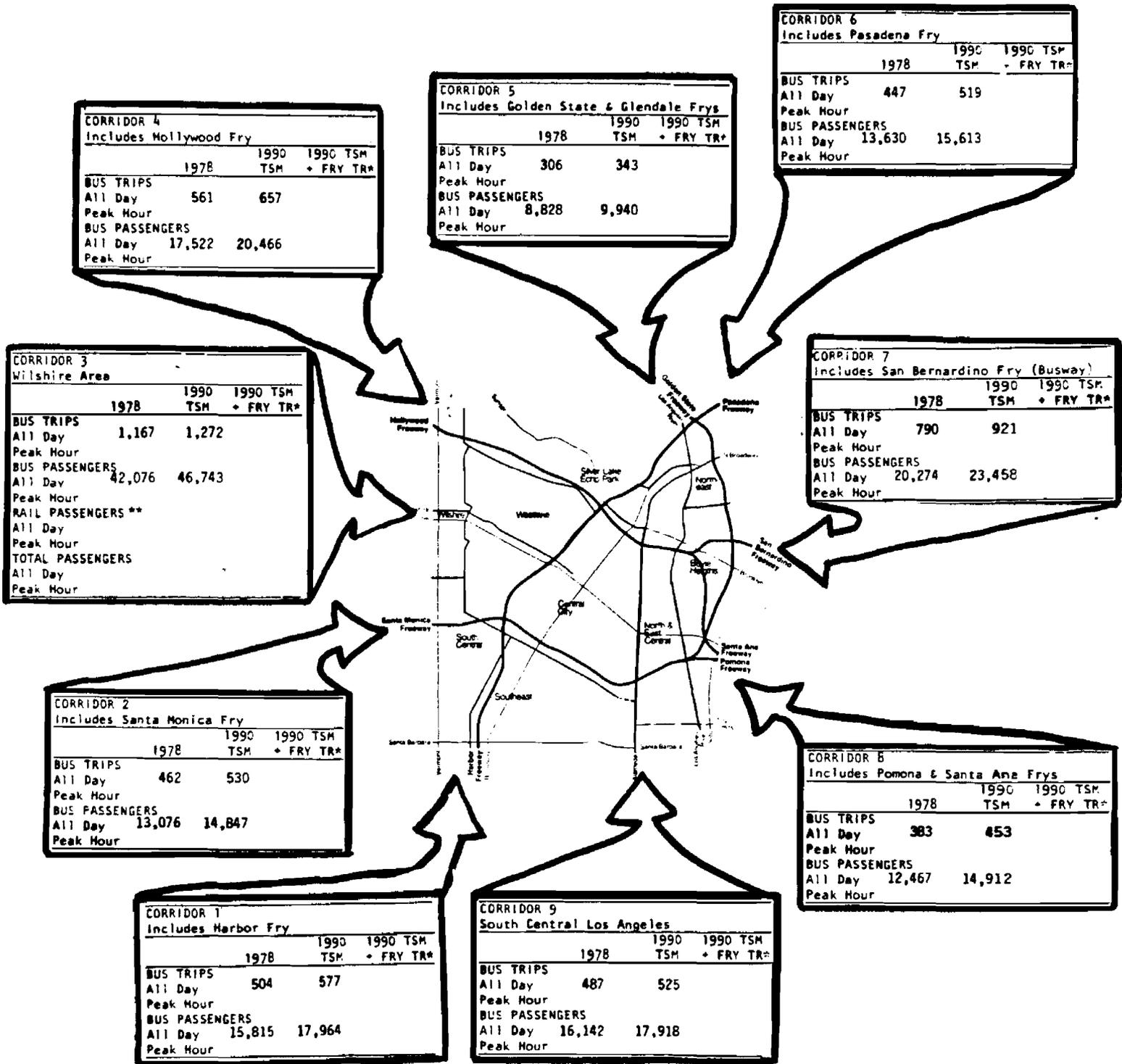
TABLE 7 -ALLOCATION OF CORRIDOR TRIPS BETWEEN SHED AREAS  
AND CONVENTION CENTER--PRESENT, 1990

# Trips Between Convention Cntr. and	Present			1990		
	Entering	Leaving	Total	Entering	Leaving	Total
Convention Center	145	138	283	129	123	252
9th St.	153	146	300	138	131	269
7th St.	383	365	748	1,038	988	2,026
5th St.	1,378	1,314	2,692	1,628	1,550	3,178
Library	720	686	1,406	1,381	1,314	2,695
Pershing Square	883	842	1,725	997	949	1,946
Hill St.	425	406	831	540	514	1,054
Bunker Hill	462	440	902	1,675	1,595	3,270
World Trade Center	254	243	498	413	393	806
Civic Center	1,030	982	2,012	1,224	1,166	2,390
Little Tokyo	779	743	1,522	902	859	1,761
Federal Bldg.	669	638	1,307	655	624	1,279
Union Station	207	197	404	202	192	394
<b>TOTAL</b>	<b>7,488</b>	<b>7,140</b>	<b>14,628</b>	<b>10,922</b>	<b>10,398</b>	<b>21,320</b>

TABLE 8 -ALLOCATION OF CORRIDOR TRIPS BETWEEN SHED AREAS  
AND UNION STATION -- PRESENT, 1990

# Trips Between Union Station And:	Present			1990		
	Entering	Leaving	Total	Entering	Leaving	Total
Union Station	102	105	207	92	96	188
Federal Bldg.	108	111	219	98	102	200
Little Tokyo	268	276	544	742	771	1,513
Civic Center	966	993	1,959	1,164	1,209	2,373
Hill St.	505	519	1,024	987	1,025	2,012
Bunker Hill	619	636	1,255	713	741	1,454
World Trade Center	298	306	604	386	401	787
Pershing Square	324	333	657	1,198	1,244	2,442
Library	179	183	362	295	307	602
5th St.	722	742	1,464	875	909	1,784
7th St.	546	561	1,107	645	670	1,315
9th St.	470	482	952	469	487	956
Convention Center	145	149	294	144	150	294
<b>TOTAL</b>	<b>5,252</b>	<b>5,396</b>	<b>10,648</b>	<b>7,808</b>	<b>8,112</b>	<b>15,920</b>

CHART 3



**CORRIDOR 4**  
Includes Mollywood Fry

	1978	1990 TSM	1990 TSM + FRY TR*
BUS TRIPS			
All Day	561	657	
Peak Hour			
BUS PASSENGERS			
All Day	17,522	20,466	
Peak Hour			

**CORRIDOR 5**  
Includes Golden State & Glendale Frys

	1978	1990 TSM	1990 TSM + FRY TR*
BUS TRIPS			
All Day	306	343	
Peak Hour			
BUS PASSENGERS			
All Day	8,828	9,940	
Peak Hour			

**CORRIDOR 6**  
Includes Pasadena Fry

	1978	1990 TSM	1990 TSM + FRY TR*
BUS TRIPS			
All Day	447	519	
Peak Hour			
BUS PASSENGERS			
All Day	13,630	15,613	
Peak Hour			

**CORRIDOR 3**  
Wilshire Area

	1978	1990 TSM	1990 TSM + FRY TR*
BUS TRIPS			
All Day	1,167	1,272	
Peak Hour			
BUS PASSENGERS			
All Day	42,076	46,743	
Peak Hour			
RAIL PASSENGERS**			
All Day			
Peak Hour			
TOTAL PASSENGERS			
All Day			
Peak Hour			

**CORRIDOR 7**  
Includes San Bernardino Fry (Busway)

	1978	1990 TSM	1990 TSM + FRY TR*
BUS TRIPS			
All Day	790	921	
Peak Hour			
BUS PASSENGERS			
All Day	20,274	23,458	
Peak Hour			

**CORRIDOR 2**  
Includes Santa Monica Fry

	1978	1990 TSM	1990 TSM + FRY TR*
BUS TRIPS			
All Day	462	530	
Peak Hour			
BUS PASSENGERS			
All Day	13,076	14,847	
Peak Hour			

**CORRIDOR 8**  
Includes Pomona & Santa Ana Frys

	1978	1990 TSM	1990 TSM + FRY TR*
BUS TRIPS			
All Day	383	453	
Peak Hour			
BUS PASSENGERS			
All Day	12,467	14,912	
Peak Hour			

**CORRIDOR 1**  
Includes Harbor Fry

	1978	1990 TSM	1990 TSM + FRY TR*
BUS TRIPS			
All Day	504	577	
Peak Hour			
BUS PASSENGERS			
All Day	15,815	17,964	
Peak Hour			

**CORRIDOR 9**  
South Central Los Angeles

	1978	1990 TSM	1990 TSM + FRY TR*
BUS TRIPS			
All Day	487	525	
Peak Hour			
BUS PASSENGERS			
All Day	16,142	17,918	
Peak Hour			

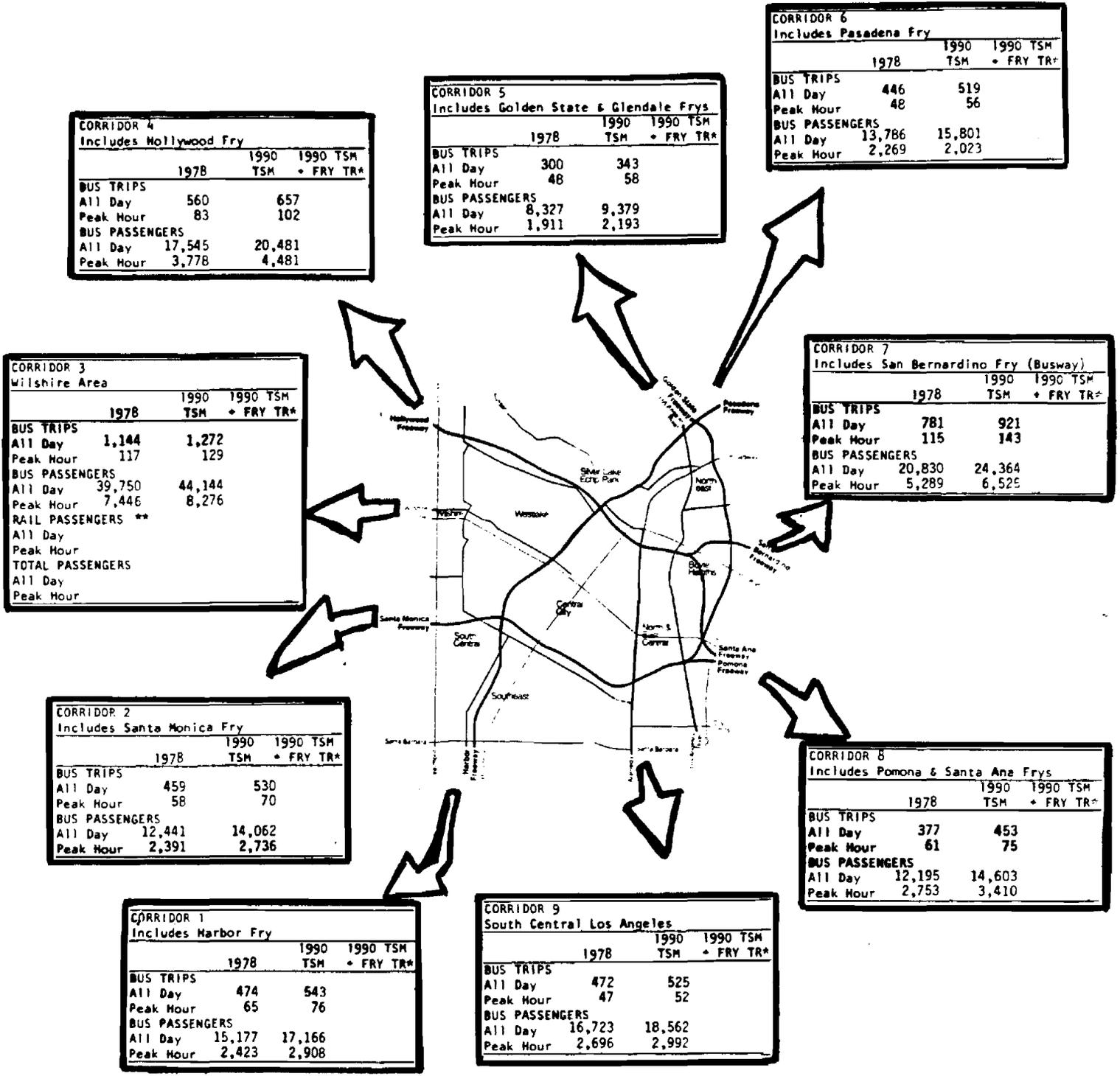
**TOTAL-ALL CORRIDORS**

	1978	1990 TSM	1990 TSM + FRY TR*
BUS TRIPS			
All Day	5,107	5,874	
Peak Hour	-	-	
BUS PASSENGERS			
All Day	159,830	181,861	
Peak Hour	-	-	

**9 APPROACH CORRIDORS**  
Passengers and Bus Trips  
**ENTERING**  
**L.A. CBD**

RTDP Element III  
L.A. CBD Bus Planning  
By SCRTD Planning Dept.

CHART 4



TOTAL-ALL CORRIDORS			
	1978	1990 TSM	1990 TSM + FRY TR*
BUS TRIPS			
All Day	5,013	5,763	
Peak Hour	642	761	
BUS PASSENGERS			
All Day	156,714	178,562	
Peak Hour	30,956	36,144	

9 APPROACH CORRIDORS  
Passengers and Bus Trips  
LEAVING  
L.A. CBD  
RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.

TABLE 9A-TOTAL BUS PATRONAGE BY TERMINAL STATION  
AND BY CORRIDOR--PRESENT\*, 1990\*

<u>LOCATION</u>	<u>PRESENT</u>	<u>1990</u>
Convention Center		
Harbor Fwy. Corridor	30,932	35,130
Santa Monica Fwy. Corridor	<u>25,517</u>	<u>28,909</u>
SUBTOTAL	56,449	64,039
Union Station		
Busway Corridor	<u>41,104</u>	<u>47,822</u>
TOTAL	97,553	111,861

\*Source: RTD Estimates, 8/7/78

TABLE 93-BREAKDOWN OF CORRIDOR TRIPS INTO TRIP TYPES

	<u>PRESENT</u>		<u>1990</u>	
Convention Center				
Entering	28,991	29.62%	32,811	29.33%
Leaving	27,558	28.25%	31,228	37.92%
Union Station				
Entering	20,274	20.78%	23,458	20.97%
Leaving	<u>20,830</u>	<u>21.35%</u>	<u>24,364</u>	<u>21.78%</u>
TOTAL	97,553	100.00%	111,861	100.00%

TABLE 9C-PROJECTED DISTRIBUTION OF CBD CORRIDOR TRIPS  
INTO SHED AREAS--PRESENT, 1990\*

	<u>PRESENT</u>	<u>1990</u>
Total Corridor Trips into CBD	97,553	111,861
% Corridor Trips into Shed Areas**	25.91%	33.29%
Total Corridor Trips into Shed Areas***	25,276	37,239

\*RTD Estimates, 1978, 1990

\*\*CRA Estimate, 1975, 1990; based upon employment distribution

\*\*\*Assumed that % unchanged between 1975 and 1978

TABLE 10--RELATIVE NUMBER OF EMPLOYEES WITHIN DPM SHED AREA  
COMPARED TO TOTAL CBD--PRESENT, 1990\*

	<u>PRESENT</u>	<u>1990</u>
Total CBD Employees	188,480	221,180
% (Shed/CBD)**	25.91%	33.29%
DPM Shed Area Employees	48,831	73,629

\*CRA Estimates for 1975 and 1990

\*\*NOTE: This percentage obtained from maps of CBD employment by zone for present (1978) and 1990. See Maps 4 and 5.

TABLE 11--NUMBER AND PERCENTAGE OF EMPLOYEES  
WITHIN SHED AREAS--PRESENT, 1990\*

<u>STATION</u>	<u>PRESENT</u>		<u>1990</u>	
Convention Center	945	1.94%	868	1.18%
9th St.	1,001	2.05%	924	1.26%
7th St.	2,494	5.11%	6,992	9.50%
5th St.	8,987	18.40%	10,985	14.91%
Library	4,691	9.61%	9,305	12.64%
Pershing Square	5,759	11.79%	6,719	9.13%
Hill St.	2,773	5.68%	3,634	4.94%
Bunker Hill	3,011	6.17%	11,299	15.34%
World Trade Center	1,661	3.40%	2,786	3.78%
Civic Center	6,715	13.75%	8,257	11.21%
Little Tokyo	5,080	10.40%	6,081	8.26%
Federal Bldg.	4,364	8.94%	4,420	6.00%
Union Station	1,350	2.76%	1,359	1.85%
TOTAL	48,831	100.00%	73,629	100.00%

\*CRA Estimates for 1975 and 1990

TABLE 12  
METHOD B  
 SUMMARY ALLOCATION  
 CORRIDOR TRIPS BETWEEN STATION AREAS

Present (1978)

	<u>Convention Center</u>	<u>Union Station</u>	<u>Total</u>
Entering	7,488	5,252	12,740
Leaving	<u>7,140</u>	<u>5,396</u>	<u>12,536</u>
TOTAL	14,628	10,648	25,276

1990

Entering	10,922	7,808	18,730
Leaving	<u>10,398</u>	<u>8,112</u>	<u>18,510</u>
TOTAL	21,320	15,920	37,240

METHOD C: BUS PASSENGERS ON-BOARD BUS ROUTES NEAR DPM STATIONS

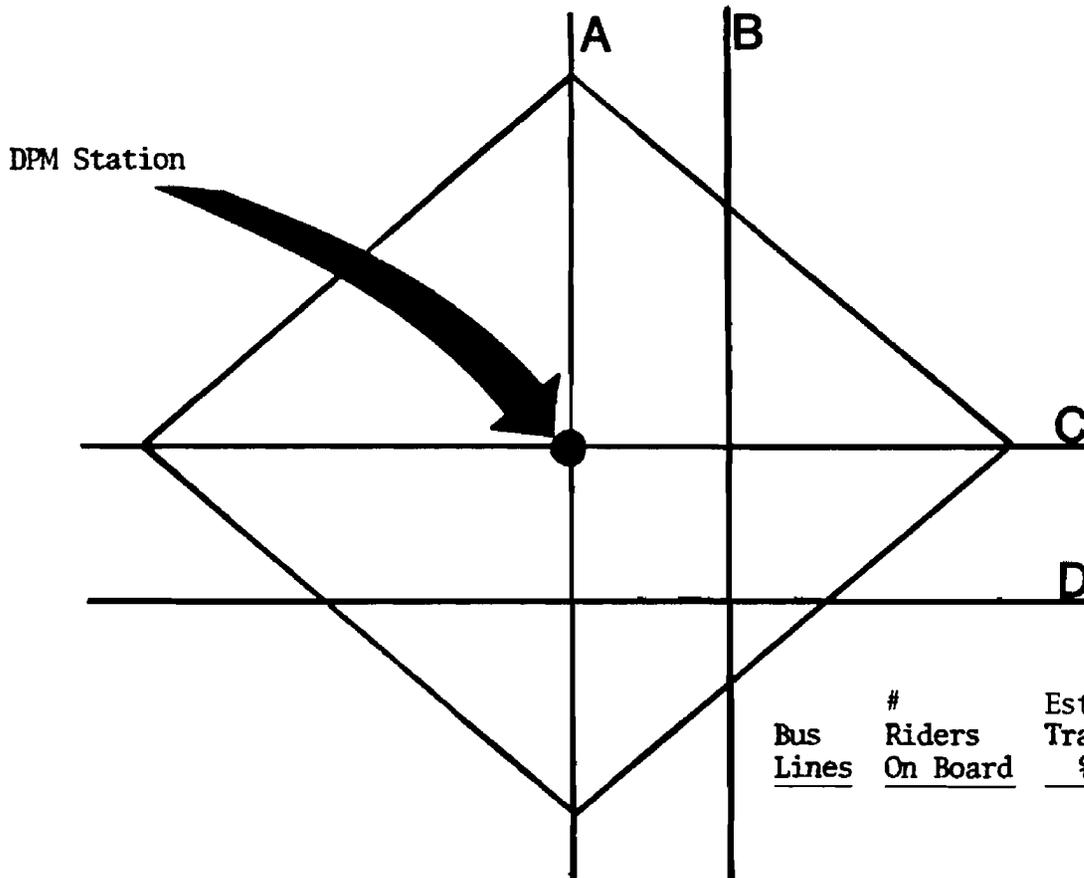
● Basic Procedure

- Assignment is made of bus riders on board buses passing through DPM passenger shed areas to DPM station. Each bus line, express and local, by direction, was assessed for their potential for diversion (transfer of) of riders to each DPM station.
  
- The procedure for the estimation of bus riders transferrring to the DPM at each DPM station is graphically illustrated in Chart 5.

CHART 5

METHOD C: On Board Bus Riders

Estimated percent of riders on board bus lines within DPM shed areas (600 ft. of each station).



	<u>Bus Lines</u>	<u># Riders On Board</u>	<u>Est. Transfer %</u>	<u>Est. # Riders Transfer to DPM</u>
A.	Northbound	_____	_____	_____
	Southbound	_____	_____	_____
B.	Northbound	_____	_____	_____
	Southbound	_____	_____	_____
C.	Westbound	_____	_____	_____
	Eastbound	_____	_____	_____
D.	Westbound	_____	_____	_____
	Eastbound	_____	_____	_____

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3/81  
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## METHOD C - Bus Passengers On-Board Bus Routes Near DPM Stations

### ● Data Sources

- On-board bus ridership--For each DPM station, the number of on-board bus passengers at that bus stop located nearest to and immediately before, the DPM Station location was tabulated. Only lines whose approximate closest bus stop was located within a DPM station's shed area (600 feet) was counted. All-day ridership totals were gathered for both local and express lines using latest available survey data.
  
- Intercept rates--It was assumed that 20% of all express trips would be intercepted at the terminal stations. Thus, for the purpose of this evaluation, 20% of the total on-board bus ridership at Union Station and the Convention Center was assumed to be "forced" to transfer to DPM.
  
- "Reasonable" transfer rates--A subjective analysis was conducted to determine what level of transfer would "reasonably" occur between bus and DPM in a free choice situation. A separate transfer rate was established for each of the lines studied above. Variables considered in the development of these rates included: line direction; line route through the CBD; proximity of closest bus stop to affected DPM station; local or express status of line; line destination (within CBD or outside CBD).

- Results

The above three data items were integrated to develop estimates of ridership transfers between DPM and bus. The resultant figures, established for both present and 1990 time frames, thus represent those forced to transfer (intercept) and those allowed to transfer (reasonable transfer rates).

See Appendix A for list of studied transfer rates for each line.

TABLE 13-METHOD C ESTIMATED TRANSFER VOLUMES AT EACH DPM STATION ASSUMING INTERCEPT OR "REASONABLENESS"--PRESENT AND 1990

<u>Station</u>	<u>PRESENT</u>			<u>1990</u>		
	<u>Local</u>	<u>Express</u>	<u>Total</u>	<u>Local</u>	<u>Express</u>	<u>Total</u>
Convention Center	727	839	1,566	799	1,092	1,891
9th Street	356	70	426	392	90	482
7th Street	3,103	69	3,172	3,414	90	3,504
5th Street	158	13	171	174	17	191
Library	Ø	Ø	Ø	Ø	Ø	Ø
Pershing Square	2,083	65	2,148	2,292	84	2,376
Hill Street	1,988	605	2,593	2,187	787	2,974
Bunker Hill	Ø	Ø	Ø	Ø	Ø	Ø
World Trade Center	112	10	122	123	13	136
Civic Center	3,060	440	3,500	3,366	567	3,933
Little Tokyo	671	1	672	738	1	739
Federal Building	45	560	605	50	729	779
Union Station	1,023	4,011	5,034	1,127	5,217	6,344
<b>TOTAL</b>	<b>13,326</b>	<b>6,683</b>	<b>20,009</b>	<b>14,662</b>	<b>8,687</b>	<b>23,349</b>

## TRAVEL TIME COMPARISON

### ● Basic Procedure

The two parts to this analysis were applied in an identical manner to the estimates of potential riders around each DPM station shown for Method A & B.

- Break Even Analysis: determination of which DPM stations have travel time advantage from each DPM Terminal station (Union Station and Convention Center) compared to travel by bus in vicinity
- Rider Perceived Preference Analysis: Four hypothetical "options" were developed to show changes in ridership volumes from varying assumptions about percentages of bus riders who would and would not transfer at each DPM station, based on travel time differences between the bus and the DPM

### Description of Travel Time Analysis: Overview

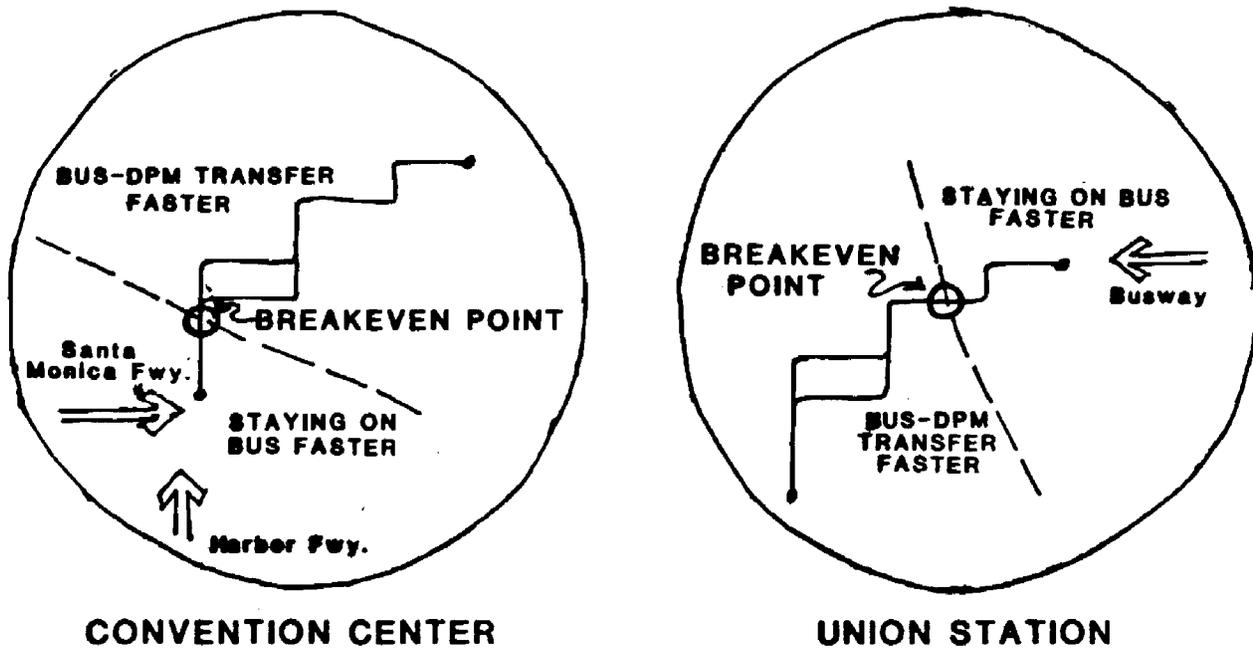
The potential DPM ridership pool as estimated from bus boardings and alightings (Method A) and employment (Method B) uses the same travel time assumptions to estimate the number of present and future bus riders attracted to the DPM.

Comparative travel times between the DPM and parallel bus routes used the 1979 DPM running time, headways and station access time estimates. Bus travel time estimates were developed for three average bus speeds: 6 mph, 9 mph and 12 mph. Use of comparative travel times resulted in establishment

of a "break even" or "cross over" point at which the bus to DPM transfer trip time becomes shorter than the trip where the bus passenger stays on board the arriving bus.

The concept of the break-even point is graphically illustrated below. The drawings diagrammatically depict the approximate break-even locations for trips passing the Convention Center, or Union Station.

CHART 6



In addition to the comparative travel time variations studied, different reactions on the part of the bus rider have also been hypothesized assuming free choice conditions, i.e., no forced transfer to the DPM due to intercept of bus routes by the DPM. Four variations in rider reaction have been studied to the travel time differences. These four variations or rider options range from a 100% transferring of all bus riders to the DPM regard-

less of travel time differences (Option I) to one in which transfers are assumed to only occur when there is a time advantage (Option IV). Two options (II and III) represent less extreme positions; they assume varying transfer percentages in situations when there is and is not a time advantage to transfer.

Although the introduction of four rider options assumes that the bus rider is free to choose whether or not to transfer to the DPM, these options can also be used to hypothesize use of bus intercepts in which the rider is forced to transfer.

The comparative time analysis assumes all other factors to be the same. Thus, it has been assumed that such factors as fares, convenience, security, walk distance between bus or DPM stop and final destination, would all be the same whether or not the DPM was used. In actual practice, these factors do influence made choice decisions and therefore would influence bus riders in using or not using the DPM.

● Description of Travel Time Analysis: Details

Comparative travel time between DPM and bus--running times for both the DPM and from a similarly-routed bus were developed. The DPM figures represented the length of time needed to travel to (or from) one of the terminal DPM stations from (to) each of the other DPM stations. The bus travel times were those needed to travel between a DPM terminal and each of the other DPM stations. Two different routings were assumed:

- The Harbor and Santa Monica Freeway express lines were hypothetically routed as nearly as possible to the streets traversed by the DPM

alignment. (Running times from segments of present DPM corridor routes parallel to the DPM were used as a basis to estimate average bus speeds.

- The Busway routes were assumed to remain as is.

Running times, for both DPM and bus modes included: running time, dwell time, transfer time, walk time. It was also assumed that the DPM, being grade-separated, would have constant running times as it would be unaffected by surface street traffic. Bus times, however, were expected to vary because of traffic. Running times for this mode were thus calculated for three assumed average speeds:

6 mph - low speed

9 mph - intermediate speed

12 mph - slightly below system-wide average speed

The speeds have been selected to represent: heavy traffic congestion and passenger boardings (6 mph); average traffic congestion and passenger boardings (9 mph), and light traffic congestion and passenger boards (12 mph). As a point of refernece, the downtown minibus, which operates within the CBD during normal working hours, averages around 7.5 miles per hour. Reasonably, it would seem that of the three speeds, the probable bus speed would be somewhere between 6 mph and 9 mph.

Comparison of the DPM and bus running times allowed the dtermination to be made of a "breakeven point". This has been defined as that location (DPM station) at which travel times by either bus or DPM were equal (or nearly so). Prior to this point, a bus would have

shorter running time and once past, the DPM would be more time-efficient.

It was assumed that any transfers between DPM and bus would occur at one of the DPM terminal stations. It was further felt that given a choice, a transfer would more likely occur for those trips which went past the breakeven point, i.e., where there was a definite time advantage in using the DPM. Trips up to and including the breakeven point would normally not result in a transfer.

o Comparative Running Times for Methods A and B: Tables

The tables below compare the total running times between the DPM and bus. As mentioned before, the times calculated (for use in both Method A and B) have included running times for the proposed routing of the DPM and also for comparable bus routes which travel as near to the DPM route as possible. Total running times include the following:

- DPM and bus actual running time.
- DPM and bus transfer time (headway/2)
- DPM dwell time\*
- DPM station, platform walk time
- DPM station access time (from station to street).

Running times for DPM trips have been calculated:

- From Convention Center to each DPM station
- To Convention Center from each DPM station
- From Union Station to each DPM station
- To Union Station from each DPM station

These times have been prepared to compensate for the differing routings, necessity of having to transfer, varying dwell times which may exist between these terminal stations and inbound and outbound trips.

Bus times also have been calculated due to the differing routings that may be created on these inbound and outbound trips. For buses, in addition, times for these trips were calculated assuming varying travel speeds--6 mph, 9 mph, 12 mph. These speeds represented assumed heavy, average and light traffic congestion situations.

\*Dwell Time = period of time DPM stopped in station to let off and pick up passengers.

TABLE 14-COMPARATIVE RUNNING TIME, DPM & BUS,  
FROM CONVENTION CENTER

<u>Location</u>	<u>Cumulative Bus Route Mileage</u>	<u>DPM</u>	<u>CUMULATIVE RUNNING TIME (Minutes)</u>		
			<u>BUS</u>		
			<u>6 mph</u>	<u>9 mph</u>	<u>12 mph</u>
Convention Center to:					
9th St. Station	.4	4.6	4.0	2.7	2.0
7th St. Station	.6	6.0	6.0	4.0	3.0
5th St./Figueroa	.7	7.3	7.0	4.7	3.5
6th St./Hope	.9	8.2	9.0	6.0	4.5
Pershing Sq. Station	1.2	9.2	12.0	8.0	6.0
Hill St. Station	1.4	10.6	14.0	9.3	7.0
Civic Center Station	1.8	11.7	18.0	12.0	9.0
Little Toyko	2.0	13.0	20.0	13.3	10.0
Federal Bldg. Station	2.2	13.9	22.0	14.7	11.0
Union Station	2.5	15.1	25.0	16.7	12.5

TABLE 15-COMPARATIVE RUNNING TIME, DPM AND BUS  
TO CONVENTION CENTER

<u>Location</u>	<u>Cumulative Bus Route Mileage</u>	<u>DPM</u>	<u>CUMULATIVE RUNNING TIME (Minutes)</u>		
			<u>BUS</u>		
			<u>6 mph</u>	<u>9 mph</u>	<u>12 mph</u>
Convetion Center from:					
9th St. Station	.4	4.8	4.0	2.7	2.0
7th St. Station	.6	6.2	6.0	4.0	3.0
5th St./Figueroa	.8	7.5	8.0	5.3	4.0
World Trade Ctr. Sta.	1.0	8.9	10.0	6.7	5.0
Bunker Hill Station	1.2	9.7	12.0	8.0	6.0
Hill St. Station	1.4	10.6	14.0	9.3	7.0
Civic Center Station	1.8	11.9	18.0	12.0	9.0
Little Tokyo Station	2.0	13.2	20.0	13.3	10.0
Federal Bldg. Station	2.2	14.1	22.0	14.7	11.0
Union Station	2.5	15.2	25.0	16.7	12.5

TABLE 16-COMPARATIVE RUNNING TIME, DPM, BUS  
FROM UNION STATION

<u>Location</u>	<u>Cumulative Bus Route Mileage</u>	<u>CUMUNATIVE DPM</u>	<u>CUMUNATIVE RUNNING TIME (Minutes)</u>			<u>Comments</u>
			<u>BUS</u>			
			<u>6MPH</u>	<u>9MPH</u>	<u>12MPH</u>	
Union Station to:						
Fed. Bldg. Sta.	.4	4.2	4.0	2.7	2.0	Arcadia & L.A. St.
Little Tokyo Sta.	.6	5.1	6.0	4.0	3.0	Transfer required
Civic Center Sta.	.8	6.0	8.0	5.3	4.0	1st M/B Spring & B'way.
Hill St. Sta.	1.3	7.3	13.0	8.7	6.5	El Monte only, add 1 blk. walk from 3rd & Olive
Bunker Hill Sta.	1.3		13.0	8.7	6.5	El Monte-3rd & Olive;
	to		to	to	to	Park/Ride-3rd-Flower: 1
	1.6	8.4	16.	10.7	8.0	blk. walk
World Trade Cntr Sta.	1.6	9.8	16.0	10.7	7.5	Park/Ride only
5th St. Sta.	1.9	11.0	19.0	12.7	9.5	Park/Ride-5th & Flower; add transfer or 2-blk walk
7th St. Sta.		NOT ANALYZED				
9th St. Sta.		NOT ANALYZED				
Covention Center		NOT ANALYZED				

TABLE 17-COMPARATIVE RUNNING TIME, DPM AND BUS,  
TO UNION STATION

<u>Location</u>	<u>Cumulative Bus Route Mileage</u>	<u>DPM</u>	<u>CUMULATIVE RUNNING TIME (Minutes)</u>		
			<u>BUS</u>		
			<u>6 mph</u>	<u>9 mph</u>	<u>12 mph</u>
Union Station from:					
Fed. Bldg. Sta.	.4	4.3	4.0	2.7	2.0
Little Tokyo Sta.	.6	5.2	6.0	4.0	3.0
Civic Center Sta.	.8	6.1	8.0	5.3	4.0
Hill St. Sta.	1.3	7.5	13.0	8.7	6.5
Pershing Sq. Sta.	1.5	9.0	15.0	10.0	7.5
Library Sta.	1.8	10.2	18.0	12.0	9.0
5th St. Sta.	1.9	11.2	19.0	12.7	9.5
7th St. Sta.	NOT ANALYZED				
9th St. Sta.	NOT ANALYZED				
Convention Center	NOT ANALYZED				

o Running Time Breakdown Point: Table and Charts

The following charts and table display the calculated running times for the DPM and bus. Also shown are the breakeven points, i.e., the locations where the total running times for both bus and DPM are identical. For travel distances that are shorter than that for the breakeven point, a bus will have a time advantage; conversely, any longer travel distances would favor the DPM over the bus.

Table 18 lists the breakeven point locations:

<u>Terminal Station</u>	<u>Breakeven Station</u>		
	<u>6 MPH</u>	<u>9 MPH</u>	<u>12 MPH</u>
From Convention Center To Convention Center	5th St. Sta. 7th St. Sta.	Hill St. Sta. Hill St. Sta.	-- --
From Union Station To Union Station	Fed. Bldg. Sta. Fed. Bldg. Sta.	Civic Cntr. Sta. Civic Cntr. Sta.	-- --

CHART 7

BUS AND DPM RUNNING TIME  
TO/FROM CONVENTION CENTER

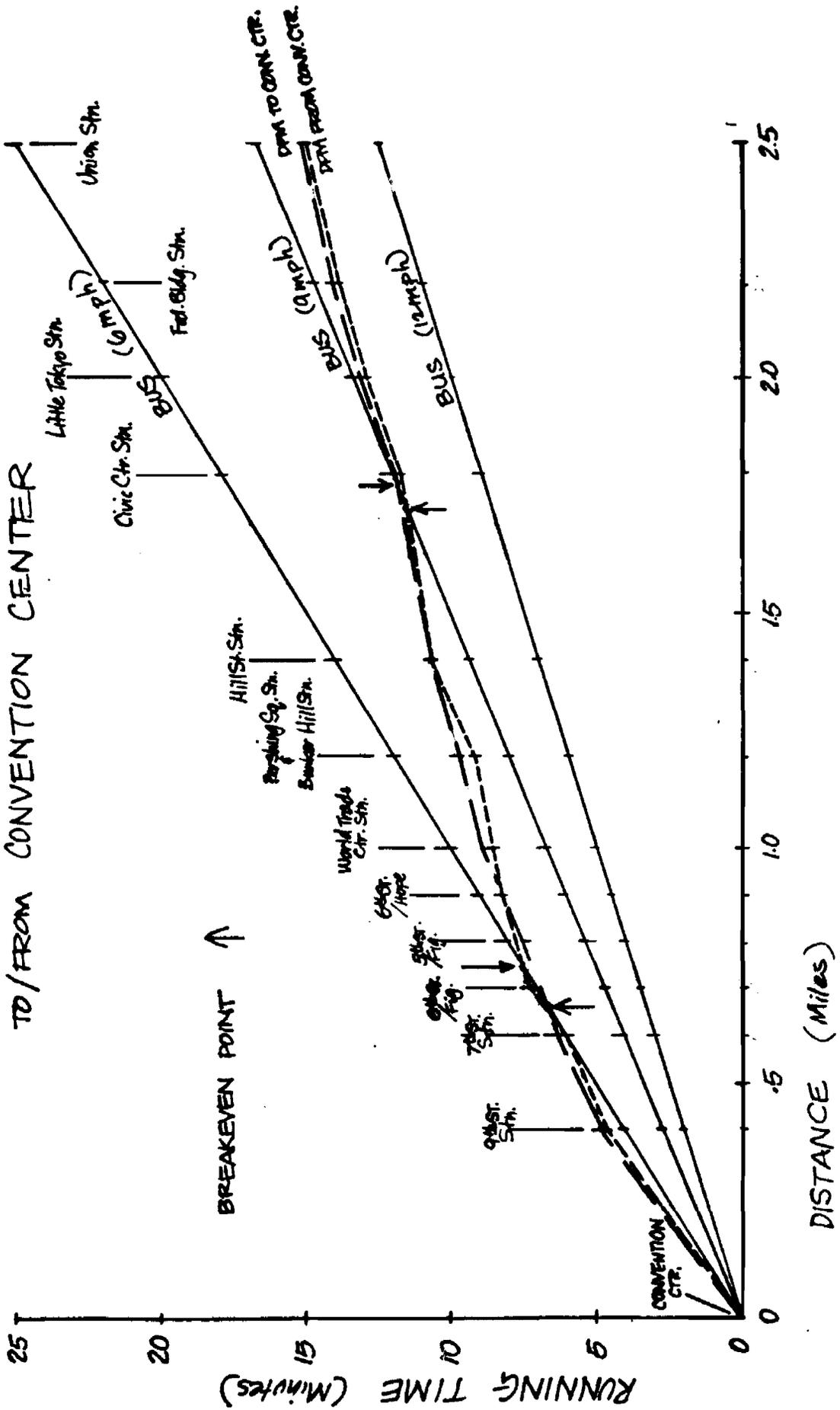
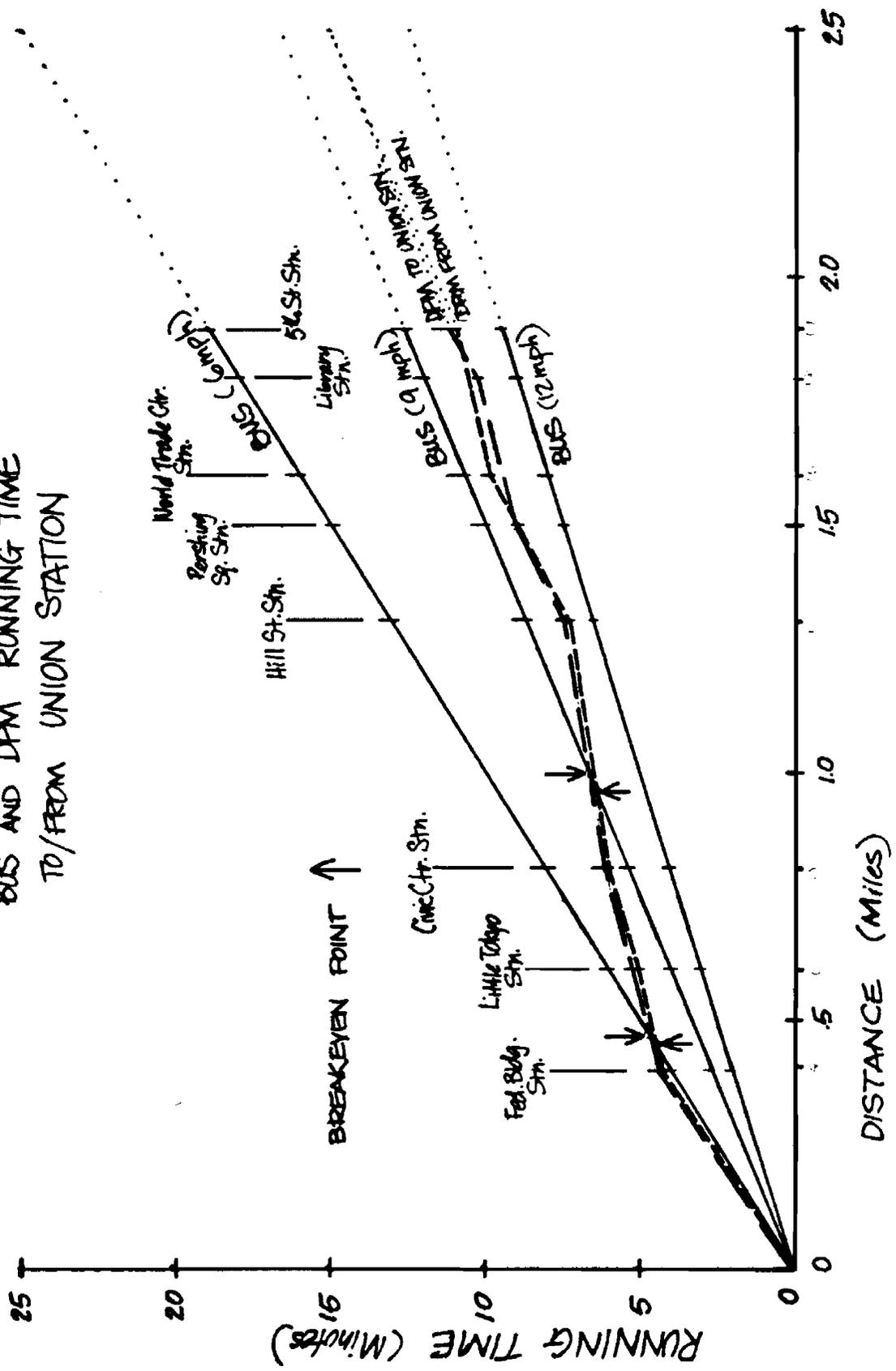


CHART 8

BUS AND DPM RUNNING TIME  
TO/FROM UNION STATION



o Rider Reaction to Travel Time Differences

Once the breakeven points for each terminal station were established, options were created which assumed varying rider reaction to these comparative travel times. Four options were developed, and are presented in Table 19. The percentages indicate the transfer rate in the cases where:

BUS  $\leq$  DPM = bus running time is less than or equal to that required to use DPM

BUS  $>$  DPM = bus running time greater than DPM

TABLE 19-RIDER REACTION OPTIONS TO COMPARATIVE TRAVEL TIMES

<u>OPTION</u>	<u>PASSENGER DIVERSION RATE</u>	
	<u>BUS <math>\leq</math> DPM*</u>	<u>BUS <math>&gt;</math> DPM**</u>
I	100%	100%
II	50%	50%
III	25%	75%
IV	0%	100%

Option I - Everyone transfers regardless of time difference

Option II - Half of all trips transfer regardless of time difference.

Option III - 25% transfer even when there is no time advantage to do so; only 75% transfer even when there is .

Option IV - Transfers only occur when there is a time advantage.

\*Bus running time less than or equal to that for DPM

\*\*Bus running time greater than that for DPM

The four options have been selected to give a wide range of transfer levels.

Option I is the high extreme. It assumes that everyone will transfer, voluntarily, between modes.

Option II and III are less severe. Option II assumes that only half of all trips will be transfer-type. It does not specify where, i.e., at what specific station, these transfers will occur. Presumably, it assumes that more transfers will be distributed where there is a time-advantage to do so.

Option III is probably the most reasonable. It assumes that most, but not all, passengers given a choice, will decide to transfer if there is a time advantage. It also allows passengers, however, the option to make the "wrong" choice, i.e., to stay on a bus even though it takes longer or to transfer even though that switch will take longer. The percentages used in this option, 25% and 75%, have been arbitrarily selected.

Option IV, like Option I, represents an extreme. It assumes that the decision will be based entirely upon comparative travel times between modes. Therefore, everyone will transfer for trips in which the DPM is quicker.

The above options have been strictly time-based. The transfer rates assume all other factors to be the same whether or not the DPM is used. Therefore, such factors as fares, convenience, security, walk distance between bus or DPM stop to final destination, are all assured to be the same.

## RESULTANT

### B'IS-DPM TRANSFER VOLUMES

Using the data presented thus far, the following transfer volumes between bus and DPM have been calculated.

To repeat the findings and conclusions of Part I, it is assumed that for Methods A and B, the most reasonable combination of comparable bus running time and rider reaction options is as follows:

Bus Speed - between 6 mph and 9 mph

Option -- III - 75% of the regional bus riders take the mode having the shorter running time

As outlined in Table 2, p.II-6, this results in a projection of between 9,000 and 12,000 bus transfers at the two terminal stations, compared to 24,000 projected by CRA/DPMA.

### Method A

Tables 20, 21, 22, 23 summarize the potential express person trips which might transfer to the DPM were passengers free to decide which mode to use. Again, this scenario is time-based and assumes four differing sets of transfer rates to the DPM before and after reaching the breakeven point, with respect to comparative travel times between the DPM and bus routes in the vicinity.

TABLE 20 METHOD "A" - BUS-DPM TRANSFER  
VOLUMES AT CONVENTION CENTER -- PRESENT, 1990

BUS SPEED	TOTAL POTENTIAL TRIPS - PRESENT	OPTION				TOTAL POTENTIAL TRIPS - 1990	OPTION (1990)			
		I	II	III	IV		I	II	III	IV
6mph	2,388	2388	1194	1511	1825	3,103	3103	1552	1956	2360
9mph	2,388	2388	1194	1020	841	3,103	3103	1552	1315	1080
12mph	2,388	2388	1194	597	0	3,103	3103	1552	776	0

TABLE 21 METHOD "A" - BUS-DPM TRANSFER  
VOLUMES AT UNION STATION--PRESENT, 1990

BUS SPEED	TOTAL POTENTIAL TRIPS - PRESENT	OPTION				TOTAL POTENTIAL TRIPS - 1990	OPTION (1990)			
		I	II	III	IV		I	II	III	IV
6mph	11,909	11,909	5954	7763	9572	15,483	15,483	7742	10,092	12,444
9mph	11,909	11,909	5954	5451	4947	15,483	15,483	7742	7086	6431
12mph	11,909	11,909	5954	2977	0	15,483	15,483	7742	3870	0

TABLE 22 METHOD "A" - TOTAL BUS-DPM  
TRANSFER VOLUMES AT TERMINAL STATION--PRESENT, 1990

BUS SPEED	TOTAL POTENTIAL TRIPS - PRESENT	OPTION				TOTAL POTENTIAL TRIPS - 1990	OPTION (1990)			
		I	II	III	IV		I	II	III	IV
6mph	14,297	14,297	7148	9268	11,397	18,586	18,586	9293	12,048	14,803
9mph	14,297	14,297	7148	6666	5,788	18,586	18,586	9293	8,401	7,512
12mph	14,297	14,297	7148	3574	0	18,586	18,586	9293	4646	0

TABLE 23 METHOD "A" PERCENT DIVERSION OF TOTAL TRIPS

SPEED	PERCENT DIVERSION FOR OPTION:			
	I	II	III	IV
6mph	100%	50%	65%	80%
9mph	100%	50%	46%	40%
12mph	100%	50%	25%	0

Method B

Using the employee-based passenger allocation from Tables 11 and 12, estimated transfer volumes for this scenario have been developed. The data below presents this information (Tables 24, 25, 26, 27).

TABLE 24 METHOD "B" - BUS-DPM TRANSFER  
VOLUMES AT CONVENTION CENTER--PRESENT, 1990

BUS SPEED	TOTAL POTENTIAL TRIPS - PRESENT	OPTION				TOTAL POTENTIAL TRIPS - 1990	OPTION (1990)			
		I	II	III	IV		I	II	III	IV
6mph	14,628	14,628	7314	9617	11,920	21,320	21,320	10,660	13,903	17,145
9mph	14,628	14,628	7314	6279	5,245	21,320	21,320	10,660	8,242	5,824
12mph	14,628	14,628	7314	3657	0	21,320	21,320	10,660	5,330	0

TABLE 25 METHOD "B" - BUS-DPM TRANSFER  
VOLUMES AT UNION STATION -- PRESENT, 1990

BUS SPEED	TOTAL POTENTIAL TRIPS - PRESENT	OPTION				TOTAL POTENTIAL TRIPS - 1990	OPTION (1990)			
		I	II	III	IV		I	II	III	IV
6mph	10,648	10,648	5324	7773	10,222	15,920	15,920	7960	11,746	15,532
9mph	10,684	10,648	5324	6521	7719	15,920	15,920	7960	9,803	11,646
12mph	10,648	10,648	5324	2662	0	15,920	15,920	7960	3,980	0

TABLE 26 METHOD "B" - BUS-DPM TOTAL  
TRANSFER VOLUMES AT TERMINAL STATIONS-PRESENT 1990

BUS SPEED	TOTAL POTENTIAL TRIPS - PRESENT	OPTION				TOTAL POTENTIAL TRIPS - 1990	OPTION (1990)			
		I	II	III	IV		I	II	III	IV
6mph	25,276	25,276	12,638	17,390	22,142	37,240	37,240	18,620	25,649	32,677
9mph	25,276	25,276	12,638	12,801	12,964	37,240	37,240	18,620	18,044	17,497
12mph	25,276	25,276	12,638	6,319	0	37,240	37,240	18,620	9,310	0

TABLE 27 METHOD "B" PERCENT DIVERSION OF TOTAL TRIPS

SPEED	PERCENT DIVERSION FOR OPTION:			
	I	II	III	IV
6mph	100%	50%	69%	88%
9mph	100%	50%	48-50%	47-51%
12mph	100%	50%	25%	0

COMPARISON WITH CRA/DPMA PROJECTIONSo CRA/DPMA Patronage Estimate

The CRA/DPMA has developed the following projected bus-DPM transfer volumes for the year 1990:

o Bus-DPM transfers (Total DPM System)--34,200 trips/day\*

o Bus-DPM transfers (at Terminal Stations)

at Union Station	--	14,670**
at Convention Center	--	9,135**
		<u>23,805</u>

These figures had been computed in 1978. An update is being conducted presently and should be completed in early 1981.

o Methods A and B

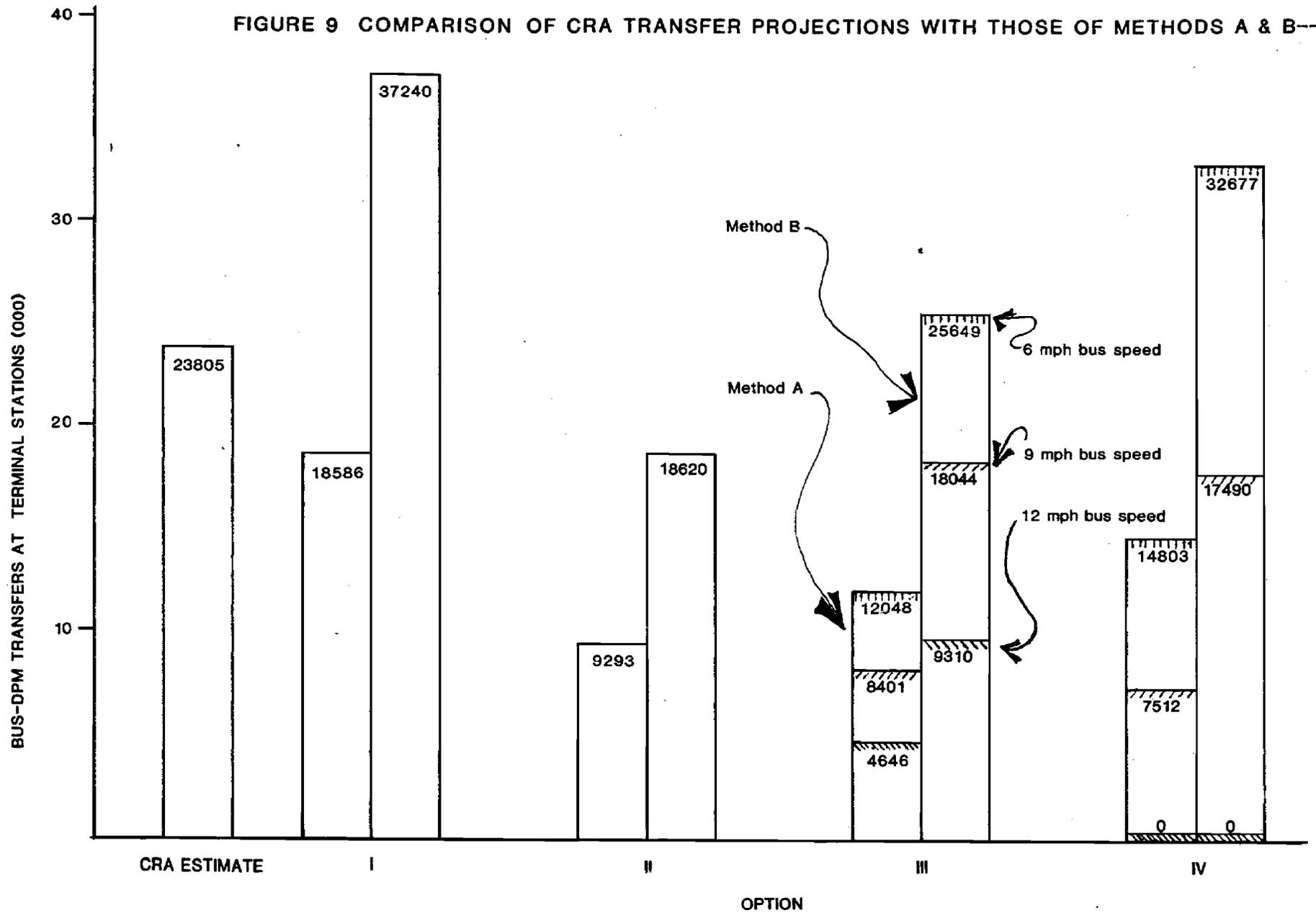
Methods A and B both project the ridership which would be transferring at Union Station and at the Convention Center. They have both looked at only those regional bus trips which could hypothetically be directed at those terminal stations. Therefore, the results of these methods should be compared only to the CRA/DPMA estimate for terminal station transfers.

Figure 9 compares the CRA/DPMA estimate against the 1990 figures of these two alternatives.

\*Cambridge Systematics, Models and Estimates of Los Angeles DPM Demand, Oct. 1978, p. E-4 (15¢ fare scenario).

\*\*Op cit. p. D-21. Extrapolated from peak hour figures.

FIGURE 9 COMPARISON OF CRA TRANSFER PROJECTIONS WITH THOSE OF METHODS A & B--1990



As can easily be observed from this chart, -

- Method B is always greater than Method A
- Method B exceeds the projected CRA estimate in three of the four options.
- Method A can only reach, under the most optimistic option, approximately three-quarters of the CRA/DPMA estimate.

Discussion has been made earlier as to the combination of vehicle speeds and options which would most likely occur. As mentioned, they are:

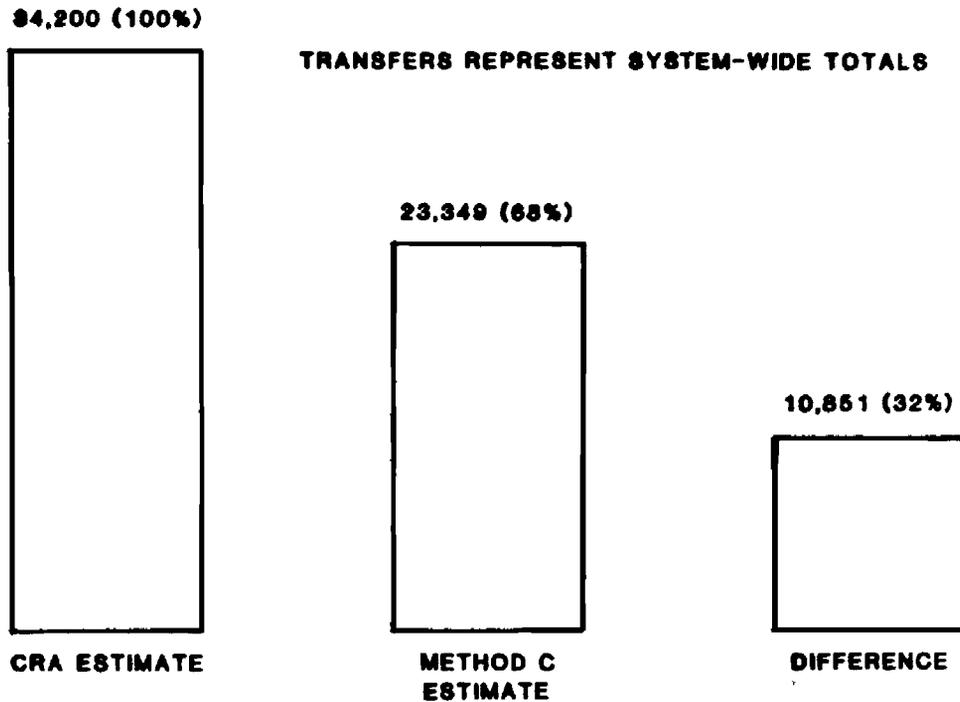
- o bus vehicle speed -- 6-9 mph (p. II-36).
- o option -- III (p. II-43).

For Method A, the estimated transfers from this combination is still, at best, only 50% of the CRA/DPMA projection. Method B, on the other hand, has estimates that are fairly close to those of CRA/DPMA. If it is assumed that the most likely bus speed will be between 6 and 9 mph, it can be seen that this alternative will be either right at, or slightly below the CRA's 23,805 transfer figure.

o Method C

Method C looks not only at the transfers coming at the terminal stations, but also considers likely transfers, by all CBD lines, at each and every DPM station. Figure 4 compares this data.

**FIGURE 4 COMPARISON OF CRA TRANSFER PROJECTIONS WITH THOSE OF METHOD C; 1990**



**FIGURE 4 COMPARISON OF CRA TRANSFER PROJECTIONS WITH THOSE OF METHOD C--1990**

Based upon staff's estimate, this alternative is approximately two-thirds the total for CRA.

o Summary of Comparisons

The three Methods have resulted in significantly different results. Table 28 summarizes these comparisons.

TABLE 28 SUMMARY OF COMPARISONS OF METHODS A, B, C,  
WITH THAT OF CRA; 1990

<u>METHOD</u>	<u>CRA/DPMA ESTIMATES</u>	<u>RTD PROJECTION</u>	<u>% OF CRA</u>
A	23,805	8,401**-12,048*	35-51%
B	23,805	18,044**-25,649*	76 -108%
C	34,200	23,349	68%

\* Option III; bus speed 6 mph

\*\* Option III; bus speed 9 mph

The above data indicates that only Method B will closely match the CRA/DPMA estimate. The other two scenarios will result in much lower transfer volumes and will, in fact, only achieve a half to two-thirds that required to meet the CRA/DPMA numbers.

It is significant to note that the lowest estimated transfer level has been obtained for Method A. In terms of the data used and the premises made, this alternative comes closest to describing the most plausible free-choice demand situation. It calls for the factoring up of actual terminal station-related express trips and alightings within the CBD. It also assumes that transfers will probably be decided by comparative travel times.

Method C also falls short of the CRA/DPMA estimate. As with Method A, this scenario attempts to approximate the actual ridership, on buses, that would use the DPM. This figure includes not only those local and express riders that would decide to use the DPM, it would also include many express riders

who would not have a choice but would, through bus intercept, be forced to transfer modes. Because it looks at both local and express trips, and because it includes the bus intercept concept, this method is probably more realistic than A. However, it will still only obtain two-thirds the CRA/DPMA estimate.

Method B, which does meet the CRA's estimate, probably does not describe as realistic a picture as the other two. Its distribution of CBD transit trips is directly correlated to the employee distribution pattern within the downtown area. Commute trips certainly do comprise a large portion of all CBD trips. Basing this scenario on this assumption, would thus appear to be appropriate. However, this alternative presumes that all trips into and out of the CBD are employee-related or show the same characteristics as work trips.

In actuality, other trip types, e.g., shopping, school, recreation, will be directed to/from the CBD; their distribution patterns may be quite different from that of the commuter. Since these other trip types also comprise a large portion of all transit trips, the results of this alternative could be on the high side.

The likelihood that transit trips would show the same distribution as that for employee distribution is made more speculative by the fact that at present, the bulk of transit trips are made by lower-income, transit-dependent segments of the population. Their trip-ends are dispersed throughout the downtown area,

but are directed primarily toward the eastern part of the CBD. It is expected, however, that by 1990, ridership will include, due to the relative cost of operating an auto, more people of higher-income.

APPENDICES  
FOR  
CHAPTER II  
DPM PATRONAGE ASSESSMENT:  
BUS TRANSFERS TO DPM

APPENDIX A  
BUS LINES ANALYZED FOR METHOD A

UNION STATION

Local Lines:       None  
Express Lines:     480, 482, 482X,  
                    483-494, 496, 760,  
                    764

CONVENTION CENTER

Local Lines:       None  
Express Lines:     5X, 7X, 601,  
                    602, 604-608,  
                    737, 810, 813,  
                    814

APPENDIX B

BUS LINES ANALYZED FOR METHOD B

UNION STATION  
Busway Corridor

Local Lines: 2, 26, 47, 420,  
422, 426, 428

Express Lines: 480, 482, 482X,  
484, 486-494, 496,  
507, 760, 764

CONVENTION CENTER  
Santa Monica  
Freeway Corridor

Local Lines: 9, 12, 44, 75,  
871

Express Lines: 601, 602, 604-608,  
776

Harbor Freeway  
Corridor

Local Lines: 5, 6, 7, 8, 33,  
49

Express Lines: 5X, 7X, 509, 737,  
810, 813, 814

APPENDIX C

TRANSFER RATE BY LINE AND BY DPM STATION FOR METHOD C

LINE NO.	E/L*	TRANSFER RATE AT DPM STATION (%)												
		US	FB	LT	CIVC	HS	BH	WTC	LIB	PS	5TH	7TH	9TH	CONC
2	L	10	0	0	5									
3	L								0				5	
4	L								0	5				
5	L	10	7	0	0									
6	L				10									
7	L				10									
8	L				0									
9	L													
12	L				10									10
24	L				10									
25	L				10							0	10	
26	L			10	0									5
28	L											10		
29	L											10		
35	L				5									
39	L			0	10									
42	L				10	5-10				10				
44	L				10	5-10				10				
49	L								0	5	10	0	5	10
56	L				10									
75	L				5									
83	L											10		
86	L							10	0		5			
91	L				5	5-10				10				
92	L	10	0	0	5									
93	L				5	5-10				10				
94	L				5	5-10				10				

\* Express/Local  
 S-Union Station  
 FB-Federal Building  
 LT-Little Tokyo

CIVC-Civic Center  
 HS-Hill Street  
 BH-Bunker Hill  
 WTC-World Trade Center

LIB-Library  
 PS-Pershing Square  
 5TH-5th Street  
 7TH-7th Street

9TH-9th Street  
 CONC-Convention  
 Center

LINE NO.	E/L*	TRANSFER RATE AT DPM STATION (%)												
		US	FB	LT	CIVC	HS	BH	WTC	LIB	PS	5TH	7TH	9TH	CONC
420	L	10			5									
422	L	10			5		0			10				
426	L	10			5		0			10				
428	L	10			5		0			10				
432	L	10			5		0			10				
871	L			0	0									
5X	E		0	0	0	5						0		
35X	E				5	10						0		
39X	E			0	10									
42X	E				5	10								
44X	E				5	10								
56X	E				10									
86X	E							10			5			
91X	E				5	10				10				
93X	E				5	10								
121	E				5	10								
122	E				5	10								
123	E				5	10				10				
144	E											10		
480	E	20	5		5							0		
482	E	20	7		5		0							
483, 84	E	20	7		5									
484	E	20	7		5									
486	E	20	7		5									
487,89,91	E	20	5		5							0		
488	E	20	7		5									
490	E	20	7		5									
492	E	20	5		5							0		
493	E	20	5		5							0		
494	E	20	5		5									
496	E	20	8		5									
01	E		10	10			0		0			10	10	20
602	E		10	10			0		0			10	10	20

LINE NO.	E/L*	TRANSFER RATE AT DPM STATION (%)												
		US	FB	LT	CIVC	HS	BH	WTC	LIB	PS	5TH	7TH	9TH	CONC
604	E		10	10			0		0			10	10	20
605	E		10	10			0		0			10	10	20
606	E		10	10			0		0			10	10	20
607	E		10	10			0		0			10	10	20
608	E		10	10			0		0			10	10	20
716	E				0	10								
721	E				5	10								
737	E		0	0					0					
755	E		10	0										
757	E		10						0	10	10	0		
758	E								0	10	0			
760	E	20	5		5				0			0		
762	E	20	5		5				0			0		
764	E	20	5		5				0			0		
0	E				5									
810	F			0	0									20
813	E			0	0									20
814	E			0	0									20
820	E								0	10				

Planning Dept.  
 BL:cym  
 7/80

## APPENDIX D

### TRANSIT TRIP DISTRIBUTION ASSUMPTIONS FOR METHOD B

The Method B alternative is based on CBD employment distribution patterns. As in Method A, variations in rider response to assumed travel time difference are provided for. Like Method A, it is assumed that this decision will be time-based, i.e., people will be more inclined to transfer where there is a definite time advantage to do so.

This method assumes the demand for local and express bus service into and out of the CBD is distributed in the same way as that for present and 1990 CBD employment distribution patterns. With respect to transit work trips this is a logical relationship. But it overstates present transit ridership somewhat on the west side of the CBD and correspondingly understates transit ridership on the east side of the CBD. This is because there is a disproportionate use of transit on the east side due to the concentrations of transit dependent trip ends on this side of the CBD. With respect to transit non-work trips (shopping, school, other), there is only a partial logical relationship between employment distribution and these transit trip ends. In some cases non-work transit trips such as shopping trips are not distributed the same as transit work trips. This is because shopping may not be distributed in proportion to employment locations and because shopping areas attract unequal proportions of transit versus auto trips (i.e., varying mode splits). The result is that again present transit ridership is overstated on the west side and correspondingly understated on the east side of the CBD.

-

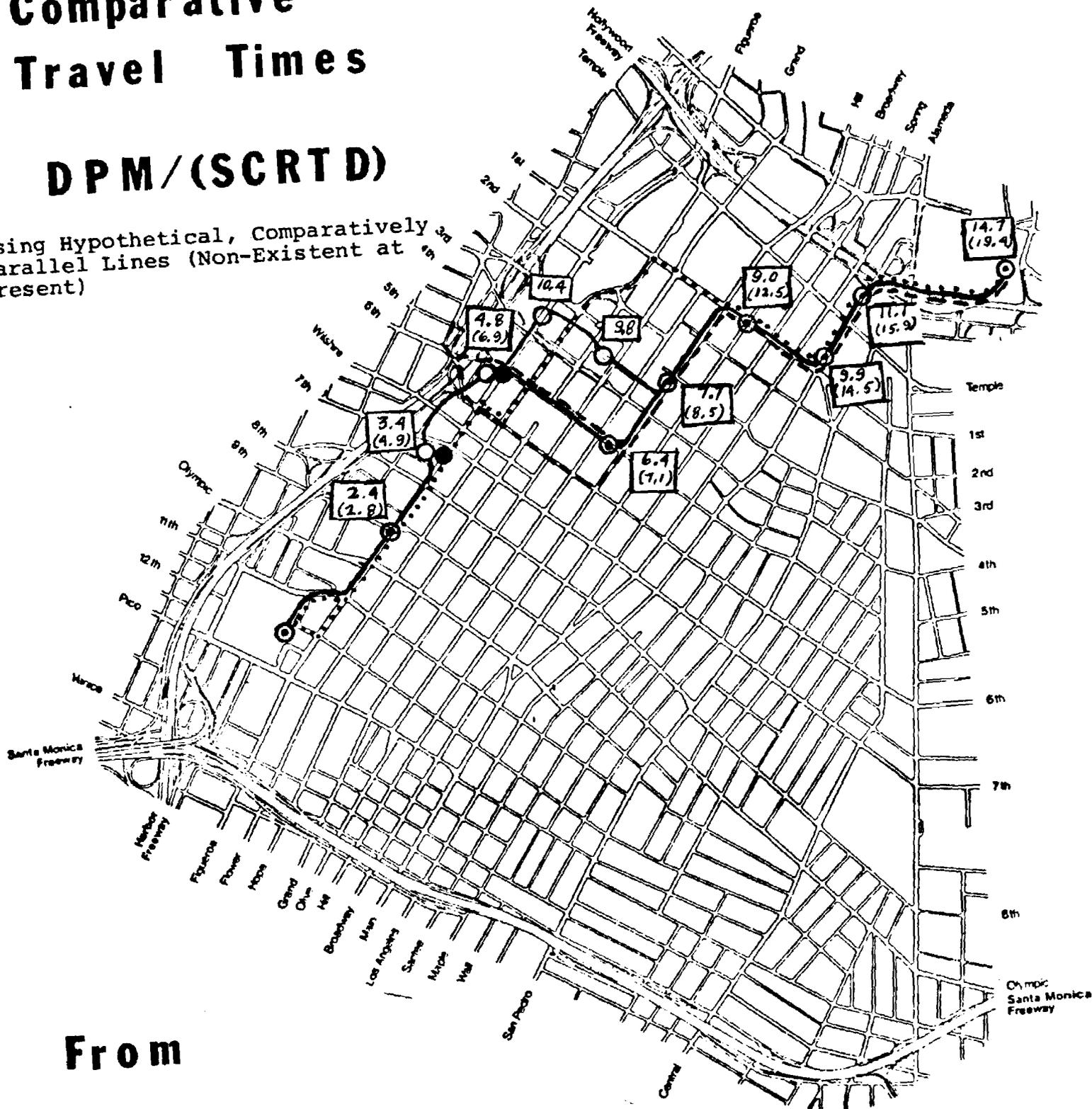
With respect to 1990 CBD transit trip projections, it may be true that trip ends will shift to the west of the CBD as a proportion of all transit trip ends within the CBD. This would be due to increasing development of the west side and to a higher percent of all CBD trips (trip ends) being made on public transportation. To the extent this is true, the more reasonable is the Method B approach.

APPENDIX E  
ILLUSTRATIONS FOR RUNNING TIME COMPUTATIONS  
FOR INDIVIDUAL BUS LINES

# Comparative Travel Times

## DPM/(SCRTD)

Using Hypothetical, Comparatively  
Parallel Lines (Non-Existent at  
Present)



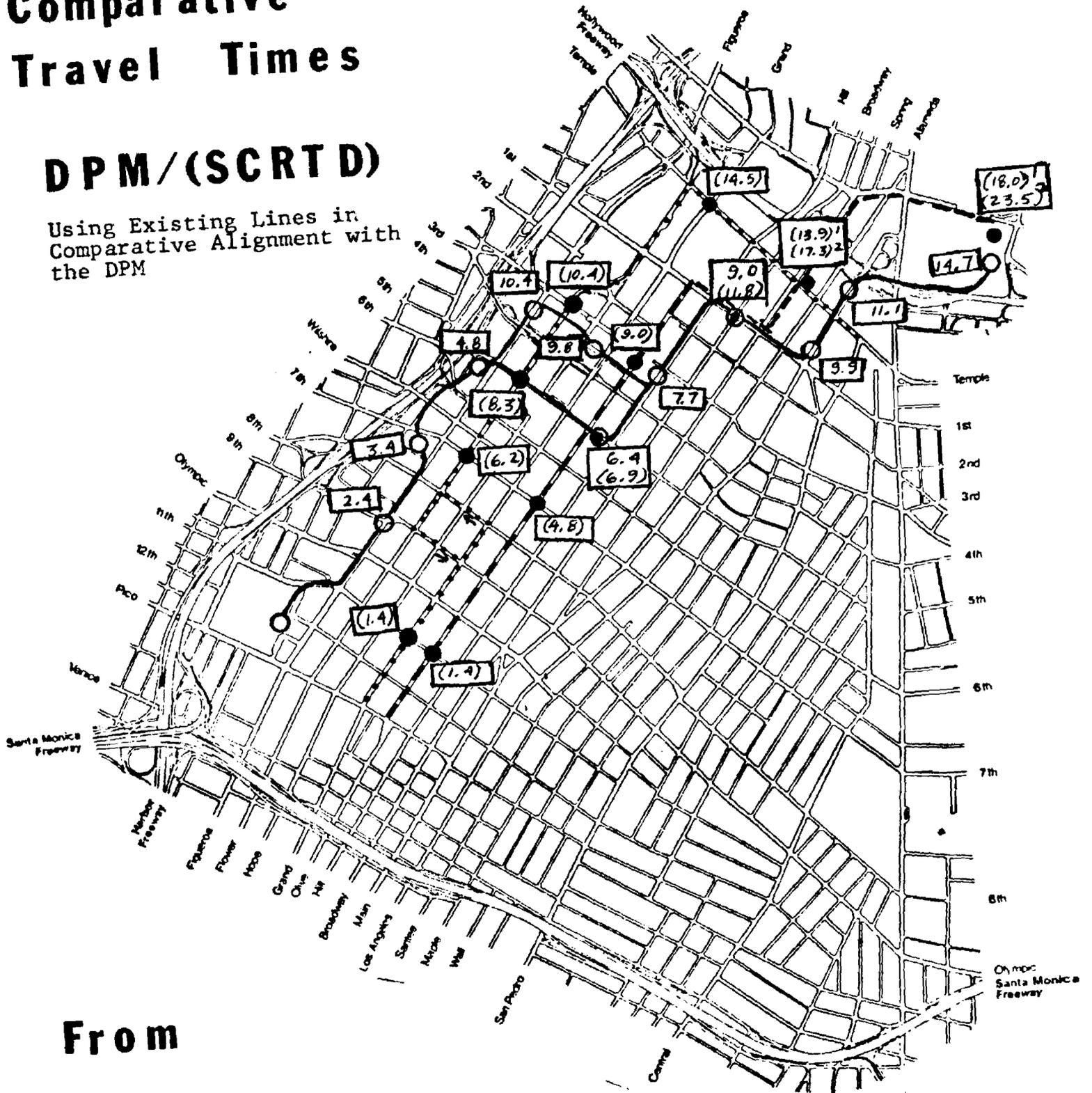
From

**CONVENTION  
CENTER**

# Comparative Travel Times

## DPM/(SCRTD)

Using Existing Lines in  
Comparative Alignment with  
the DPM



From

# CONVENTION CENTER

MJC  
July 1978

**LEGEND:**

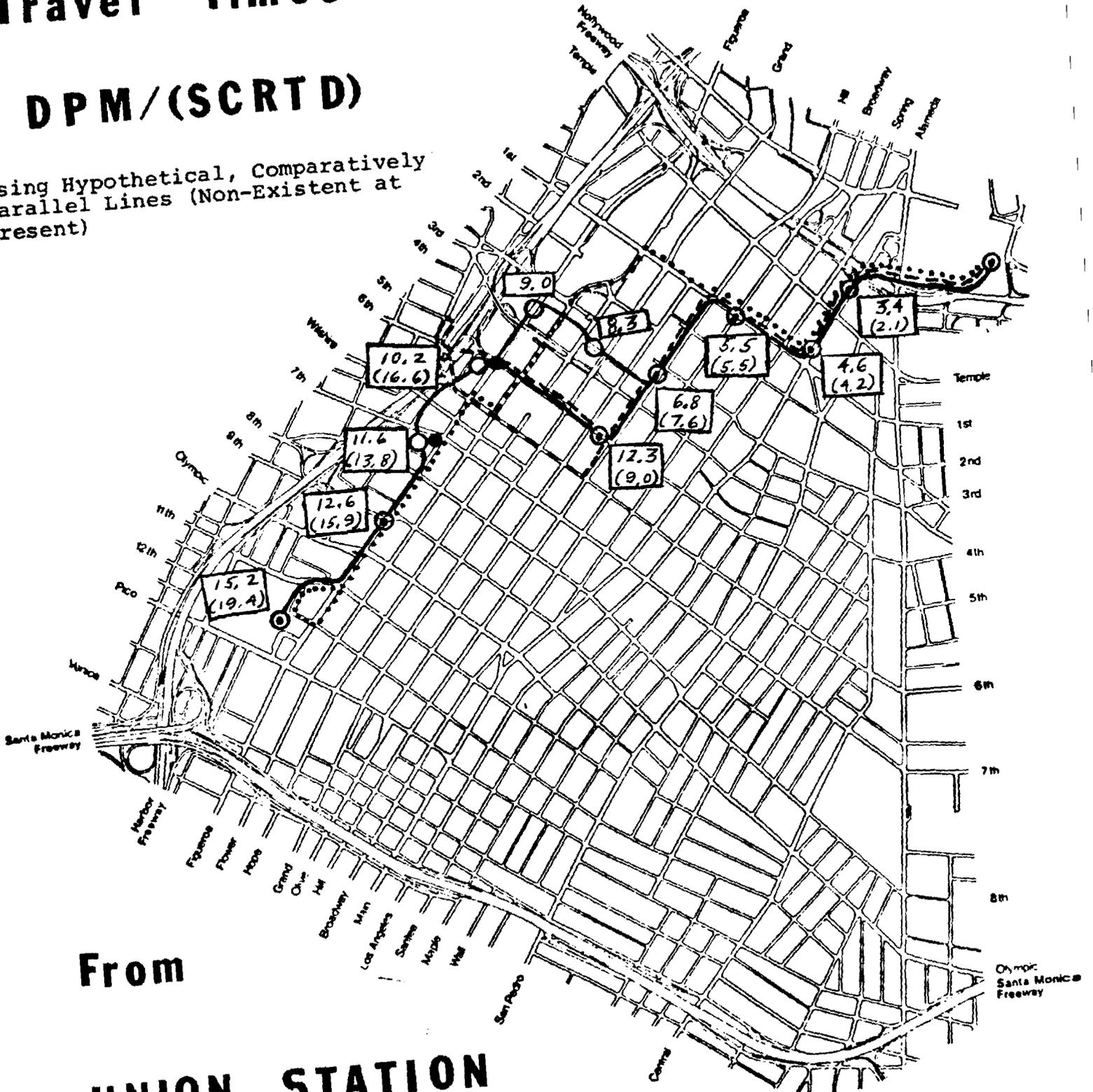
- 426 Line
- ..... 602 Line
- Joint DPM & RTD Time Points
- DPM Time Points
- RTD Time Points

1 Via Line 426  
2 Via Line 602

# Comparative Travel Times

## DPM/(SCRTD)

Using Hypothetical, Comparatively  
Parallel Lines (Non-Existent at  
Present)



From

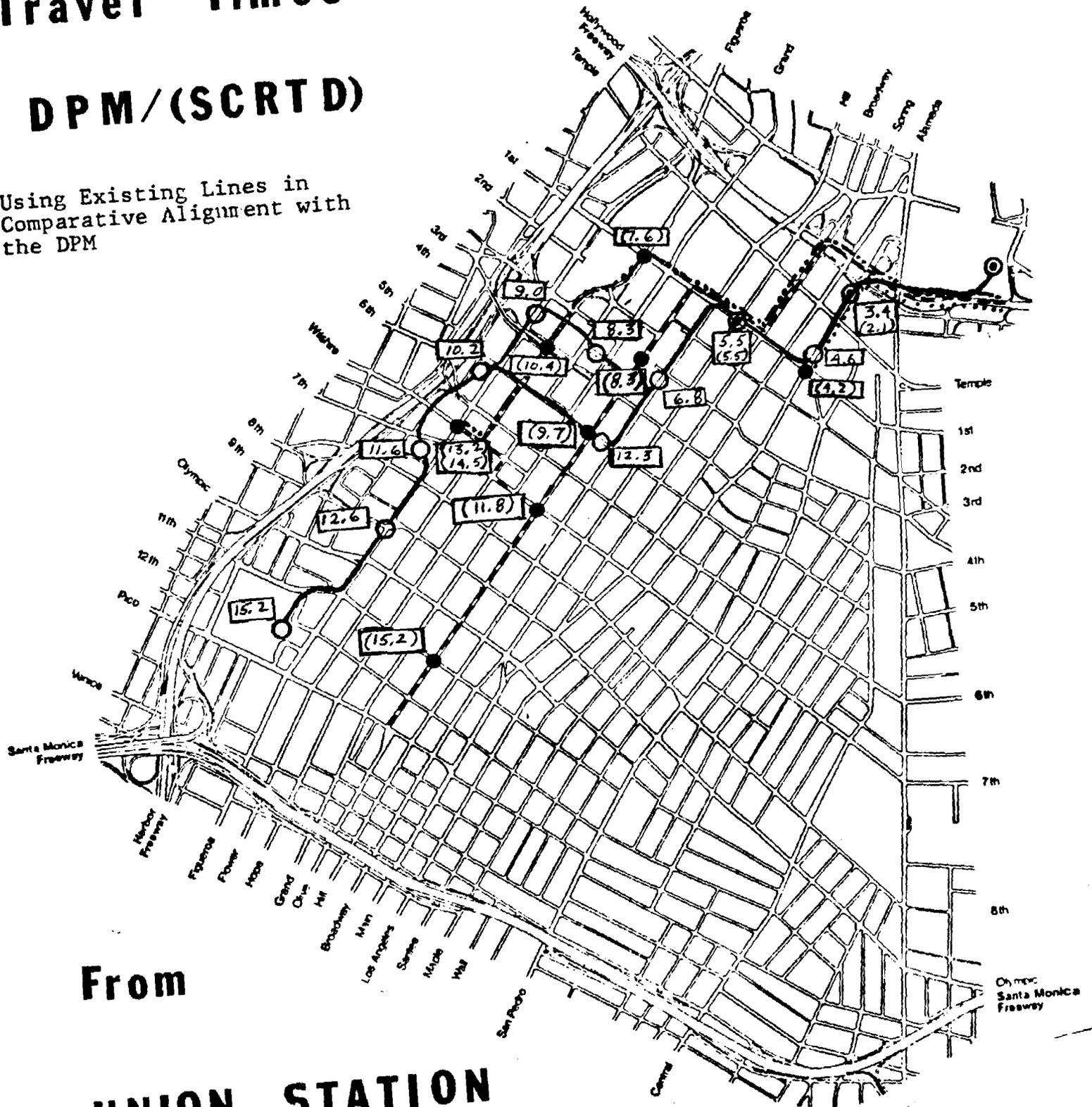
**UNION STATION**

MJC  
July 1978

# Comparative Travel Times

## DPM/(SCRTD)

Using Existing Lines in  
Comparative Alignment with  
the DPM



From

## UNION STATION

- LEGEND:
- 480 & 484 lines
  - .-.- 760 line
  - ..... 810 line
  - Joint DPM & RTD Time Points
  - DPM Time Points
  - RTD Time Points

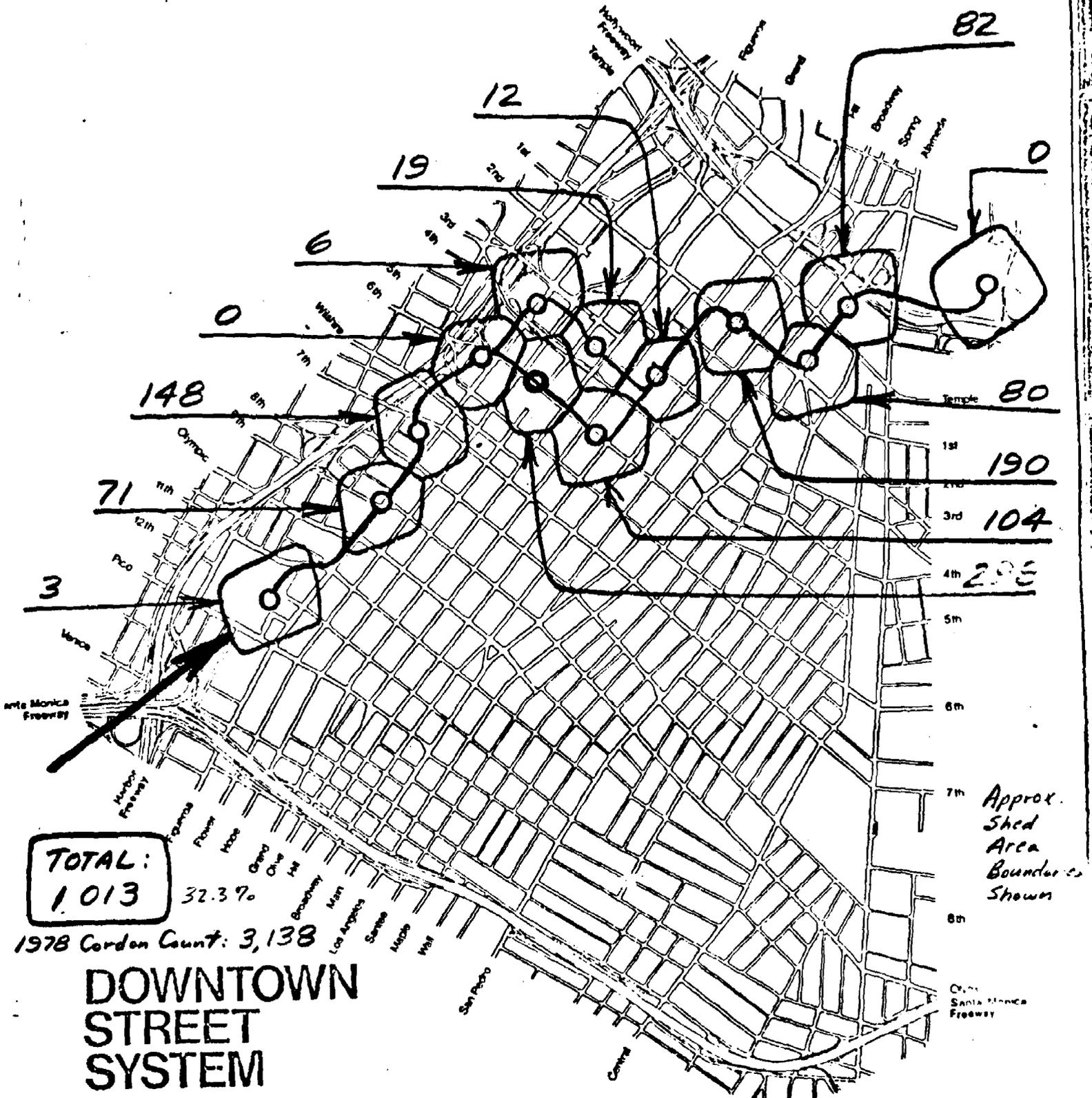
II-66

MJC  
July 1978

APPENDIX F

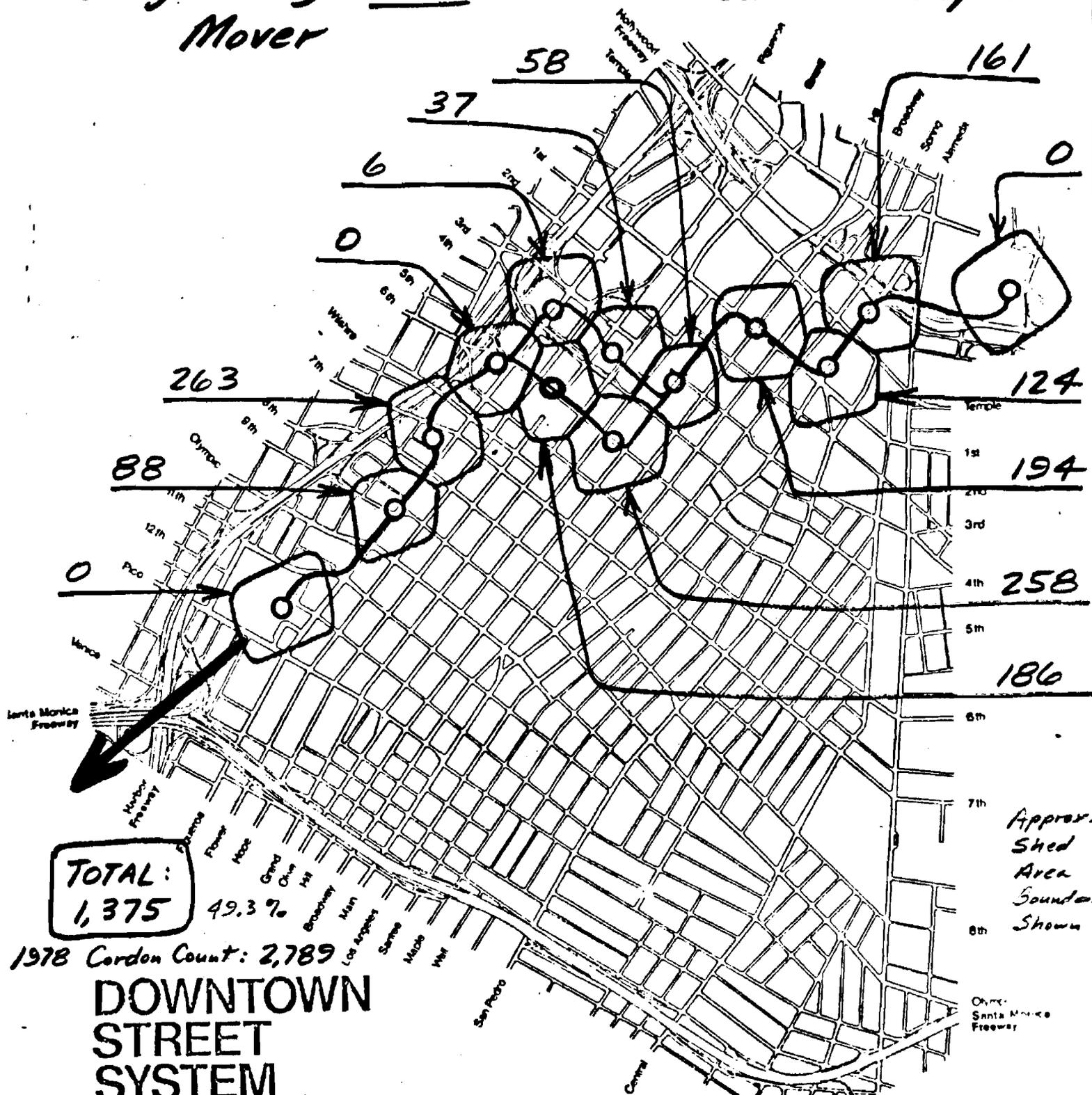
METHOD A: BOARDING AND ALIGHTING MAPS

# INBOUND PASSENGERS Passing Convention Center Bound to Shed Area of People Mover



Present Riders on Santa Monica & Harbor Freeway Express Lines Only  
 + Total Daily Alighting's

# OUTBOUND PASSENGERS Passing Convention Center Originating from Shed Area of People Mover



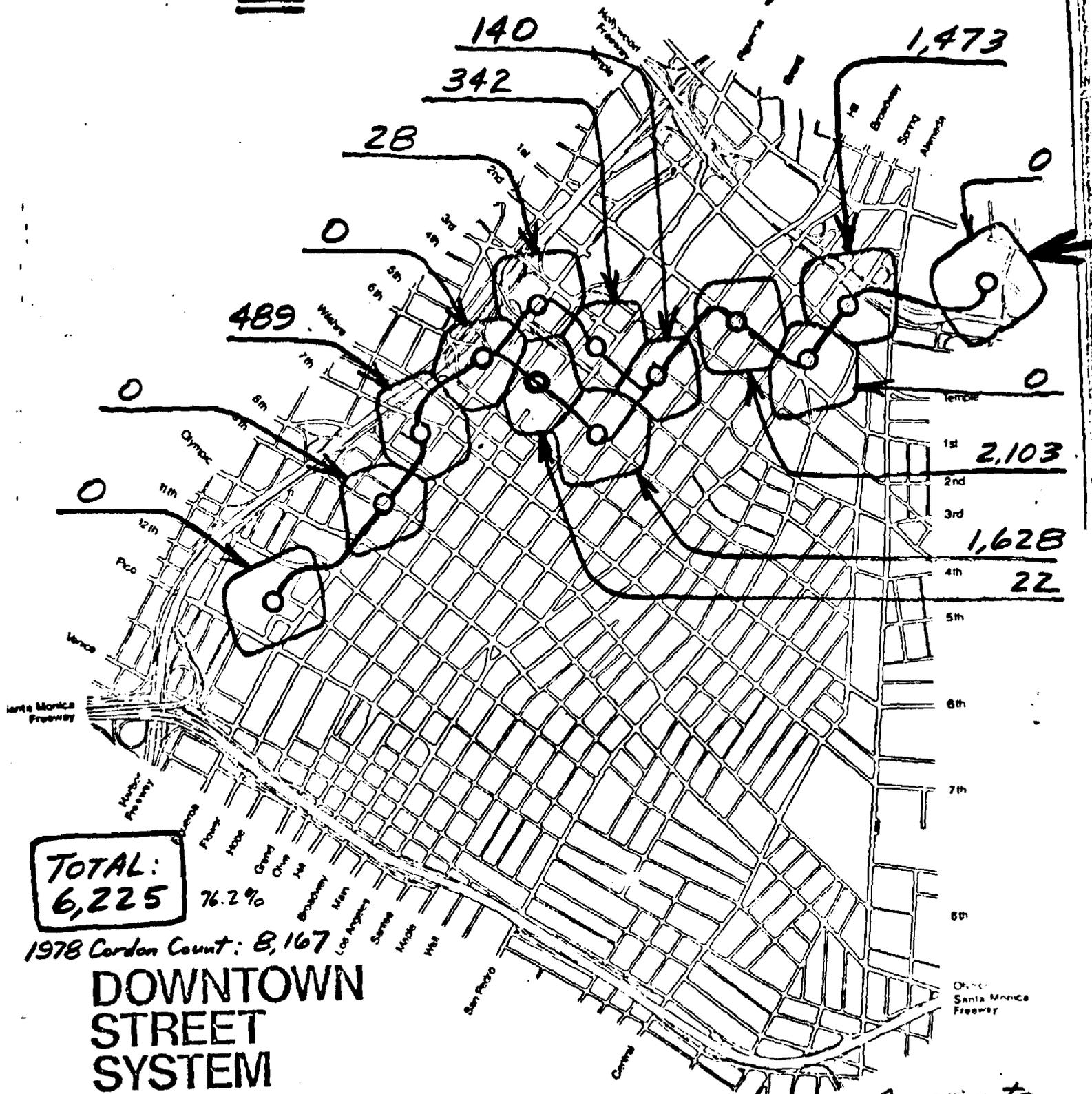
## DOWNTOWN STREET SYSTEM

Present Riders on Santa Monica & Harbor Freeway Express Lines Only + Total Daily Boardings

# INBOUND PASSENGERS

Passing Union Station

Bound to Shed Area of People Mover



**TOTAL:**  
6,225 76.2%

1978 Cordon Count: 8,167

## DOWNTOWN STREET SYSTEM

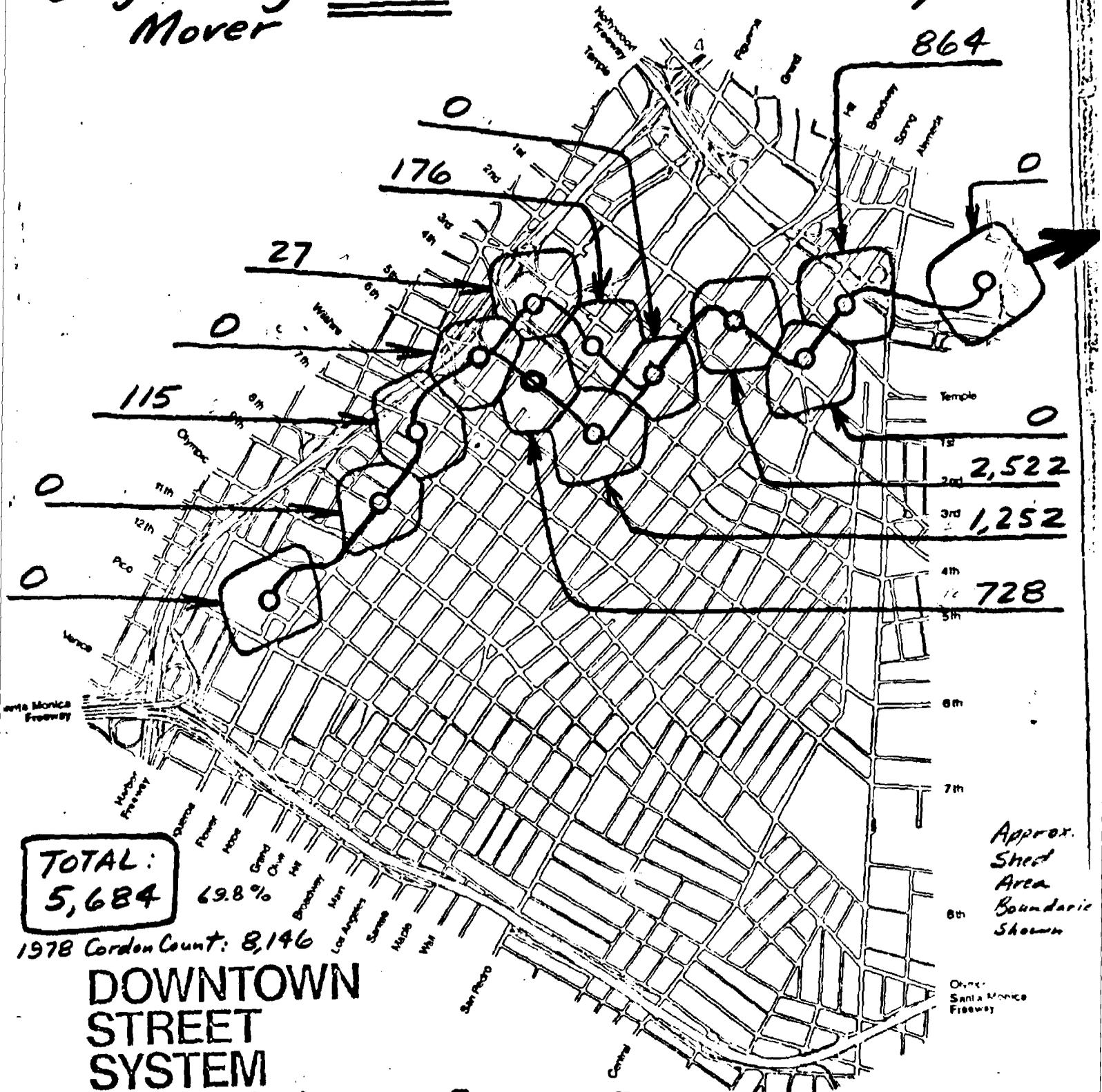
Present Riders on Busway Express Lines Only  
+ Total Daily Alightings

Approximate Shed Area Boundaries Are Shown

# OUTBOUND PASSENGERS

Passing Union Station

Originating from Shed Area of People Mover



**TOTAL:**  
**5,684**

1978 Cordon Count: 8,146

69.8%

## DOWNTOWN STREET SYSTEM

Present Riders on Busway Express Lines Only.  
Total Daily Boardings

ACKNOWLEDGEMENTS

FOR

DPM PATRONAGE ASSESSMENT TECHNICAL REPORT

CONTRIBUTORS (IN ALPHABETICAL ORDER)

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RTD PLANNING  
April, 1981

CBD BUS PLAN FOR DPM  
CHAPTER III DRAFT  
DPT-BUS INTERCEPT  
OPERATING COST ASSESSMENT

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT  
PLANNING DEPARTMENT  
APRIL 1981

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### LOS ANGELES CENTRAL BUSINESS DISTRICT (CBD) BUS PLAN FOR THE LOS ANGELES DOWNTOWN PEOPLE MOVER (DPM)

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- II DPM PATRONAGE ASSESSMENT
- III DPM-BUS INTERCEPT OPERATING COST ASSESSMENT
- IV BUS OPERATION CONCEPTS AND SPECIFIC SERVICE AT  
DPM TERMINAL STATIONS AND VICINITIES
- V CBD TRAVEL PROJECTIONS DATA

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A

SUMMARY

The figures presented below represent the best approximations possible under the limitations which applied. As outlined below in more detail, somewhat arbitrary assumptions were used about the extent bus intercepts would be employed in conjunction with the DPM operation. Later analysis may permit more refined and sophisticated techniques in the bus planning portion of the DPM planning work.

An additional caveat is the use of specific bus lines in this analysis. Use of specific current bus routes is necessary to indicate approximate aggregate levels of service and cost impacts, but it must not be construed as identification or recommendation of specific bus lines for intercept treatment. Major bus route changes are planned within the Los Angeles CBD as a part of the Greater Los Angeles Sector Improvements Plan, tentatively scheduled for implementation in June, 1980. \* When bus routes and schedules are finalized for the FY 80 plan, the specific bus routes used in this analysis will be updated to reflect the CBD bus routes as they will exist after the FY 80 plan is implemented.

It should also be understood that the "savings" listed may not represent true savings to the District, in that funds saved from cost reductions due to DPM bus intercepts might be expended on increased bus service to the eastern section of the CBD, in

\*As of June 1980, these route changes will be implemented in phases.

order to provide a service level in balance with that provided the western section by the DPM.

Background Data \*\*

Eighty-six lines (approximately 10,000 trips) operate into and out of the Los Angeles CBD each weekday.

Operating costs for these 86 lines:

Entire Routes	\$ 120,000,000
CBD Portions of Routes, 1978	\$ 20,000,000
CBD Portions of Routes, 1990*	\$ 23,000,000

Operating costs for DPM corridor Express Lines:

CBD Portions of Express Lines, 1978	\$ 3,000,000
CBD Portions of Express Lines, 1990*	\$ 3,800,000

Estimated Savings

Possible bus operating cost savings from limited DPM Bus Intercept (20% of Peak Period Express bus trips at Union Station and Convention Center):

Possible Savings, 1978	\$ 300,000
Possible Savings, 1990*	\$ 390,000

\*\* For purposes of aggregate analysis, the amount of service in June 1980 is the same.

\* 1990 figures are based on projected "TSM" growth of 15% (distributed 11% to local service and 30% to express service), expressed in 1978 dollars.

## B

### INTRODUCTION

The outline for the initial DPM bus support plan provided for a brief analysis of the bus operating cost savings which might result from operation of the DPM. This report is the presentation of the brief analysis which has been made.

There are two types of bus support to be provided: interface and intercept. Bus interface results when a bus is routed so as to provide an opportunity for transferring from a bus to the DPM but then continues through the CBD, distributing those passengers who wish to alight along its route. Bus intercept results when a bus terminates its run at a DPM station and all its passengers must get to their CBD destinations by one of three methods: walking, transferring to another bus, or transferring to the DPM. The primary reason for the consideration of the bus intercept concept is the possibility which exists for savings in operating costs.

Throughout the presentation, whenever figures are given for 1990, such figures are based on projected "TSM" growth of 15% (distributed 11% to local service and 30% to express service), expressed in 1978 dollars.

BOARD-ADOPTED PLANNING POLICY FOR DPM/BUS INTERACTION

SCRTD Board-adopted planning policy guidelines stipulate that a balance should be maintained between avoiding needless duplication of the DPM route and insuring that bus transfers to the DPM be generally on a voluntary basis. The potential for saving bus operating costs was also stipulated as a consideration in making planning decisions. The determination of what constitutes needless route duplication includes consideration of a number of factors: parallel alignment of bus routes to the DPM route; bus riders' destinations; and integrity of sector bus route patterns.

INTERCEPT POLICY USED FOR ANALYSIS PURPOSES

The premise used in making the bus intercept analysis was that a reasonable range of bus trips to be intercepted would be between 20-40% of all bus trips passing in the vicinity of either of the two DPM terminal stations. It seemed reasonable that there would be less demand for transfer to the DPM by local bus riders, compared to users of express bus services, so it was decided that the 20-40% would be applied only to express bus service. (For study purposes, this, of course, reduces the total number of bus trips intercepted.) The assumption that lower demands would come from local lines is based on some of the current distinctions between local and express riders, in which higher proportions of local riders are destined to the east side of the CBD. (Since intercepts also interfere with grid patterns for local routes to and through the CBD, this is another factor in focusing on express lines as the primary candidates for intercept treatment.)

Application of the Board's guidelines resulted in a finding that express bus passengers who were presented with a free choice between transfer to the DPM and bus distribution would choose the DPM in approximately 20-40% of the cases. Interception of 20% of all peak-period, prevailing-direction express bus trips passing near a DPM terminal station was viewed, therefore, as a reasonable working hypothesis for the

required analysis. SCRTD input to the conceptual designs for the terminal stations was based on this hypothesis. That is, it was specified that the stations be designed to handle bus intercept of 20-40% of the express bus trips. Additionally, the DPM patronage projections performed by CRA, which used the latest UMTA-approved computerized mathematical models for CBD trip forecasting, assumed bus intercept rates approximately in this same 20-40% range for express bus trips.

## E

### DETERMINING THE BASIS FOR POSSIBLE COST SAVINGS

Bus intercept would result in reduced bus service in favor of the mode to which bus passengers are transferring, whether the transfer is forced or voluntary. For a policy of voluntary transfer only, bus trips would be intercepted only to the extent demand dropped off for the bus service as a result of bus-DPM transfers. Ridership diverted to the DPM would result in unused capacity on the buses downstream from point of transfer. This unused capacity, in theory at least, can be reduced or eliminated through bus intercept, which would reduce net operating costs. Any cost savings to the District from DPM operation would arise from fewer buses operating in the CBD. The interception of buses at the periphery of the CBD, with transfer of passengers to the DPM, would result in two types of savings: (1) savings from reduced mileage and (2) savings from the lowered bus requirements (from use of turned-back buses for additional trips). Ascertainment of the number of bus trips to be intercepted is, therefore, essential to the determination of possible cost savings.

Under the voluntary transfer policy set forth by SCRTD's Board of Directors, interception of trips would occur only when all the passengers on a bus desired to transfer to the DPM. The ideal method of determining the number of bus trips which could be intercepted without displacement of passengers

would be to await the implementation of DPM service, run all buses passing the terminals on an interface operation, make a count of the passengers transferring (and those remaining on board for distribution by bus), and then plan for interception of the percentage of buses in proportion to the percentage of passengers transferring to the DPM.

Since this method could only be followed after DPM implementation, and since rough cost savings projections are needed prior to such implementation, another method had to be used to determine which trips would be interfaced and which would be intercepted, even though the results could not possibly be as accurate as an actual count.

The most reliable pre-implementation method of forecasting passenger choice as to DPM or bus distribution would be to make detailed, small-zone origin and destination surveys and make samplings as to choices. The resources for such a costly study were not available, however; so, as a supplement to the computerized DPM patronage forecasts, it was necessary to develop an alternate method of arriving at an estimate of the ratio of DPM/bus choice by those passengers aboard lines which will pass by one of the terminals.

A quick, limited DPM patronage estimate was performed using limited, readily available information. The estimate was based on the proportion of passengers aboard terminal-passing

lines presently alighting within a reasonable distance of a proposed DPM station. The results of this work, which is reported separately, have been performed independently of this cost savings estimate task.

F

STUDIED BUS TRIPS INTERCEPTED

The basis for this cost savings estimate was simply to start with a given assumption that about 20% of the peak period express bus trips would be intercepted. This represents the low end of the 20-40% bus intercept range considered to be planning policy for this analytic task.

Proceeding from this assumption, there are two possible approaches in the assignment or allocation of the intercepted bus trips to particular bus routes in the two DPM corridors:

- (1) assume a proportionate amount of bus-DPM transfers spread among all the lines connecting with the DPM terminals, or
- (2) within the agreed to total number of intercepted trips, for cost analysis purposes, intercept all the peak period bus trips on selected bus routes.

The DPM patronage modeling work used the first approach, in that the modeled policy input of about 20% intercepted bus trips was proportionately distributed among all the DPM corridor express peak period bus trips. In terms of how the model works, this was a reasonable approach. However, in a real-world situation, the even distribution approach to bus intercept presents major bus scheduling and loading imbalance problems. (See Section J for elaboration on this point.) Accordingly, even for this preliminary analysis, the more realistic approach of designation

of entire lines for peak period intercept treatment is preferable.

Table 1 summarizes the total trips in the DPM corridors and shows the studied intercept trip volumes. Within the context of obtaining an even 20% total bus intercept rate within the two DPM corridors, the specific lines studied for intercept treatment are shown in Table 2. The basis for selection was: (1) bus schedule most adaptable to DPM intercept operations and (2) transfer opportunities at a suburban transfer point or transportation center.

Those bus schedules most adaptable to DPM intercept proved to be those which either operate only during peak periods, or, in the case of three of the four studied busway lines, which operate into the CBD only during the peak period and are a shuttle operation between the suburbs and El Monte during the balance of the day. Potential confusion could result from interception of all peak service on a line which continued through-routed service in the CBD during the off peak hours. The interception of service on lines which only operate in the CBD during peak periods (both prevailing and reverse direction trips) would avoid that confusion.

Excellent transfer opportunities are available at the present El Monte station. Only limited transfer opportunities are available for the DPM Convention Center corridor bus lines at

Santa Monica Freeway and La Cienega for the 604 line and at San Diego Freeway and Artesia Boulevard for the 814 line.

Other intercept criteria should include consideration of the "common interests" of the majority of bus line patrons, with regard to trip desire on lines between suburban and CBD zones. This is best indicated by current origin-destination data, when available.

Another approach to selection of bus trips to be intercepted is to consider partial peak period interception of lines which operate into the CBD all day. For example, all peak period service that is an increase over the base period level of service could be intercepted. From the standpoint of maintaining even passenger loading and short headways over both intercepted and non-intercepted schedule alternates of the same route, perhaps a better approach is to establish schedule criteria of an even split between intercept and non-intercept bus trips. A corollary to this schedule criteria would be to intercept trips only on lines with high enough volumes so that headways would not exceed say 15 minutes on each alternate (i.e. four trips an hour each on intercept and non-intercept alternate schedules on same route, for a combined total of 8 trips per hour. This approach could either be a substitute for or an addition to the so-called 20% intercept plan for studied intercept bus trips in Table 1. It is shown as a separate bus intercept increment in Table IA.

TABLE 1

SUMMARY OF STUDIED BUS TRIPS  
INTERCEPTED IN DPM CORRIDORS  
(EXPRESS LINES ONLY)

20% PLAN (100% OF SELECTED PEAK PERIOD ONLY LINES)\*

		CONVENTION CENTER CORRIDOR							UNION STATION CORRIDOR														
		SANTA MONICA FREEWAY			HARBOR FREEWAY				BUSWAY														
		A.M. PEAK PERIOD	P.M. PEAK PERIOD	TOTAL PEAK PERIODS	A.M. PEAK PERIOD	P.M. PEAK PERIOD	TOTAL PEAK PERIODS	CORR. TOT.	A.M. PEAK PERIOD	P.M. PEAK PERIOD	TOTAL PEAK PERIODS	2 CORR. TOT. (UN. STA. & C.C.)											
		Trips	Trips	Trips	Trips	Trips	Trips	Trips	Trips	Trips	Trips	Trips	Trips										
<b>1978</b>																							
IN		34	13	47	48	15	63	110	158	69	227	337											
OUT		11	33	44	14	42	56	100	66	153	219	319											
TOTAL		45	46	91	62	57	119	210	224	222	446	656											
<b>1990</b>																							
IN		46	12	18	0	64	12	62	10	20	3	82	13	146	25	207	43	90	11	297	54	443	79
OUT		15	0	43	10	58	10	19	3	55	9	74	12	132	22	86	12	200	43	286	55	418	77
TOTAL		61	12	61	10	122	22	81	13	75	12	156	25	276	47	293	55	290	54	583	109	861	156
		TABLE 1A																					
<b>1990</b>		50% INTERCEPT DURING PEAK PERIODS OF MAJOR ALL DAY LINES**																					
IN		46	18	64	62	20	82	146	207	29	90	18	297	47	443	47							
OUT		15	43	58	19	55	74	132	86	17	200	27	286	44	418	44							
TOTAL		61	61	122	81	75	156	278	293	46	290	45	583	91	861	91							

NOTES: | = No. of Intercepted Bus Trips  
\* Intercept Category A., see page 26  
\*\* Intercept Category D., see page 26

PLANNING DEPARTMENT  
DGM:drd 5/31/79

**TABLE 2**  
**DPM CORRIDORS LINE-BY-LINE BUS TRIPS**  
**SHOWING TRIPS INTERCEPTED**

EXPRESS LINES - UNION STATION CORRIDOR													
LINE	Direction	1977				Total Trips	30%	1990				Total Trips	
		AM Peak		PM Peak				AM Peak		PM Peak			
		Hr.	Per.	Hr.	Per.			Hr.	Per.	Hr.	Per.		
480	E		8	8	20	51			10	10	26	66	**
	W		21	3	9	53			27		12	69	**
482	E		4	5	10	14			5	7	13	18	*
	W		9	2	3	13			12		4	17	*
482x	E		-	2	3	3				3	4	4	
	W		3	-	-	3			4			4	
483-5	N		18	9	21	83			23	11	27	108	**
	S		23	6	18	85			30		23	111	**
484	E		7	5	12	36			9	7	16	47	
	W		16	3	8	43			21		10	56	*
486	E		-	5	10	10			-	7	13	13	*
	W		11	1	2	13			14		3	17	*
487-899	N		16	10	28	73			21	13	36	95	
	S		28		17	79			36		22	103	
488	E		5	4	10	15			7	5	13	20	*
	W		10		3	13			13		4	17	*
490	E		5	5	13	33			7	7	17	43	
	W		12		5	32			16		7	42	
492	E		0	2	3	3			-	3	4	4	
	W		3		1	4			4		1	4	
493	N		0	2	3	3			-	3	4	4	
	S		3		0	3			4		-	4	
494	E		0	2	3	3			-	3	4	4	*
	W		3		0	3			4		-	4	*
496	E		3	1	3	12			4	1	4	16	
	W		2		3	13			3		4	17	
760	E		0	5	9	10			-	7	12	13	
	W		9		0	10			12		-	13	
764	E		0	2	5	5			-	3	7	7	
	W		5		0	5			7		-	7	
	TOTAL IN		158	15	69	372			207	0	90	485	
	TOTAL OUT		66	67	153	354			86	90	200	462	

\*\* \* \* See Page 3 of Table III-14-

EXPRESS LINES - CONVENTION CENTER CORRIDOR

Line	Direction	1977					1990				
		AM Peak Hr.	AM Peak Per.	PM Peak Hr.	PM Peak Per.	Total Trips	AM Peak Hr.	AM Peak Per.	PM Peak Hr.	PM Peak Per.	Total Trips
5x	N		11		0	11	31	14		-	14
	S			7	9	10		-	9	12	13
7x	N		11		0	11		14		-	14
	S			4	6	6		-	4	8	8
601	E		2		2	4		3		3	5
	N		1	1	2	4		1	1	3	5
602	E		5		3	8		7		4	10
	W		2	2	4	8		3	3	5	10
604	E		9		0	9		12		-	12
	W		0	6	8	8		-	8	10	10
605	E		5		3	8		7		4	10
	W		2	2	5	7		3	3	7	9
606	E		4		0	5		5		-	7
	W		0	3	4	4		-	4	5	5
607	E		6		5	28		8		7	36
	W		6	3	7	28		8	4	9	36
608	E		3		0	3		4		-	4
	W		0	2	3	3		-	3	4	4
737	N		3		0	3		4		-	4
	S		0	2	3	3		-	3	4	4
B10	N		10		7	37		13		9	48
	S		6	5	10	32		8	7	13	42
B13	N		5		6	28		7		8	36
	S		6	3	7	27		8	4	9	35
B14	N		8		2	10		10		3	13
	S		2	4	7	11		3	5	9	14
	TOTAL IN		82		28	165		108		38	213
	TOTAL OUT		25	44	75	151		34	58	98	195

\* & \*\*

See Page 3 of Table

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LOCAL LINES - UNION STATION CORRIDOR

LINE	Direction		1977				Total Trips		1990			
			AM Peak Hr.	AM Peak Per.	PM Peak Hr.	PM Peak Per.			AM Peak Hr.	AM Peak Per.	PM Peak Hr.	PM Peak Per.
2	N	} CBD STUB ROUTED	10	9	24	60	.11%	11	10	27	67	
	S		20		10	57		22		11	63	
92	N	} CBD STUB ROUTED	16	6	18	77		18	7	20	86	
	S		19		17	80		21	19	89		
420	E	} CBD THRU ROUTED	10	3	9	40		11	3	10	44	
	W		8		9	40		9	10	44		
422	E		9	6	17	49		10	7	19	54	
	W		14		10	48		16	11	53		
426	E		9	5	12	43		10	6	13	48	
	W		12		9	45		13	10	50		
428	E		8	6	13	41		9	7	14	46	
	W		10		9	43		11	10	48		
432	E	8	3	9	32		9	3	10	36		
	W	8		7	34		9	8	38			
	TOTAL	IN	91	0	71	347		101		79	385	
	TOTAL	OUT	70	38	102	342		78	43	113	361	

LOCAL LINES - CONVENTION CENTER CORRIDOR

26	N	} CBD THRU ROUTED	51		46	188				209
	S		41	18	51	178		20	57	198
49	N	} CBD THRU ROUTED	13		15	61			16	57
	S		12	5	13	50		6	14	56
12	N	} CBD THRU ROUTED	20		14	59			16	66
	S		13	7	20	59		8	22	66
	TOTAL	IN	84		75	298				332
	TOTAL	OUT	66	30	84	287		34	93	320

\* BUS TRIPS INTERCEPTED FOR 20% INTERCEPT PLAN (100% OF SELECTED LINES)

\*\* BUS TRIPS INTERCEPTED FOR ALTERNATE PLAN (50% OF PEAK PERIOD TRIPS ON SELECTED LINES) III-16-

EXPRESS LINES--- UNION STATION CORRIDOR								
LINE	DIRECTION	1977			1990			TOTAL TRIPS
		AM PEAK HOUR PER.	PM PEAK HOUR PER.	TOTAL TRIPS	AM PEAK HOUR PER.	PM PEAK HOUR PER.	TOTAL TRIPS	
480	East	20	10	30	10	10	20	66
	West	21	9	30	27	12	39	69
482	East	10	5	15	10	5	15	18
	West	9	3	12	10	4	14	17
482x	East		2	2		3	3	4
	West	3		3	4		4	4
483-5	North	18	9	27	23	11	34	108
	South	23	11	34	30	14	44	111
484	East	7	5	12	9	7	16	47
	West	10	3	13	21	10	31	47
486	East		3	3		10	10	13
	West	11	2	13	14	8	22	17
487-89-91	North	16	10	26	21	13	34	95
	South	28	17	45	36	22	58	101
488	East	5	4	9	7	5	12	20
	West	10	3	13	13	4	17	17
490	East	5	5	10	7	7	14	41
	West	12	5	17	16	7	23	47
492	East		2	2		3	3	4
	West		1	1		4	4	4
494	North		2	2		3	3	4
	South	3		3	4		4	4
494	East		2	2		3	3	4
	West	9	0	9	4	1	5	4
496	East	3	1	4	4	1	5	10
	West	2	3	5	3	4	7	17
760	East		5	5		9	9	10
	West	9		9	12		12	13
764	East		2	2		5	5	7
	West	5		5	7		7	7
EXPRESS UNION STATION CORRIDOR	TOTAL IN	15	69	84	207	90	297	485
	TOTAL OUT	65	67	153	86	200	286	462

EXPRESS LINES---CONVENTION CENTER CORRIDOR								
5x	North		11		11		14	14
	South		7	9	10		9	12
7x	North		11		11		14	14
	South		4	6	6		4	8
601	East		2	2	4		3	3
	West		1	1	2		1	2
602	East		5	3	8		7	4
	West		2	4	6		3	5
604	East		9	8	17		12	10
	West		5	8	13		8	10
605	East		5	3	8		7	4
	West		2	5	7		3	7
606	East		4		4		5	7
	West		3	4	7		4	5
607	East		6	5	11		8	7
	West		6	7	13		8	9
608	East		3		3		4	4
	West		2	3	5		3	4
737	North		3		3		4	4
	South		2	3	5		3	4
810	North		10	7	17		13	9
	South		6	10	16		8	13
813	North		5	6	11		7	8
	South		3	7	10		4	9
814	North		8	2	10		10	3
	South		2	7	9		3	8
EXPRESS CONVENTION CENTER CORR.	TOTAL IN	82	28	165	108	38	213	213
	TOTAL OUT	25	44	75	34	98	195	195

LOCAL LINES---UNION STATION CORRIDOR								
2	North		10	9	24		11	10
	South		20	10	30		22	11
92	North		16	6	22		18	7
	South		19	17	36		21	19
420	East		10	3	13		11	3
	West		8	9	17		9	10
422	East		9	6	15		10	7
	West		14	10	24		16	11
424	East		9	5	14		10	6
	West		12	9	21		13	10
428	East		8	6	14		9	7
	West		10	9	19		11	10
432	East		8	3	11		9	3
	West		8	7	15		9	8
LOCAL UNION STATION CORRIDOR	TOTAL IN	91	71	347	101	79	365	365
	TOTAL OUT	70	38	102	78	43	361	361

LOCAL LINES---CONVENTION CENTER CORRIDOR								
26	North		51	46	188		57	11
	South		41	18	178		46	20
49	North		13	15	51		14	16
	South		12	5	20		13	6
12	North		20	14	59		22	16
	South		13	7	20		14	8
LOCAL CONVENTION CENTER CORR.	TOTAL IN	84	75	296	93	83	332	332
	TOTAL OUT	66	30	84	73	34	93	320

Bus trips intercepted for 20% intercept plan (100% of Selected Lines)

Bus trips intercepted for alternate plan (50% of Peak Period trips on Selected Lines)

TABLE 2A  
III-17

## G

### METHODOLOGY

#### General

As stated in Section E, any cost savings to the District from DPM operation would arise from fewer buses operated in the CBD. The potential operating savings from bus intercept consist of two components: (1) savings in driver pay and mileage-related maintenance and fuel costs; and (2) any reduction in total buses required.

#### Savings From Reduced Bus Miles and Hours

The difference in route length and estimated trip time between the intercept points of Union Station and Convention Center and the present CBD terminals of the candidate bus lines was multiplied by the number of bus trips intercepted for each bus line. This sum was, in turn, multiplied by the 1978 applicable cost formula of \$.50 per service mile and \$.50 per service minute. This dollar amount is the basis for the estimated potential savings cited in the summary.

#### Savings from Reduced Bus Requirement

As a basis for assessing the impact of DPM-bus intercept upon total buses required, the impact upon two representative lines was reviewed by developing a skeleton schedule (schedule rotation). Based on these sample schedule rotations and considering the general impact of possible reduced running time

upon bus requirements from DPM intercepts, estimates were made of possible reductions in the number of buses for all bus lines intercepted by the DPM (See Table 6).

#### Identification of Specific Bus Routes for Cost Study Purposes Only

As with most other SCRTD bus analysis for DPM planning work, present route configurations, levels of service and patronage were assumed and where required somewhat arbitrarily factored up to represent the 1990 "TSM" expanded service levels. However, the use of these specific bus routes in this analysis should not be construed as identification or recommendation of specific bus lines for intercept treatment. Use of specific lines in this analysis only serves to indicate approximate aggregate levels of service and cost impacts.

Major rerouting proposals involving major restructuring of routes within the CBD are now under study. Furthermore, there could be additional major CBD bus route restructuring between 1978 and the start of DPM service.

#### Express Versus Local Lines for Intercept

Perhaps all lines in the vicinity of Union Station and Convention Center should be considered to be candidates for bus intercept. However, in the DPM patronage estimates to date, the express lines in the two corridors have been assumed to be most susceptible to intercept treatment because these lines were thought

to have more and longer commuter trips. The type of rider making the longer commute is considered to be more attracted to the west side of the CBD, and thus more likely to use the DPM.

For reference purposes, local lines in the two DPM corridors are shown separately on Table 2. Although considered as candidates for interception in the more preliminary stages of the analysis, no local lines are included in this presentation of the analysis findings. The list of local lines in the DPM corridors in Table 2 distinguishes between lines which are routed through the CBD and those which are stub ended. This is a differentiation which would be of importance if these lines were to be seriously considered for interception, since interception of through-routed lines would require major CBD route restructuring. If such lines were intercepted, the other half of any former through route would have to be stub ended or retied to another corridor.

## H

### POTENTIAL REDUCTIONS IN BUS REQUIREMENTS

Bus intercept results in a reduction in the route length of those bus trips intercepted. This, in turn, reduces the running time for those bus trips. Reduced running time, however, does not necessarily result in a need for fewer buses

The number of buses necessary for a line can be computed in two ways, the simplest of which is by the use of the following formula:

$$\frac{\text{Running Time} + \text{Layover Time}}{\text{Headway}} = \text{Buses Required}$$

In order to reduce the buses required, it is necessary to reduce the sum of the running time and layover time sufficiently so that the division of that sum by the headway produces a quotient lower than that of the sum of the original running time and layover time divided by the headway.

The use of the formula results in a comparatively accurate answer when the headways on a line remain fairly constant throughout the day. However, when there are major expansions and contractions between base and peak hour headways, the formula does not produce an accurate result. For such lines (and they constitute the majority of the candidates for interception), the use of another, more involved, method is indicated: the development of a schedule rotation. A schedule rotation is a skeleton bus schedule and its construction is time consuming, as can be

visualized from the inspection of the two sample schedules in Appendix A. Because of the time involved, rotations were completed for only two lines and, from the results of these two lines, rough estimates were made of possible savings in buses from DPM bus intercepts for selected express lines in the two DPM corridors.

Based on the sample schedule rotations, potential reduction in fleet requirements (expressed as a percent of the before-intercept fleet size for a particular line) is shown in Table 3. The greater reductions for the Wilshire route are due to its longer route, compared to the Olive CBD route segment.\*

Immediately below these percentages are percentages based on use of intercepts for midday service only. As noted in Appendix B, only reductions in bus requirements during the peak period reduces the total fleet size requirements. However, the midday figures are included as a frame of reference for the peak period data.

Tables 5 and 6 categorize approaches to bus intercept, assign present routes to those categories, and show estimates of reduced bus requirements. Categories A and D (the 20% Intercept Plan and the Alternate Intercept Plan, respectively) are

\* Both possible bus distance and time-related savings, as well as fleet size reductions from DPM bus intercepts have included Wilshire route segments from busway lines. Since the DPM will not serve these route segments, further analysis may suggest elimination of all or a portion of the trips on these line segments for intercept consideration.

especially noted. The 20% Intercept Plan is the basis for the intercept operating cost saving estimates cited in the summary (Section A). The Alternate Intercept Plan is excluded from the cost saving estimate, but, as noted in Section F, could be considered either a substitute or an addition to the 20% Intercept Plan. From a real-world scheduling standpoint, this list includes possible criteria for a practical approach to full and/or partial interception of selected bus lines in the DPM corridors.

In sum, the analysis indicates that the 20% Intercept Plan, i.e., interception of approximately 20% of all express lines in the two DPM corridors, would require seven\* fewer buses in the peak periods. To make up this 20% trip total, selected peak-period-only bus lines are identified for interception of 100% of their bus trips (see Table 5). As explained elsewhere, distributing the intercepted trips equally among the corridor lines presents insurmountable scheduling problems.

\* Seven fewer buses in the peak period, for 1990 projections.

TABLE 3

DPM INTERCEPT OF BUSWAY LINES

Studied Bus Reduction as  
Percent of Present Buses

<u>Trips Intercepted</u>	<u>Wilshire Route</u>	<u>Olive Route</u>
(From Schedule Rotation shown in Appendix A)		
50% Peak Period	11% Fewer Buses	7% Fewer Buses
100% Peak Period	22% Fewer Buses	15% Fewer Buses
(From Schedule Cycle Equation shown in Appendix B)		
100% Midday Period	27%	11%

A schedule cycle consists of bus running time plus layover time. In order to intercept the percentage of buses listed for interception, it is necessary that a minimum number of buses be scheduled prior to the bus intercept. Table 4 illustrates the minimum fleet size necessary to save one bus at the stated percentage of reduction, assuming the route is to remain the same and that the headway is to be maintained as at present.

TABLE 4

**Minimum Fleet Size Per Bus Line  
Necessary to Save One Bus for Percent Reduction  
in Schedule Cycle**

Bus Reduction Required	4%	5%	6.66%	10%	20%
Minimum Buses Necessary for Such Reduction *	25	20	15	10	5

\* In other words, bus intercept of a bus line that results in a requirement for 20% fewer buses will result in a savings of one bus, only if the line has at least five buses assigned to it. If the route of the line and the headway remain the same, there can be no savings in buses from a reduced requirement for buses in fractions of a bus.

CBD MAP  
OF STUDIED INTERCEPT ROUTES  
(To be completed)

TABLE 5

Designation of Bus Lines  
Studied Categories for DPM Bus Intercept  
Express Lines in DPM Corridors

Categories <sup>1</sup>	1978 ROUTES			1990 EXPANSION OF 1978 ROUTES		
	Convention Center		Union Station	Convention Center		Union Station
	Santa Monica Freeway	Harbor Freeway	Busway	Santa Monica Freeway	Harbor Freeway	Busway
A <sup>2</sup>	604	814	482 486 488 494	604	814	482 486 488 494
B	0	0	0	0	5X <sup>3</sup> 7X <sup>3</sup>	0
C	601 602 605 606 608	5X 7X 737	(489) <sup>4</sup> 492 493 760 764	601 602 605 606 608	737	(489) 492 493 760 764
D <sup>5</sup>	0	0	480 483/485	0	0	480 483/485
E	607	810 813	484 487/491 490 496	607	810 813	484 487/491 490 496
F	A11	A11	A11	A11	A11	A11

- NOTES: 1 - See following page for category definitions.  
 2 - 20% Intercept Plan.  
 3 - With 30% expansion, frequency of service increases approximately to a level which permits 50% intercept under frequency criterion.  
 4 - Operated as part of 487/491 line.  
 5 - Alternate Intercept Plan.

## STUDIED BUS LINE CATEGORIES FOR DPM BUS INTERCEPT

### Category

- |          |   |
|----------|---|
| <b>A</b> | <b>Peak Period Only Lines</b><br>Limited to excellent suburban transfer opportunities<br>Appropriate bus trip volumes to add up to 20% bus intercept<br>of all DPM corridor peak period express service<br>100% intercept of identified lines |
|----------|---|
- B** **Peak Period Only Lines**  
Major lines only, defined as  $\geq 16$  prevailing direction bus  
trips in peak two hours  
50% intercept of identified lines
- C** **Peak Period Only Lines**  
Balance of lines not included in A or B  
100% intercept of identified lines
- D** **Lines with All Day Through Service to CBD**  
Major lines only, defined as  $\geq 16$  prevailing direction bus  
trips in peak two hours  
50% intercept of all identified lines
- E** **Lines with All Day Through Service to CBD**  
Balances of lines not included in D  
50% intercept of all identified lines
- F** **All corridor lines**  
100% intercept all day

TABLE 6

DPM Bus Intercept  
Possible Reduction in Total Buses Required  
Express Buses in DPM Corridors

DPM Corridors	Total Buses <sup>1</sup> Required	A <sup>3</sup>	Intercept Categories <sup>2</sup>					Total all Categories A thru F
			B	C	D <sup>4</sup> 1978	E	F	
Convention Center								
Santa Monica Fwy.	32	1	0	0	0	0	1	1
Harbor Fwy.	43	0	0	0	0	0	4	4
Union Station	<u>150</u>	<u>4</u>	<u>0</u>	<u>4</u>	<u>3</u>	<u>3</u>	<u>5</u>	<u>19</u>
TOTAL . . . . .	225	5	0	4	3	3	10	24

1990 Projected Service Expansion

Convention Center	
Santa Monica Fwy.	1
Harbor Fwy.	1
Union Station	<u>5</u>
TOTAL . . . . .	7

- NOTES: 1 1978 Level of Service  
2 See page 26 for intercept category definitions.  
3 20% Intercept Plan  
4 Alternate Intercept Plan

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## POSSIBLE ADJUSTMENTS TO OPERATING COST SAVINGS ESTIMATES

Introduction

The savings from the interception of 20% of all peak period express lines operating in the DPM Convention Center and Union Station corridors is estimated to be \$390,000. This estimate represents the savings (in 1978 dollars) from service operated at a 30 percent expansion of the present services. There are a number of factors which could increase or decrease the cited potential savings; several of these are discussed below.

Reasons for Possible Increase in Savings

An increase in the use of intercepts of the 20% used in the analysis might occur under a voluntary transfer policy. The amount of bus intercept employed will depend on the volume of passengers choosing to transfer to the DPM. The DPM may turn out to be a strong enough attractor of bus riders to warrant higher percentages of bus intercepts at the Union Station and Convention Center intercept points.

A change in plans used could increase the number of intercepts. Categories of bus services for possible additional intercept treatment are outlined in Section H. The Alternative Intercept Plan (Category D) is flagged for possible further study. This plan involves interception of every other peak period bus trip on major lines which have sufficiently close headways--16 or more

trips in the peak direction during the peak two hours. This level of service is considered necessary in order to maintain reasonable headways for both the intercept and the non-intercept buses.

#### Reasons for Possible Decrease in Savings

Instead of intercepting buses at the DPM terminal stations, the buses might need to be rerouted to other portions of the CBD to balance the service provided to the west side by the DPM. It is expected that this alternative will receive close study as the DPM bus support plan is refined. To the extent this is done, there will be no actual savings in operating cost.

Cost savings estimates include intercept of busway lines which presently operate through the CBD and out Wilshire Boulevard. Since the Wilshire Boulevard route segments are clearly outside the DPM passenger shed area, these lines may be excluded from consideration for intercept treatment. If this is done, it would reduce potential operating cost savings.

The express bus lines in the DPM corridors have a high ratio of peak buses required compared to base buses in the midday. The cost formula employed to figure possible savings used the two variables of bus miles and bus hours with current cost factors, which are based on the system-wide average cost experience. Using the cost formula to estimate operating cost savings from peak-period-only service may be overestimating potential cost

savings due to provisions of the labor contract. This condition is outlined in more detail in Appendix C.

## SCHEDULING PROBLEMS WITH DPM-BUS INTERCEPT

A mixture of intercept and interface trips creates the potential for serious loading imbalances. This condition is exacerbated when only a small proportion of the trips on a line is proposed for intercept and the rest of the trips operate on a through-routed, self-distribution basis. Although the problem applies to both the morning (inbound) and evening (outbound) peak direction trips, it appears to be more severe in the evening.

As one example, consider a commuter bus line at Union Station in the peak period outbound which has 15 minute headways. Presume a 20% intercept rate. Assuming an even passenger accumulation rate in the downtown area and at the station, the intercepted bus is likely to be underloaded, particularly if substantial numbers of passengers continue to use the self-distribution trips. The outbound self-distribution trip buses will arrive already partially loaded at the station while the intercepted bus will arrive empty. Since each of the trips is likely to receive the same number of passengers deboarding from the DPM trains, the self-distributing buses are likely to be overcrowded, while the intercepted bus is likely to be lightly loaded. This situation is illustrated on the following page.

**ILLUSTRATION C UNEVEN LOADING**  
**BETWEEN CBD THROUGH ROUTED BUSES AND INTERCEPT BUSES**  
**EXAMPLE OF PM OUTBOUND**

	<u>PASSENGERS ON BOARD PRIOR TO CBD PICK-UPS</u>	<u>PASSENGERS ACCUMULATED AT PICK-UP POINTS IN CBD FOR LINE X DURING PREVIOUS 15 MINUTES</u>	<u>PASSENGERS ON BOARD FOLLOWING CBD PICK-UPS</u>	<u>PASSENGERS ACCUMULATED AT DPM STATION FOR LINE X DURING PREVIOUS 15 MINUTES</u>	<u>PASSENGERS ON BOARD LEAVING DPM STATION</u>
4:15 Trip		40		10	
4:30 Trip		40		10	
5:00 Trip		40		10	
5:15 Trip		40		10	
5:30 Trip (No CBD pick-up; starts at DPM station.)	Intercepted Trip	40		10	
5:45 Trip		40 + 40*		10**	
6:00 Trip		5 + 40		10 + 10	

\* Maximum of 75 of the waiting 80 passengers could board, leaving 5 to wait for next bus.  
 \*\* These 10 would be unable to board already crowded bus and would need to wait for next bus.

**NOTE:** This chart attempts to illustrate possible or probable uneven passenger loading as a result of bus intercept operation at the intercept terminal. The assumptions include the following: even rate of passenger accumulation on CBD surface portion of through bus routes; even rate of passenger accumulation at the intercept terminal from DPM arriving passengers; and an unwillingness of passengers to wait for uncrowded bus. As a corollary, it can be assumed that the shorter the wait between buses (from shorter headways or time intervals) the more inclined are passengers to avoid boarding crowded buses and wait for comparatively uncrowded buses. Similarly, according to this reasoning, the longer the headway, the greater will be uneven loading between buses.

**APPENDIX A**

**SUPPLEMENTARY (TRIPPER) BUS PRODUCTIVITY COMPARISON  
BETWEEN PRE-INTERCEPT/POST-INTERCEPT BY DPM  
Using Sample Schedule Rotations  
as Expanded (30%) for 1990 TSM**

## HYPOTHETICAL 1990 BUS SCHEDULE

On the following pre- and post-intercept schedule rotations (for Line 482), bus runs numbered higher than 3 are supplementary buses (trippers).

The peak-period, peak-direction service is shown between line ----- and line -----.

Tripper bus runs making a second trip are marked by a star (\*).

PEAK DIRECTION PRODUCTIVITY  
ANALYSIS  
(FOR DPM BUS INTERCEPTS)  
HYPOTHETICAL 1990 BUS SCHEDULE

LINE 482\* \*\*

PRE-INTERCEPT  
Buses Assigned  
AM Base PM Night  
13 3 14 3

POST-INTERCEPT #  
Buses Assigned  
AM Base PM Night  
12 3 13 3

<u>Supplemental Buses</u>	<u>AM PEAK INBOUND</u>		<u>PM PEAK OUTBOUND</u>		<u>AM PEAK INBOUND</u>		<u>PM PEAK OUTBOUND</u>	
	<u>(No. of Buses)</u>	<u>No. of Bus Trips</u>	<u>(No. of Buses)</u>	<u>No. of Bus Trips</u>	<u>(No. of Buses)</u>	<u>No. of Bus Trips</u>	<u>(No. of Buses)</u>	<u>No. of Bus Trip</u>
Bus Trips Orig/Term at Indian Hill 1 trip @ bus	(5)	5	(3)	3	(4)	4	(3)	3
Bus Trips Orig/Term at Diamond Bar 1 trip @ bus	(3)	3	(5)	5	(3)	3	(6)	6
Bus Trips Orig/Term at Indian Hill + 1 Shuttle Trip 1 trip @ bus	(1)	1	(2)	2	(1)	1	(0)	0
Bus Trips Orig/Term at Indian Hill + 2 Shuttle Trips 1 trip @ bus	(0)	0	(1)	1	(0)	0	(1)	1
Bus Trips for Shuttle 1 trip @ bus	(1)	1	(0)	0	(1)	1	(0)	0
	<u>(10)</u>	<u>10</u>	<u>(11)</u>	<u>11</u>	<u>(9)</u>	<u>9</u>	<u>(10)</u>	<u>10</u>

\* Both pre- and post-intercept schedules were based on a 30% expansion of 1978 schedules. About 10 peak-period, peak-direction (6-8 am inbound and 4-6 pm outbound) bus trips are provided, for an average headway of 13 minutes.

\*\*482 Express trips were excluded.

#100% intercept. Pre-intercept line operates into the L.A. CBD (peak and reverse directions) only during the peak periods, for the balance of the schedule the line operates as a suburban shuttle to El Monte.



LINE 482 - Daily

1990  
TSM

Non-Intercept

BUS REQ: 13-3-14-3

Roundtrip (Does not include Line 482X)

Bus Run	Indian Hill Village	Diamond Bar & G. Springs	El Monte Sta.	Term. 28		Term. 28	El Monte Sta.	Diamond Bar & G. Springs	Indian Hill Village	Dep.
4.12							505	550	612	621
5 P9							535	620	642	706
6 P9							605	650	713	731
7 P9							630	716	739	801
8 P9		505	554	622		629	700	747	811	836
1 P9	510	530	619	649		659	730	817	841	906
9 P9		545	634	700-Ven.						P9
10 P9	540	600	651	719		729	800	847	911	P9
2 P9		609	703	733		759	830	917	941	1006
11 P9	559	621	715	743-Ven.						P9
12 P9		633	727	755-Ven.						P9
4	621	643	739	808-Ven.						P9
13 P9		655	751	811-Ven.						P9
3 P9	645	709	805	838		859	930	1017	1041	1106
5	706	730	824	852-Ven.						P9
6	731	755	846	914-Ven.						P9
7	801	825	914							P9
8	836	900	947							P9
1	906	930	1017				1030	1120	1144	1206
2	1006	1030	1117				1130	1223	1248	106
3	1106	1130	1217				1230	124	149	206
1	1206	1230	117				130	228	253	302
2	106	130	217				230	328	353	419
3	206	230	317				323	421	446	454
4 P9						330	405	505	528	540
5 P9						346	423	523	546	611
6 P9						358	435	535		P9
7 P9						410	447	547		P9
8 P9						422	459	559	620	641
9 P9	232	257	351	422		434	511	609		P9
10 P9						445	522	621	641	P9
11 P9						456	533	630		P9
1	302	327	421	452		507	544	640		P9

LINE 482 - Daily  
Cont'd.

1990  
TSM Non-Intercept

Bus Run	Indian Hill Village	Diamond Bar & G. Springs	El Monte Sta	Term. 28	Term. 28	El Monte Sta.	Diamond Bar & G. Springs	Indian Hill Village	Dep.
12 P <sub>9</sub>					519	556	649	709	P <sub>9</sub>
13 P <sub>9</sub>	334	359	453	524	535	608	701		P <sub>9</sub>
14 P <sub>9</sub>	354	419	513	544	555	628	719	738	741
2	419	444	538	609	615	648	737		P <sub>9</sub>
3	454	518	610						P <sub>9</sub>
4	540	604	654			720	808	827	841
5	611	634	722						P <sub>9</sub>
8	641	702	748			820	908	927	941
14	741	800	844			920	1008	1027	1041
4	841	900	944			1020	1108	1127	P <sub>9</sub>
8	941	1000	1044						P <sub>9</sub>
14	1041	1100	1144						P <sub>9</sub>

RTD BY-81  
REV. 8/68

LINE 482 - Daily

1990  
TSM

WITH INTERCEPT

BUS REQ: 12-3-13-3

Roundtrip

(Does not include Line 482x)

100% INTERCEPT  
AT UNION STA

BUS Run	Indian Hill Village	Diamond Bar & G. Springs	El Monte Sta.	Union Sta.		Union Sta.	El Monte Sta.	Diamond Bar & G. Springs	Indian Hill Village	Dep
1 P <sub>2</sub>		510	559	615	(ok. Diamond Bar 655)					
4 P <sub>2</sub>						505	550	612	621	
5 P <sub>2</sub>						530	615	637	645	
2 P <sub>2</sub>						605	650	713	731	
6 P <sub>2</sub>						630	716	739	801	
7 P <sub>2</sub>	510	530	619	635	644	700	747	811	836	
8 P <sub>2</sub>		545	634	650						P <sub>2</sub>
3 P <sub>2</sub>	540	600	651	707	714	730	817	841	906	
9 P <sub>2</sub>		609	703	719						P <sub>2</sub>
10 P <sub>2</sub>	559	621	715	731	744	800	847	911		P <sub>2</sub>
11 P <sub>2</sub>		633	727	743						P <sub>2</sub>
4	621	643	739	755						P <sub>2</sub>
1		655	751	807	814	830	917	941	1006	
5	645	709	805	821						P <sub>2</sub>
12 P <sub>2</sub>	706	730	824	840						P <sub>2</sub>
2	731	755	846	902	914	930	1017	1041	1106	
6	801	825	914							P <sub>2</sub>
7	836	900	947							P <sub>2</sub>
3	906	930	1017			1030	1120	1144	1206	
1	1006	1030	1117			1130	1223	1248	106	
2	1106	1130	1217			1230	124	149	206	
3	1206	1230	117			130	228	253	304	
1	106	130	217			230	328	353	432	
2	206	230	321			330	431	456	508	
4 P <sub>2</sub>						349	405	505	528	540
5 P <sub>2</sub>						407	423	523	546	611
6 P <sub>2</sub>	232	257	351	407		419	435	535		P <sub>2</sub>
7 P <sub>2</sub>						431	447	547		P <sub>2</sub>
3	302	327	421	437		443	459	559	620	641
8 P <sub>2</sub>						455	511	609		P <sub>2</sub>
9 P <sub>2</sub>						506	522	621	641	P <sub>2</sub>
10 P <sub>2</sub>						517	533	630		P <sub>2</sub>
11 P <sub>2</sub>	334	359	453	509		528	544	640		P <sub>2</sub>
12 P <sub>2</sub>						540	556	649	709	P <sub>2</sub>

Line 482 - Daily Cont'd.

WITH INTERCEPT

Bus Run	Indian Hill Village	Diamond Bar & G. Springs	El Monte Sta.	Union Sta.		Union Sta.	El Monte Sta.	Diamond Bar & G. Springs	Indian Hill Village	Dep
13 <sup>15</sup>	404	429	522	538		554	608	701		PS
1	432	457	550	606		612	628	719	738	741
2	508	532	624				648	737		PS
4	540	604	654				720	808	827	841
5	611	634	722							PS
3*	641	702	748				820	908	927	941
1*	741	800	844				920	1008	1027	1041
4	841	900	944				1020	1108	1127	PS
3	941	1000	1044							PS
1	1041	1100	1144							PS

## HYPOTHETICAL 1990 BUS SCHEDULE

On the following pre- and post-intercept schedule rotations (for Line 480), bus runs numbered higher than 14 are supplementary buses (trippers).

The peak-period, peak-direction service is shown between line ----- and line -----.

Tripper bus runs making a second trip are marked by a star (\*).

PEAK DIRECTION PRODUCTIVITY  
ANALYSIS  
(FOR DPM BUS INTERCEPTS)  
HYPOTHETICAL 1990 BUS SCHEDULE

LINE 480\*

PRE-INTERCEPT  
Buses Assigned  
AM Base PM Night  
26 14 26 7

POST-INTERCEPT #  
Buses Assigned  
AM Base PM Night  
23 14 23 7

and PM Peak Direction Analysis

<u>Supplemental Buses</u>	<u>AM PEAK INBOUND</u>		<u>PM PEAK OUTBOUND</u>		<u>AM PEAK INBOUND</u>		<u>PM PEAK OUTBOUND</u>	
	(No. of Buses)	No. of Bus Trips	(No. of Buses)	No. of Bus Trips	(No. of Buses)	No. of Bus Trips	(No. of Buses)	No. of Bus Trips
s Trips Orig/Term at Indian Hill								
1 trip @ bus	(1)	1	(1)	1	(2)	2	(2)	2
2 trips @ bus	(0)	0	(0)	0	(0)	0	(1)	2
s Trips Orig/Term at Eastland								
1 trip @ bus	(11)	11	(9)	9	(4)	4	(2)	2
2 trips @ bus	(0)	0	(2)	4	(2)	4	(4)	8
mbined bus trip Orig/Term at Indian Hill plus trip orig/term at Eastland	(0)	0	(0)	0	(1)	2	(0)	0
	<u>(12)</u>	<u>12</u>	<u>(12)</u>	<u>14</u>	<u>(9)</u>	<u>12</u>	<u>(9)</u>	<u>14</u>

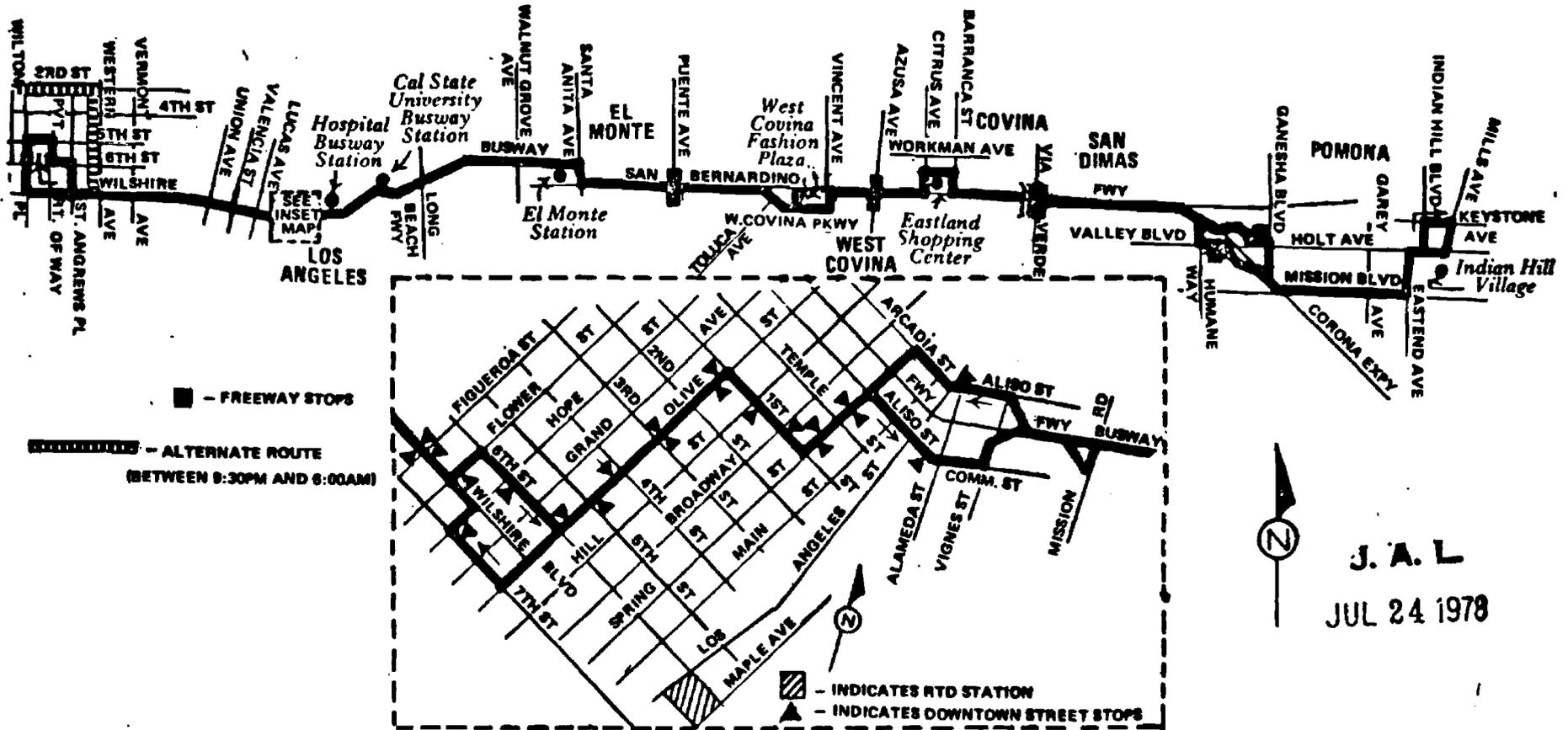
Both pre- and post-intercept schedules were based on a 30% expansion of 1978 schedules. About 20 peak-period, peak-direction (6-8 am inbound and 4-6 pm outbound) bus trips are provided for an average headway of six minutes for each two hour period.

0% intercept of peak-period, peak-direction bus trips. Both pre-intercept and post-intercept this line operates into the CBD all day.

Planning  
GM:drd 9-26-78

# SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

## LINE 480



Effective October 16, 1977

**J. A. L**  
**JUL 24 1978**

Div. 9

LINE 480

1990 Schedule TSM

NON-INTERCEPT

BUS REQ: 26-14-26-7

Roundtrip

BUS Run		Holt Indian Hill	Eastland Center	El Monte Sta.	6th Priv. Rt. of Way	6th Priv. Rt. of Way	El Monte Sta.	Eastland Center	Holt Indian Hill	DEP
14	P9 (512)						517	536	604	620
1	P9 (511)						537	556	624	634
2	P9 (551)						555	614	642	648
3	P9 (608)						612	631	659	706
4	P9 (622)						627	646	714	724
5	P9 (426)		446	508	548	600	642	701	729	742
6	P9 (441)		501	523	603	615	657	716	744	800
7	P9 (856)		516	538	618	630	712	731	759	815
8	P9 (428)	503	531	553	633	645	727	746	814	830
9	P9 (526)		546	608	648	700	742	801	829	845
10	P9 (538)		558	620	700	715	757	816	844	900
15	P9 (859)	534	606	630	713					O/R (804)
11	P9 (853)		613	637	720	730	812	831	859	915
12	P9 (512)	547	619	642	726	745	827	846	914	930
16	P9 (655)		625	649	732					O/R (821)
17	P9 (611)		631	655	738					P9 (812)
13	P9 (529)	604	636	700	743	800	842	901	929	945
18	P9 (622)		642	706	749					P9 (629)
19	P9 (628)		648	712	755					P9 (835)
14		620	652	716	759	815	857	916	944	1000
20	P9 (627)		657	721	804					P9 (844)
21	P9 (642)		702	726	809					P9 (849)
1		634	706	730	813	830	912	931	959	1015
22	P9 (651)		711	735	818					P9 (858)
23	P9 (656)		716	740	823					P9 (503)
2		648	720	744	827	845	927	946	1014	1030
24	P9 (706)		726	750	833					P9 (913)
25	P9 (713)		733	757	838					P9 (918)
3		706	738	801	841	902	944	1003	1031	1045
26	P9 (726)		746	809	849					P9 (929)
4		724	754	817	857	918	1000	1019	1047	1100
15*			804	826	906					P9 (946)
5		742	812	835	915	933	1015	1034	1102	1115
16*			821	844	924					P9 (1015)

Bus Run		Holt Indian Hill	Eastland Center	El Monte Sta.	6th Priv. Rt. of Way	6th Priv. Rt. of Way	El Monte Sta.	Eastland Center	Holt Indian Hill	Dep
6		800	830	853	933	948	1030	1049	1117	1130
7		815	845	908	948	1003	1045	1104	1132	1145
8		830	900	923	1003	1018	1100	1119	1147	1200
9		845	915	938	1018	1033	1115	1134	1202	1215
10		900	930	953	1033	1048	1130	1149	1217	1230
11		915	945	1008	1048	1103	1145	1204	1232	1245
12		930	1000	1023	1103	1118	1200	1219	1247	100
13		945	1015	1038	1118	1133	1215	1234	102	115
14		1000	1030	1053	1133	1148	1230	1249	117	130
1		1015	1045	1108	1148	1203	1245	107	136	145
2		1030	1100	1123	1203	1218	100	122	151	200
3		1045	1115	1138	1218	1233	115	137	206	215
4		1100	1130	1153	1233	1248	130	152	221	230
5		1115	1145	1208	1248	103	145	207	236	245
6		1130	1200	1223	103	118	200	222	251	300
7		1145	1215	1238	118	133	215	237	306	315
8		1200	1230	1253	133	148	230	252	321	330
9		1215	1245	108	148	203	245	307	336	345
10		1230	100	123	203	218	300	322	351	400
11		1245	115	138	218	233	315	337	406	415
12		100	130	133	233	248	330	352	421	430
13		115	145	208	248	303	349	412	441	445
14		130	200	223	303	315	401	424	453	500
1		145	214	237	316	327	413	436	507	517
15	P9 (357)					337	423	446	517	535
2		200	229	252	331	347	433	456	527	P9 (557)
16	P9 (314)					354	444	508		PK (557)
17	P9 (320)					400	450	514	545	555
3		215	244	307	346	406	456	520	551	P9 (621)
18	P9 (331)					411	501	525		PK (627)
4		230	259	322	401	416	506	530	601	615
19	P9 (313)					423	513	537		P9 (552)
5		245	314	337	416	429	519	543	614	P9 (644)
20	P9 (354)					434	524	548		P9 (603)
21	P9 (401)				III=47	441	531	555		P9 (610)

Bus Run		Holt Indian Hill	Eastland Center	El Monte Sta.	6th Priv. Rt. of Way	6th Priv. Rt. of Way	El Monte Sta.	Eastland Center	Holt Indian Hill	Dep
6		300	329	352	435	447	537	601	632	645
22	PS (412)					452	542	606		PS (621)
23	PS (419)					459	549	613		PS (628)
7		315	344	407	450	505	554	618	649	PS (719)
24	PS (420)					510	556	620		PS (635)
8		330	359	422	505	517	603	627	658	715
25	PS (410)					524	608	631		PS (646)
5		345	414	437	520	530	613	636	707	PS (737)
26	PS (459)					539	622	645		PS (700)
10		400	429	452	535	548	631	654	723	745
16*						557	640	703		PS (718)
11		415	444	507	550	607	650	713	742	PS (812)
12		430	459	522	605	617	700	723	750	815
18*						627	708	727		PS (742)
13		445	514	537	620	642	723	743	810	PS (840)
14		500	529	552	635	707	748	807	834	845
1		517	546	609	652	730	811	830	857	915
15		535	604	627	710					PS (750)
17		555	622	646	725					PS (805)
4		615	642	706	745	800	841	900	927	1000
6		645	712	736	815	830	911	930	957	PS (1027)
8		715	742	803	842	900	941	1000	1027	1100
10		745	812	833	912	930	1011	1030	1057	PS (1127)
12		815	842	903	942	1010	1051	1110	1137	1200
14		845	912	933	1012					PS (1052)
1		915	942	1003	1042	1055	1136	1155	1222	100
4		1000	1027	1048	1127	1155	1236	1255	122	200
8		1100	1127	1148	1227	1255	136	155	222	300
12		1200	1227	1248	127	155	236	255	322	PS (352)
1		100	127	148	227	255	336	355	422	430
4		200	227	248	327	355	436	455	522	PS (552)
8		300	327	348	427	455	536			PS (538)
1		430	457	518						PS (520)

LINE 480

1990 Schedule TSM  
do not interrupt during  
peaks at Union Sta.

WITH - INTERCEPT

BUS REQ: 22-14-23-7

Westbound

Bus Run		Holt Indian Hill	Eastland Center	El Monte Sta.	Union Sta.	6th Ave. Rt. of Way			Dep
4	P9 (426)		446	508	520	548			600
5	P9 (441)		501	523	535	603			615
6	P9 (454)		516	538	550	618			630
7	P9 (476)	503	531	553	605	633			645
8	P9 (524)		546	608	620	648			700
14	P9 (638)		558	620	632			o/r (711)	
10	P9 (455)	534	606	630	642	713			730
15	P9 (553)		613	637	649			o/r (726)	
11	P9 (512)	547	619	642	654	726			745
16	P9 (605)		625	649	701			o/r (733)	
17	P9 (611)		631	655	707	738			P9 (818)
2	P9 (529)	604	636	700	712			o/r (744)	
12	P9 (622)		642	706	718	749			800
3	P9 (628)		648	712	724			o/r (804)	
13		620	652	716	728	759			815
18	P9 (622)		657	721	733				P9 (746)
19	P9 (627)		702	726	738	809			P9 (845)
20		634	706	730	742			o/r (821)	
14			711	735	747	818			830
21	P9 (656)		716	740	752				P9 (807)
1		648	720	744	756	827			845
15*			726	750	802				P9 (817)
16*			733	757	809	838			P9 (918)
22		706	738	801	813				P9 (825)
2			746	809	821	849			902
23		724	754	817	829				P9 (806)
3			804	826	838	906			913
4		742	812	835	847	915			933
20*			821	844	856				P9 (811)
5		800	830	853	905	933			945
6		815	845	908	930	948			1003
7		830	900	923	945	1003			1018
8		845	915	938	1000	1018			1033
9		900	930	953	1015	1033			1048
F5	9-6-78								

Line 480

Westbound (Cont'd.)

Bus Run	Holt Indian Hill	Eastland Center	El Monte Sta	Union Sta.	6th Prr. Rt of Way	Dep
10	915	945	1008	1020	1048	1103
11	930	1000	1023	1035	1103	1118
12	945	1015	1038	1050	1118	1133
13	1000	1030	1053	1105	1133	1148
14	1015	1045	1108	1120	1148	1203
1	1030	1100	1123	1135	1203	1218
2	1045	1115	1138	1150	1218	1233
3	1100	1130	1153	1205	1233	1248
4	1115	1145	1208	1220	1248	103
5	1130	1200	1223	1235	103	118
6	1145	1215	1238	1250	118	133
7	1200	1230	1253	105	133	148
8	1215	1245	108	120	148	203
9	1230	100	123	135	203	215
10	1245	115	138	150	218	233
11	100	130	153	205	233	248
12	115	145	208	220	248	303
13	130	200	223	235	303	315
14	145	214	237	249	316	327
1	200	229	252	304	331	347
2	215	244	307	319	346	406
3	230	259	322	334	401	416
4	245	314	337	349	416	429
5	300	325	352	404	435	452
6	315	344	409	419	450	505
7	330	359	422	434	505	517
8	345	414	437	449	520	530
9	400	429	452	504	535	548
10	415	444	507	519	550	607
11	430	459	522	534	605	617
12	445	514	537	549	620	642
13	500	529	552	604	635	PS (715)
14	517	546	609	621	652	707
1	535	604	627	639	710	730

Line 480

Westbound (Cont'd.)

Bus Run	Holt Indian Hill	Eastland Center	El Monte Sta.	Union Sta.	6th Priv. Rt. of Way	Dep
17	555	622	646	658	725	P9 (805)
2	615	642	706	718	745	800
22	645	712	736	748	815	830
7	715	742	803	815	842	900
9	745	812	833	845	912	930
10	815	842	903	915	942	1010
14	845	912	933	945	1012	P9 (1052)
1	915	942	1003	1015	1042	1055
2	1000	1027	1048	1100	1127	1155
7	1100	1127	1148	1200	1227	1255
10	1200	1227	1248	100	127	155
1	100	127	148	200	227	255
2	200	227	248	300	327	355
7	300	327	348	400	427	455
1	430	457	518			P9 (520)

# LINE 480

1950 Schedule TSM  
50% intercept during  
peaks at Union Sta.

## WITH-INTERCEPT

BUS REQ: 22-14-23-7

Eastbound

Bus Run	6th Priv. Rt. of Way	Union Sta.	El Monte Sta.	Eastland Ctr.	Holt Hill	Dep	
13	P9 (513)		517	536	604	620	
20	P9 (534)		537	556	624	634	
1	P9 (551)		555	614	642	648	
22	P9 (600)		612	631	659	706	
23	P9 (623)		627	646	714	724	
4		600	630	642	701	729	742
5		615	645	657	716	744	800
6		630	700	712	731	759	815
7		645	715	727	746	814	830
8		700	730	742	801	829	845
9	P9 (711)	715	745	757	816	844	900
10		730	800	812	831	859	915
11		745	815	827	846	914	930
12		800	830	842	901	929	945
13		815	845	857	916	944	1000
14		830	900	912	931	959	1015
1		845	915	927	946	1014	1030
2		902	932	944	1003	1031	1045
3		918	948	1000	1019	1047	1100
4		933	1003	1015	1034	1102	1115
5		948	1018	1030	1049	1117	1130
6		1003	1033	1045	1104	1132	1145
7		1018	1048	1100	1119	1147	1200
8		1033	1103	1115	1134	1202	1215
9		1048	1118	1130	1149	1217	1230
10		1103	1133	1145	1204	1232	1245
11		1118	1148	1200	1215	1247	100
12		1133	1203	1215	1234	102	115
13		1148	1218	1230	1249	117	130
14		1203	1233	1245	104	132	145
1		1218	1248	100	119	147	200
2		1233	103	115	134	202	215
3		1248	118	130	149	217	230
4		103	133	145	204	232	245

FS 9-6-78

III-52

Line 480

Eastbound (Cont'd.)

Bus Run		6th Priv. Rt. of Way	Union Sta.	El Monte Sta.	Eastland Ctr.	Holt Indian Hill			Dep
5		118	148	200	222	251			300
6		133	203	215	237	306			315
7		148	218	230	252	321			330
8		203	233	245	307	336			345
9		218	248	300	322	351			400
10		233	303	315	337	406			415
11		248	318	330	352	421			430
12		303	337	349	412	441			445
13		315	349	401	424	453			500
14		327	401	413	436	507			517
15	PS (356)		411	423	446	517			PS (547)
1		347	421	433	456	527			535
16	PS (314)	354	432	444	508		O/R (507)		
17	PS (423)		438	450	514	545			555
2		406	444	456	520	551			615
18	PS (434)		449	501	525		O/R (556)		
3		416	454	506	530	601			PS (631)
19	PS (416)		501	513	537		O/R (610)		
4		429	507	515	543	614			PS (644)
20	PS (457)		512	524	548		O/R (629)		
21	PS (401)	441	519	531	555				PS (610)
22	PS (510)		525	537	601	632			645
5		452	530	542	606		O/R (658)		
23	PS (522)		537	549	613				PS (628)
6		505	542	554	618	649			PS (719)
16*			547	559	623				PS (679)
7		517	551	603	627	658			715
18*			556	608	631				PS (646)
8		530	601	613	636	707			PS (737)
19*			610	622	645				PS (700)
9		548	619	631	654	723			745
20*			629	641	704				PS (719)
10		607	638	650	713	742			815
11		617	648	700	723				PS (735)
FS	9-6-78								

Line 480

Eastbound (Cont'd.)

Bus Run	6th Priv Rt. of Way	Union Sta.	El Monte Sta.	Eastland Ctr.	Holt Indian Hill	Dep
5		656	708	727		PS (742)
12	642	711	723	743	810	PS (840)
14	707	736	748	807	834	845
1	730	759	811	830	857	915
2	800	829	841	900	927	1000
22*	830	859	911	930	957	PS (1027)
7	900	929	941	1000	1027	1100
9	930	959	1011	1030	1057	PS (1127)
10	1010	1039	1051	1110	1137	1200
1	1055	1124	1136	1155	1222	100
2	1155	1224	1236	1255	122	200
7	1255	124	136	155	222	300
10	155	224	236	255	322	PS (352)
1	255	324	336	355	422	430
2	355	424	436	455	522	PS (552)
7	455	524	536			PS (530)

## APPENDIX B

### Midday Schedule Cycle Illustration: With and Without Intercept

Bus intercept results in reduction in route length (and, therefore, running time) for the bus trips involved. Depending on the amount of reduction to the total schedule cycle time (running time plus layover time) fewer buses may be required to operate at the same headway. This mathematical relationship, of course, applies to both peak and off-peak schedule cycle times. Reductions in the total fleet size requirements only result from reductions in bus requirements during the peak period, however, since this is the period which determines the line's bus requirements.

An even level of service is one which has little change in headways. This type of service occurs all day on light patronage lines but only during midday on heavy patronage lines. Such an even level of service allows use of the simple mathematical schedule cycle equation to determine impacts on bus requirements from use of bus intercepts. To illustrate this point, the bus requirement for two candidate lines for DPM intercept is shown on the following page for midday service only.

SCHEDULE CYCLE EQUATION

1. (EQUATION FOR DETERMINING REQUIRED BUSES)

$$\frac{\text{Running Time (RT)} + \text{Layover (LO)}}{\text{Headway (H)}} = \text{Required Buses (B)}$$

1978 Midday Service

1978 Midday Service with 100%  
DPM Bus Intercept at Union Station

EXAMPLE OF BUS LINE 480

2. (Busway Line Serving CBD Route via Wilshire to Pomona)

$$\frac{182 \text{ min. (RT)} + 38 \text{ min. (LO)}}{20 \text{ min. (H)}} = 11 \text{ (B)}$$

$$\frac{127 \text{ min. (RT)} + 33 \text{ min. (LO)}}{20 \text{ min. (H)}} = 8 \text{ (B)}$$

3.

EXAMPLE OF BUS LINE 482

(Busway Line Serving CBD route via Olive St. to Pomona-Ontario Airport)

CBD-Ontario

$$\frac{246 \text{ min. (RT)} + 54 \text{ min. (LO)}}{60 \text{ min. (H)}^*} = 5 \text{ (B)}$$

$$\frac{214 \text{ min. (RT)} + 26 \text{ min. (LO)}^{**}}{60 \text{ min. (H)}^*} = 4 \text{ (B)}$$

CBD-Pomona Shortline

$$\frac{202 \text{ min. (RT)} + 38 \text{ min. (LO)}}{60 \text{ min. (H)}^*} = 4 \text{ (B)}$$

$$\frac{170 \text{ min. (RT)} + 70 \text{ min. (LO)}^{**}}{60 \text{ min. (H)}^*} = 4 \text{ (B)}$$

9 (B)

8 (B)

\* Dovetailed headway on common portion of route is 30 minutes; 60 minute headway applies to portion of route applicable to individual routing.

\*\* This particular midday schedule cycle, with intercept, results in a critically low amount of layover for through route, when recovery time for unscheduled traffic delays is considered. Also, excessive amount of layover occurs in the shortline route. Either a shortening or lengthening of this alternate route is indicated, assuming no change in policy headway of 60 minutes on each branch of 482.

## APPENDIX C

### Possible Overstatement of Cost Savings Due to Labor Contract

Estimates of savings attributed to reduced driver pay costs resulting from bus intercept may be overstated. As outlined in the methodology section, the 1978 standard operating cost formula (\$.50 per service mile and \$.50 per service minute) was employed to estimate cost savings from shortening the lines from their present CBD terminals to the point of the DPM intercept.. Many split work runs are employed by SCRTD because of the big difference in demand for service between peak and off-peak. According to the present labor contract, a percentage of the work runs in the system can be split, with an unpaid work break in the middle of the work run. This arrangement saves on the number of drivers required by the District. Regular drivers are guaranteed a minimum of 8 hours pay within a spread of 10 hours each day; extra board drivers are guaranteed 8 hours pay within a spread of 11 hours each day.

The bus trips intercepted by the DPM will result in a reduction in the bus trip time. Because of the 8-hour guaranteed pay provision in the labor contract, however, this may result in little or no reduction in the total pay for the drivers working split runs. Bus intercepts would result in a reduced running time, which, in turn, would result in a shorter schedule

cycle. A shorter schedule cycle will mean some reduction in total drivers required. However, all the drivers required for the peak period must be paid a full day's salary.

This issue can be described in another way. Bus intercept for split work runs (i.e., driver assignments or work pieces) will result in less platform time (i.e., time spent driving the bus) but this reduced driving time occurs at the end of the morning peak period and at the beginning of the evening peak period. This is referred to as "inside spread time" because the time not worked is inside of the split runs within the 10 or 11-hour spread of work time, and as such, there may be no driver pay savings by reducing the driving time. This is a generalization and actual savings vary significantly, depending upon how the driver's work runs are cut for a particular bus schedule.

DPM-BUS INTERCEPT OPERATING  
COST ASSESSMENT

ACKNOWLEDGMENTS

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CBD BUS PLAN FOR DPM  
CHAPTER IV DRAFT  
BUS OPERATION CONCEPTS AND  
SPECIFIC SERVICE AT DPM TERMINAL  
STATIONS AND VICINITIES

RTD Planning Department  
April 1981

LOS ANGELES CENTRAL BUSINESS DISTRICT (CBD)  
BUS PLAN FOR DOWNTOWN PEOPLE MOVER (DPM)

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IV. BUS OPERATION CONCEPTS AND SPECIFIC SERVICE  
AT DPM TERMINAL STATIONS AND VICINITIES

A. INTRODUCTION

The Downtown People Mover (DPM) will operate between terminal stations located at Union Station and Convention Center and will be routed through the west side of the Los Angeles Central Business District. These two DPM terminals are expected to handle the following types of buses-DPM connections:

- a. Through and intercept Busway and Freeway Express lines.\*
- b. Surface lines terminating at the station.
- c. Through-routed surface bus lines with adjacent on-street bus stop location(s).

Preliminary bus planning evaluations in and around these two sites have been conducted to show how bus service will support and be coordinated with the DPM. The conclusions presented here are the results of this analysis. They will form the background and basis for input to future bus planning in these areas, and will also be used as input for future facilities' design analyses.

The focus of the study is directed at the Union Station Transportation Center since this terminal is expected to provide services to a larger number of vehicles and passengers than the Convention Center terminal. Many concepts and bus services, however, discussed in the first section can be applied to the second one.

\* See Section e. for definition and discussion of through and intercept bus operation concepts. A lesser amount of local lines may also be intercepted by the two DPM terminals.

UNION STATION TRANSPORTATION CENTER  
PRESENT AND FUTURE BUS SERVICE ANALYSIS

B. UNION STATION TRANSPORTATION CENTER

1. PRESENT AND FUTURE BUS SERVICE

Union Station DPM terminal is considered as a transportation center because it is planned to serve a variety of transportation modes. The existing and future planned modes which are expected to interface at the terminal include: railroad trains, freeway express and local bus lines; DPM; and Wilshire Corridor Starter Rail Line (i.e. the rapid transit subway line under Wilshire Boulevard). In addition the requirements for regional parkers using the planned garage and walk-ins must be integrated into the design of the terminal.

With such a variety of transportation elements to plan for the District will be faced with the challenge of providing bus service which combines maximum passenger convenience to these other modes with an efficient and convenient bus operation.

a. Ridership and Service Forecasts

For CBD bus planning, projected growth in public transit ridership through 1990 is based on CBD employment growth projections, expected transit policy decisions, past CBD ridership trends and projected stimulated ridership by the completion of the Wilshire Corridor Starter Line and to a lesser extent by the gradually expanding network of express bus services.

During 1978, approximately 200,000 people were employed in the CBD. Based on current interagency consensus, by 1990 CBD employment is projected to grow by 15% and reach 230,000 workers. For bus planning purposes, it is further anticipated that increases in 1990 bus patronage will also be 15% greater than 1978. This increase will be achieved through a combination of an 11% ridership growth on local bus lines and of a 30% ridership growth on express bus lines.

Proportionally higher growth of express compared to the higher proportional growth of local services has been projected because, in general, long range transit improvement plans have placed more emphasis on increases to the former service rather than the latter. In addition, recent past experience seems to indicate that the steadily worsening energy situation affects longer-distance commuting more and thus will cause relatively larger increases in ridership on express lines than on local lines.

Another reason for projection of higher rates of ridership increases for express service is that presently public transportation attracts a much

smaller proportion of these trips. Thus a general switch to transit from the private auto will result in higher percentage increases in express compared to local ridership.

Another ridership factor is the planned construction of the Wilshire Corridor Starter Line. This will substantially reduce travelling time to the CBD for this corridor and accordingly will stimulate more feeder bus ridership. The El Monte Busway lines will serve as a long feeder line to the Rail Line. To a lesser extent, this will also occur with those Macy Street local bus lines which serve the East Los Angeles and the San Gabriel Valley areas.

In the last several years, public transit ridership into the Los Angeles CBD has increased at a faster rate compared to the growth in CBD employment. For all of these reasons, it appears likely that CBD directed ridership will increase higher than the anticipated 15% between 1978 and 1990. Therefore, the ten year growth projection of 11% for local lines and 30% for express lines used for this CBD bus planning work is considered conservatively low.

Lastly, with respect to the 1990 local lines terminating at or passing by Union Station, it is suggested that the increase in ridership and, in

turn, in bus trips will actually be in the range of 10% - 30%, even though only 11% has been projected.

b. Current Bus Service and Ridership

As stated in the Introduction, there are three basic types of bus service which do now and will in the future serve Union Station Transportation Center:

1. Busway Service

(a) Some routes will connect with DPM and Wilshire Rail Station with bus routes through-routed into the CBD.

(b) Some routes will connect with DPM and Wilshire Rail Station with bus routes intercepted. (This means buses terminate at DPM and Rail Station).

2. Terminating Surface Bus Lines

- These lines terminate at Union Station in off-street facility (may or may not be included inside transportation center garage).\*

3. Through Routed Surface Bus Lines

- These lines operate on Macy Street and will use an on-street bus stop adjacent to off-street terminal.

\* But see next page. some local lines may also be intercepted.

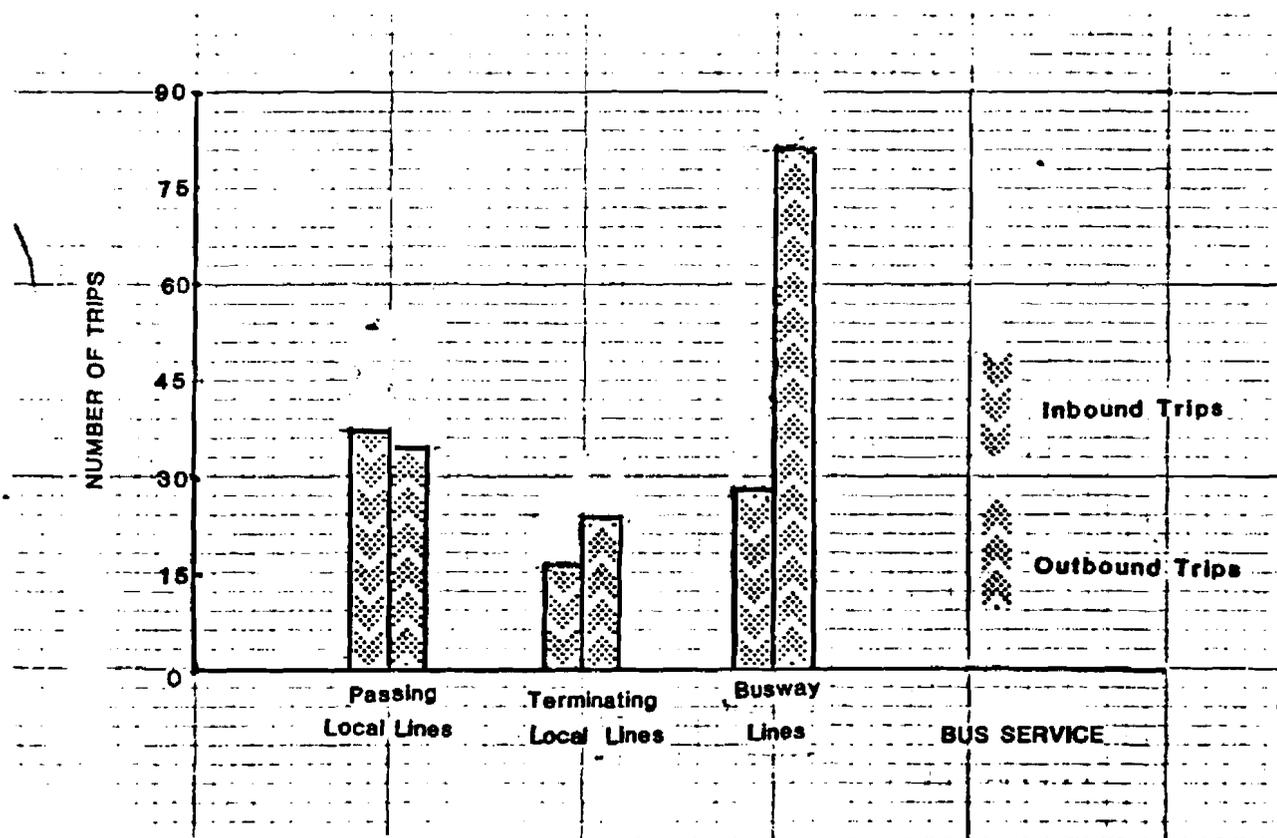
All bus services discussed above are in need of either on-street or off-street loading and unloading space. Additionally, layover space will be required for the terminating lines. It is not requested that the considerable bus layover requirement in the vicinity of Union Station be included within the parking garage and intermodal transfer building. However, it is very important that this bus parking requirement be provided in close proximity to the new terminal/garage transportation center building. Without adequate bus parking, additional running time is required which in turn adds to driver pay costs, mileage costs and requires additional buses. For major bus lines with frequent service, these additional costs per bus line can be substantial.

The data section of this study contains information regarding current and projected bus trips, ridership and layover requirements for each bus service type.

Surface bus lines data shown in the tables refer only to lines terminating at Union Station after they complete distribution in the CBD. However, some local lines may terminate (i.e. be intercepted) at Union Station coming from an easterly direction. That is, in addition to lines from the South Central and Western sections, terminating at Union Station, lines from the East Los Angeles and San Gabriel Valley sector may also be intercepted, depending on riders' CBD destinations.

Documentation of the present level of service to and passing by Union Station is shown in Table 1. in which the present PM peak hour bus trips are broken down between passing local lines, terminating local lines and Busway lines.

TABLE 1.  
EXISTING LINES\* - P.M. PEAK BUS TRIPS (4:15PM-5:15PM) AT UNION STATION



\* For service in effect

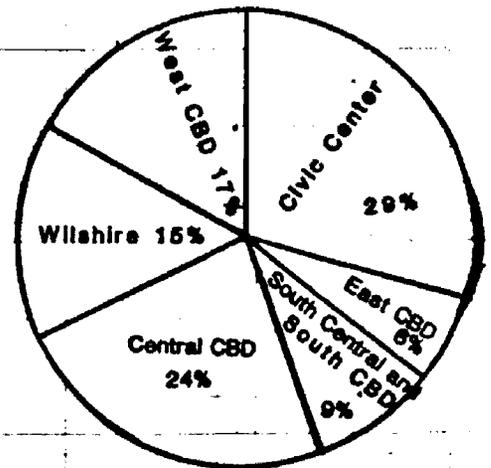
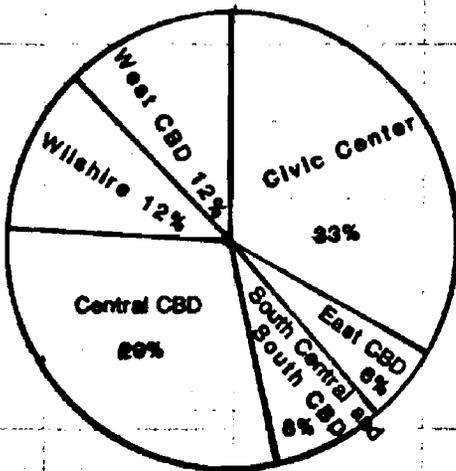
An analysis of weekday, all-day CBD/Wilshire destinations of present Busway users reveals that the largest portion of alighting occurs at the Civic Center (33%). This is followed by alightings in the Central part of the CBD (29%), West Central Business District and Wilshire (12% each), South Central - South Central Business District (8%) and East Central Business District (6%). The total number of Busway users alighting during a weekday count exceeded 9,000 (inbound only).

The alightings were tabulated within each zone. It was assumed that the majority of trips coincide with final destinations. However, some of the alightings include bus transfers to other CBD zones or to destinations outside of the CBD. Further analysis is needed to determine the number of busway riders who transfer to another bus after alighting in the CBD. For example, a review of AM peak boardings of local lines at Civic Center bus stops is needed to help verify the above assumption relating to CBD destinations.

TABLE 2

WEEKDAY (ALL DAY)  
CBD/WILSHIRE DESTINATIONS  
BUSWAY USERS

WEEKDAY (A.M. PEAK PERIOD)  
CBD/WILSHIRE DESTINATIONS



The location of the CBD zones referred to above is shown on page IV-57 for the plotting of all day busway rider destinations and on page IV-56 for the plotting of the AM Peak Period busway riders destinations.

Comparison of the All Day with the Peak Period destinations of Busway users shows that the Western CBD and Wilshire areas combine to capture a proportionately larger space of peak period commuter trips than that which is generated all day. The relatively larger all day alightings found in the Civic Center and Central CBD zones indicate that Busway users are relatively more attracted to these areas during the base or midday periods. Higher concentrations of Busway user destinations along Wilshire Boulevard during the peak period can also be explained as the result of the availability of more Wilshire Boulevard Busway service during peak periods.

c. Sector Improvement Plan (SIP)

The Sector Improvement Plan (SIP) was developed in response to anticipated transit needs and was to have been implemented all at once in September 1980. It was necessary to abandon this implementation strategy, due to greater service requirements and lower funding levels than first projected.

Although this plan will not be implemented all at one time as it was intended, it is still considered the route specific transit Master Plan. As such, it provides guidance for specific service changes and improvements for the coming years. The SIP Plan is being and will continue to be implemented in phases, contingent upon adequate funding support.

The SIP data is presented here because while it is based on present levels of ridership, it provides for a significant increase in bus routes terminating or passing by Union Station. This increase is a result of two changes in the existing lines.

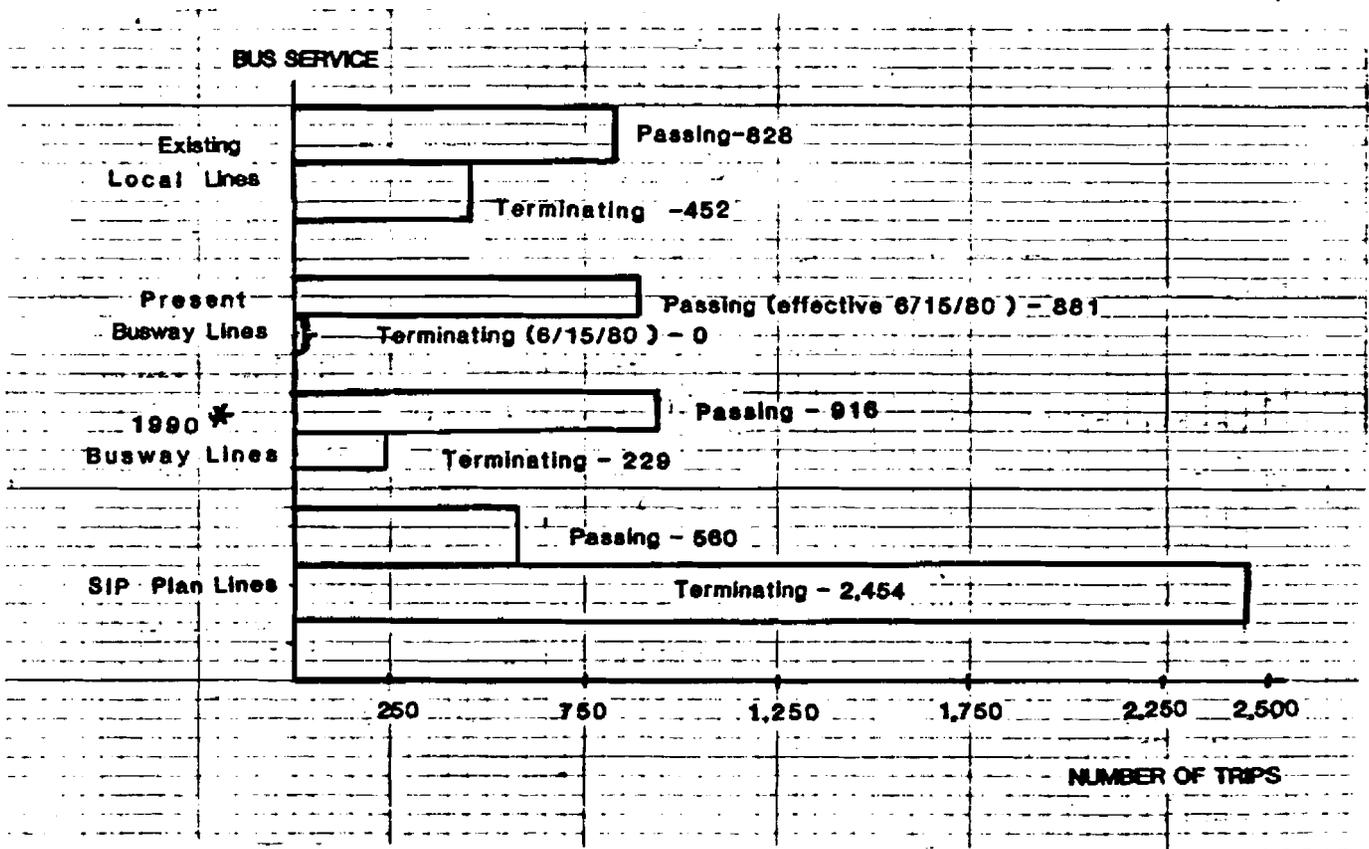
1. Many existing lines were shifted to converge upon the Union Station Transportation Center.
2. Some existing CBD through lines or U-shape lines were split to make two shorter lines, each with a terminal at the far end of the CBD. While this improves bus operations and service, it creates many more bus trips terminating at Union Station Transportation Center as shown in Table 3.

Separate from benefits to the Union Station Transportation Center, the above two types of service changes result in these benefits:

1. Removal of on-street layovers within the CBD, thus improving overall traffic flow conditions;
2. Provision of improved service coverage on streets leading to Union Station to include Los Angeles Street and San Pedro Street.

TABLE 3  
SIP PLAN VS. EXISTING SERVICE  
AT UNION STATION

ALL-DAY BUS TRIPS BY BUS TYPE  
 SERVICE (Both Directions)



\*The 1990 Busway trips are a 30% increase over the number of 1980 Busway trips. Since 20% of the Busway trips are projected to terminate at the Union Station, (20% of 1145=229) only 80% of the Busway trips (80% of 1145=916) are projected to be through-routed).

Table 3 represents a mixture of present and future service levels. The SIP Plan lines consists of rearrangement of the present local lines in the manner described above, together with a few changes within the CBD to the route configurations of the present Express lines.\* As already explained, the substantial increase in bus trips for the SIP Plan is due primarily to the reconfiguration of the local lines around Union Station although service has been increased somewhat on a number of SIP lines serving Union Station. To account for 1990 projected local service levels, a growth expansion factor must be applied to the SIP Plan bus trips. On the other hand, for the Busway lines both the present service level and a projected 30% service increase between 1980 and 1990 are included in Table 3.

d. Layover, Loading and Unloading

● Bus Layover

The layover requirements at Union Station are broken out between existing needs and the proposed needs created by the SIP Plan.

<u>Existing Needs</u>	<u># Layover Spaces</u>
Lines presently terminating at either Union Station or the County Jail	11
Existing nearby local lines planned to be rerouted to terminate in vicinity of Union Station, as per SIP Plan	9
SUB-TOTAL	20

\* There are no changes to the Busway lines shown (after June 15, 1980)

<u>Future Needs</u>	<u># Layover Spaces</u>
Lines planned to be rerouted to terminate in vicinity of Union Station not now serving Union Station area of CBD, as per SIP Plan	25
<u>TOTAL EXISTING AND FUTURE</u>	45
 <u>Busway Layover Needs</u>	
For intercepted buses. Possible double use of other layover space (See Section e.)	6 ?
 <u>GRAND TOTAL EXISTING &amp; FUTURE</u>	 51

There will also be a layover requirement for the Busway lines which are intercepted at Union Station. However, the average layover time for intercept buses will be much shorter because most of the buses are traveling to and from the bus yard (Division) before starting and ending revenue service at Union Station. Therefore, the number of required bus parking spaces is projected to be few in number. It is possible this bus parking requirement can be met by obtaining double duty from some of the 45 spaces projected to be needed for all of the other bus lines planned to terminate in the vicinity of Union Station.

- Loading and Unloading Spaces

Spaces for loading and unloading of passengers either in the facility or adjacent to it will depend on the dwell time. Under the assumption of 30 seconds dwell time for loading and 15 seconds for unloading, the required space at the SIP Plan service level will be:

1 space for each direction for local passing service and 5 spaces for both directions for local terminating lines. An increased dwell time to 1½ minutes for loading and half of it for unloading produces a requirement for 3 spaces for each direction of local passing service and 8 spaces for both directions for local terminating lines.

Loading and unloading requirements also apply to the Busway lines. If we assume 1.5 minutes dwell time per loading bus and half of that for each unloading bus, a total of 2 inbound spaces and 4 outbound spaces are shown in the tables below as the minimum required platform lengths.

TABLE 4

Loading and Unloading Spaces Required  
Union Station Intermodal Terminal

	Low Estimate		High Estimate	
	<u>Inbound</u>	<u>Outbound</u>	<u>Inbound</u>	<u>Outbound</u>
Local buses passing through (on-street bus stop)	1	1	3	3
Local buses terminating (on-street <u>or</u> off-street)	5	5	8	8
Busway buses at on-line station	2	4		

Bus intercept for the Busway lines may create an additional loading and unloading space requirement if a second Busway station is constructed which is off-line the Busway. This alternative has been included

as a means of providing more convenient transfer point between Busway lines and the proposed alignment for the Wilshire Rail Line to be located somewhere between Macy Street, 1200 feet north of the Busway extension, and the Busway/DPM station.

An assumption of 1.5 minutes dwell time for bus loading and 1 minute for unloading time may appear to be too long. However, given the fact that: (1) buses do not operate at an even rate of flow and (2) passenger loadings and street traffic congestion vary considerably, even the above maximum dwell time assumptions may not provide sufficient loading space for normal day to day variances in operating conditions.

e. Interface Vs. Intercept Bus Service

Bus interface involves the provision of convenient passenger transfers to and from a bus line at the station; the bus lines continue past the station, and into the CBD. Bus intercept involves terminating or turning around lines at the station.

For the Union Station Transportation Center, the handling of freeway bus service connections has first priority since it is projected that there will be less demand for local bus riders transferring to the DPM compared to express bus service. Additional reasons for focusing on express bus service at the DPM terminal rather than on local bus services are discussed on the next page.

It is assumed for planning purposes, that all of the express Busway lines will stop at the on-line station at the Union Station Transportation Center. It is projected that at least initially, about 80% of the Busway trips would continue on through the CBD operating in self-distribution manner. The remaining 20% of the buses will presumably be intercepted. These intercepted buses will either return to service on the same route or else will go out of service.

Buses going into service at this point involve a staging requirement which is reflected in a need for bus stalls for intercept buses. A 20% bus intercept would require six layover spaces at or near the terminal in addition to the 45 spaces for the surface buses terminating at the Transportation Center and County Jail. (See Section d.).

The 20% intercept is anticipated to occur with the completion of the DPM. Interception of approximately another 20% of the Busway trips at the Union Station terminal is projected with the completion of the Wilshire Corridor Starter Line. This combined approximate 40% bus intercept will require a total of 12 layover spaces and is in addition to the 45 spaces stated above.

TABLE 5  
SUMMARY OF BUS LAYOVER REQUIREMENTS

Local Lines Existing & Future	45
Busway Layover Needs	
For DPM (20% Busway Intercept)	6
For Wilshire Rail (20% Busway Intercept)	6
SUB-TOTAL	12
GRAND TOTAL	57

To repeat from Section d., some of the 45 layover spaces for local lines may be able to serve double duty for busway intercept buses. To the extent this is true, the grand total of 57 layover spaces would be reduced and would approach the lower figure of 45 spaces.

If a second busway station is constructed off line to the busway for interface with the Wilshire Rail station, only intercepted buses would be able to use this station. This is because the time delay would be excessive for through routed buses.

f. Projected Passenger Transfer Volumes

Table 15 in the Data Section shows 1990 weekday projected daily modal transfer volumes at Union Station. These data show a high and low number for persons transferring from the Busway to the DPM and to the Wilshire (Starter Rail Line) Station. The high transfer volume represents the patronage modal output from CRA/DPM and the RTD/Rail projections.

The Busway passenger volumes transferring to DPM and to the Wilshire Rail Line are based upon the RTD planning policy position as discussed above. The 40% intercept (20% each for DPM and for Wilshire Rail Line) results in the following transfer volumes: 5,700 transfers to the DPM; and 5,700 transfers to the Wilshire Rail Line.

g. General Design Considerations

The design of the Union Station Transportation Center has evolved over two to three years through the work of the CRA\* design staff. More recently Caltrans and Los Angeles City Department of Transportation staff have become involved in the terminal's design.

In order to provide the design staff with bus operation input, the District reviewed a range from zero to 100% bus intercept at the terminal. It is desired that the terminal facilities will be designed to permit a significant increase in total bus trips over present service levels (consisting of a mix of interface and intercept buses) to accommodate future ridership growth. It is further desired that the interface between the Busway and the DPM facility be designed to make possible a 100% DPM-bus transfer connection of all express buses passing by Union Station.

Given the constraint of the terminal site selection and cost, two main elements should be emphasized in the design process:

- a. A design which will permit maximum flexibility of transit operations (local bus, express/freeway bus, DPM and Wilshire Rail);
- b. A design which will minimize delays to passengers; if delays are in excess of approximately three minutes per trip, it appears some through-routed buses would have to bypass the DPM terminal to avoid excessive passenger delays. An on-line bus station on or adjacent to the freeway would minimize these delays. For this to happen, adequate on-line capacity (platform length and width, etc.) must be provided.

Regularity of the flow of buses is an important factor in determining the number of loading and unloading bus spaces required for the busway/DPM station and for the local buses terminating at or passing by the Union Station intermodal facility. Previously, Table 4 in Section d. showed a high and a low estimate of the number of spaces required for loading and unloading. Using the high estimate for spaces required, some additional bus capacity might be obtained over that shown in the tables, if a consistently even flow of buses is assumed. However, in actual practice, bunching of buses is extremely difficult to avoid, despite the efforts of transit management to maintain a smooth flow of buses.

h. Inventory of Bus Routes in Union Station Corridor

The following tables describe the feasibility of intercepting/interfacing bus routes at Union Station. The tables analyze both present lines and projected SIP routes.

The tables also show which bus lines have been identified for possible intercept at the DPM terminal stations. Different lines have been used as potential intercept in the operating cost and operational feasibility study than have been inputted into the DPM patronage forecasting model work conducted by the CRA. The reason for this difference is that the modeling work required only that a percent of all trips in each DPM corridor be intercepted, without regard to operational feasibility. The operating cost and operational feasibility study looked at a different group of lines for potential intercept treatment for the reasons discussed in that separate report.

Lastly, the report shows SIP Plan lines which may be considered as possible lines for obtaining additional transfer connections with the Union Station DPM terminal. In order to accomplish this, several of these lines would have to be shifted from other streets to Macy Street. Such a shift would leave gaps or voids in the SIP Plan system of lines. It would thus affect the integrity of the improved grid system and of the better route coverage obtained by the SIP Plan. The route deviations necessary to establish these additional transfer connections to the DPM (whether simply interface or intercept) are therefore not recommended at this time. The purpose in listing them is to show the maximum possible route options available.

DATA SECTION

TABLE 6  
BUS ROUTE INVENTORY-EXISTING  
FOR DPM TERMINAL STATIONS AND ADJACENT CORRIDORS  
UNION STATION

Line #	Suburban Description	CBD Route	CBD Terminal	Route Modification Needed For Interface	Number of Bus Trips Intercepted		Comments
					OP Cost & Feasibility Study PM Outbound (1978) Peak Hour/Period	1985 Patronage Modelling Input PM Outbound Peak Hour/Period	
<u>Local</u>							
2	Compton Av/City Terrace	Main/Spring St	None	None			
5	Hawthorne/S. Bay/Union Station/Co. Jail	Broadway St.	Union Station/Co. Jail	None			
92	Watts/Sierra Vista	Main/Spring St	None	None			
420	Garfield/Alhambra	Spring St.	8th & Wall St.	None		4/	
422	Garvey/El Monte	Olive St.	Olive & Venice Bl.	None			
426	Valley/El Monte	Olive St.	Olive & Washington	None			
428	Main/S. Arcadia	Olive St.	Olive & Venice Bl.	None			
432	Huntington/Arcadia	Olive St.	Olive & Venice Bl.	None			
871	Redondo Beach	Olive St.	Union Station	None			
<u>Busway Lines</u>							
480	Pomona	Olive St./Wilshire	Wilshire/Western (PROV)	None		8/	
482	Pomona	Olive St.	Olive/Venice Bl.	None	5/10		Rush hour only in CBD. Excludes 482X.
483/5	Alatadena	Olive St.	Olive/Venice Bl.	None			
484	Ontario	Olive St.	Olive/Venice Bl.	None			
486	Puente Hills Mall	Olive St.	Olive/Venice Bl.	None	5/10		Rush hour only in CBD.
487-89-91	Sierra Madre	Olive St./Wilshire	Wilshire/Union	None			489 & 91 rush hour only in CBD. (487-All Day Service)
488	Glendora	Olive St.	Olive/Venice Bl.	None	4/10		Rush hour only in CBD.
				IV-24			

TABLE 6  
 BUS ROUTE INVENTORY-EXISTING  
 FOR DPM TERMINAL STATIONS AND ADJACENT CORRIDORS  
 UNION STATION

Line #	Suburban Description	CBD Route	CBD Terminal	Route Modification Needed For Interface	Number of Bus Trips Intercepted		Comments
					OP Cost & Feasibility Study PM Outbound (1978) Peak Hour/Period	1985 Patronage Modelling Input PM Outbound Peak Hour/Period	
<b>Busway Lines</b>							
490	Pomona	Olive St.	Olive/Venice Bl.	None			
492	San Dimas	Olive/ Wilshire Bl.	Wilshire & Union Av.	None		5/ )	Rush hour only entire line.
493	Monrovia	Olive/ Wilshire Bl.	Wilshire & Union Av.	None		)	Rush hour only in CBD.
494	Glendora	Olive/ Wilshire Bl.	Wilshire & Union Av.	None	2/3	)	Rush hour only entire line.
496	San Bernardino	Spring St.	Greyhound Station	None		1/	
760	West Covina	Flower/ Wilshire Bl.	Wilshire/Western Av.	None			Rush hour only in CBD.
762	Diamond Bar	Flower/ Wilshire Bl.	Wilshire/Western Av.	None			Rush hour only in CBD.
764	Montclair	Flower/ Wilshire Bl.	Wilshire/Western Av.	None			Rush hour only in CBD.
481	West Covina	Harbor Pwy/ Wilshire Bl.	Wilshire/Western Av. (PROW)	Yes/More Feasible			Effective June 1980.
495	El Monte	Spring St.	18th & Hill St.	None			Effective June 1980.
<b>Subtotal Intercept Trips</b>					16/33	18/	
MJB:cym 6/80				1V-25			

TABLE 6  
 BUS ROUTE INVENTORY-SIP PLAN ROUTES  
 FOR DPM TERMINAL STATIONS AND ADJACENT CORRIDORS  
 UNION STATION

Line #	Suburban Description	CBD Route	CBD Terminal	Route Modification Needed For Interface	For 1990 Projections Number of Bus Trips Intercepted		Comments
					OP Cost & Feasibility Study PM Outbound (1990) Peak Hour/Period	1990 Patronage Modelling Input PM Outbound Peak Hour/Period	
<b>Local</b>							
28	Century City/Olympic/ Brooklyn	Macy/ Broadway	None	None			
70	Garvey Av/El Monte	Macy/Spring St	Convention Center	None			
71	City Terrace/Sybil Brand Institute	Macy/Spring St	Convention Center	None			
330	Valley/El Monte	Macy/Olive St	18th & Hill St.	None			Limited line.
31	Pico & Rimpau/E. 1st/ Monterey Park	1st/Broadway	None	Less Feasible			
75	Valley/El Monte	Macy/Spring St	18th & Hill St.	Less Feasible			
80	Main/S. Arcadia	1st/Olive St	18th & Hill St.	Less Feasible		4/	
81	Huntington/Arcadia	1st/Olive St	18th & Hill St.	Less Feasible			
332	Main/S. Arcadia	1st/Olive St	18th & Hill St.	Less Feasible			Limited line.
<b>Busway Lines</b>							
X475	Garvey Bl/El Monte	Spring St.	Convention Center	None			
480	Pomona	Olive/ Wilshire Bl.	Wilshire & Western (PROW)	None			
482	Pomona	Olive St.	Olive & Venice Bl.	None	7/13		Rush hour only in CBD.
483/5	Altadena	Olive St.	Olive & Venice Bl.	None		8/	
484	Ontario	Olive St.	Olive & Venice Bl.	None			
486	Puente Hills Mall	Olive St.	Olive & Venice Bl.	None	7/13		Rush hour only in CBD.
				IV-26			

TABLE 6

BUS ROUTE INVENTORY-SIP PLAN ROUTES  
FOR DPM TERMINAL STATIONS AND ADJACENT CORRIDORS  
UNION STATION

Page 4 of 6

Line #	Suburban Description	CBD Route	CBD Terminal	Route Modification Needed For Interface	For 1990 Projections Number of Bus Trips Intercepted		Comments
					Op Cost & Feasibility Study PM Outbound (1990) Peak Hour/Period	1990 Patronage Modelling Input PM Outbound Peak Hour/Period	
<u>Busway Lines</u>							
487-89-91	Sierra Madre	Olive/Wilshire	Wilshire & Union	None		8/	489 & 91 rush hour only in CBD. (487 all day service)
488	Glendora	Olive St.	Olive & Venice Bl.	None	5/13	3/	Rush hour only in CBD.
490	Pomona	Olive St.	Olive & Venice Bl.	None		3/	
492	San Dimas	Olive/Wilshire	Wilshire & Union	None		} 5/	Rush hour only entire line
493	Monrovia	Olive/Wilshire	Wilshire & Union	None			Rush hour only in CBD
494	Glendora	Olive/Wilshire	Wilshire & Union	None	3/4		Rush hour only entire line.
496	San Bernardino	Spring St.	Greyhound Station	None			
760	West Covina	Flower/Wilshire	Wilshire & Western	None			Rush hour only entire line.
762	Diamond Bar	Flower/Wilshire	Wilshire & Western	None			Rush hour only entire line.
764	Montclair	Flower/Wilshire	Wilshire & Western	None			Rush hour only entire line.
481	West Covina	Harbor Pwy/ Wilshire	Wilshire & Western (PROW)	Yes/ More Feasible		8/	New route, June 1980.
495	El Monte	Spring St.	18th & Hill St.	None			New route, June 1980.
<u>Terminating Lines</u>							
26	Virgil/Hollywood Bl.	7th St.	Union Station	None			All lines terminating at Union Station and L.A. Co. Jail are not candidates for Intercept for this station.
33	Venice Bl./ Santa Monica	Main/Spring St	Union Station	None			
35	W. Washington Bl.	Broadway	Union Station	None			
37	W. Adams Bl.	Hill St.	Union Station	None			
					IV-27		

TABLE 6  
 BUS ROUTE INVENTORY-SIP PLAN ROUTES  
 FOR DPM TERMINAL STATIONS AND ADJACENT CORRIDORS  
 UNION STATION

Line #	Suburban Description	CBD Route	CBD Terminal	Route Modification Needed For Interface	For 1990 Projections Number of Bus Trips Intercepted		Comments
					OP Cost & Feasibility Study PM Outbound (1990) Peak Hour/Period	1990 Patronage Modelling Input PM Outbound Peak Hour/Period	
<b>Terminating Lines</b>							
38	W. Jefferson Bl.	7th St.	Union Station	None			
40	Hawthorne Bl./So. Bay Ctr.	Hill St.	L.A. Co. Jail	None			
41	La Brea Av./So. Bay Ctr.	Hill St.	L.A. Co. Jail	None			
42	Santa Barbara/LAX-98th & Vicksburg	Hill St.	L.A. Co. Jail	None			
47	So. Main St./Wilmington	Main&Spring St	Union Station	None			
48	San Pedro St.	7th/Figueroa/Alpine	Union Station	None			
55	Compton Av./Wilmington	Main&Spring St	Union Station	None			
56	Long Beach Av./Wilmington Av./Carson	Main&Spring St	Union Station	None			
311	Olympic Bl./Century City	Broadway	Union Station	None			Limited line.
315	Santa Barbara/Hawthorne Bl/ So. Bay Center	Hill St.	L.A. Co. Jail	None			Limited line.
317	So. Broadway	Broadway	Union Station	None			Limited line.
430	Santa Monica Pwy/Sunset Bl/ Pacific Palisades	Flower St.	Union Station	None			
434	Santa Monica Pwy/Santa Monica C.B.D./Malibu	Flower St.	Union Station	None			
436	Santa Monica Pwy/Venice Bl/Venice	Flower St.	Union Station	None			
437	Santa Monica Pwy/Marina del Rey	Flower St.	Union Station	None			

TABLE 6

BUS ROUTE INVENTORY-SIP PLAN ROUTES  
FOR DPM TERMINAL STATIONS AND ADJACENT CORRIDORS

UNION STATION

Line #	Suburban Description	CBD Route	CBD Terminal	Route Modification Needed For Interface	For 1990 Projections		Comments
					Number of Bus Trips Intercepted OP Cost & Feasibility Study PM Outbound (1990) Peak Hour/Period	1990 Patronage Modelling Input PM Outbound Peak Hour/Period	
<b>Terminating Lines</b>							
439	Santa Monica Fwy/La Cienega Bl/Redondo Beach	Flower St.	Union Station	None			
442	Harbor Fwy/Inglewood Av./Redondo Beach	Hill St.	Union Station	None			
444	Harbor Fwy/Imperial Hwy/Pershing Dr.	Hill St.	L.A. Co. Jail	None			
448	Harbor Fwy/Avalon Bl./San Pedro	Olive St.	Union Station	None			
737	Harbor Fwy/San Pedro	Flower St.	Temple & San Pedro St.	None			
813	Harbor Fwy/Marineland	Olive St.	Union Station	None			
814	Harbor Fwy/Palos Verdes	Olive St.	Union Station	None			
Union Station Intercept Trips					22/43	39/	
MJB:cym 6/80				IV-29			

TABLE 7

## EXISTING LINES

Bus Trips and Layover Requirement  
at Union Station

Line	BUS TRIPS									Layover Spaces Required
	Base Hr. (12:01pm-1:00pm)			Peak Hr. (4:15pm-5:15pm)			All Day			
	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total	
<u>Macy Street</u>										
2	3	3	6	10	3	13	83	73	156	-
92	6	6	12	7	7	14	82	83	165	-
420	4	4	8	3	5	8	50	52	102	-
422	4	3	7	5	8	13	63	64	127	-
426	3	3	6	3	5	8	55	54	109	-
428	3	3	6	6	3	9	45	42	87	-
432	<u>3</u>	<u>3</u>	<u>6</u>	<u>3</u>	<u>4</u>	<u>7</u>	<u>42</u>	<u>40</u>	<u>82</u>	<u>-</u>
Subtotal	26	25	51	37	35	72	420	408	828	-
<u>South Bay</u>										
810	2	2	4	2	4	6	38	39	77	2
813	2	2	4	2	3	5	30	29	59	2
814	-	-	-	1	4	5	11	10	21	2
871	<u>2</u>	<u>2</u>	<u>4</u>	<u>2</u>	<u>3</u>	<u>5</u>	<u>36</u>	<u>36</u>	<u>72</u>	<u>2</u>
Subtotal	6	6	12	7	14	21	115	114	229	8
5*	-	-	-	4	1	5	34	7	31	-
5**	<u>6</u>	<u>6</u>	<u>12</u>	<u>5</u>	<u>7</u>	<u>12</u>	<u>98</u>	<u>94</u>	<u>192</u>	<u>3</u>
Subtotal	<u>6</u>	<u>6</u>	<u>12</u>	<u>9</u>	<u>8</u>	<u>17</u>	<u>122</u>	<u>101</u>	<u>223</u>	<u>3</u>
TOTAL	38	37	75	53	57	110	657	623	1,280	11

\* Terminate at Union Station

\*\* Terminate at County Jail

RTD Planning Department

HG:4/1/80

TABLE 8: UNION ST ION STUDY

Existing Busway Lines - Bus Trips Passing By Union Station\*

Line	Base Hr. (12:01pm-1:00pm)			Peak Hr. (4:15pm-5:15pm)			All Day		
	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total
<u>Olive Street</u>									
482	0	0	0	2	5	7	13	14	27
483	3	3	6	3	4	7	48	50	98
484	2	2	4	4	4	8	47	50	97
485	3	3	6	4	3	7	51	48	99
486	0	0	0	1	6	7	15	12	27
488	0	0	0	2	5	7	14	17	31
490	<u>2</u>	<u>2</u>	<u>4</u>	<u>2</u>	<u>6</u>	<u>8</u>	<u>35</u>	<u>31</u>	<u>66</u>
Subtotal	10	10	20	18	33	51	223	222	445
<u>WILSHIRE BOULEVARD</u>									
<u>To Union Avenue</u>									
487	2	2	4	2	3	5	35	34	69
489	0	0	0	2	4	6	13	11	24
491	2	2	4	2	4	6	34	32	66
<u>To Western Avenue</u>									
492	0	0	0	0	3	3	5	4	9
493	0	0	0	0	2	2	3	3	6
494	0	0	0	0	2	2	4	4	8
<u>To Wilton Place</u>									
480	<u>3</u>	<u>3</u>	<u>6</u>	<u>3</u>	<u>10</u>	<u>13</u>	<u>64</u>	<u>59</u>	<u>123</u>
Subtotal	7	7	14	9	28	37	158	147	305
<u>Flower Street</u>									
760**	0	0	0	0	8	8	17	16	33
762**	0	0	0	0	6	6	12	12	24
764**	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>5</u>	<u>11</u>	<u>10</u>	<u>21</u>
Subtotal	0	0	0	0	19	19	40	38	78
<u>Spring Street</u>									
496	<u>1</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>14</u>	<u>14</u>	<u>28</u>
Total	18	18	36	28	81	109	435	421	856

\*\* Terminate at Western Avenue

RTD Planning Department  
HG/dmg  
4/2/80

\* As of September 1979

## Busway Lines - Bus Trips Passing By Union Station

Effective June 15, 1980

Line	Base Hr. (12:01pm-1:00pm)			Peak Hr. (4:15pm-5:15pm)			All Day			Change From Existing
	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total	
<u>Olive Street</u>										
482	0	0	0	2	5	7	13	14	27	-
483	3	3	6	3	4	7	48	50	98	-
484	2	2	4	4	3	7	46	49	95	-2
485	3	3	6	4	3	7	51	48	99	-
486	0	0	0	1	5	6	14	11	25	-2
488	0	0	0	2	5	7	14	16	30	-1
490	<u>2</u>	<u>2</u>	<u>4</u>	<u>2</u>	<u>5</u>	<u>7</u>	<u>34</u>	<u>30</u>	<u>64</u>	<u>-2</u>
Subtotal	10	10	20	18	30	48	220	218	438	-7
<u>WILSHIRE BOULEVARD</u>										
<u>To Union Avenue</u>										
487	2	2	4	2	3	5	35	34	69	-
489	0	0	0	2	4	6	13	11	24	-
491	0	0	0	2	3	5	26	24	50	-16
492	0	0	0	0	3	3	5	4	9	-
493	0	0	0	0	2	2	3	3	6	-
494	0	0	0	0	2	2	4	4	8	-
<u>To Wilton Place</u>										
480	3	3	6	3	6	9	54	49	103	-20
481	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>4</u>	<u>4</u>	<u>10</u>	<u>10</u>	<u>20</u>	<u>+20</u>
Subtotal	5	5	10	9	27	36	150	139	289	-16

Busway Lines - Bus Trips Passing By Union Station  
Effective June 15, 1980

Line	Base Hr. (12:01pm-1:00pm)			Peak Hr. (4:15pm-5:15pm)			All Day			Change From Existing
	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total	
<u>Flower Street</u>										
760*	0	0	0	0	8	8	17	16	33	-
762*	0	0	0	0	6	6	12	12	24	-
764*	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>5</u>	<u>11</u>	<u>10</u>	<u>21</u>	<u>-</u>
Subtotal	0	0	0	0	19	19	40	38	78	-
<u>Spring Street</u>										
495	3	3	6	0	14	14	24	24	48	+48
496	<u>1</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>14</u>	<u>14</u>	<u>28</u>	<u>-</u>
Subtotal	<u>4</u>	<u>4</u>	<u>8</u>	<u>1</u>	<u>15</u>	<u>16</u>	<u>38</u>	<u>38</u>	<u>76</u>	<u>+48</u>
TOTAL	19	19	38	28	91	119	448	433	881	+23

\* Terminate at Western.

RTD Planning Department

HG:4/2/80

## Estimated Bus Trips and Layover Requirements at Union Station

Line	B U S T R I P S						All-Day Total	Layover Spaces Required
	A.M. Peak Hr. (Period 6am-9am)	Base Hr. (Period 9am-4pm)	P.M. Peak Hr. (Period 4pm-7pm)	Evening Hr. (Period 7pm-10:30pm)	Night Hr. (Period 10:30pm-12am)	Owl Hr. (Period 12am-6am)		
<u>Passing By</u>								
<u>Un. Sta.</u>								
28-E	15 (31)	8 (56)	15 (31)	3 (11)	2 (3)	1 (5)	(137)	-
W	15 (31)	8 (56)	15 (31)	3 (11)	2 (3)	1 (5)	(137)	-
70-E	4 (12)	4 (28)	8 (16)	2 (7)	1 (2)	-	(65)	-
W	8 (16)	4 (28)	4 (12)	2 (7)	1 (2)	-	(65)	-
71-E	4 (12)	4 (28)	8 (16)	2 (7)	1 (2)	1 (5)	(70)	-
W	8 (16)	4 (28)	4 (12)	2 (7)	1 (2)	1 (5)	(70)	-
330-E	-	-	4 (8)	-	-	-	(8)	-
W	4 (8)	-	-	-	-	-	(8)	-
<b>Sub-Total</b>	<b>58 (126)</b>	<b>32 (224)</b>	<b>58 (126)</b>	<b>14 (50)</b>	<b>8 (14)</b>	<b>4 (20)</b>	<b>(560)</b>	<b>-</b>
<u>Terminating</u>								
<u>at Un. Sta.</u>								
26-E	9 (21)	6 (42)	6 (18)	3 (11)	2 (3)	-	(95)	3
W	6 (18)	6 (42)	9 (21)	3 (11)	2 (3)	-	(95)	
35-E	9 (21)	6 (42)	6 (18)	3 (11)	2 (3)	1 (5)	(100)	3
W	6 (18)	6 (42)	9 (21)	3 (11)	2 (3)	1 (5)	(100)	
37-E	10 (22)	6 (42)	6 (18)	3 (11)	2 (3)	1 (5)	(101)	3
W	6 (18)	6 (42)	10 (22)	3 (11)	2 (3)	1 (5)	(101)	
38-E	9 (21)	6 (42)	6 (18)	3 (11)	2 (3)	1 (5)	(100)	3
W	6 (18)	6 (42)	9 (21)	3 (11)	2 (3)	1 (5)	(100)	
40-N	8 (20)	6 (42)	6 (18)	3 (11)	2 (3)	1 (5)	(99)	2
S	6 (18)	6 (42)	8 (20)	3 (11)	2 (3)	1 (5)	(99)	
41-N	3 (9)	3 (21)	3 (9)	2 (6)	1 (2)	-	(47)	1
S	3 (9)	3 (21)	3 (9)	2 (6)	1 (2)	-	(47)	

Estimated Bus Trips and Layover Requirements at Union Station

← B U S T R I P S →

Line	A.M. Peak Hr. (Period 6am-9am)	Base Hr. (Period 9am-4pm)	P.M. Peak Hr. (Period 4pm-7pm)	Evening Hr. (Period 7pm-10:30pm)	Night Hr. (Period 10:30pm-12am)	Owl Hr. (Period 12am-6am)	All-Day Total	Layover Spaces Required
42-N	3 (9)	3 (21)	3 (9)	2 (6)	1 (2)	1 (5)	(52)	1
S	3 (9)	3 (21)	3 (9)	2 (6)	1 (2)	1 (5)	(52)	
47-N	6 (14)	4 (28)	4 (12)	2 (7)	-	-	(61)	2
S	4 (12)	4 (28)	6 (14)	2 (7)	-	-	(61)	
48-N	8 (16)	4 (28)	4 (12)	3 (11)	2 (3)	-	(70)	2
S	4 (12)	4 (28)	8 (16)	3 (11)	2 (3)	-	(70)	
55-N	6 (14)	4 (28)	4 (12)	2 (7)	1 (2)	1 (5)	(68)	2
S	4 (12)	4 (28)	6 (14)	2 (7)	1 (2)	1 (5)	(68)	
56-N	8 (16)	4 (28)	4 (12)	2 (7)	1 (2)	-	(65)	2
S	4 (12)	4 (28)	8 (16)	2 (7)	1 (2)	-	(65)	
311-E	8 (16)	-	8 (16)	-	-	-	(32)	2
W	8 (16)	-	8 (16)	-	-	-	(32)	
315-N	6 (12)	-	6 (12)	-	-	-	(24)	2
S	6 (12)	-	6 (12)	-	-	-	(24)	
430-E	3 (7)	2 (14)	2 (6)	2 (7)	1 (2)	-	(36)	1
W	2 (6)	2 (14)	3 (7)	2 (7)	1 (2)	-	(36)	
434-E	3 (6)	1 (7)	1 (3)	1 (4)	-	-	(20)	1
W	1 (3)	1 (7)	3 (6)	1 (4)	-	-	(20)	
436-E	5 (10)	-	2 (4)	-	-	-	(14)	2
W	2 (4)	-	5 (10)	-	-	-	(14)	
437-E	3 (6)	-	2 (4)	-	-	-	(10)	1
W	2 (4)	-	3 (6)	-	-	-	(10)	
439-E	4 (8)	2 (14)	2 (6)	1 (4)	-	-	(32)	1
W	2 (6)	2 (14)	4 (8)	1 (4)	-	-	(32)	
442-N	9 (18)	1 (7)	2 (4)	-	-	-	(29)	3
S	2 (4)	1 (7)	9 (18)	-	-	-	(29)	
444-N	2 (4)	-	2 (4)	-	-	-	(8)	1
S	2 (4)	-	2 (4)	-	-	-	(8)	

## Estimated Bus Trips and Layover Requirements at Union Station

Line	B U S   T R I P S							Layover Spaces Required
	A.M. Peak Hr. (Period 6am-9am)	Base Hr. (Period 9am-4pm)	P.M. Peak Hr. (Period 4pm-7pm)	Evening Hr. (Period 7pm-10:30pm)	Night Hr. (Period 10:30pm-12am)	Owl Hr. (Period 12am-6am)	All-Day Total	
448-N	4 (8)	2 (14)	2 (6)	2 (7)	1 (2)	-	(37)	1
S	2 (6)	2 (14)	4 (8)	2 (7)	1 (2)	-	(37)	
33-E	7 (15)	4 (28)	4 (12)	4 (14)	2 (3)	1 (5)	(77)	2
W	4 (12)	4 (28)	7 (15)	4 (14)	2 (3)	1 (5)	(77)	
317-E	5 (10)	-	-	-	-	-	(10)	2
W	-	-	5 (10)	-	-	-	(10)	
813-N	3 (6)	2 (14)	2 (6)	2 (4)	-	-	(30)	1
S	2 (7)	2 (14)	4 (8)	-	-	-	(29)	
814-N	4 (8)	1 (1)	1 (2)	-	-	-	(11)	1
S	1 (2)	1 (1)	4 (7)	-	-	-	(10)	
Sub-Total	233 (559)	134 (926)	234 (559)	78 (274)	40 (66)	14 (70)	(2,454)	45
TOTAL	291 (685)	166 (1,150)	292 (685)	92 (324)	48 (80)	18 (90)	(3,014)	

o See attached comments.

TABLE 4

ESTIMATED BUS TRIPS AND LAYOVER  
REQUIREMENT AT UNION STATION

COMMENTS

1. The number of bus trips for each line during the peak period was estimated as follows:
  - a.  $60 \div \text{Headway} = \text{peak hour bus trips}$
  - b.  $(\text{Peak hour bus trips} \times 2) \div 3 = \text{estimated bus trips during a 3 hour peak period.}$   
(Some peak period bus trips were adjusted upward to insure that peak period bus frequency (bus trips) are not less than the base period.)
2. Reverse direction trips during peak period were assumed to maintain the same headway as during the base period.
3. Estimates of space required for bus layover were based on a 15 minute layover per bus, using the following formula:  
 $(\# \text{ bus round trips} \times 15 \text{ min. layover}) \div 60 \text{ min.} = \text{required space.}$  For example, a line with 5 minutes headway will require 3 layover spaces, while a line with 20 minutes headway will require one layover space. Peak hour headways were used to estimate layover space needs.
4. Bus trips and layover requirements for Lines 813 and 814 are actual figures since they are not changed in the SIP plan.

TABLE 11  
UNION STATION STUDY

SIP PLAN SERVICE LEVELS  
LOADING, UNLOADING & LAYOVER SPACE REQUIRED

LINES	Total # One-Way Trips 4:15 pm- 5:15 pm	One-Way Trips Per Minute	LOADING SPACES			UNLOADING SPACES			TOTAL LOADING/UNLOADING			LAYOVER SPACES
			DWELL TIME			DWELL TIME			DWELL TIME			
			.5 min.	1 min.	1.5 min.	.25 min.	.5 min.	.75 min.	.5 min.	1 min.	1.5 min.	
<u>Local Lines Passing by *</u> <u>Union Station</u>												
<u>Macy St. Lines</u>												
North-East	35	.58	.29	.58	.87	.15	.29	.44	1	1	2	
South-West	23	.39	.20	.39	.59	.10	.20	.30	1	1	1	
<u>County Jail Lines</u>												
North-East	22	.37	.19	.37	.56	.10	.19	.28	1	1	1)	9 at
South-West	31	.52	.26	.52	.78	.13	.26	.39	1	1	1)	County Jail
<u>Sub-Total Lines Passing By</u> <u>Union Station</u>												
North-East	57	.95	.50	1.0	1.5	.25	.50	.75	1	2	3	
South-West	54	.90	.50	1.0	1.5	.25	.50	.75	1	2	3	
<u>Local Lines Terminating at *</u> <u>Union Station</u>												
North-East	66	1.1	.55	1.1	1.65	.25	.55	.85	1	2	3)	36 at
South-West	125	2.1	1.05	2.1	3.15	.50	1.05	1.55	2	3	5)	Union Station
<u>TOTAL</u>												
North-East	123	2.0	1.0	2.0	3.0	.50	1.0	1.50	2	3	5	
South-West	179	3.0	1.5	3.0	4.5	.75	1.5	2.25	2	5	7	
Both Directions	292	5.0	2.5	5.0	7.5	1.25	2.5	3.75	4	8	12	45

\* By 1990 local lines terminating at or passing by Union Station are projected to increase in ridership and, in turn, bus trips are projected to increase between 10% - 30%.

• See following Assumptions and Comments

RTD Planning Department - 5/7/80  
Haim Geffen/ydh

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UNION STATION STUDY  
SIP PLAN SERVICE LEVELS  
LOADING, UNLOADING & LAYOVER SPACE REQUIRED

LINES	Total # One-Way Trips 4:15 pm- 5:15 pm	One-Way Trips Per Minute	LOADING SPACES			UNLOADING SPACES			TOTAL LOADING/UNLOADING			LAYOVER SPACES
			DWELL TIME			DWELL TIME			DWELL TIME			
			.5 min.	1 min.	1.5 min.	.25 min.	.5 min.	.75 min.	.5 min.	1 min.	1.5 min.	
<b>BUSWAY LINES *</b> (effective June 1980)												
<u>On-Line Station- all lines interface</u>												
Inbound	28	.50	.25	.50	.75	.10	.25	.40	1	1	2	
Outbound	91	1.50	.75	1.50	2.25	.40	.75	1.10	2	3	4	
TOTAL	119	2.00	1.00	2.00	3.00	.50	1.00	1.50	2	3	5	
<u>Off-Line Station **</u>												
<b>A. 20% intercept Union Station &amp; terminate there</b>												
Inbound	6	.10	.05	.10	.15	.02	.05	.10	1	1	1	1
Outbound	18	.30	.15	.30	.45	.08	.15	.20	1	1	1	5
TOTAL	24	.40	.20	.40	.60	.10	.20	.30	1	1	1	6
<b>B. 40% intercept Union Station &amp; terminate there</b>												
Inbound	12	.20	.10	.20	.30	.05	.10	.15	1	1	1	2
Outbound	36	.60	.30	.60	.90	.15	.30	.45	1	1	2	10
TOTAL	48	.80	.40	.80	1.20	.20	.40	.60	1	2	2	12

\* By 1990 Busway patronage and, in turn, bus trips are projected to increase by 30%. Consequently, loading, unloading and layover space requirements are also expected to be higher by a third than in 1980.

\*\* If a second Busway station for connection in the terminal is constructed, two service level alternatives were considered.

• See assumptions and comments.

RTD Planning Department - May 8, 1980  
Haim Geffen/ydh

SIP PLAN SERVICE LEVELSESTIMATED SPACE REQUIREMENT FOR LOADING,  
UNLOADING AND LAYOVER AT UNION STATIONASSUMPTIONS

1. All passing buses at Macy Street load and unload on the street.
2. County Jail line buses also pass by Union Station on Macy Street and load and unload on the street. These lines terminate at the County Jail.
3. The terminating lines have a separate location for layover and for loading and unloading of passengers.
4. Busway lines are assumed to have one on-line station where all buses will stop. If a second station for connection in the terminal will be constructed, two alternatives were considered in the table.
  - A. 20% of all Busway line buses will enter the second station and will terminate there.
  - B. 40% of all of the Busway line buses will enter the second station and will terminate there.

To the extent that the intercept buses using the second Busway station are peak period buses only (tripper buses) layover requirement will be reduced.

COMMENTS

1. The total figures for loading, unloading and layover space are rounded.
2. Loading and unloading space requirements were calculated as follows:
  - A. Total peak hour trips were compiled by peak direction and reverse peak direction.
  - B. Total peak hour trips divided by 60 = trips per minute.
  - C. Dwell time x trips per minute = loading and unloading space requirements.
3. Unloading time requirements were assumed to be half of the loading time, therefore, unloading space was also estimated to require half of the loading space.
4. Layover space calculations were based on line headways and an assumption of a layover space need for each 15 minutes (see Table " Plan Lines-Bus Trips" for further explanation)

TABLE 12

UNION STATION STUDY  
 WEEKDAY CBD/WILSHIRE DESTINATIONS OF PRESENT BUSWAYS USERS \*  
 Inbound - A.M. Peak Period and All Day

<u>ZONE</u>	<u>PEAK PERIOD</u> (6:00 a.m.-9:00 p.m.)		<u>ALL DAY</u>	
	<u>Alightings</u>	<u>%</u>	<u>Alightings</u>	<u>%</u>
East Civic Center	1,075	18	1,735	19
West Civic Center	650	11	1,255	14
East CBD	325	6	580	6
Bunker Hill	170	3	260	3
Central CBD	1,230	21	2,360	26
West CBD	1,005	17	1,100	12
Wilshire	855	15	1,080	12
South Central CBD	155	3	215	2
Occidental Center	245	4	300	3
South CBD	<u>120</u>	<u>2</u>	<u>260</u>	<u>3</u>
TOTAL	5,830	100%	9,145	100%

o See attached maps on pp. IV - , IV -

\* The above data reflects bus alightings within each zone. It was assumed that the majority of this trip coincides with final destinations. However, some of the alightings include bus transfers to other CBD zones or to destinations outside the CBD.

UNION STATE STUDY

Existing Macy Street Lines  
Passengers on Board at Selected Intersections

\* Nearest Stop  
RTD Plann Dept.  
HG/ydh 4/1/80

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LINE	I N T E R S E C T I O N S *									
	MACY & LYON	MACY & VIGNES	OLIVE & FIRST	OLIVE & EIGHTH	MAIN & FIRST	MAIN & EIGHTH	SPRING & FIRST	SPRING & SEVENTH	BROADWAY & FIRST	BROADWAY & EIGHTH
<u>2</u>										
North-Out	2130	2119	---	---	2023	1640	---	---	---	---
South-In	1969	1963	---	---	---	---	1961	1915	---	---
<u>92</u>										
North-Out	2691	2701	---	---	2696	1775	---	---	---	---
South-In	2764	2778	---	---	---	---	2779	2169	---	---
<u>420</u>										
North-Out	1139	1138	---	---	---	---	869	514	---	---
South-In	1215	1202	---	---	---	---	862	96	---	---
<u>422</u>										
East-Out	1129	1128	946	355	---	---	---	---	---	---
West-In	996	1000	815	213	---	---	---	---	---	---
<u>426</u>										
East-Out	1399	1387	829	272	---	---	---	---	---	---
West-In	1396	1379	814	250	---	---	---	---	---	---
<u>428</u>										
East-Out	914	914	591	186	---	---	---	---	---	---
West-In	909	905	617	134	---	---	---	---	---	---
<u>432</u>										
East-Out	521	521	398	99	---	---	---	---	---	---
West-In	554	552	370	97	---	---	---	---	---	---
<u>5</u>										
North-Out	335	364	---	---	---	---	---	---	1188	3196
South-In	548	450	---	---	---	---	---	---	1531	3567
Outbound	10,258	10,272	2,764	912	4,719	3,415	869	514	1,188	3,196
Inbound	10,351	10,229	2,516	694	---	---	5,609	4,180	1,531	3,567
TOTAL	20,609	20,501	5,380	1,606	4,719	3,415	6,478	4,694	2,719	6,763

UNION STATION STUDY  
Existing Busway Lines  
Passengers on Board at Selected Intersections

————— I N T E R S E C T I O N S \* —————

<u>LINE</u>	<u>ALISO &amp; ALAMEDA</u>	<u>SPRING &amp; CITY HALL</u>	<u>OLIVE &amp; 6TH</u>	<u>OLIVE &amp; 9TH</u>	<u>WILSHIRE &amp; UNION</u>	<u>WILSHIRE &amp; WESTERN</u>
<u>Olive Street</u>						
<u>482</u>						
Inbound	482	289	138	47		
Outbound	429	389	226	117		
<u>483/485</u>						
Inbound	1,541	1,400	705	186		
Outbound	1,563	1,260	601	137		
<u>484</u>						
Inbound	1,014	784	371	125		
Outbound	1,027	947	614	166		
<u>486</u>						
Inbound	381	296	158	88		
Outbound	424	373	195	104		
<u>488</u>						
Inbound	456	250	104	53		
Outbound	413	345	168	88		
<u>490</u>						
Inbound	710	546	238	86		
Outbound	<u>624</u>	<u>540</u>	<u>240</u>	<u>109</u>		
<u>Subtotal</u>						
Inbound	4,484	3,565	1,714	585		
Outbound	4,480	3,854	2,044	721		
 <u>WILSHIRE BOULEVARD</u>						
<u>To Union Avenue</u>						
<u>487</u>						
Inbound	450	351	137		22	
Outbound	414	387	263		14	
<u>489</u>						
Inbound	159	118	60		10	
Outbound	174	158	117		3	

UNION STATION STUDY  
Existing Busway Lines  
Passengers on Board at Selected Intersections

I N T E R S E C T I O N S *						
<u>LINE</u>	<u>ALISO &amp; ALAMEDA</u>	<u>SPRING &amp; CITY HALL</u>	<u>OLIVE &amp; 6TH</u>	<u>OLIVE &amp; 9TH</u>	<u>WILSHIRE &amp; UNION</u>	<u>WILSHIRE &amp; WESTERN</u>
<u>WILSHIRE BOULEVARD</u>						
<u>To Union Avenue (cont'd)</u>						
<u>491</u>						
Inbound	546	395	160		22	
Outbound	455	390	243		12	
<u>To Western Avenue</u>						
<u>492</u>						
Inbound	129	98	51		26	2
Outbound	126	122	101		23	0
<u>493</u>						
Inbound	91	80			24	4
Outbound	56	52			28	0
<u>494</u>						
Inbound	116	93	47		16	5
Outbound	55	52	22		43	0
<u>To Wilton Place</u>						
<u>480</u>						
Inbound	1,842	1,520	962		587	179
Outbound	1,882	1,799	1,347		557	45
<u>Subtotal</u>						
Inbound	3,333	2,655	1,417		707	190
Outbound	3,162	2,960	2,093		680	45
<u>Flower Street</u>						
<u>760</u>						
Inbound	887				127	
Outbound	752				130	
<u>762</u>						
Inbound	569				110	
Outbound	534				85	

TABLE 14

UNION STATION STUDY  
Existing Busway Lines  
Passengers on Board at Selected Intersections

<u>LINE</u>	<u>ALISO &amp; ALAMEDA</u>	<u>SPRING &amp; CITY HALL</u>	<u>OLIVE &amp; 6TH</u>	<u>OLIVE &amp; 9TH</u>	<u>WILSHIRE &amp; UNION</u>	<u>WILSHIRE &amp; WESTERN</u>
<u>Flower Street (cont'd)</u>						
<u>764</u>						
Inbound	462				59	
Outbound	<u>387</u>				<u>60</u>	
<u>Subtotal</u>						
Inbound	1,918				296	
Outbound	1,673				275	
<u>Spring Street</u>						
<u>496</u>						
Inbound	235	214				
Outbound	<u>279</u>	<u>253</u>				
<u>TOTAL</u>						
Inbound	9,970	6,434	3,131		976	
Outbound	<u>9,594</u>	<u>7,067</u>	<u>4,137</u>		<u>955</u>	
<u>GRAND TOTAL</u>	19,564	13,501	7,268		1,931	

\* Nearest Bus Stop.

RTD Planning Department  
HG:cym  
4/3/80

TABLE 15  
 1990 WEEKDAY CONSTRAINED TRANSFER  
 VOLUMES AT UNION STATION  
 BOARDINGS & ALIGHTINGS

Un. Sta. Ad Hoc  
 Com. 27 Mar. 80  
 REVISED  
 1 Apr 80  
 ADR  
 2nd Revision  
 24 June 81 DGM

UNION STATION  
 TRANSPORTATION CENTER

TRANSFER VOLUME	BUSWAY	WILSHIRE RAIL	DPM	AMTRAK	PARK	WALK	LOCAL	INTER CITY BUS	TAXI	TOTAL
1. Busway	-0-	16,000/5,700	13,000/5,700	300	-0-	1,000	1,500	200	-0-	32,000/ 14,000
2. Wilshire Rail	16,000/5700	-0-	-0-	1,600	650	3,000	3,500	200	-0-	24,950/ 14,650
3. DPM	13,000/5,700	-0-	-0-	2,300	5,050	3,400	2,300	200	-0-	26,250/ 18,950
4. AMTRAK	300	1,600	2,300	-0-	50	800	600	200	200	6,050
5. PARK	-0-	650	5,050	50	-0-	200	-0-	50	-0-	6,000
6. WALK	1,000	3,000	3,400	800	200	-0-	1,200	50	-0-	9,650
7. LOCAL BUS (Macy St.)	1,500	3,500	2,300	600	-0-	1,200	-0-	200	-0-	9,300
8. INTERCITY BUS	200	200	200	200	50	50	200	-0-	300	1,400
9. TAXI	-0-	-0-	-0-	200	-0-	-0-	-0-	300	-0-	500
<u>TOTAL</u>	32,000/14,400	24,950/14,650	26,250/18,950	6,050	6,000	9,650	9,300	1,400	500	116,100/ 80,900

(SEE ATTACHED NOTES)

COMPILED BY: Gil Hicks - CRA; Dan Miller - RTD Bus Planning; Allyn Rifkin - LAC DOT

MJB/vb

IV-46

TABLE 15

1990 WEEKDAY CONSTRAINED TRANSFER VOLUMES

AT UNION STATION

NOTES TO TABLE

1. High projection transfer volumes between DPM and busway and Wilshire Rail and busway represent model projections from latest CRA and RTD patronage modeling work.
2. Low projection transfer volumes between DPM and busway and Wilshire Rail and busway represent studied planning policy constraints as follows:
  - o Low range bus intercept rates - 20% of Busway for DPM; 20% of Busway for MRT; 80% of local thru bus (Macy St.) for both DPM and Wilshire Rail.
  - o Busway patronage growth limited to 29,000 (30%) which is the Caltrans Freeway Transit projection.
  - o Local bus (Macy St.) growth limited to 29,000 (30%) which represents a combination of studied local bus growth (10%) and rail induced feeder bus growth potential.
  - o Parking projection is limited by 2,000 parking spaces, at 1.5 persons vehicle occupancy, plus other assumptions as per CRA and LACDOT.
  - o Walk-in projection is limited to projected employee population, attracted trips and assumed mode split.
  - o Amtrak projection as per Caltrans.
  - o Intercity bus projection as per Caltrans.
3. The Busway volumes shown in the Busway-to-Busway cell (8,400/15,700) represent balance of busway passengers not transferring to other modes at the Union Station Transportation Center. High and low transfer volumes from the Busway result in correspondingly low and high thru busway volumes.

-2-

4. Model output from CRA/DPM for DPM Union Station boarding and alightings and from RTD/Rail for Rail Union Station boardings and alightings are listed below for comparison.

Downtown People Mover (DPM)  
Patronage Model Output

Boardings & Alightings To/From  
DPM Station at Union Station

Busway	13,037
Local Bus (Macy St.)	1,611
Park	7,358
Other (Walk, Amtrak, Intercity Bus)	6,086
	<u>28,092</u>

NOTE: Input to CRA model assumed a 46% intercept rate from peak hour express (Busway) bus trips, as mutually agreed by CRA and RTD Bus Planning, during DPM preliminary engineering.

Wilshire Rail Patronage Model Output

Boardings & Alightings To/From  
Rail Station at Union Station

Busway	16,000
Local Bus (Macy St.)	10,000
Walk	9,000
Park	2,000
Commuter Rail (Amtrak)	800
Intercity Bus	500
	<u>38,300</u>

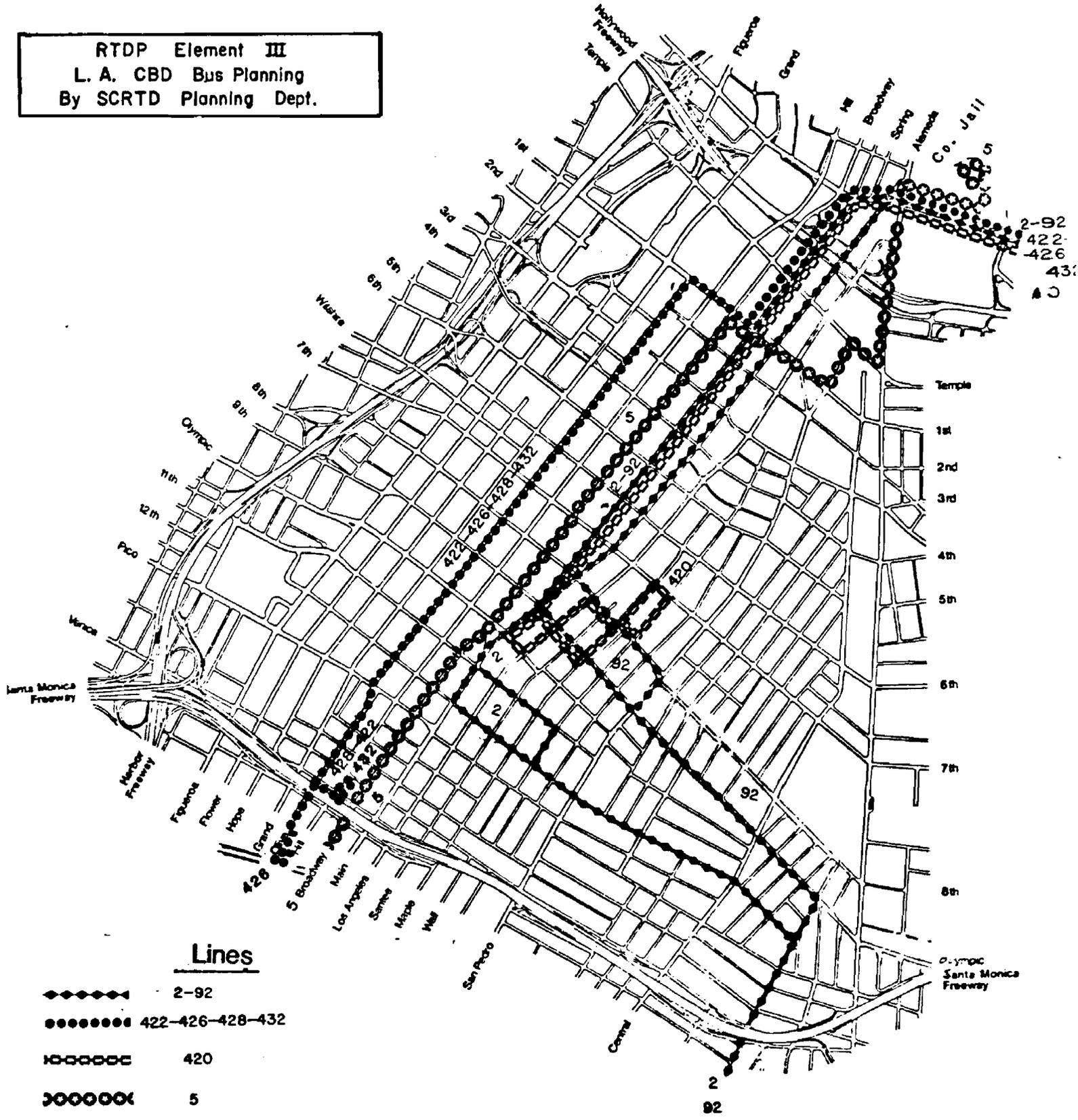
MAPS

# EXISTING LINES

## Passing By Union Station

MAP 1

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.



### Lines

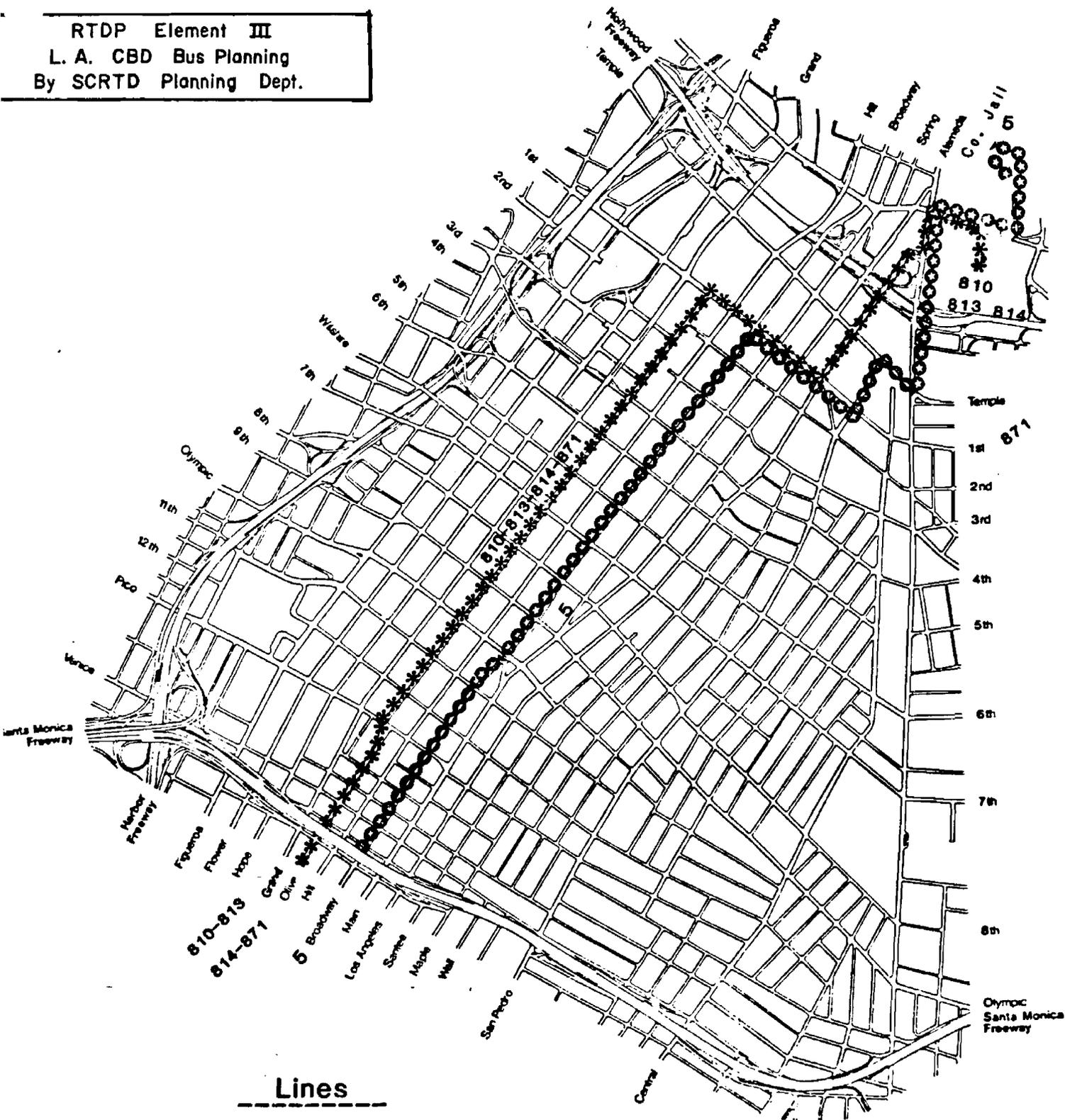
- ◆◆◆◆◆ 2-92
- 422-426-428-432
- ▬▬▬▬▬ 420
- ▬▬▬▬▬ 5

# EXISTING LINES

## Terminating at Union Station

MAP 2

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.



Lines

○○○○○○○○

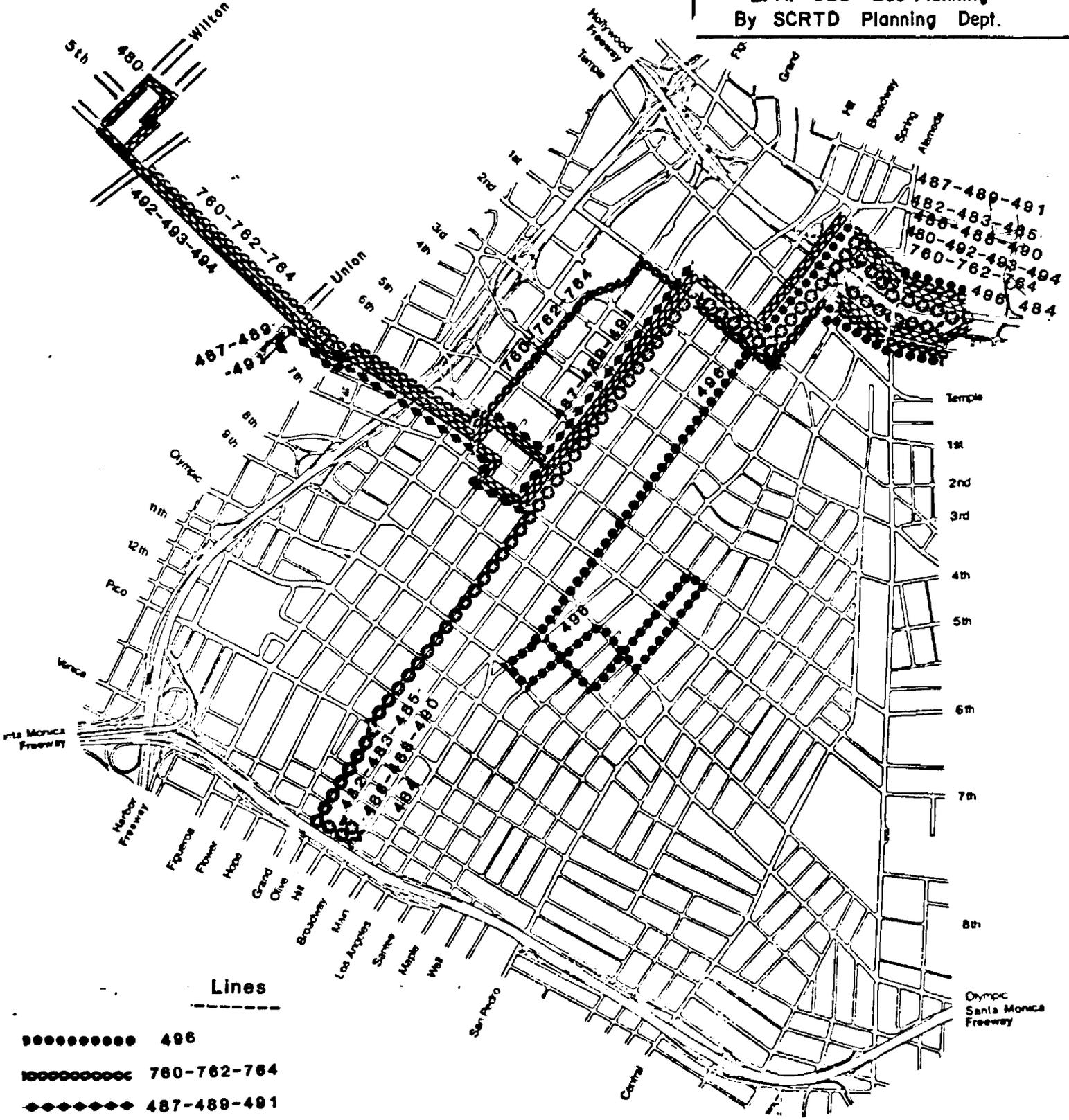
5

\*\*\*\*\* 810-813-814-871

IV-51

# EXISTING BUSWAY LINES

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTPD Planning Dept.



### Lines

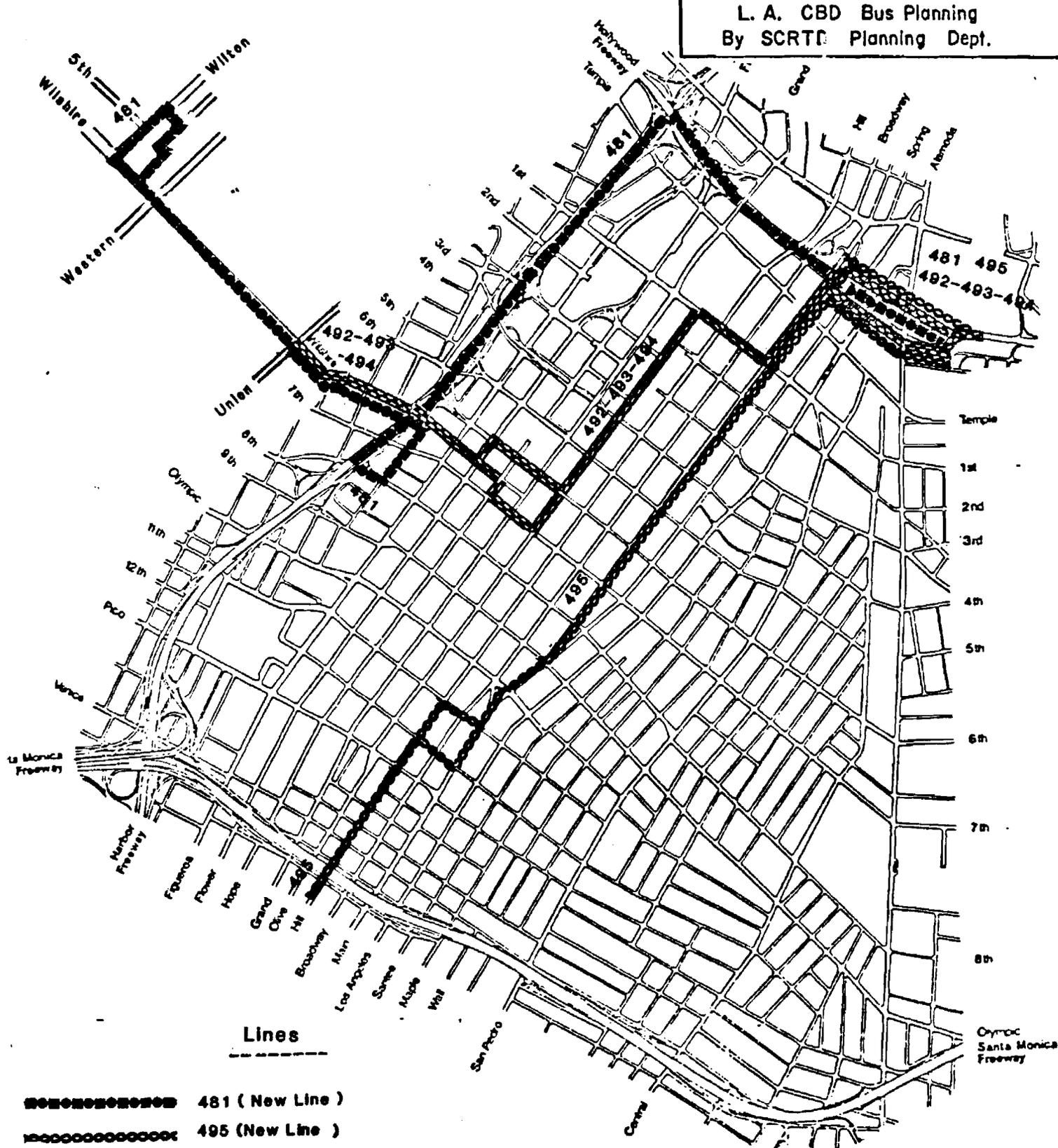
- 486
- ▤▤▤▤▤▤▤▤ 760-762-764
- ◆◆◆◆◆◆◆◆ 487-489-491
- ▧▧▧▧▧▧▧▧ 482-483-484-485-486-488-490
- ▨▨▨▨▨▨▨▨ 480 (492-493-494--terminate at Western Ave.)

# BUSWAY LINES

MAP 4

Effective June 15, 1980 \*

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.



**Lines**

-  481 ( New Line )
-  495 ( New Line )
-  492-493-494 ( terminate at Union Ave. )

4-'80  
H.G.

\* All other Busway Lines remain the same as the existing Lines (see "Existing Busway Lines" map)

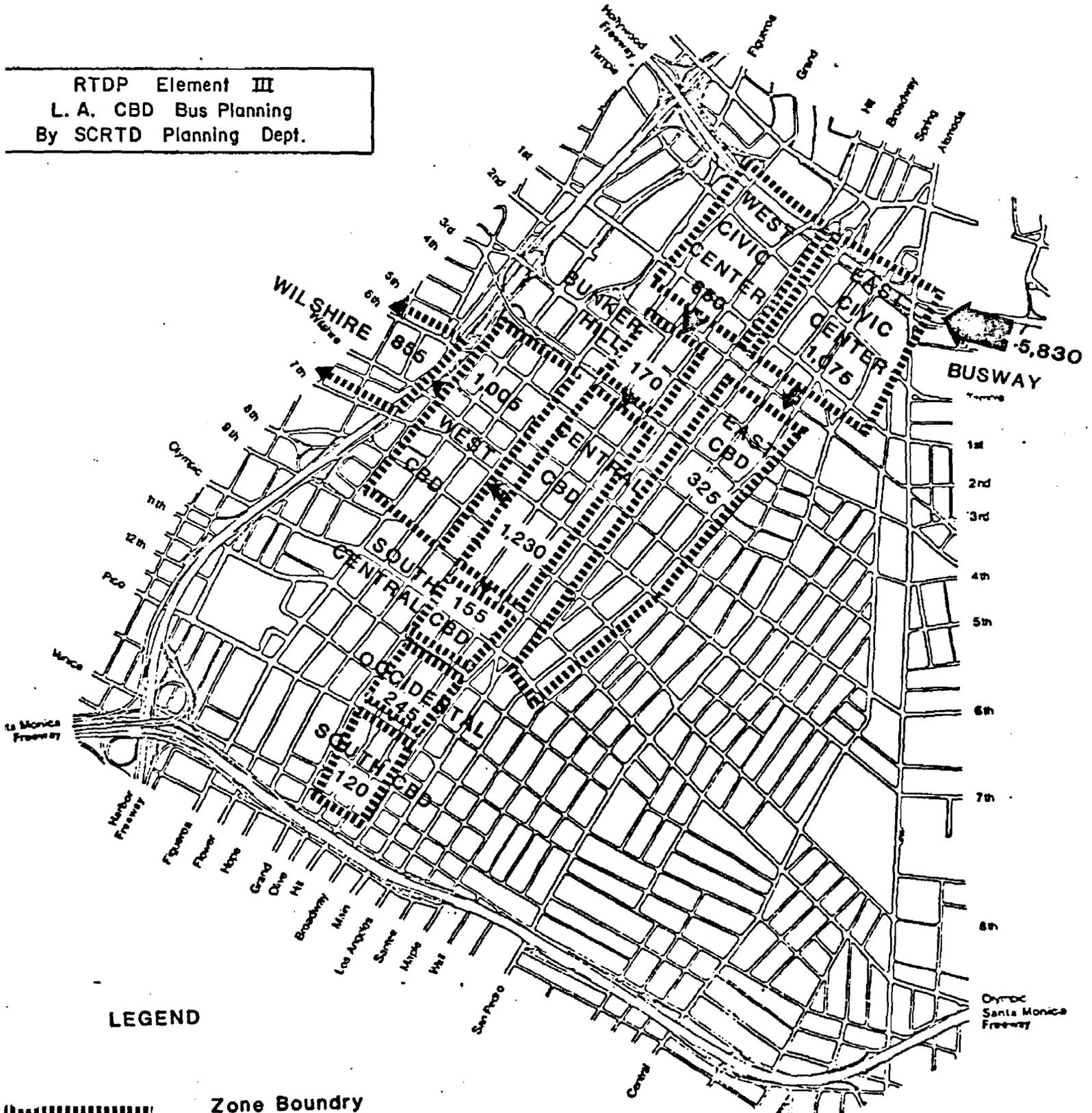




Weekday CBD/Wilshire Destinations of Present Busway Users

Peak Period (6:00am-9:00am)

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.



LEGEND



Zone Boundary

000

Number of Passengers  
Going to Each Zone

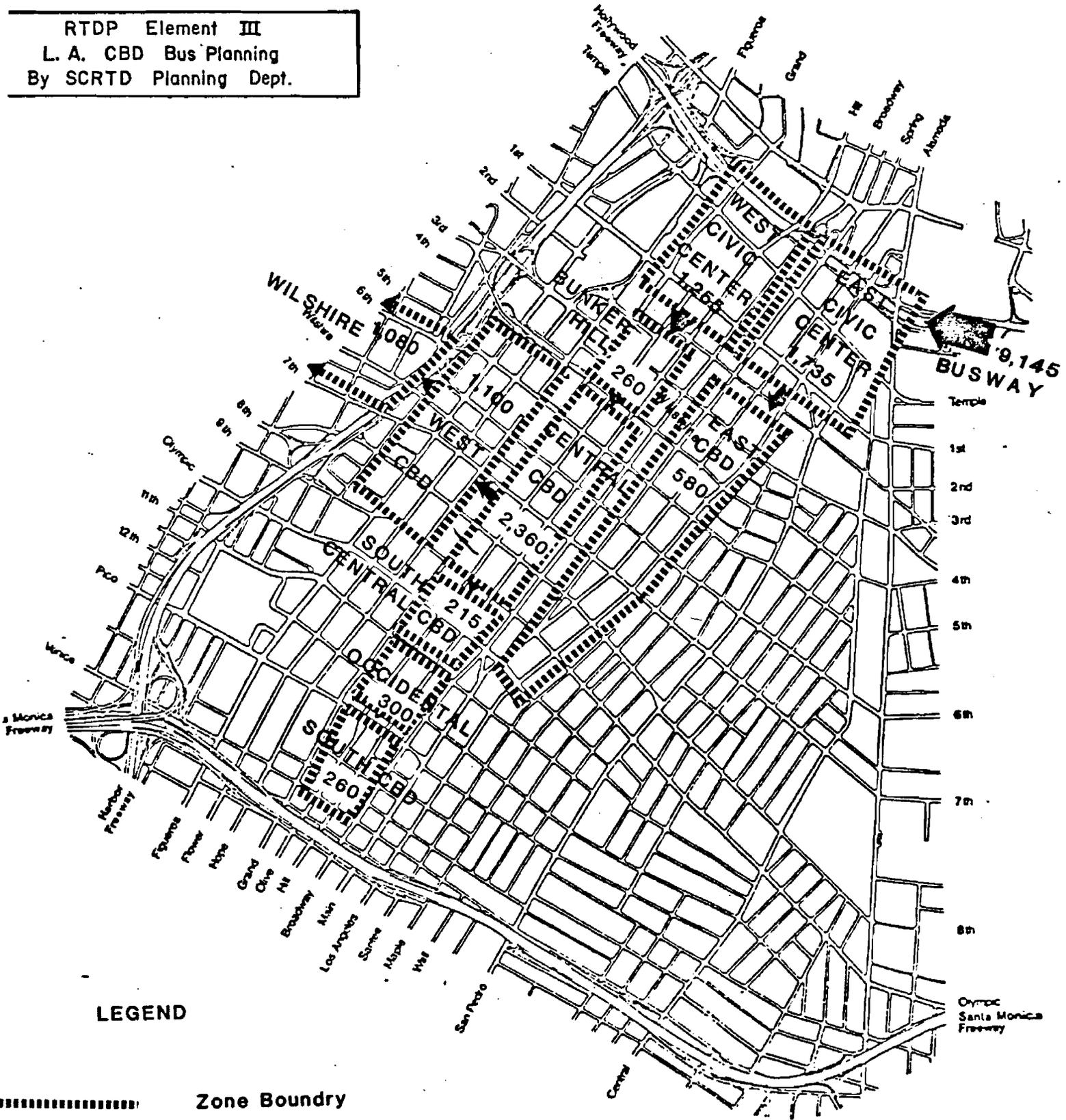
# UNION STATION STUDY

MAP 8

## Weekday CBD/Wilshire Destinations of Present Busway Users

All Day

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.

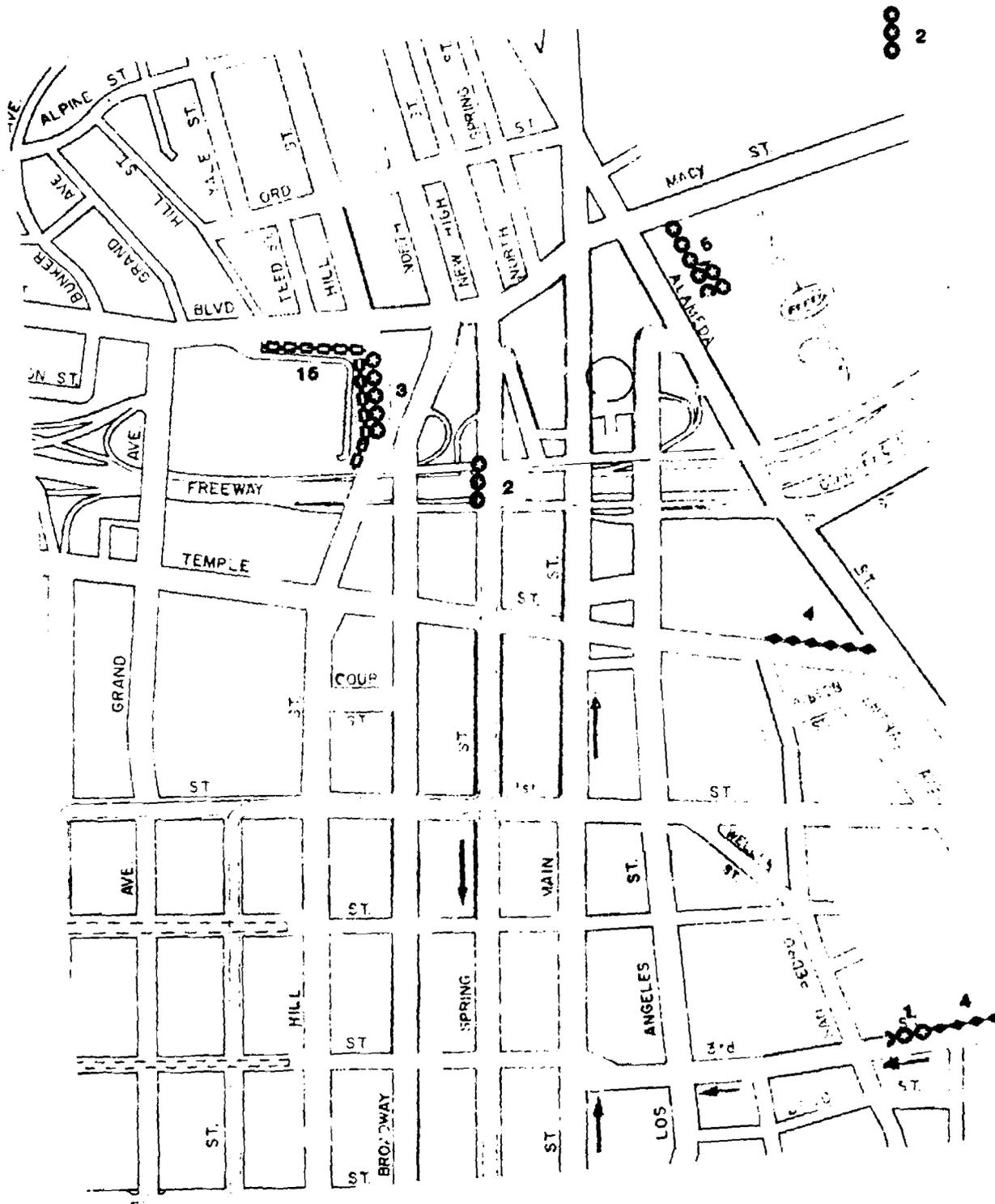


### LEGEND

-  Zone Boundry
-  Number of Passengers Going to Each Zone

# EXISTING LAYOVER LOCATIONS AND SPACES

## In The Vicinity Of Union Station



### LEGEND

- ○ ○ ○ ○ ○ All Day Layovers
- ◆ ◆ ◆ ◆ ◆ Peak Period Layovers (3:00p.m.-7:00p.m.)
- ⊗ ⊗ ⊗ ⊗ Layovers on Hollywood Park Race Track Days
- Numbers Number of Layover Spaces Currently Used

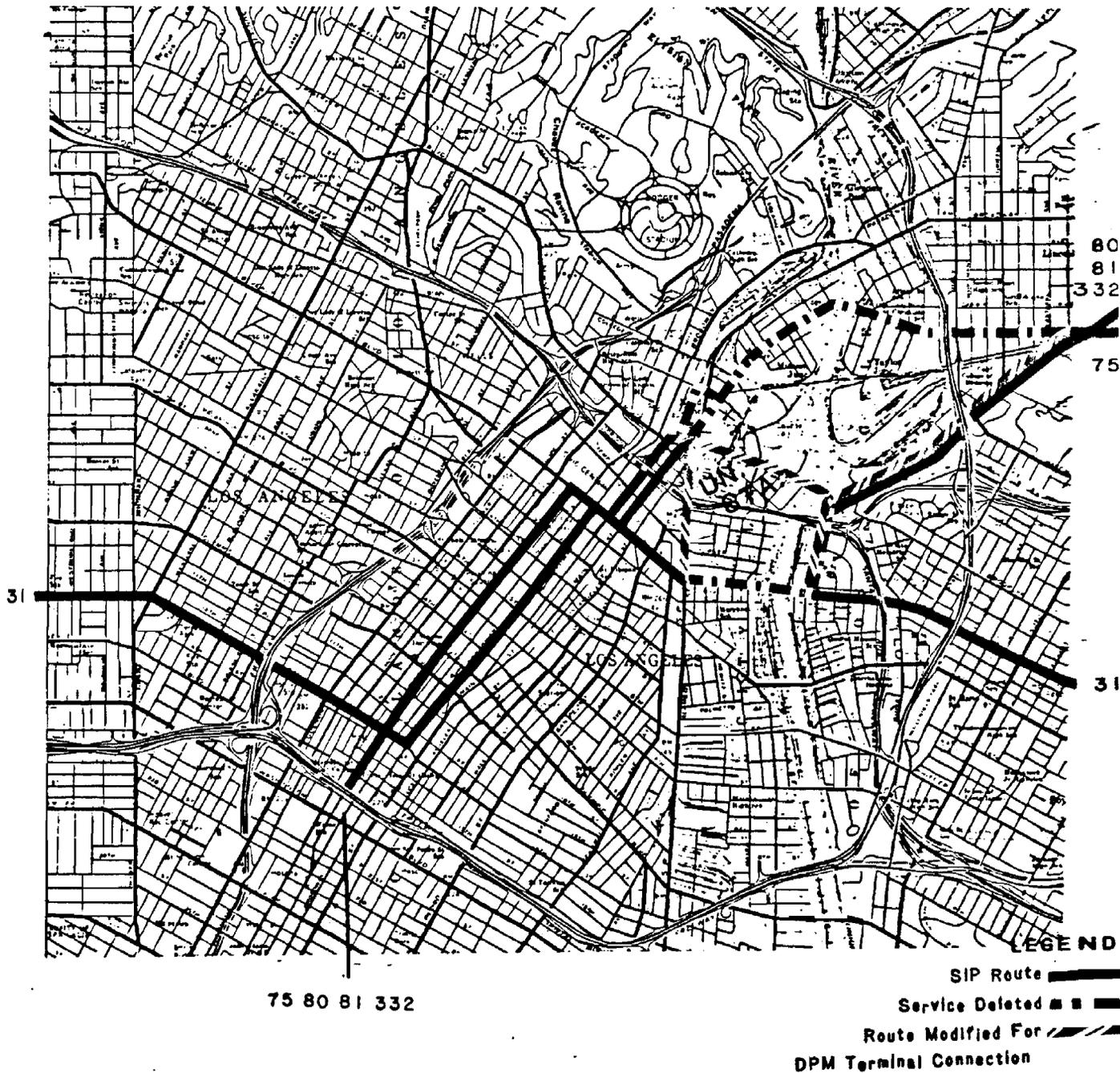
RTDP Element III  
 L. A. CBD Bus Planning  
 By SCRTP Planning Dept.

# SIP PLAN LOCAL LINES

MAP 10

## Possible Route Modification For Bus Interface With Union Station DPM Terminal

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.



1980  
MJB

IV-59

NOTE : these candidate lines for route modification are not recommended. See Text.

MAP #11 SERIES

DPM  
UNION STATION  
TERMINAL

SAN BERNARDINO FREEWAY ROUTES  
(J1 ALTERNATIVES)

SIP PLAN EXPRESS LINES  
 SAN BERNARDINO FREEWAY  
SUMMARY OF ALTERNATIVES

Explanation of alternatives studies. In summary, the variables studied in these route configuration alternatives consist of varying percentages of service operated over the SIP plan of routes in the CBD for El Monte Busway routes. These can be reduced to three basic variables as shown in the table below.

PERCENTAGE OF BUSWAY TRIPS PM  
PEAK PERIOD OUTBOUND

<u>Alternative Description</u>	<u>% Trips Terminating @ Union Sta.</u>	<u>% Trips Terminating @ Civic Center</u>	<u>% Trips Thru</u>
1. Present routes as of 6/15/80	0%	0%	100%
2. * 1st Model (1979)	0%	0%	100%
3. 2nd Model (with Rapid Transit)	43%	0%	57%
4. <u>Without Rail</u>	21%	0%	79%
5. <u>Without Rail</u>	21%	18%	61%
6. <u>Without Rail</u>	40%	0%	60%
7. <u>Without Rail</u>	100%	0%	0%
8. <u>With Rail</u>	40%	0%	0%
9. <u>With Rail</u>	21%	39%	40%
10. <u>With Rail</u>	40%	18%	42%
11. <u>With Rail</u>	100%	0%	0%

\* The "1st Model (1979)" refers to the bus routes and frequency of service provided as input to the DPM patronage projection modeling work. In the case of the first round of the DPM patronage forecasting, about 40% of all PM peak hour outbound busway trips were shown to be intercepted (begin and end service) at Union Station. However, only individual bus trips of Busway bus lines were intercepted. Entire bus lines were not intercepted. In the case of the second DPM patronage modeling iteration, to better reflect actual operating practices, entire bus lines were shown to be intercepted instead of a few bus trips from each Busway bus line.

DEPARTMENTAL

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**

425 SOUTH MAIN STREET  
LOS ANGELES

DO NOT INCLUDE MORE THAN ONE  
SUBJECT IN THIS COMMUNICATION

DATE: February 3, 1981

TO: File

FROM: Milton J. Brame *MJB*

SUBJECT: Studied Intercept Criteria for  
Union Station & Civic Center

Each of the intercept criteria listed below has been considered in the decision of what bus lines are to be intercepted at Union Station and Civic Center, given studied intercept requirements for Union Station and Civic Center intercept points. The criteria represent an attempt to integrate suggestions from all planning staff concerned. Obviously, all criteria cannot be met in the several alternatives considered. The following criteria are listed below in descending priority:

1. Use peak period buses only for intercept.
2. Avoid breaking up lines with common routes, i.e. 487-489-491, 483-485, 492-493-494.
3. With rail alternatives, use lines with Wilshire service for intercept.
4. Avoid intercept of Line 481 in the alternatives without rail.
5. Consider balancing service by individual distribution routes in the CBD.
6. Retain, where possible, service on east side of CBD.
7. Avoid Civic Center Intercept of all day bus routes (due to bus layover problem).
8. Avoid the use of Park/Ride lines.

MJB/dmg



SIP PLAN EXPRESS LINES  
SAN BERNARDINO FREEWAY

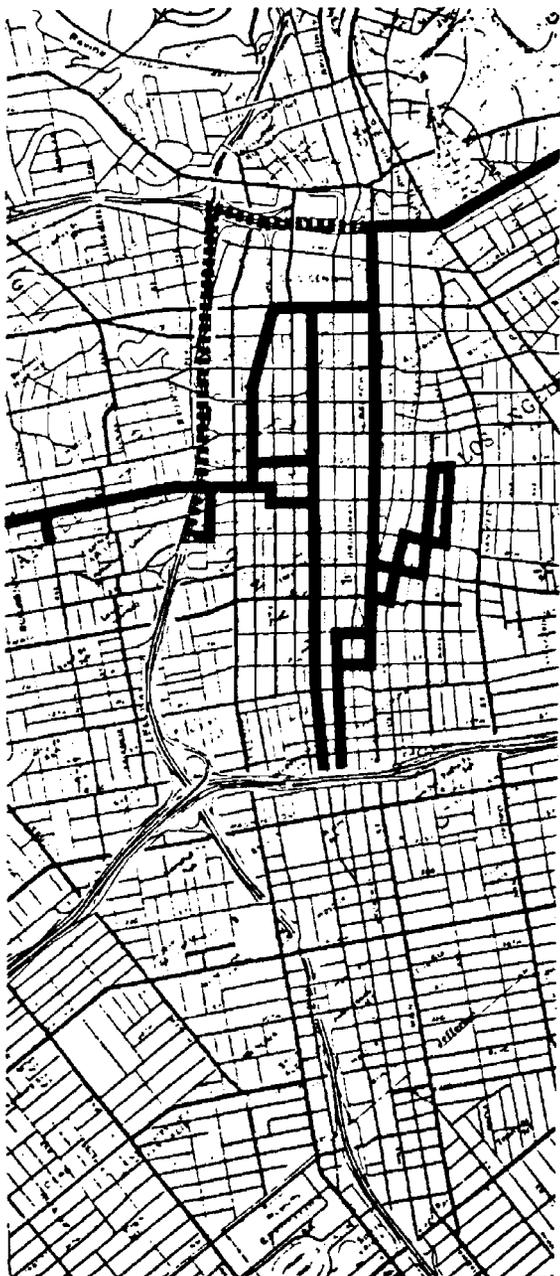
11 ROUTES AND SERVICE ALTERNATIVES FOR INTERFACE WITH UNION STATION TERMINAL

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTPD Planning Dept.

1. Present routes as of June 15, 1980

NOTE: Percent of trips and lines travelling to the following CBD areas

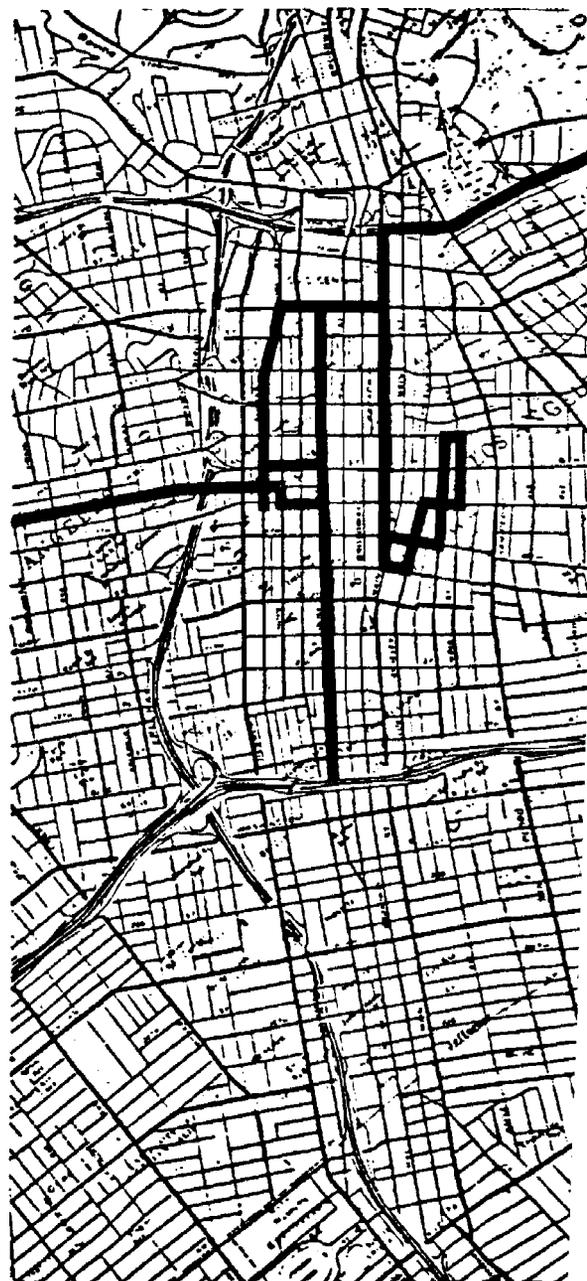
- Wilshire/Western (via Flower St.) - 20% (Lines 760,762,764)
- Wilshire/Union (via Olive St.) - 36% (Lines 492,493,494,487,489,491,480,481)
- Terminal 28 - 37% (Lines 482,483,484,485,486,458,490)
- Spring St. - 7% (Lines 495,496)



2. 1st Model (1979)

NOTE: Percent of trips and lines travelling to the following CBD areas

- Wilshire/Western - 54% (Lines 480,487,489,492,493,494,760,762,764)
- Terminal 28 - 45% (Lines 482,483,484,485,490)
- Maple Lot - 1% (Line 496)



SIP PLAN EXPRESS LINES  
SAN BERNARDINO FREEWAY

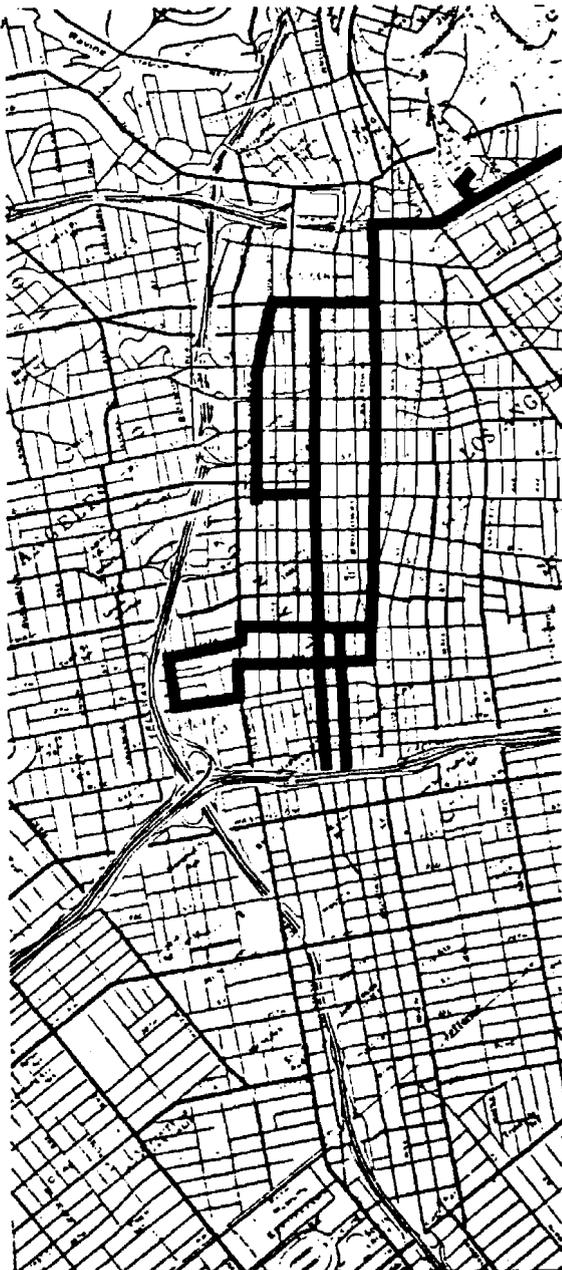
ALTERNATIVES 4 THROUGH 7 ARE MODELLED WITHOUT RAIL,

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.

3. 2nd Model (with Rapid Transit)

NOTE: Percent of trips and lines travelling to the following CBD areas

- Union Station - 43% (Lines 481,482,483,485, 486,488,762)
- 7th/Flower - 35% (Lines 480,487,489,491,492, 493,494,760,764)
- Spring Street - 13% (Lines X475,495,496)
- Terminal 28 - 9% (Lines 484,490)

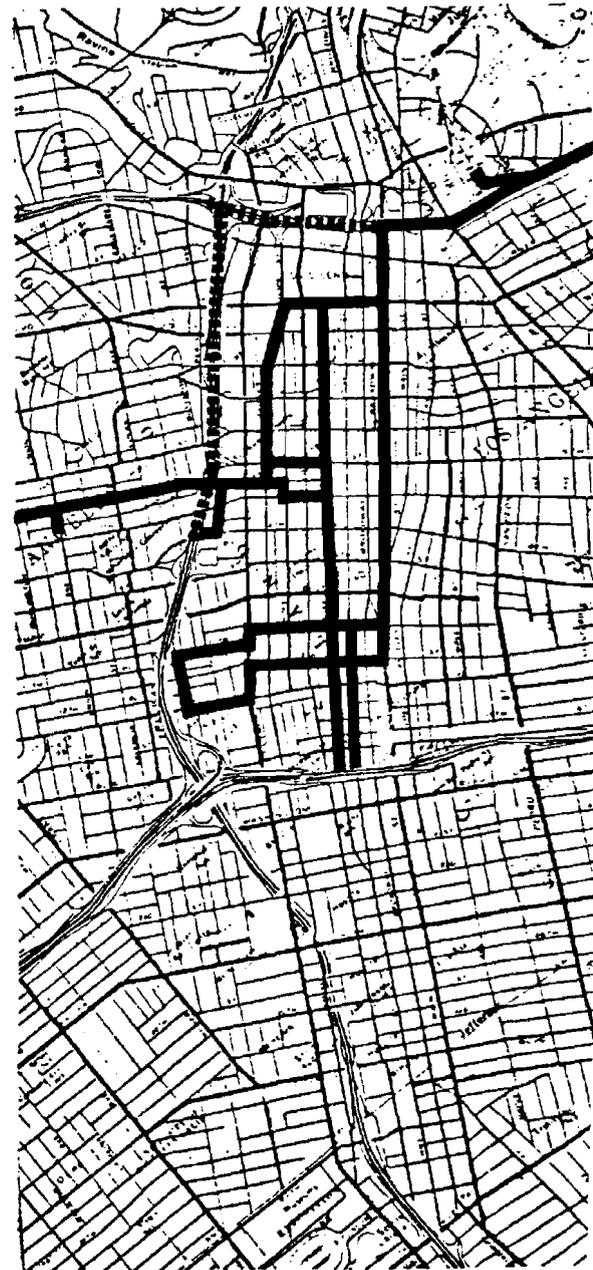


(3)

4. Alternative Without Rail

NOTE: Percent of trips & lines travelling to the following CBD areas

- Union Station-20% (Lines 492-493-494-488-486-482)
- Wilshire/Western (via Flower St.)-19% (Lines 760-762-764)
- Wilshire/Union (via Harbor Pwy.)-9% (Line 481)
- Wilshire/Union (via Olive St.)-18% (Lines 480-487-489-491)
- Terminal 28-21% (Lines 484-483-485-490)
- Spring St.-12% (Lines X475-496-495)



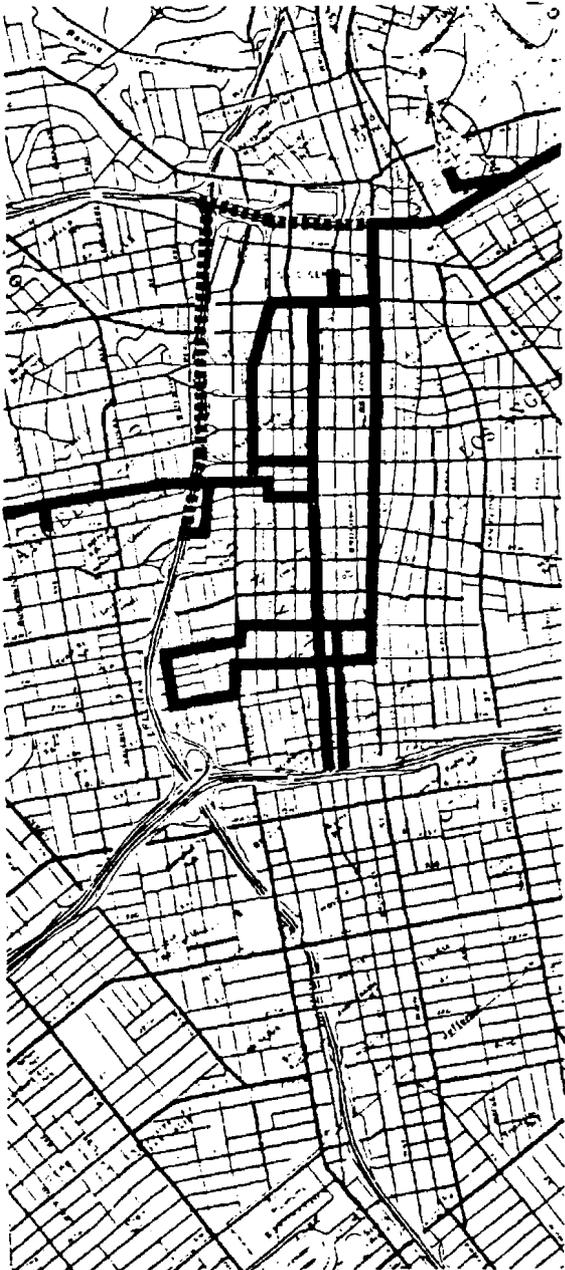
**SIP PLAN EXPRESS LINES  
SAN BERNARDINO FREEWAY**

**RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.**

**5. Alternative Without Rail**

NOTE: Percent of trips & lines travelling to the following CBD areas

- Union Station-20% (Lines 492-493-494-487-489-491)
- Civic Center-20% (Lines 482-486-488-762)
- Wilshire/Western (via Flower St.)-12% (Lines 760-764)
- Wilshire/Western (via Harbor Fwy.)-9% (Line 481)
- Wilshire/Union (via Olive St.)-4% (Line 480)
- Terminal 28-21% (Lines 484-483-485-490)
- Spring St.-12% (Lines X475-496-495)

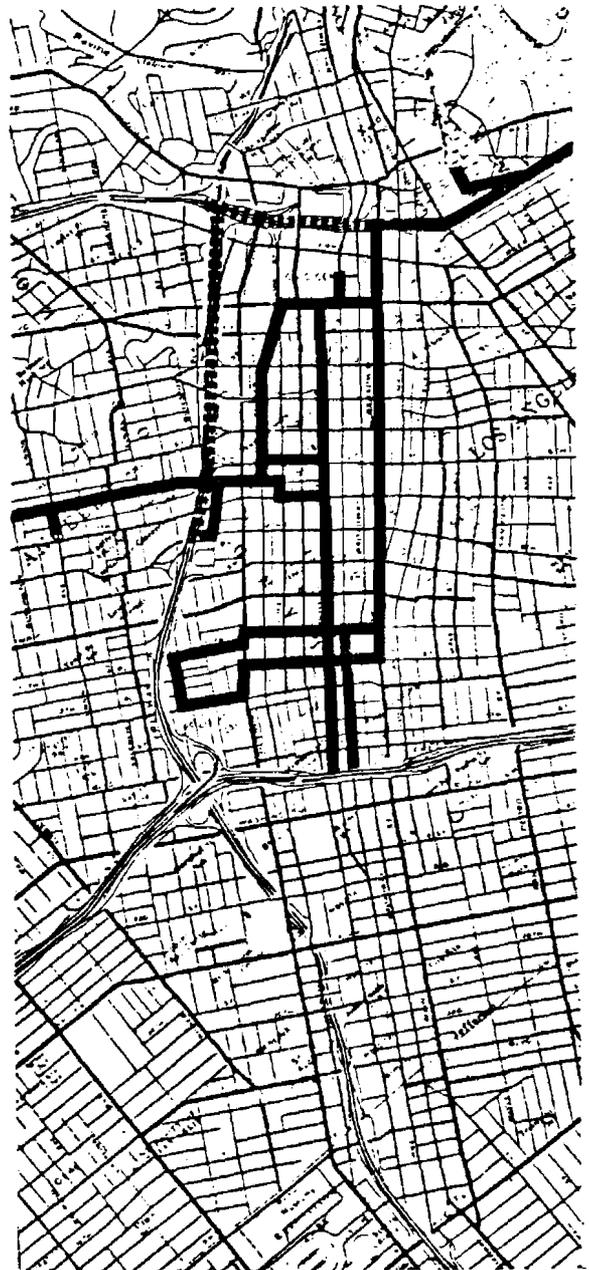


(5)

**6. Alternative Without Rail**

NOTE: Percent of trips & lines travelling to the following CBD areas

- Union Station-42% (Lines 487-489-491-495-484-492-493-494-484-762-764)
- Civic Center-21% (Lines 482-486-488-760)
- Wilshire/Western (via Flower St.)-0%
- Wilshire/Western (via Harbor Fwy.)-9% (Line 481)
- Wilshire/Union (via Olive St.)-4% (Line 480)
- Terminal 28-17% (Lines 483-485-490)
- Spring St.-7% (Lines X475-496)



(6)



(7)

**7. Alternative without Rail**

NOTE: 100% of all trips intercepted Union Station

SIP PLAN EXPRESS LINES  
SAN BERNARDINO FREEWAY

ALTERNATIVES 8 THROUGH 11 WITH RAIL

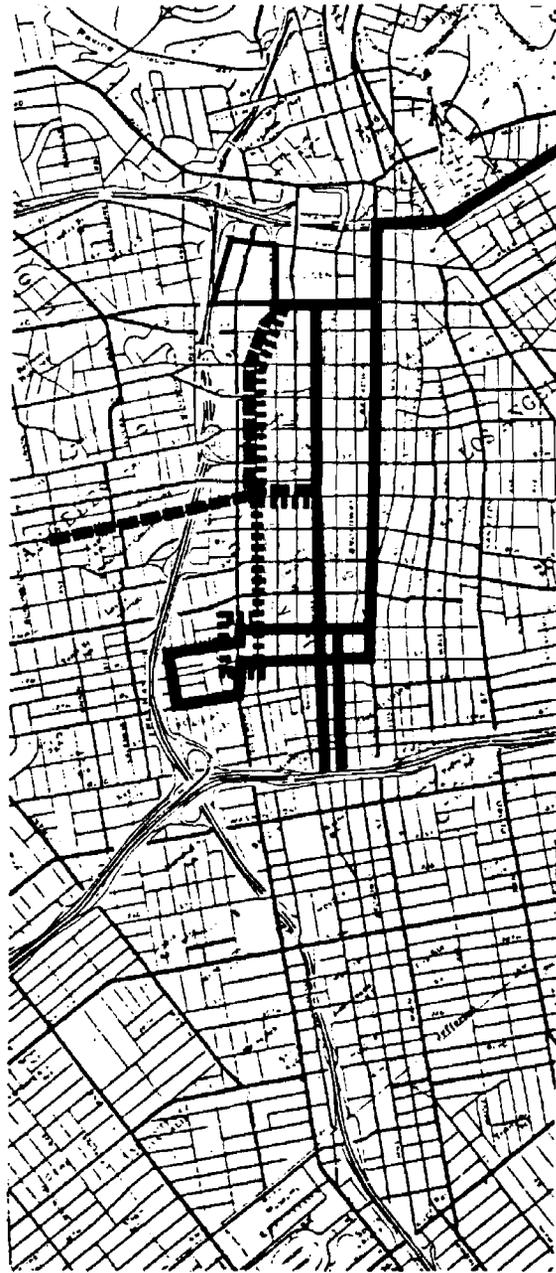
RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.

NOTE: Consider 3 terminal alternatives for Wilshire Express lines for Maps 8-10

Fremont Lot—————

7th/Union■■■■■■■■■

Convention Center■■■■■■■■■



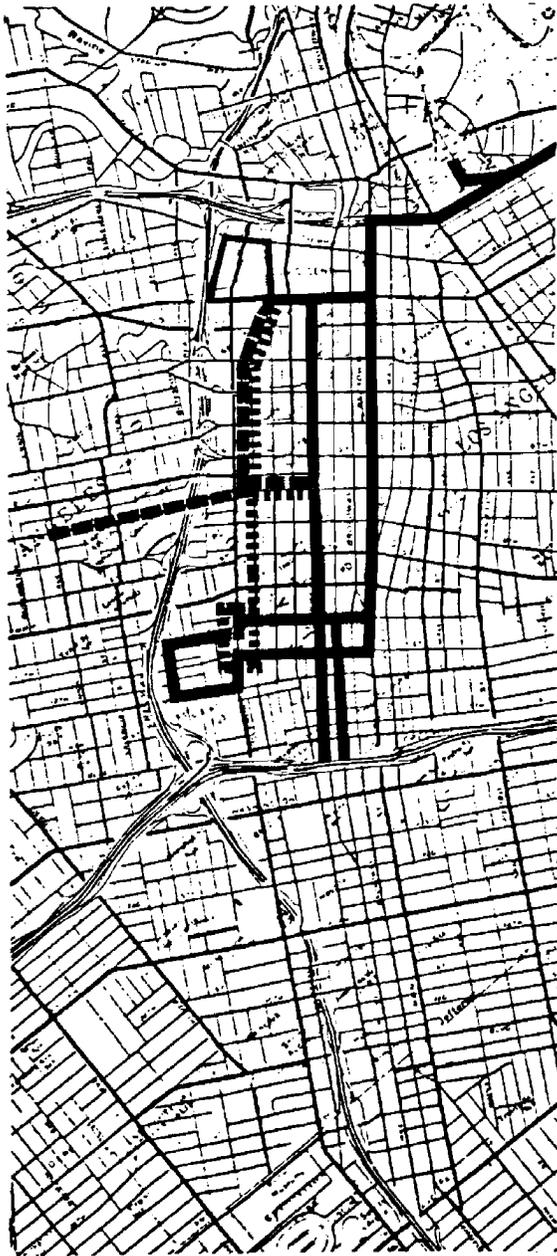
SIP PLAN EXPRESS LINES  
 SAN BERNARDINO FREEWAY

RTDP Element III  
 L. A. CBD Bus Planning  
 By SCRTD Planning Dept.

8. Alternative With Rail

NOTE: Percent of trips & lines travelling to the following CBD areas

- Union Station-39% (Lines 487-489-491-480-486-492-493-494-481)
- Wilshire/Western (via Flower St.)-19% (Lines 760-762-764)
- Wilshire/Western (via Harbor Fwy.)-0%
- Wilshire/Union (via Olive St.)-0%
- Terminal 28-29% (Lines 482-483-485-484-488-490)
- Spring St.-12% (Lines X475-495-496)

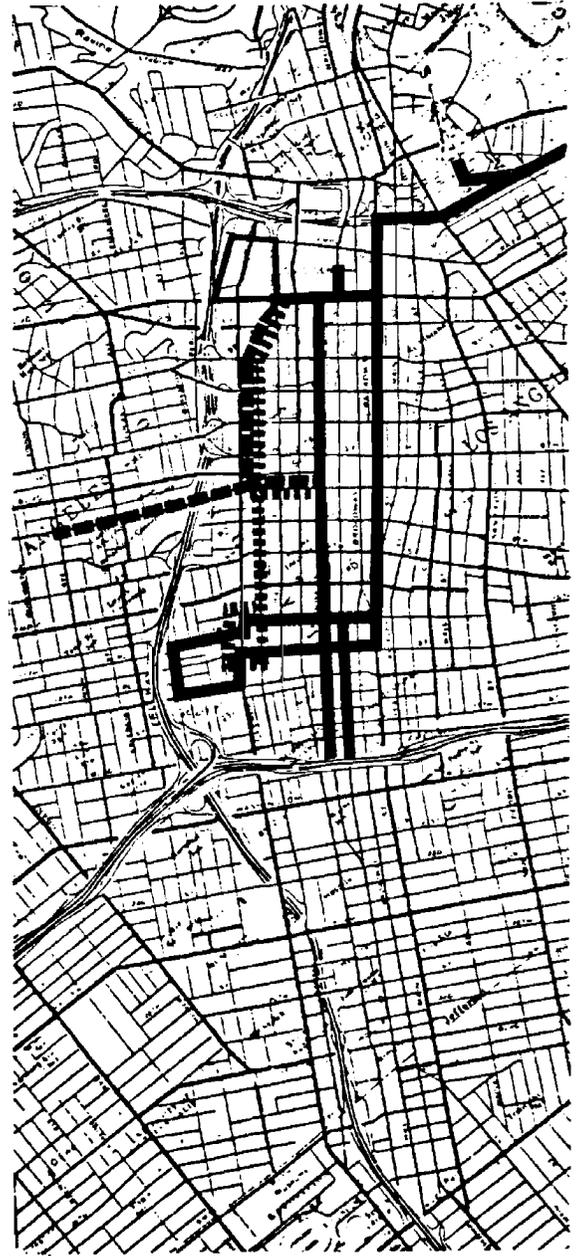


(8)

9. Alternative With Rail

NOTE: Percent of Trips & lines travelling to the following CBD areas

- Union Station-27% (Lines 487-489-491-480-481)
- Civic Center-31% (Lines 482-492-493-494-762-764-488-486)
- Wilshire/Western (via Flower St.)-8% (Line 760)
- Wilshire/Western (via Harbor Fwy.)-0%
- Wilshire/Union (via Olive St.)-0%
- Terminal 28-21% (Lines 484-483-485-490)
- Spring St.-12% (Lines X475-495-496)



(9)

SIP PLAN EXPRESS LINES  
SAN BERNARDINO FRIEWAY

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.

10. Alternative With Rail

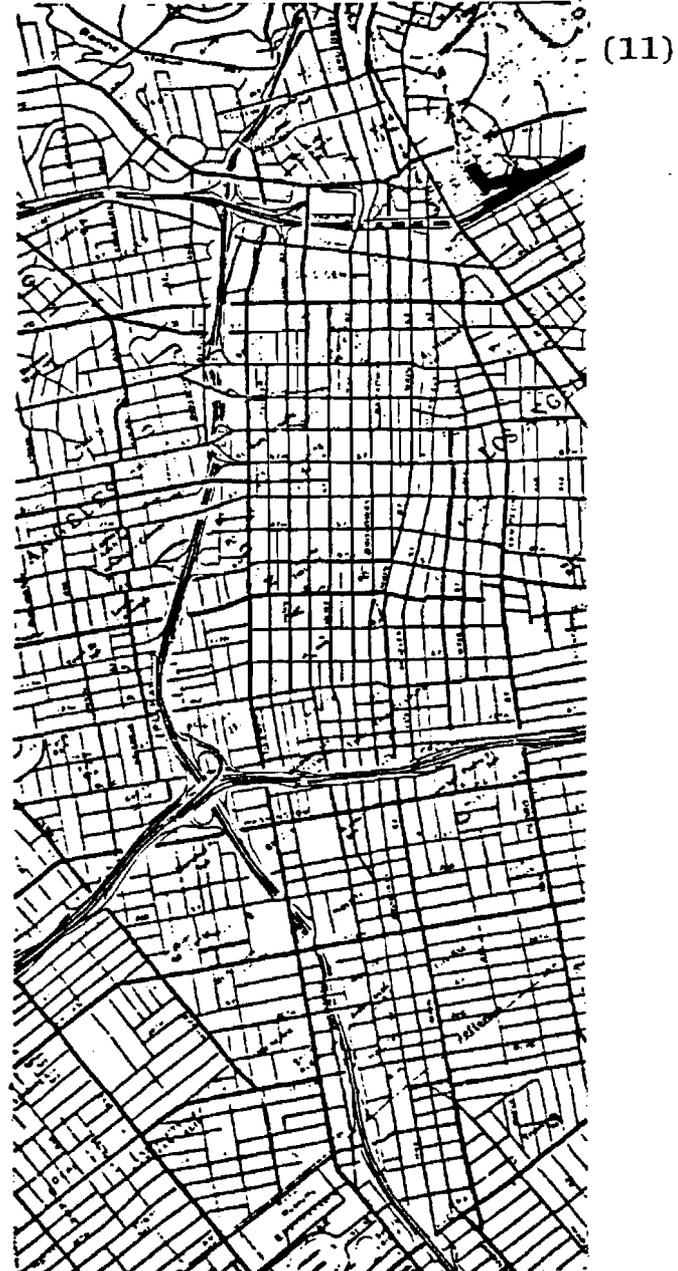
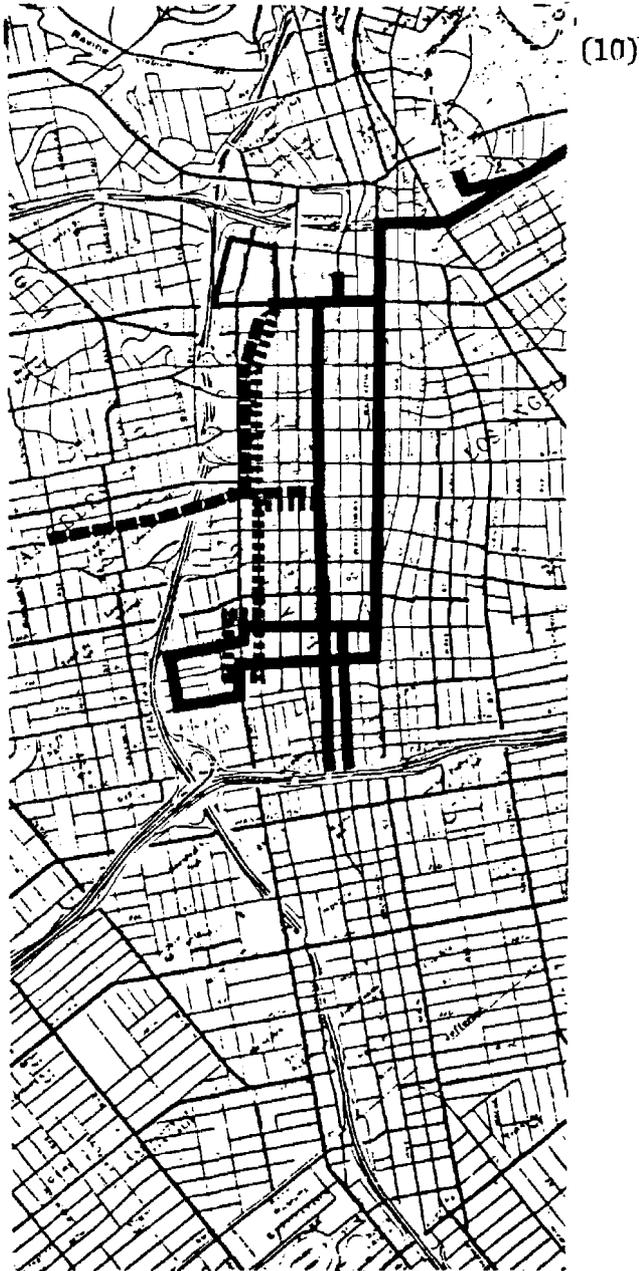
NOTE: Percent of trips & lines travelling to the following CBD areas

- Union Station-39% (Lines 487-489-491-480-492-493-494-481-486)
- Civic Center-19% (Lines 488-762-764-482)
- Wilshire/Western (via Flower St.)-8% (Line 760)
- Wilshire/Western (via Harbor Fwy.)-0%
- Wilshire/Union (via Olive St.)-0%
- Terminal 28-21% (Lines 484-483-485-490)
- Spring St.-12% (Lines X475-495-496)

11. Alternative with Rail

NOTE: Percent of trips and lines travelling to the following CBD areas

- Union Station - 100% (Lines 480,481,482,483, 484,485,486,487,488,489,490,491,492,493,494, 495,496,X475,760,762,764)



CONVENTION CENTER TRANSPORTATION CENTER

PRESENT AND FUTURE BUS SERVICE  
ANALYSIS

## C. CONVENTION CENTER TRANSPORTATION CENTER

### 1. PRESENT AND FUTURE BUS SERVICE ANALYSIS: COMPARISON WITH UNION STATION DPM CORRIDOR

A multi modal transportation center will be developed at the DPM Convention Center Terminal similar to the DPM terminal at Union Station. However, the potential transfer volumes between buses, both express and local, and the DPM is lower than the Union Station site. The transfer volume will be lower at the Convention Center site for two primary reasons: (1) less service converging upon this portion of the CBD compared to the Union Station area and (2), less opportunity for convenient transfer connections and for bus intercept connections. The second case is particularly true for express bus service from the Harbor and especially the Santa Monica freeways.

In regard to the Santa Monica Freeway express bus service, the closest on and off ramp to the Convention Center is Grand Ave. This is the present route used by the Santa Monica freeway express buses. In the future, as shown on the SIP Plan route maps, for service to the Convention Center DPM site, Grand Ave. will have to continue to be used unless direct access ramps can be constructed between the DPM terminal site and the freeway. Without improved freeway access at this point, buses destined to the DPM terminal will have to back track three blocks west to Figueroa--a loss of several minutes running time.

The tables that follow show present local and express lines passing through the Convention Center corridor. Also shown are the SIP Plan local and express lines, together with their layover and loading and unloading requirements, for buses connecting with and terminating at the Convention Center DPM site.

Some of the data shown for the Union Station DPM corridor, to include bus rider destination analysis, based on bus boardings and alightings, has not yet been developed for the Convention Center DPM corridor.

As was shown with the Union Station tables, a bus route inventory table immediately below lists the route destinations of each line number used in the following tables. Also as was shown with the Union Station data, lines requiring route deviations in order to obtain additional opportunities for bus riders to transfer to the DPM terminal station are shown. In the case of the Santa Monica Freeway express lines, it is believed route deviation may be warranted, as discussed above, even though significant additional running time will

result. However the additional SIP Plan lines which are identified as candidates for route deviation in order to connect with the DPM Convention Center are not recommended at this time. These route deviations would be very detrimental to the improved grid system provided for in the SIP Plan system of lines. The purpose in listing the route deviation candidate lines is to show the maximum route options available.

As with the analysis for the Union Station DPM terminal, layover, loading and unloading requirements have been projected for the Convention Center DPM Terminal. In summary, for layover a requirement for 6 spaces is projected for express lines and 6 spaces for local lines. These layover spaces need not be provided within the terminal facilities, but they should be close by, either on street or off street. In addition, for loading and unloading, a requirement of 4 spaces is projected for local lines (both passing and terminating lines) and 4 spaces for express lines (includes through bus and intercept bus requirements).

DATA SECTION

TABLE 1

BUS ROUTE INVENTORY-EXISTING  
FOR DPM TERMINAL STATIONS AND ADJACENT CORRIDORS  
CONVENTION CENTER

Line #	Suburban Description	CBD Route	CBD Terminal	Route Modification Needed For Interface	Number of Bus Trips Intercepted		Comments
					OP Cost & Feasibility Study PM Outbound (1978) Peak Hour/Period	1985 Patronage Modelling Input PM Outbound Peak Hour/Period	
<b>Local</b>							
12	W. Washington Bl./ El Sereno	Broadway	None	None			
26	Pico Bl./E. 1st St.	Broadway	None	None			
49	S. Figueroa/San Pedro	5th/6th St.	None	None			
<b>Express</b>							
5X	Harbor Pwy/South Bay	Broadway	Union Station	More Feasible			Rush hour only.
7X	Harbor Pwy/South Bay/ Eagle Rock	Spring St.	None	--			7X cancelled; 7 Limited new service is not in corridor.
601	S.M. Pwy./Pacific Palisades	Flower St.	3rd & San Pedro St.	More Feasible		) } 4/	Rush hour only.
602	S.M. Pwy./Westwood	" "	" " "	" "			" " "
604	S.M. Pwy./Venice	" "	" " "	" "	6/8		" " "
605	S.M. Pwy./Marina Del Rey	" "	" " "	" "			" " "
606	S.M. Pwy./Hermosa Beach	" "	" " "	" "			" " "
607	S.M. Pwy./Torrance	" "	" " "	" "			
608	S.M. Pwy./Malibu	" "	" " "	" "			Travels all day.
737	Harbor Pwy./San Pedro	" "	Temple & San Pedro St.	" "			Rush hour only.
810	Harbor Pwy./San Pedro	Olive St.	Union Station	" "			5/
813	Harbor Pwy./Marineland	Olive St.	Union Station	" "			
814	Harbor Pwy./Palos Verdes	Olive St.	Union Station	" "	4/7		
Subtotal Intercept Trips				IV-74	10/15	9/	MJB:cym 6/80

TABLE 1

BUS ROUTE INVENTORY-SIP PLAN ROUTES  
FOR DPM TERMINAL STATIONS AND ADJACENT CORRIDORS  
CONVENTION CENTER

Line #	Suburban Description	CBD Route	CBD Terminal	Route Modification Needed For Interface	For 1990 Projections Number of Bus Trips Intercepted		Comments
					OP Cost & Feasibility Study PM Outbound (1990) Peak Hour/Period	1990 Patronage Modelling Input PM Outbound Peak Hour/Period	
<b>Local</b>							
30	Pico & Rimpau/Floral/ Monterey Park	Broadway	None	None			
31	Pico & Rimpau/E 1st/ Monterey Park	Broadway	None	None			
44	So. Figueroa/No. Figueroa/ Eagle Rock	5th & 6th/ Hill St.	None	None			
65	E. Washington Bl/La Mirada	Figueroa St.	Diamond & Fremont	None			
28	Century City/Olympic/ Brooklyn	Broadway	None	Less Feasible			
33	W. Venice/Santa Monica	Main/Spring St	Union Station	Less Feasible		10/	
35	W. Washington Bl	Broadway	Union Station	Less Feasible			
37	W. Adams Bl	Hill St.	Union Station	Less Feasible			
38	W. Jefferson Bl	Hill St.	Union Station	Less Feasible			
311	Olympic Bl/Century City	Broadway	Union Station	Less Feasible			Limited.
70	Garvey Av/El Monte	Spring St.	Convention Center	None			Terminating at Conv. Center.
71	City Terrace/Sybil Brand Institute	Spring St.	Convention Center	None			Terminating at Conv. Center.
<b>Express</b>							
430	Santa Monica Pwy/Sunset Bl/ Pacific Palisades	Flower St.	Union Station	More Feasible		4/	
434	Santa Monica Pwy/Santa Monica C.B.D./Malibu	Flower St.	Union Station	More Feasible			
436	Santa Monica Pwy/Venice Bl/ Venice	Flower St.	Union Station	More Feasible IV-75	8/10		#604 for OP Study.

TABLE 1

BUS ROUTE INVENTORY-SIP PLAN ROUTES  
FOR DPM TERMINAL STATIONS AND ADJACENT CORRIDORS  
CONVENTION CENTER

Line #	Suburban Description	CBD Route	CBD Terminal	Route Modification Needed For Interface	For 1990 Projections		Comments
					Number of Bus Trips Intercepted OP Cost & Feasibility Study PM Outbound (1990) Peak Hour/Period	1990 Patronage Modelling Input PM Outbound Peak Hour/Period	
<b>Express</b>							
437	Santa Monica Pwy/Marina del Rey	Flower St.	Union Station	More Feasible			
439	Santa Monica Pwy/La Cienega Bl/Redondo Bch	Flower St.	Union Station	More Feasible			
442	Harbor Pwy/Inglewood Av/Redondo Beach	Hill St.	Union Station	More Feasible			
444	Harbor Pwy/Imperial Hwy/Pershing Dr.	Hill St.	Union Station	More Feasible			
448	Harbor Pwy/Avalon Bl/San Pedro	Olive St.	Union Station	More Feasible		3/	
405	Glendale Pwy/Altadena	Flower St.	18th & Hill St.	Less Feasible**			
422	Hollywood Pwy/Van Nuys/Northridge	Flower St.	18th & Hill St.	Less Feasible**			
475	Busway/Garvey Bl/El Monte	Main/Spring St.	Convention Center	None			
737	Harbor Pwy/San Pedro	Flower St.	Temple & San Pedro St.	More Feasible		4/	
813	Harbor Pwy/Marineland	Olive St.	Union Station	More Feasible			
814	Harbor Pwy/Palos Verdes	Olive St.	Union Station	More Feasible	5/9		
Convention Center Subtotal Intercept Lines					13/19	21/	
NOTE: **	Those lines are candidates for termination at Convention Center			not intercept			
MJB 6/80				IV-76			

BUS ROUTE INVENTORY - SIP EXPRESS ROUTES

as modified by  
Proposed Harbor-Century Transitway  
For DPM Terminal Stations and  
Adjacent Corridors  
Convention Center

TABLE 1-A

LINE #	SUBURBAN DESCRIPTION	CBD ROUTE	CBD TERMINAL	RTE. MOD. NEEDED FOR INTERFACE	FOR 1990 PROJECTIONS # BUS TRIPS INTERCEPTED		COMMENTS
					OP COST & FEASIBILITY STUDY OUTBOUND(1990) PK HR/PERIOD	1990 PATRONAGE MODELLING INPUT PM OUTBOUND PK HR./PERIOD	
444X	Harbor-Century Fwy/LAX Transit Center	Figueroa Street	Convention Center	None			
448X	Harbor Fwy./Avalon Bl/San Pedro	Figueroa/Olive St.	Union Station	None			
449X	Harbor Fwy/EI Segundo Bl/ Willowbrook Ave./North Long Beach Park/Ride	Figueroa/Olive St.	Union Station	None			
737	Harbor Fwy/San Pedro	Figueroa/Olive St.	Union Station	None			
740	Harbor Fwy/Artesia Bl./ Gardena	Figueroa/Olive St.	Union Station	None			
750	Harbor-Century Fwy/Norwalk Transit Center	Figueroa/Olive St.	Union Station	None			
755	Harbor-San Diego Fwy/PCH/ East Long Beach Transit Center	Figueroa/Olive St.	Union Station	None			
813	Harbor-San Diego Fwy/Hawthorne Bl/Rancho Palos Verdes	Figueroa/Olive St.	Union Station	None			
814	Harbor-San Diego Fwy/Palos Verdes Bl/Rancho Palos Verdes	Figueroa/Olive St.	Union Station	None			
510	LAX/Century Fwy/Fullerton	-----	-----	N/A			

Existing Bus Trips Passing by Convention Center

<u>Line</u>	<u>Base Hr. (12:01pm-1:00pm)</u>			<u>Peak Hr. (4:15pm-5:15pm)</u>			<u>All Day</u>		
	<u>Inbound</u>	<u>Outbound</u>	<u>Total</u>	<u>Inbound</u>	<u>Outbound</u>	<u>Total</u>	<u>Inbound</u>	<u>Outbound</u>	<u>Total</u>
<u>LOCAL</u>									
12	3	3	6	6	8	14	83	80	163
26	12	12	24	18	19	37	210	209	419
49	<u>3</u>	<u>3</u>	<u>6</u>	<u>7</u>	<u>7</u>	<u>14</u>	<u>68</u>	<u>69</u>	<u>137</u>
Subtotal	18	18	36	31	34	65	361	358	719
<u>FREEWAY EXPRESS</u>									
5X	-	-	-	-	5	5	12	12	24
601	-	-	-	1	1	2	4	4	8
602	-	-	-	1	1	2	8	8	16
604	-	-	-	-	3	3	9	8	17
605	-	-	-	2	2	4	8	7	15
606	-	-	-	-	2	2	4	4	8
607	2	2	4	2	2	4	28	29	57
608	-	-	-	-	2	2	3	3	6
737	-	-	-	-	3	3	5	5	10
810	2	2	4	2	4	6	38	39	77
813	2	2	4	2	3	5	30	29	59
814	<u>-</u>	<u>-</u>	<u>-</u>	<u>1</u>	<u>4</u>	<u>5</u>	<u>11</u>	<u>10</u>	<u>21</u>
Subtotal	6	6	12	11	32	43	160	158	319
TOTAL	24	24	48	42	66	108	521	516	1,037

RTD Planning Dept.  
 HG:cym  
 6/4/80

SIP PLAN - LOCAL AND EXPRESS LINES  
 Estimated Bus Trips Passing By and Terminating At  
 Convention Center

LINE	AM PEAK HR. PERIOD (6am-9am)	BASE HR. PERIOD (9am-4pm)	PEAK HR. PERIOD (4pm-7pm)	EVENING HR. PERIOD (7pm-10:30 pm)	NIGHT HR. PERIOD (10:30 pm-12am)	OWL HR. PERIOD (12 am-6am)	ALL DAY TOTAL
<b>LOCAL PASSING</b>							
30-E	15 (3)	6 (42)	6 (18)	4 (14)	3 (4)	2 (12)	(120)
W	6 (18)	6 (42)	15 (30)	4 (14)	4 (4)	2 (12)	(120)
31-E	15 (30)	6 (42)	6 (18)	4 (14)	4 (6)	---	(110)
W	6 (18)	6 (42)	15 (30)	4 (14)	4 (6)	---	(110)
44-N	12 (24)	6 (42)	6 (18)	3 (11)	2 (3)	1 (6)	(104)
S	6 (18)	6 (42)	12 (24)	3 (11)	2 (3)	1 (6)	(104)
65-E	2 (6)	2 (14)	2 (6)	1 (4)	---	---	(30)
W	2 (6)	2 (14)	2 (6)	1 (4)	---	---	(30)
<b>SUB-TOTAL</b>	<b>64 (150)</b>	<b>40 (280)</b>	<b>64 (150)</b>	<b>24 (86)</b>	<b>18 (26)</b>	<b>6 (36)</b>	<b>(728)</b>
<b>TERMINATING</b>							
70-E	4 (12)	4 (28)	8 (16)	2 (7)	1 (2)	---	(65)
W	8 (16)	4 (28)	4 (12)	2 (7)	1 (2)	---	(65)
71-E	4 (12)	4 (28)	8 (16)	2 (7)	1 (2)	1 (5)	(70)
W	8 (16)	4 (28)	4 (12)	2 (7)	1 (2)	1 (5)	(70)
<b>SUB-TOTAL</b>	<b>24 (56)</b>	<b>16 (112)</b>	<b>24 (56)</b>	<b>8 (28)</b>	<b>4 (8)</b>	<b>2 (10)</b>	<b>(270)</b>
<b>FREEWAY EXPRESS</b>							
<b>PASSING</b>							
430-E	3 (7)	2 (14)	2 (6)	2 (7)	1 (2)	---	(36)
W	2 (6)	2 (14)	3 (7)	2 (7)	1 (2)	---	(36)
434-E	3 (6)	1 (7)	1 (3)	1 (4)	---	---	(20)
W	1 (3)	1 (7)	3 (6)	1 (4)	---	---	(20)
436-E	5 (10)	---	2 (4)	---	---	---	(14)
W	2 (4)	---	5 (10)	---	---	---	(14)
437-E	3 (6)	---	2 (4)	---	---	---	(10)
W	2 (4)	---	3 (6)	---	---	---	(10)
439-E	4 (8)	2 (14)	2 (6)	1 (4)	---	---	(32)
W	2 (6)	2 (14)	4 (8)	1 (4)	---	---	(32)

<u>LINE</u>	<u>AM PEAK HR. PERIOD (6am-9am)</u>	<u>BASE HR. PERIOD (9am-4pm)</u>	<u>PEAK HR. PERIOD (4pm-7pm)</u>	<u>EVENING HR. PERIOD (7pm-10:30pm)</u>	<u>NIGHT HR. PERIOD (10:30pm-12am)</u>	<u>OWL HR. PERIOD (12am-6am)</u>	<u>ALL DAY TOTAL</u>
442-N	9 (18)	1 (7)	2 (4)	---	---	---	( 29)
S	2 (4)	1 (7)	9 (18)	---	---	---	( 29)
448-N	4 (8)	2 (14)	2 (6)	2 (7)	1 (2)	---	( 37)
S	2 (6)	2 (14)	4 (8)	2 (7)	1 (2)	---	( 37)
<u>ACTUAL</u>							
737-N	2 (5)	---	---	---	---	---	( 5)
S	---	---	2 (5)	---	---	---	( 5)
813-N	3 (6)	2 (14)	2 (6)	2 (4)	---	---	( 30)
S	2 (7)	2 (14)	4 (8)	---	---	---	( 29)
814-N	4 (8)	1 (1)	1 (2)	---	---	---	( 11)
S	1 (2)	1 (1)	4 (7)	---	---	---	( 10)
<u>SUB-TOTAL</u>	56 (124)	22 (142)	57 (124)	14 (48)	4 (8)	---	(446)
<u>TERMINATING</u>							
475-E	---	---	4 (8)	---	---	---	( 8)
W	4 (8)	---	---	---	---	---	( 8)
<u>SUB-TOTAL</u>	4 (8)	---	4 (8)	---	---	---	( 16)
<u>TOTAL</u>	148 (338)	78 (534)	149 (338)	46 (162)	26 (42)	8 (46)	(1,460)

o See attached comments

RTD Planning Department  
5/19/80  
Haim Geffen/ydh

TABL A  
 SIP PLAN - EXPRESS LINES MODIFIED BY  
 Proposed Harbor-Century Transitway Lines  
 Estimated Bus Trips Passing By and Terminating  
 at Convention Center

<u>FREEWAY EXPRESS PASSING</u>		<u>AM PEAK HOUR PERIOD (6am-9am)</u>	<u>BASE HOUR PERIOD (9am-3pm)</u>	<u>PM PEAK HOUR PERIOD (3pm-6pm)</u>	<u>EVENING &amp; NIGHT HR. PERIOD (6pm-12am)</u>	<u>OWL HOUR PERIOD (12am-6am)</u>	<u>ALL DAY TOTAL</u>
444X	N	6 (18) <sup>1</sup>	4 (12)	6 (18)	4 (12)	---	(60)
	S	6 (18)	4 (12)	6 (18)	4 (12)	---	(60)
448X	N	6 (18)	4 (24)	6 (18)	2 (12)	---	(72)
	S	6 (18)	4 (24)	6 (18)	2 (12)	---	(72)
449X	N	4 (16)	---	---	---	---	(16)
	S	---	---	4 (16)	---	---	(16)
737	N	4 (16)	---	---	---	---	(16)
	S	---	---	4 (16)	---	---	(16)
740	N	9 (40)	---	---	---	---	(40)
	S	---	---	9 (40)	---	---	(40)
750	N	9 (40)	---	---	---	---	(40)
	S	---	---	9 (40)	---	---	(40)
755	N	6 (36)	---	---	---	---	(36)
	S	---	---	6 (36)	---	---	(36)
813	N	3 (3) <sup>2</sup>	4 (48)*	2 (12)	---	---	(63)
	S	3 (3) <sup>2</sup>	4 (48)*	2 (12)	---	---	(63)
814	N	4 (26)	---	---	---	---	(26)
	S	---	---	4 (26)	---	---	(26)
510	N**	6 (18)	4 (24)	6 (18)	2 (12)	---	(72)
	S	6 (18)	4 (24)	6 (18)	2 (12)	---	(72)
TOTAL		<u>- (288)</u>	<u>- (216)</u>	<u>- (306)</u>	<u>- (72)</u>		<u>(882)</u>

NOTE: 1 Numbers in parenthesis equal number of trips per time period not per hour

2 AM peak hour period 5am - 6pm

IV-81

SIP PLAN

ESTIMATED BUS TRIPS AT THE CONVENTION CENTER

COMMENTS

1. The number of bus trips for each line during the peak period was estimated as follows:
  - a.  $60 \div \text{Headway} = \text{peak hour bus trips}$
  - b.  $(\text{Peak hour bus trips} \times 2) \div 3 = \text{estimated bus trips during a 3 hour peak period. (Some peak period bus trips were adjusted upward to insure that peak period bus frequency (bus trips) are not less than the base period).}$
2. Reverse direction trips during peak period were assumed to maintain the same headway as during the base period.
3. Bus trips for Lines 737, 813 and 814 are actual figures since they are not changed in the SIP Plan.

DGM/ydh  
6/4/80

TABLE 4

## SIP PLAN SERVICE LEVELS AT CONVENTION CENTER

## LOADING, UNLOADING AND LAYOVER SPACE REQUIRED

LINE	Total # One-Way Trips 4:15 p.m., 5:15 p.m.	One-Way Trip Per Minute	LOADING SPACES DWELL TIME			UNLOADING SPACES DWELL TIME			TOTAL LOADING/UNLOADING DWELL TIME			LAYOVER SPACES
			.5 min.	1 min.	1.5 min.	.25 min.	.5 min.	.75 min.	5 min.	1 min.	1.5 min.	
<b>Local Lines Passing by by Convention Center*</b>												
Eastbound	20	.33	.165	.330	.495	.062	.165	.247	1	1	1	
Westbound	44	.73	.365	.730	1.095	.182	.365	.547	1	2	2	
Subtotal	64	1.06	.530	1.060	1.580	.244	.530	.794	1	2	3	
<b>Local Lines Terminating at Convention Center*</b>												
Eastbound	16	.26	.130	.260	.390	.065	.130	.195	1	1	1	4
Westbound	8	.13	.065	.130	.195	.032	.065	.097	1	1	1	2
Subtotal	24	.39	.195	.390	.585	.097	.195	.292	1	1	1	6
<b>Local Lines - Total</b>												
Eastbound	36	.60	.30	.60	.90	.15	.30	.45	1	1	2	
Westbound	52	.88	.43	.86	1.29	.22	.43	.65	1	2	2	
Total	88	1.46	.73	1.46	2.19	.37	.73	1.10	2	3	4	

\*By 1990 local lines passing by or terminating at Convention Center are projected to increase in ridership and, in turn, bus trips are projected to increase between 10%-30%.

See the following assumptions and comment

TABLE 4

SIP PLAN SERVICE LEVELS AT CONVENTION CENTER  
LOADING, UNLOADING AND LAYOVER SPACE REQUIRED

<u>LINE</u>	Total # One-Way Trips 4:15 p.m., 5:15 p.m.	One-Way Trip Per Minute	LOADING SPACES DWELL TIME			UNLOADING SPACES DWELL TIME			TOTAL LOADING/UNLOADING DWELL TIME			LAYOVER SPACES
			.5 min.	1 min.	1.5 min.	.25 min.	.5 min.	.75 min.	5 min.	1 min.	1.5 min.	
<u>Freeway Express Lines passing by and terminating at Convention Center*</u>												
North-East	20	.33	.165	.330	.495	.062	.165	.247	1	1	1	
South-West	41	.68	.340	.680	1.020	.170	.340	.510	1	2	2	
TOTAL	61	1.01	.505	1.110	1.515	.232	.505	.757	1	2	3	
<u>Service Levels Alternatives</u>												
A. <u>20% Intercept C.C. and terminate there</u>												
North-East	4	.07	.035	.070	.105	.018	.035	.053	1	1	1	1
South-West	8	.13	.065	.195	.033	.065	.098	.098	1	1	1	2
TOTAL	12	.20	1.100	.200	.300	.051	.100	.151	1	1	1	3
B. <u>40% Intercept C.C. and Terminate there</u>												
North-East	8	.14	.070	.140	.210	.035	.070	.105	1	1	1	2
South-West	16	.26	.130	.260	.390	.065	.130	.195	1	1	1	4
TOTAL	24	.40	.200	.400	.600	.100	.200	.300	1	1	1	6

\*By 1990 Freeway Express patronage and, in turn, bus trips are projected to increase by 30%.

See the following assumption and comments.

TABLE 4SIP PLAN SERVICE LEVELSESTIMATED SPACE REQUIREMENT FOR LOADING,  
UNLOADING AND LAYOVER AT CONVENTION CENTERASSUMPTIONS

1. All passing lines at the Convention Center load and unload on the streets.
2. The terminating lines have a separate location for layover and loading and unloading of passengers.
3. Two alternative levels of service were considered regarding Freeway Express interception and termination at Convention Center.
  - a. 20% of all Freeway Express line buses intercept C.C.
  - b. 40% of all Freeway Express lines buses intercept C.C.

To the extent that the intercept buses at Convention Center are peak period buses only (tripper buses) layover requirements will be reduced.

COMMENTS

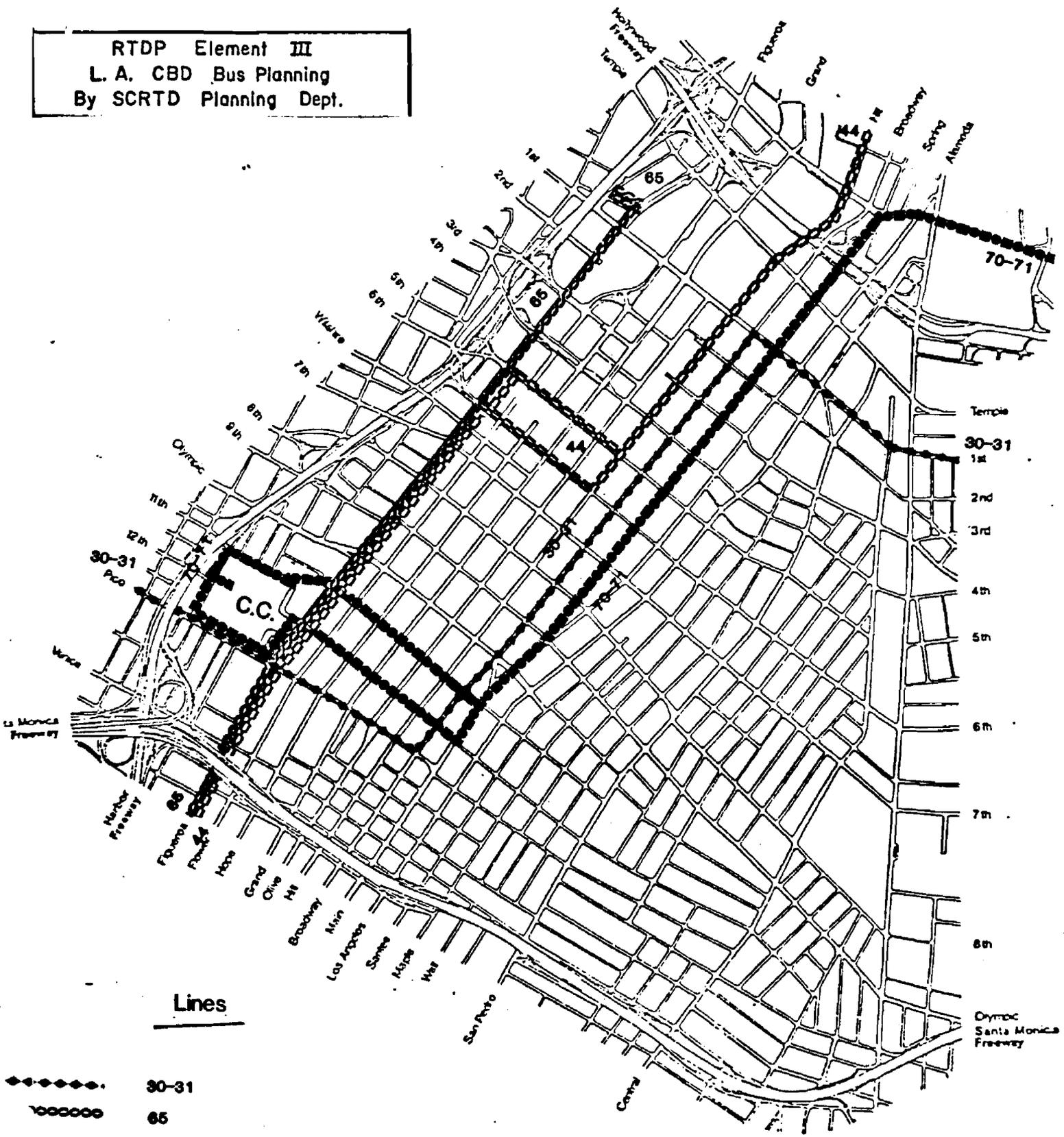
1. The total figures for loading, unloading and layover space are rounded.
2. Loading and unloading space requirements were calculated as follows:
  - a. Total peak hour trips were compiled by peak direction and reverse peak direction.
  - b. Total peak hour one-way trips divided by 60 = trips per minute.
  - c. Dwell time x trips per minute = loading and unloading space requirements.
3. Unloading time requirements were assumed to be half of the loading time, therefore, unloading space was also estimated to require half of the loading space.
4. Estimates of space required for bus layover were based on a 15 minute layover per bus, using the following formula: (# bus roundtrips x 15 min. layover) ÷ 60 min. = required space. For example, a line with 5 minutes headway will require 3 layover spaces, while a line with 20 minutes headway will require one layover space. Peak hour headways were used to estimate layover space needs.





Passing by and Terminating at Convention Center

RTDP Element III  
 L. A. CBD Bus Planning  
 By SCRTD Planning Dept.



- Lines**
- ◆◆◆◆◆ 30-31
  - 65
  - 44
  - 70-71

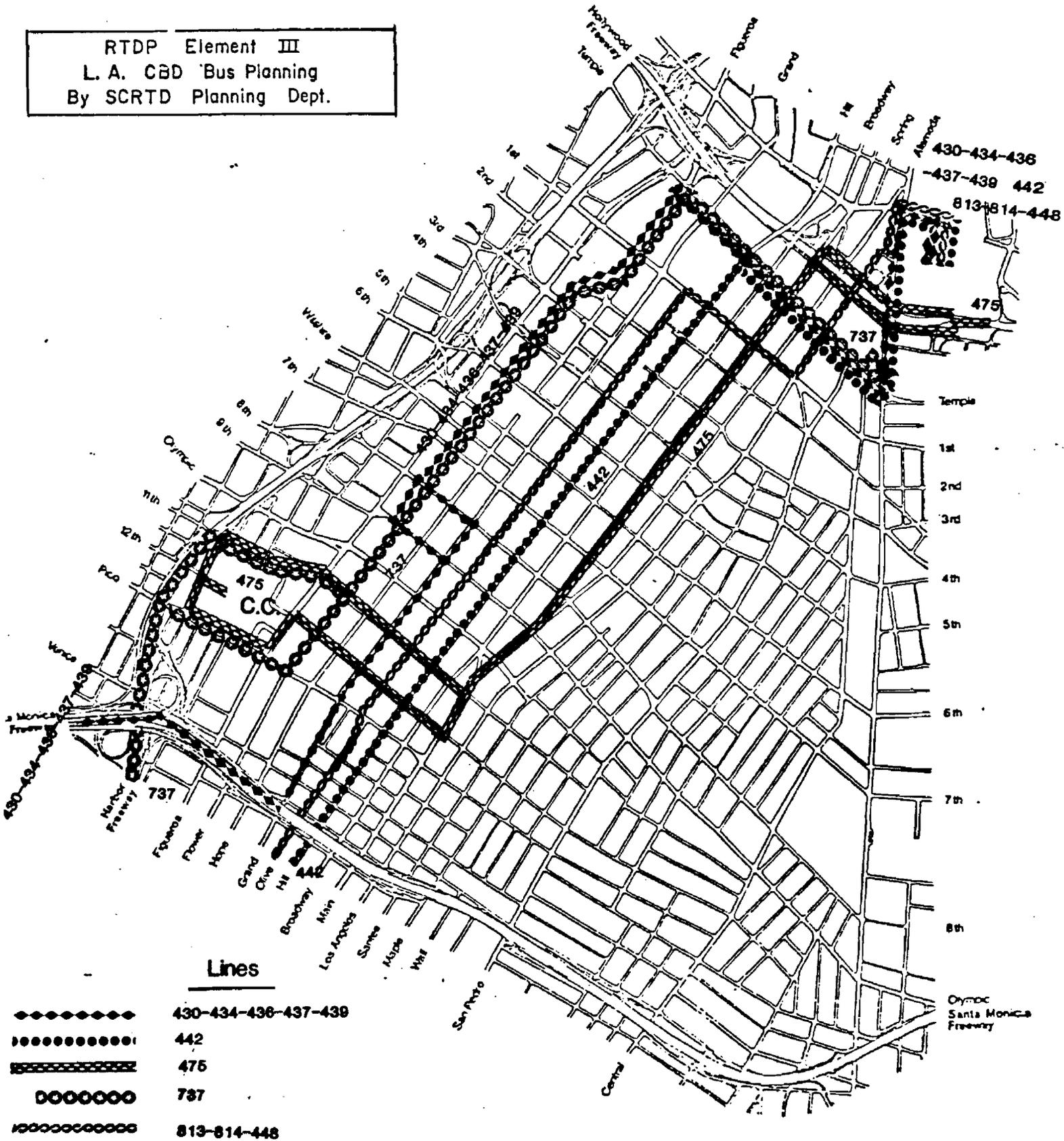
5-'80  
 H.G.

# SIP PLAN-FREEWAY EXPRESS LINES

MAP 4

## Passing by and Terminating at Convention Center

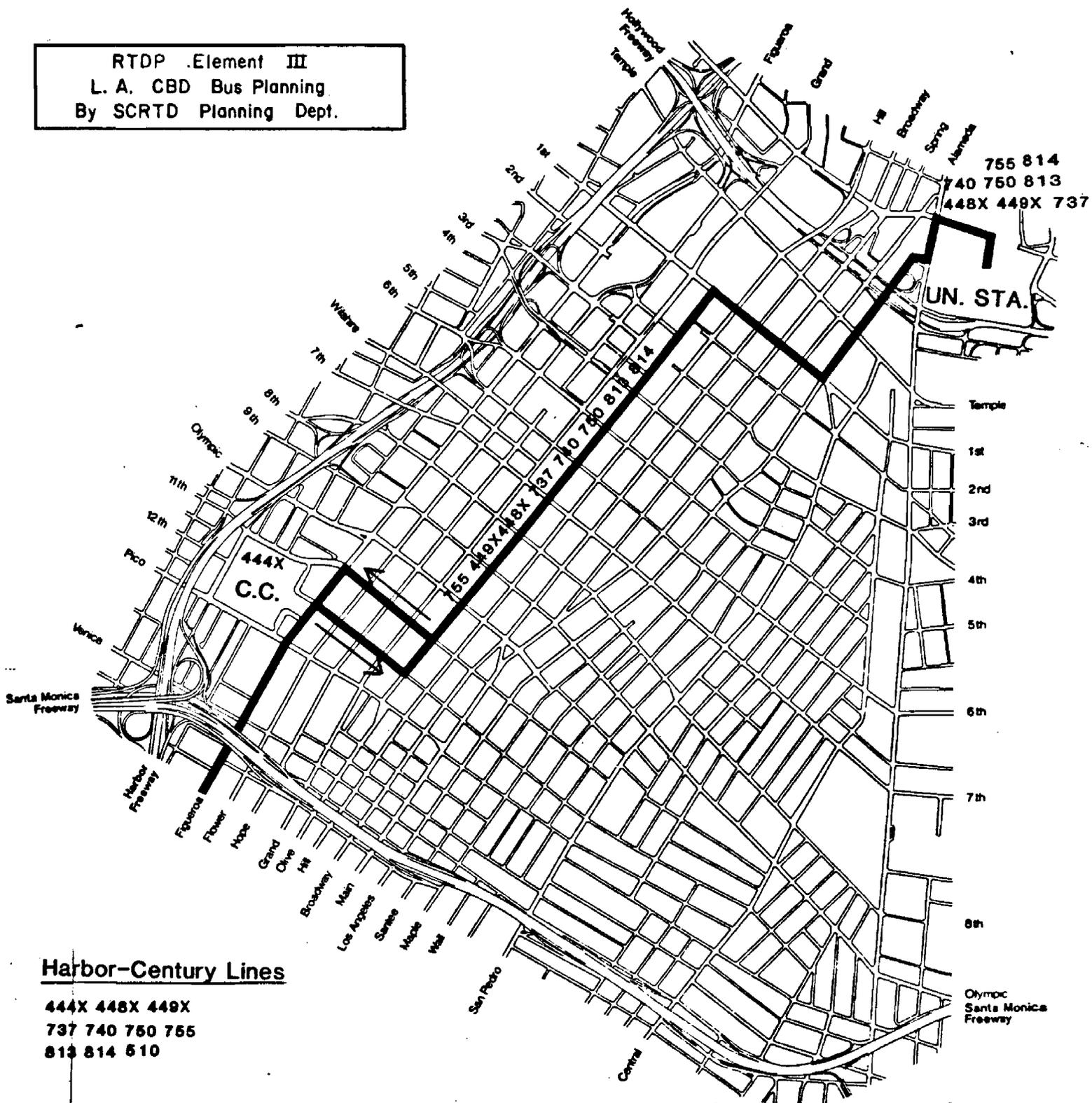
RTDP Element III  
 L. A. CBD Bus Planning  
 By SCRTD Planning Dept.



**SIP PLAN-FREEWAY EXPRESS LINES**  
**as modified by**  
**PROPOSED HARBOR-CENTURY TRANSITWAY**  
**Passing by and Terminating at Convention Center**

MAP 4A

RTDP Element III  
 L. A. CBD Bus Planning  
 By SCRTD Planning Dept.



**Harbor-Century Lines**

444X 448X 449X  
 737 740 750 755  
 813 814 510

NOTE : Route 510 operates from LAX to Fullerton P/R via Century Fwy. (does not interface with Convention Center)

2-81

IV-90

M.J.B. NOTE : SIP Route 442X (present 5X) converted to SIP limited Route L315 operating from VIA Hawthorne Blvd

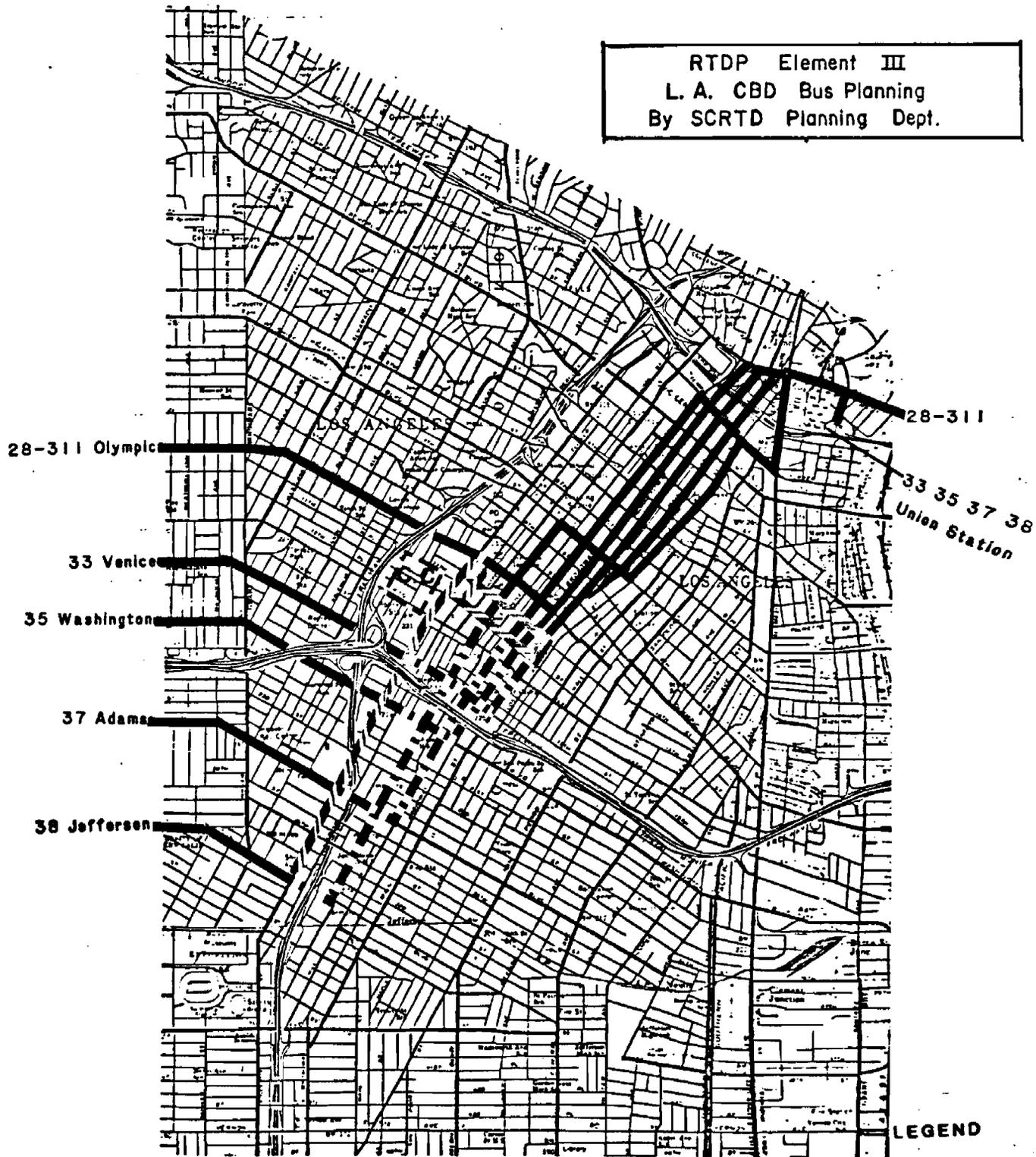
# SIP PLAN LOCAL LINES

## Possible Route Modification For Bus Interface With Convention Center DPM Terminal

MAP 5

Page 1 of 2

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.



1980  
ALB

**LEGEND**  
 SIP Route   
 Service Deleted   
 Route Modified For   
 DPM Terminal Connection

IV-91

NOTE: These candidate lines for route modification are not recommended. See Text.



MAP #6 SERIES

DPM

CONVENTION CENTER  
TERMINAL

SANTA MONICA FREEWAY ROUTES  
(11 ALTERNATIVES)

HARBOR FREEWAY ROUTES  
(12 ALTERNATIVES)

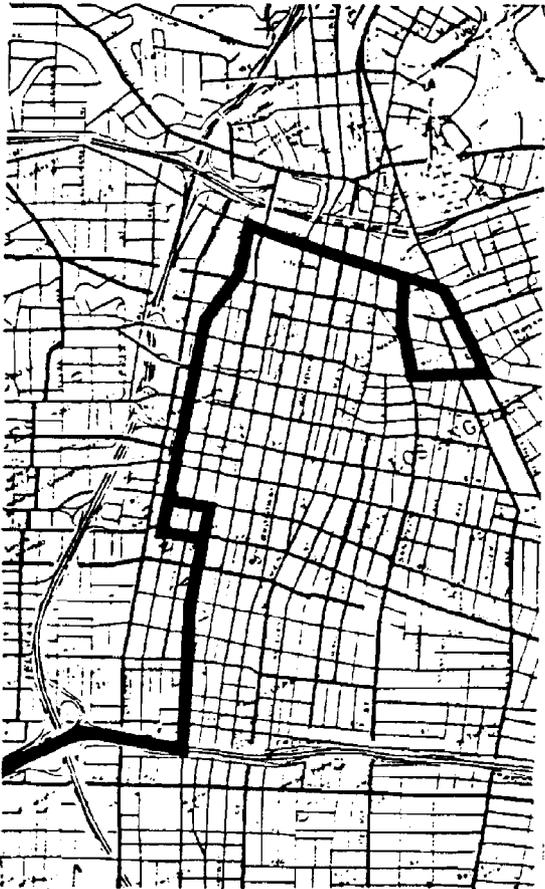
SIP PLAN EXPRESS LINES  
 SANTA MONICA AND HARBOR FREEWAYS  
SUMMARY OF ALTERNATIVES

<u>Alternatives Description</u>	<u>Rec. For Further Study</u>	<u>Approx. % of Trips Intercepted Conv. Ctr. DPM Terminal</u>	<u>% Trips Through</u>
<u>SANTA MONICA FREEWAY ROUTES</u>			
1. Santa Monica Fwy Existing Routes		0%	100%
2. Santa Monica Fwy Original SIP Routes		0%	100%
3. 1st DPM Patronage Modelling Network		20%	80%
4. 2nd DPM Patronage Modelling Network		40%	60%
5. Figueroa & 1st Terminal	X	0%	100%
6. Figueroa & 1st Terminal	X	40%	60%
7. 7th & Maple Terminal		0%	100%
8. 7th & Maple Terminal		40%	60%
9. Wilshire & Union Terminal		0%	100%
10. Wilshire & Union Terminal		40%	60%
11. Convention Center DPM Station Terminal	X	100%	0%
<u>HARBOR FREEWAY ROUTES</u>			
1. Harbor Fwy Existing Routes		0%	100%
2. Harbor Fwy Original SIP Routes		0%	100%
3. Proposed Routes for 1981		0%	100%
4. Studied Routes Without DPM		0%	100%
5. DPM Patronage Modelling Network		20%	80%
6. No Connection to DPM		0%	100%
7. Figueroa St. Without Harbor Busway	X	20%	80%
8. Harbor Busway (Adams Exit)	X	20%	80%
9. Conv. Ctr. DPM Station Terminal (with and w/o Busway)		100%	0%
10. Same as above via Hill Street		100%	0%
11. Civic Center Terminal (with and w/o Busway)		20%	80%
12. Harbor - Century Transitway	X	20%	80%

Planning Department  
 DGM/MJB/ydh  
 1/13/81

SIP PLAN EXPRESS LINES  
SANTA MONICA FREEWAY

11 ROUTES & SERVICE ALTERNATIVES FOR INTERFACE WITH CONVENTION CENTER DPM TERMINAL

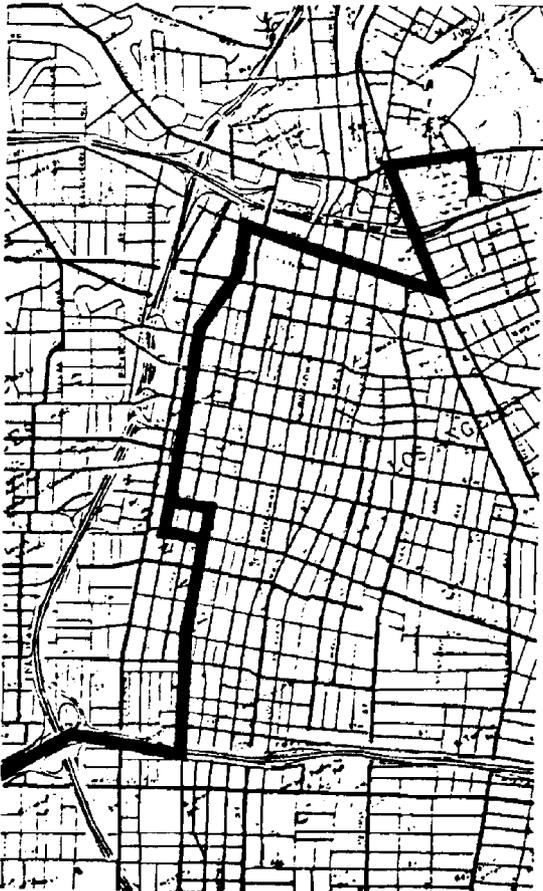


(1)

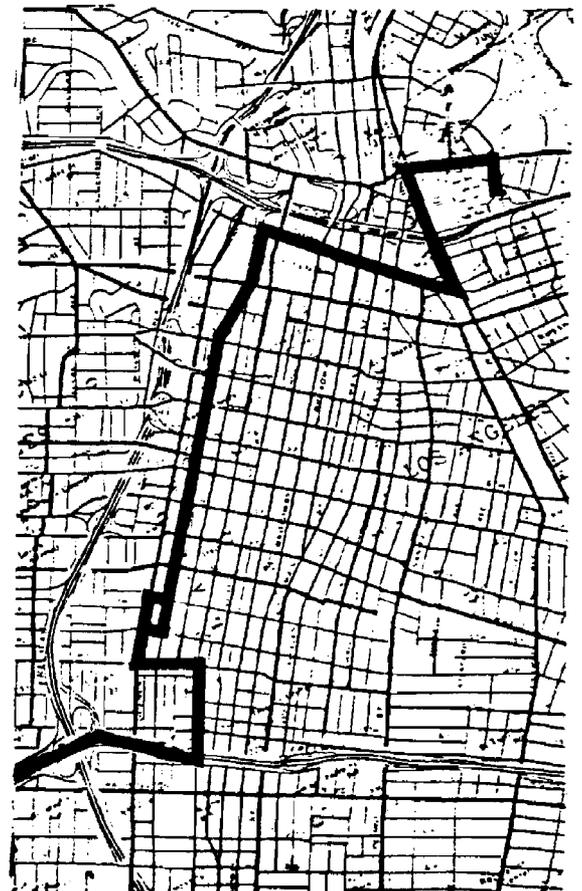
RTDP Element III  
L. A. CBD Bus Planning  
By SCRDT Planning Dept.

1. Existing routes serving Santa Monica Freeway.
2. Original SIP Route & Service  
0% of bus trips intercepted.
3. Connection to Convention Center  
20% of bus trips intercepted.

NOTE: Used for first DPM  
patronage modelling.



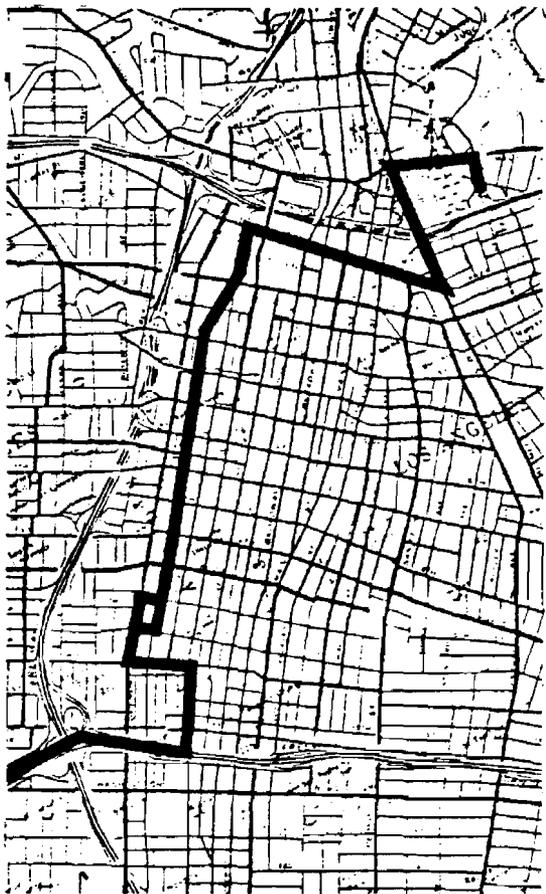
(2)



(3)

SIP PLAN EXPRESS LINES  
SANTA MONICA FREEWAY

11 ROUTES & SERVICE ALTERNATIVES FOR INTERFACE WITH CONVENTION CENTER DPM TERMINAL



(4)

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTO Planning Dept.

4. 40% of Bus Trips Intercepted

NOTE: Used for second DPM  
patronage modelling

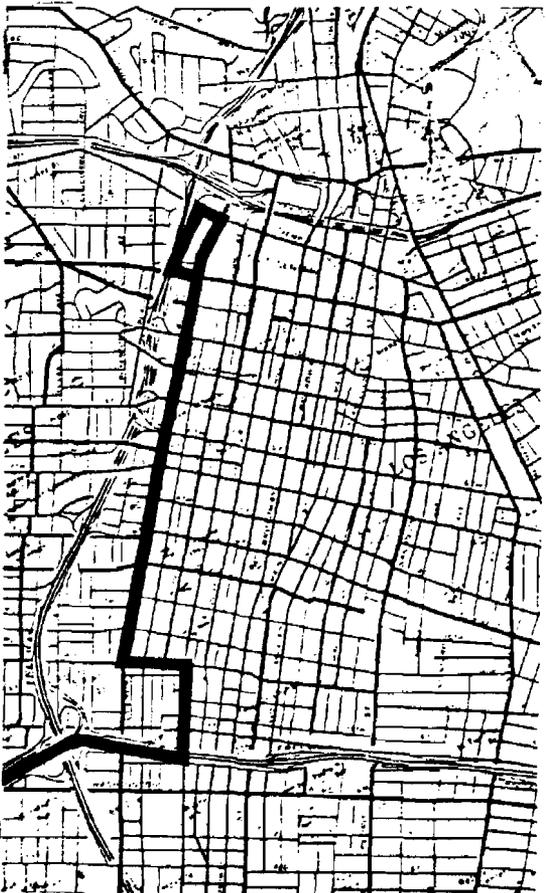
ALTERNATIVES 5 and 6 Use Figueroa and First Terminal

5. 0% of Bus Trips Intercepted

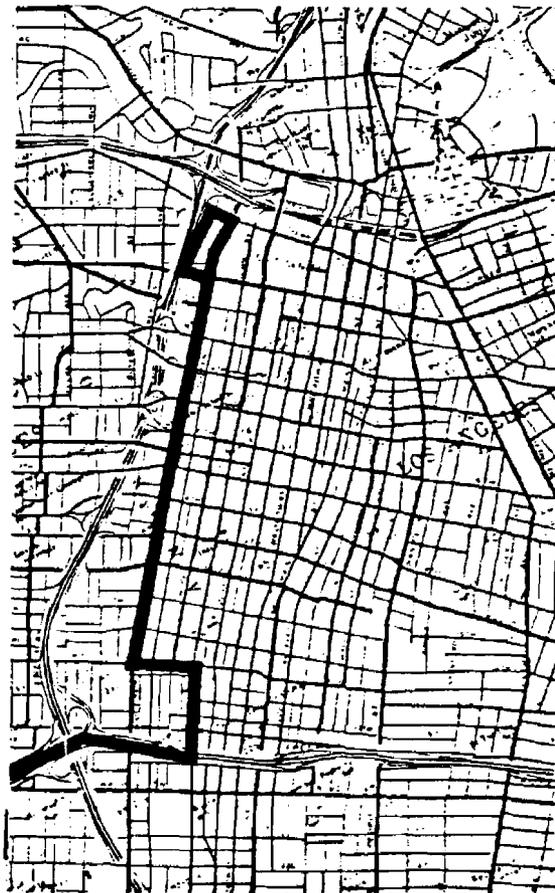
NOTE: Recommended for Further Study

6. 40% of Bus Trips Intercepted

NOTE: Recommended for Further Study

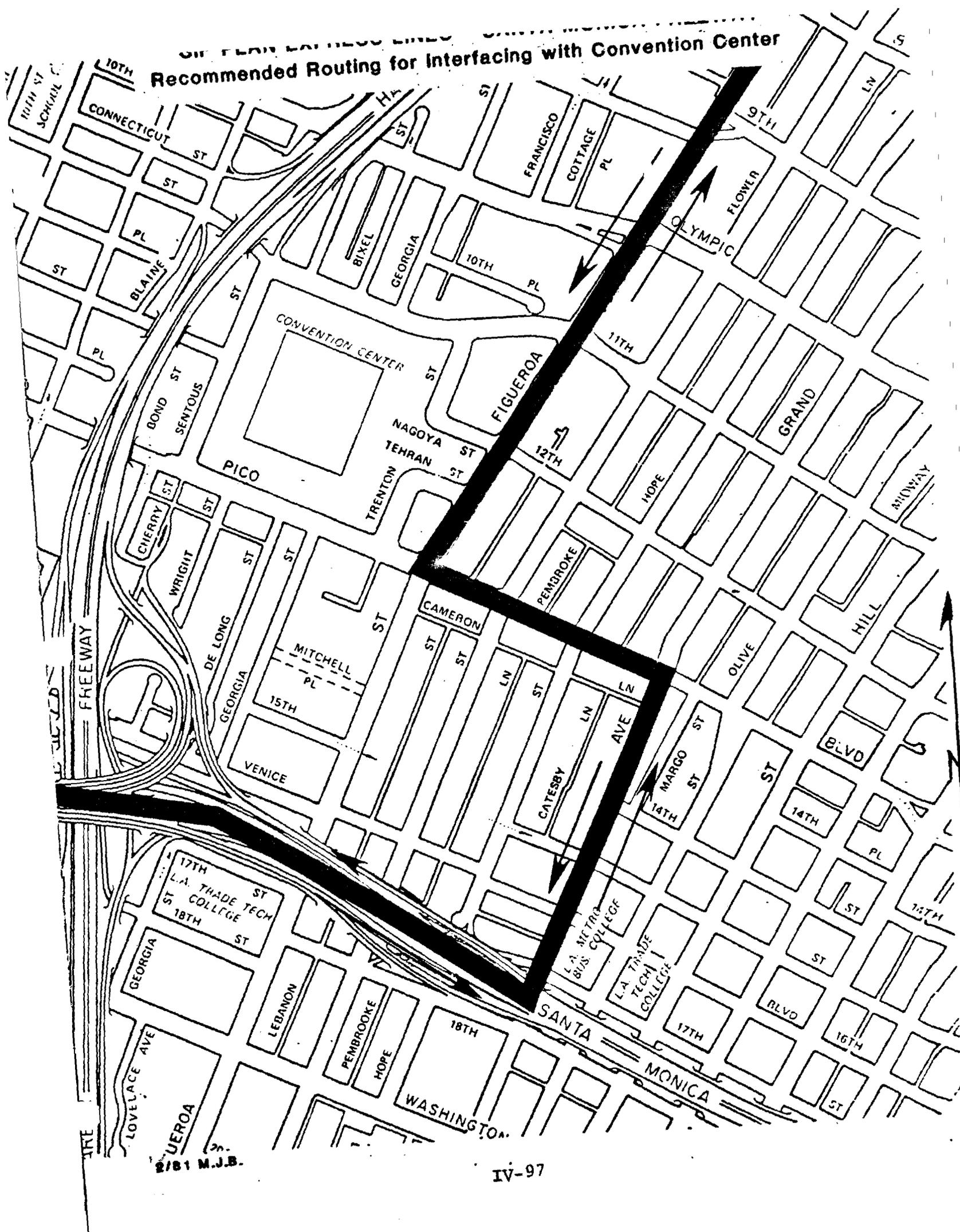


(5)



(6)

Recommended Routing for Interfacing with Convention Center



2/81 M.J.B.

IV-97

SIP PLAN EXPRESS LINES  
SANTA MONICA FREEWAY

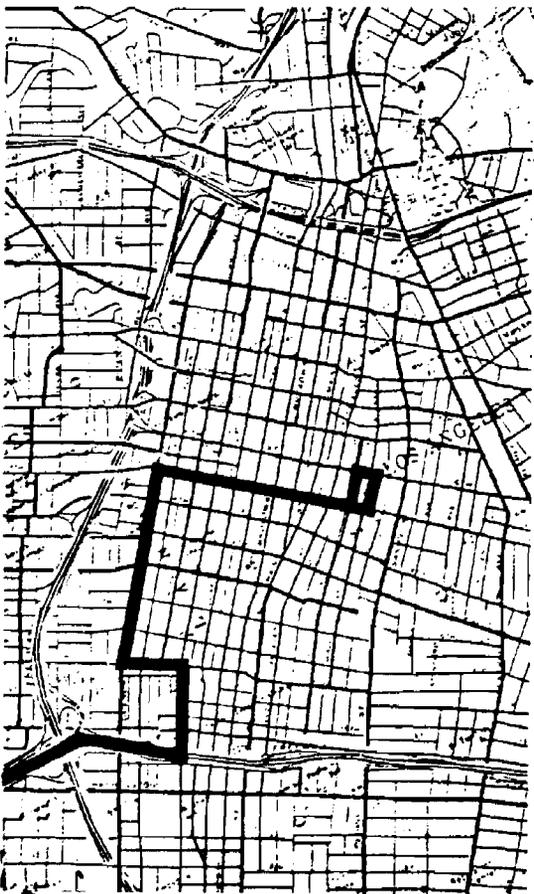
11 ROUTES & SERVICE ALTERNATIVES FOR INTERFACE WITH CONVENTION CENTER DPM TERMINAL

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.

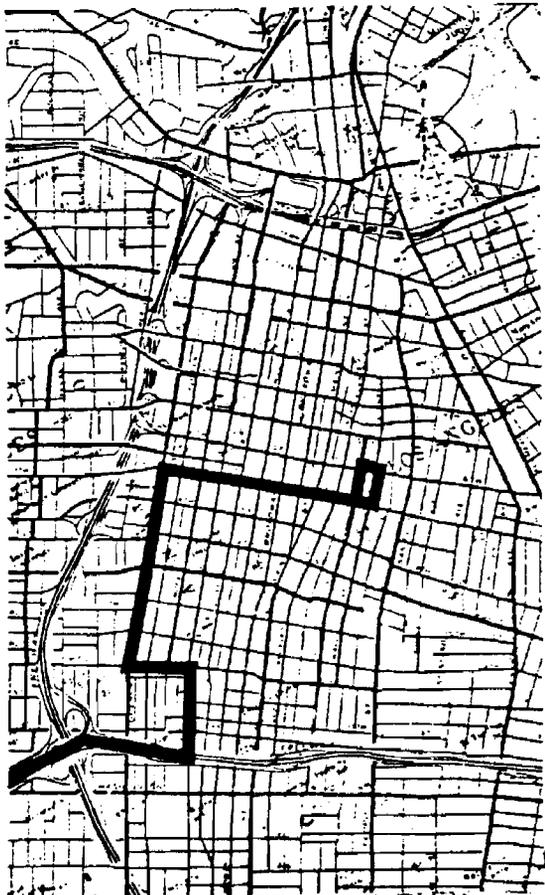
ALTERNATIVES 7 & 8 Use 7th & Maple Terminal

7. 0% of Bus Trips Increased

8. 40% of Bus Trips Intercepted



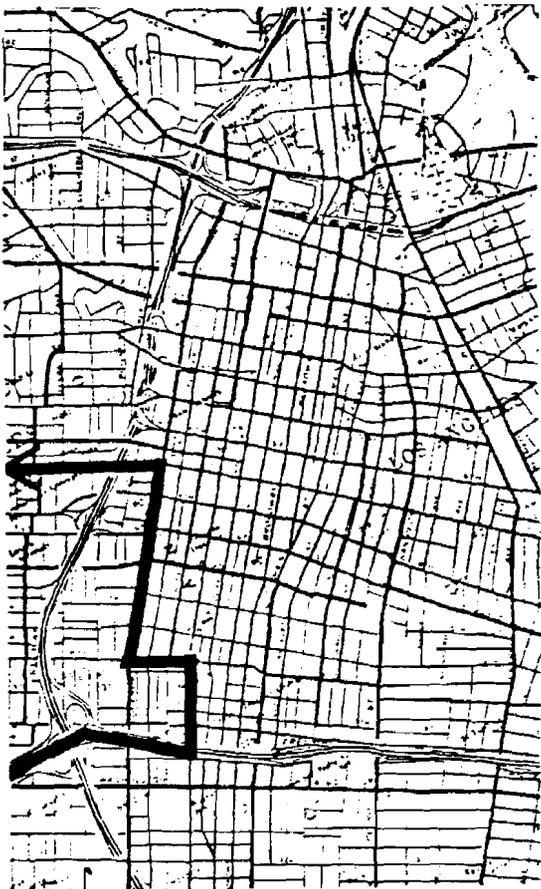
(7)



(8)

SIP PLAN EXPRESS LINES  
SANTA MONICA FREEWAY

11 ROUTES & SERVICE ALTERNATIVES FOR INTERFACE WITH CONVENTION CENTER TERMINAL



(9)

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.

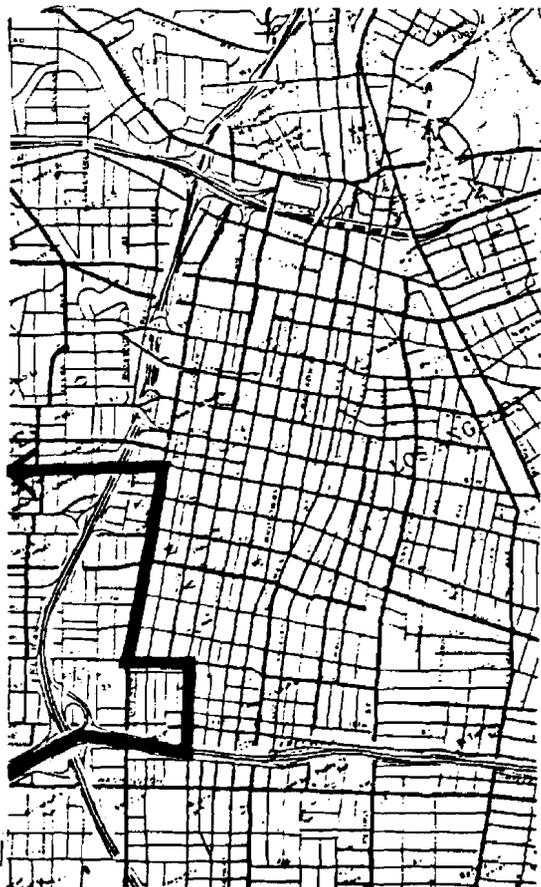
ALTERNATIVES 10 & 11 Use Wilshire Blvd. & Union St. Terminal

9. 0% of Bus Trips Intercepted

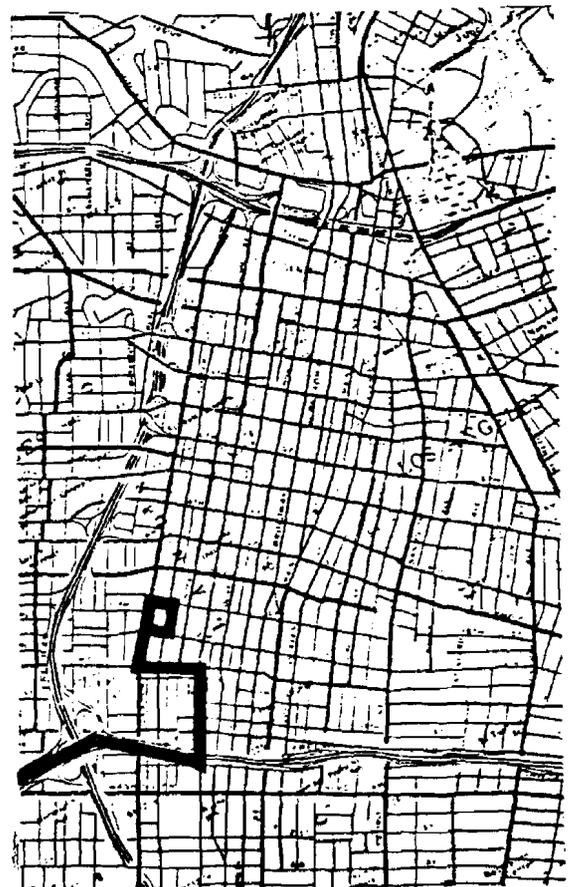
10. 40% of Bus Trips Intercepted

ALTERNATIVE 11 Uses 100% Intercept at the Convention Center DPM Station.

NOTE: Recommended for Further Study



(10)



(11)

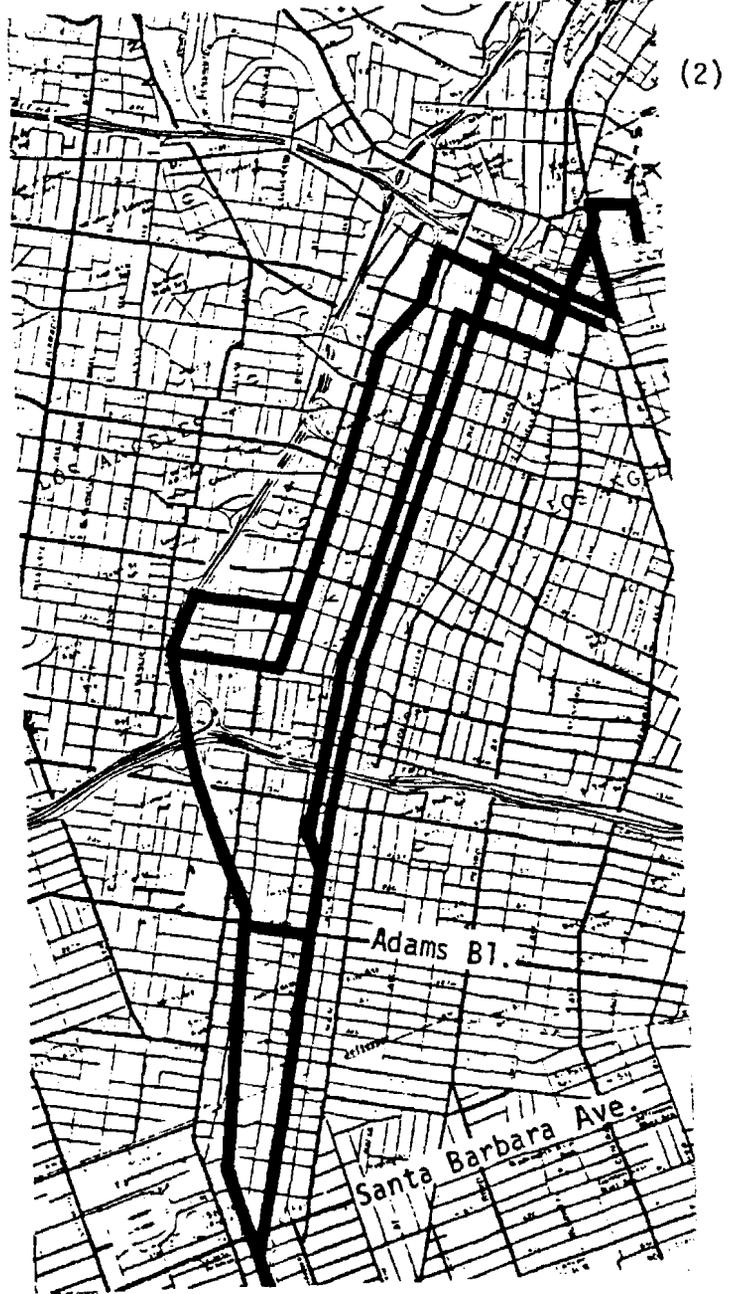
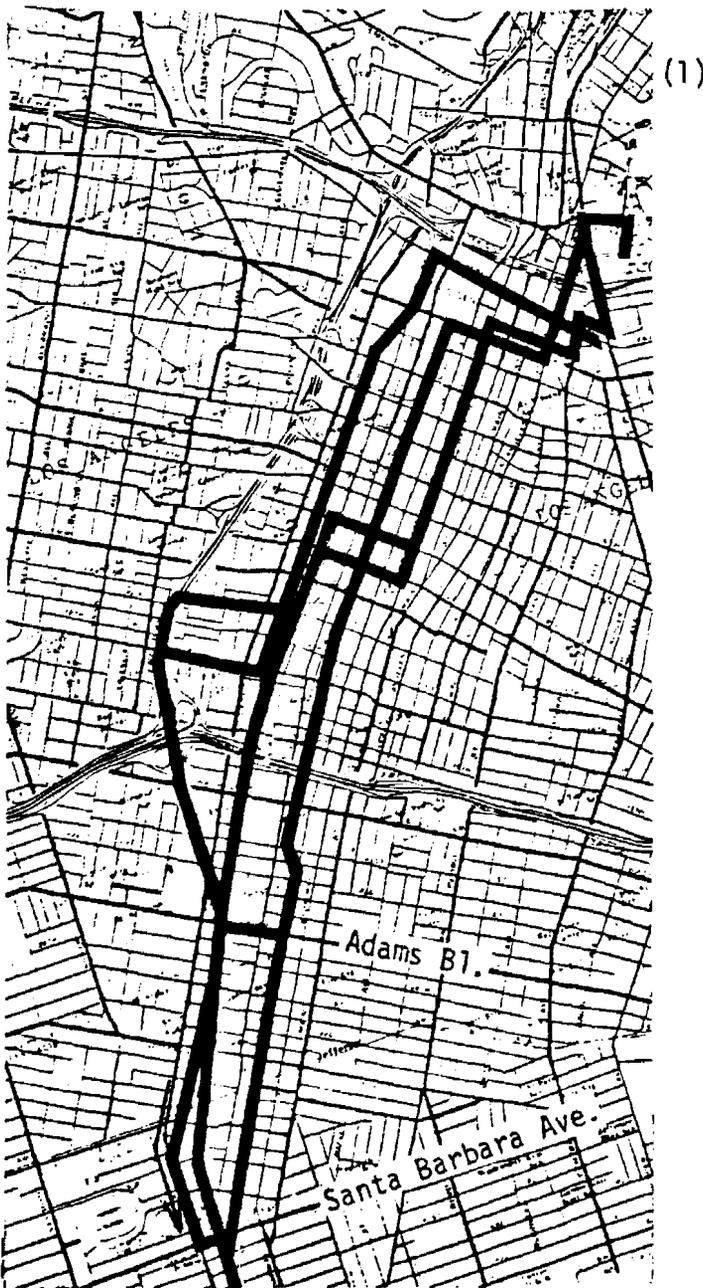
SIP PLAN EXPRESS LINES  
HARBOR FREEWAY

12 ROUTES AND SERVICE MODIFICATIONS FOR INTERFACE WITH CONVENTION CENTER DPM  
TERMINAL

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.

NOTE: ● Existing Routes Serving Harbor Freeway  
● 0% of Bus Trips Intercepted

NOTE: ● Original SIP Routes Serving Harbor Freeway  
● 0% of Bus Trips Intercepted

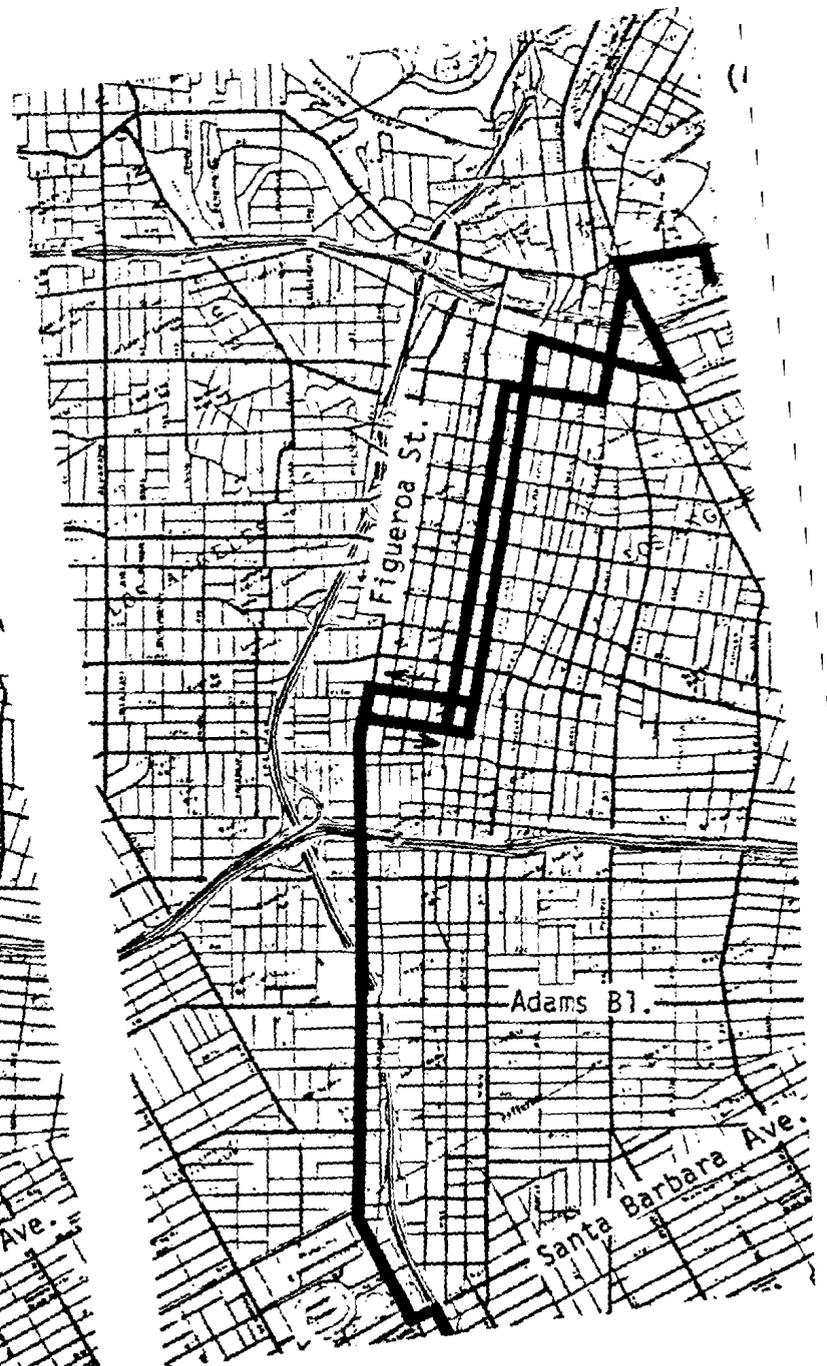
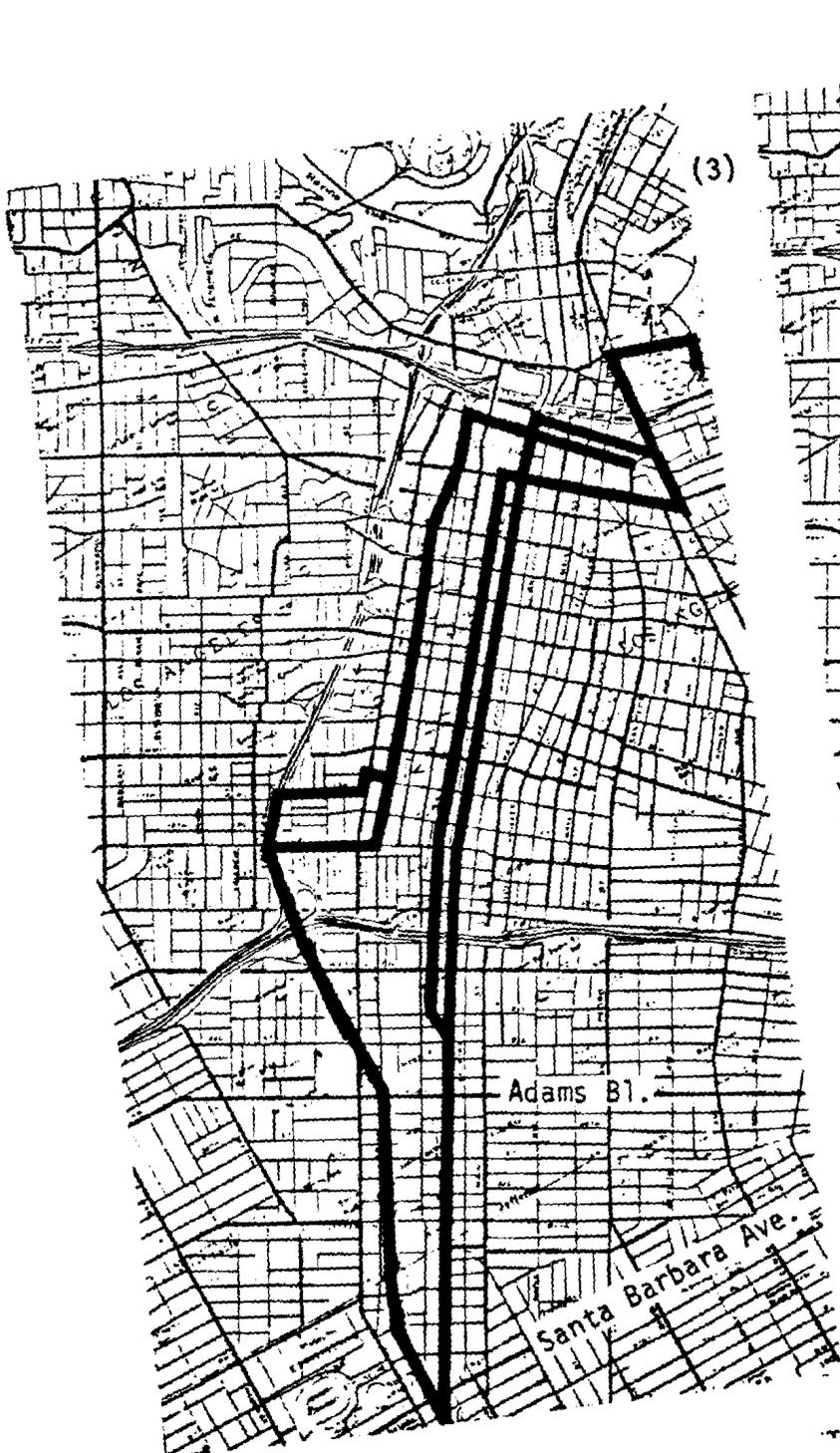


SIP PLAN EXPRESS LINES  
HARBOR FREEWAY

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.

- NOTE:
- Proposed Routes for December 1981
  - 0% of Bus Trips Intercepted

- NOTE:
- Studied Routes without DPM
  - 0% of Bus Trips Intercepted



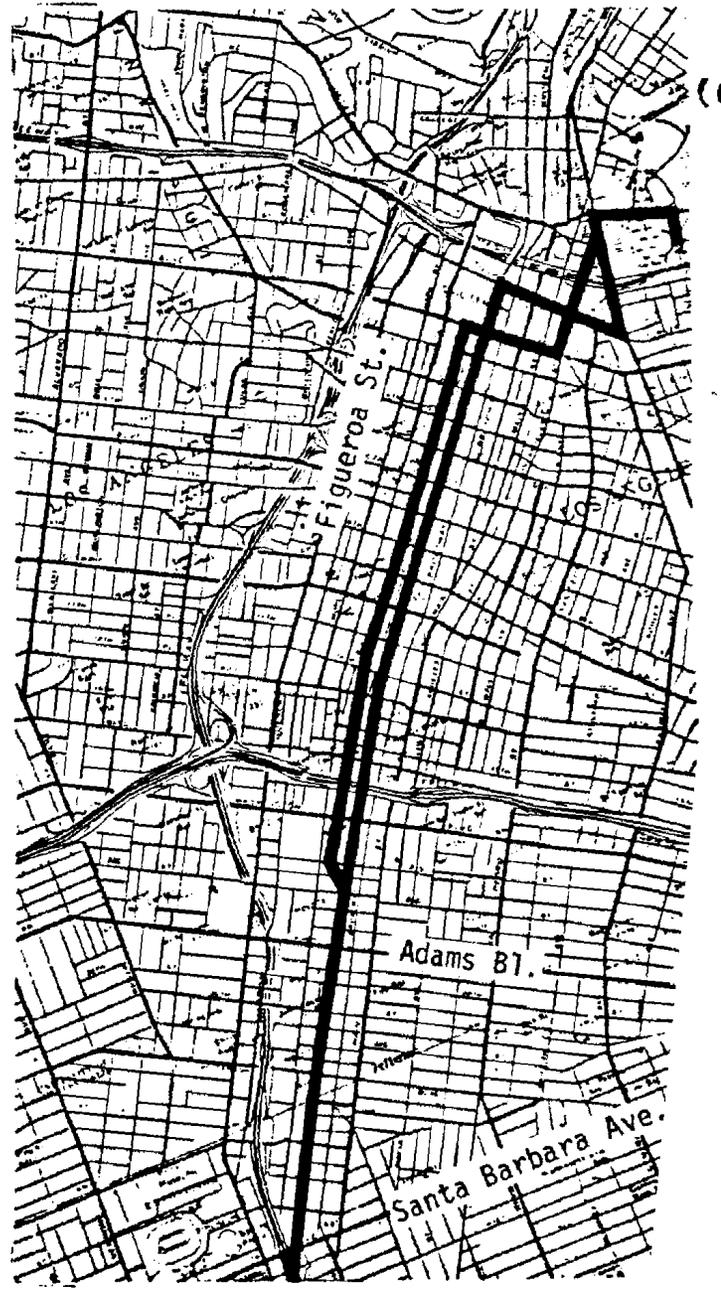
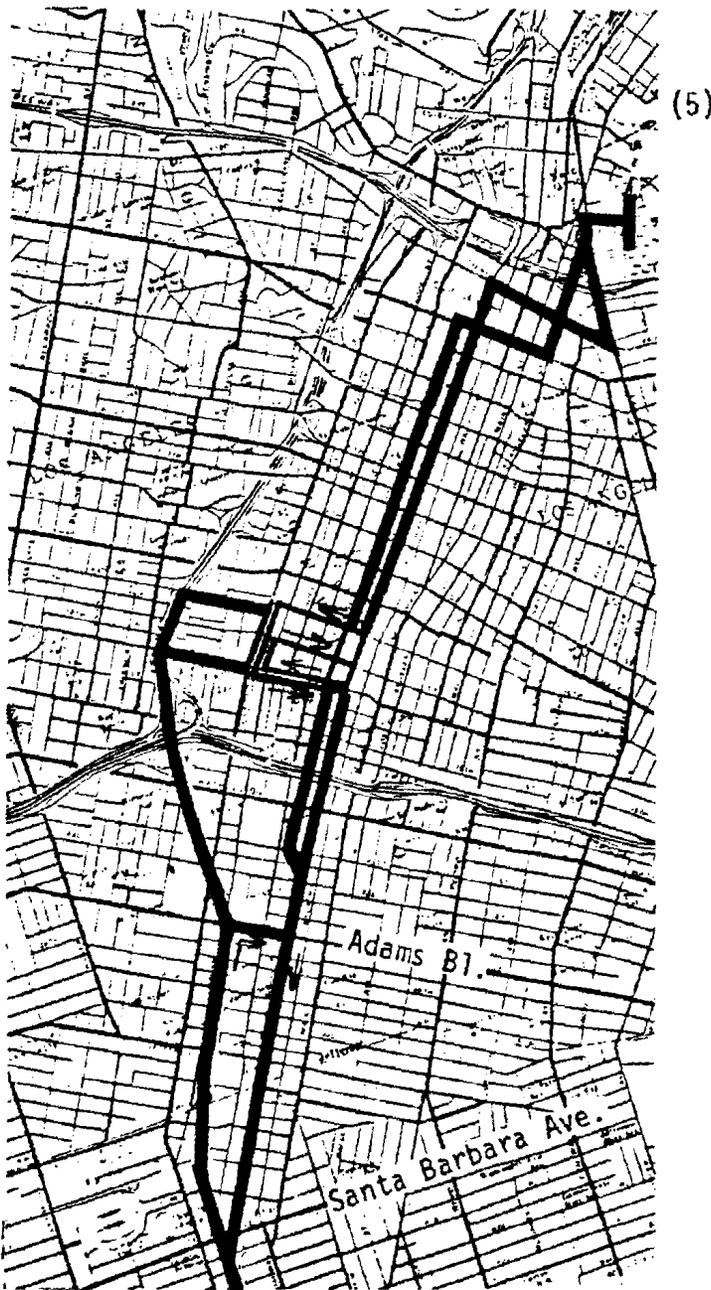
SIP PLAN EXPRESS LINES  
HARBOR FREEWAY

ROUTES AND SERVICE MODIFICATIONS FOR INTERFACE WITH CONVENTION CENTER DPM  
TERMINAL

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.

- NOTE: ● Network Modelled for DPM  
Patronage Projections
- 20% of Bus Trips Intercepted

- NOTE: ● No Interface with DPM  
Terminal
- 0% of Bus Trips Intercepted

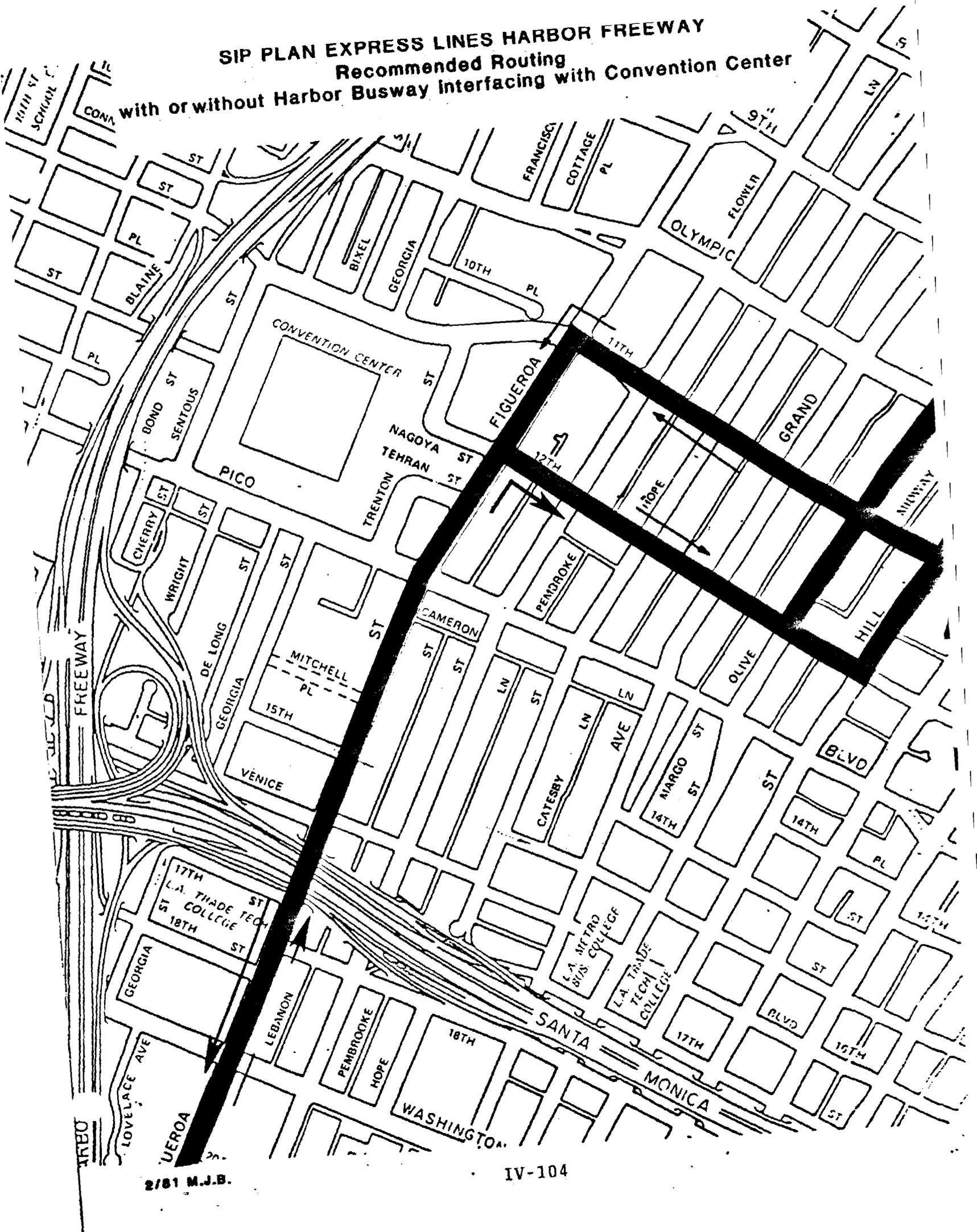




# SIP PLAN EXPRESS LINES HARBOR FREEWAY

## Recommended Routing

with or without Harbor Busway interfacing with Convention Center

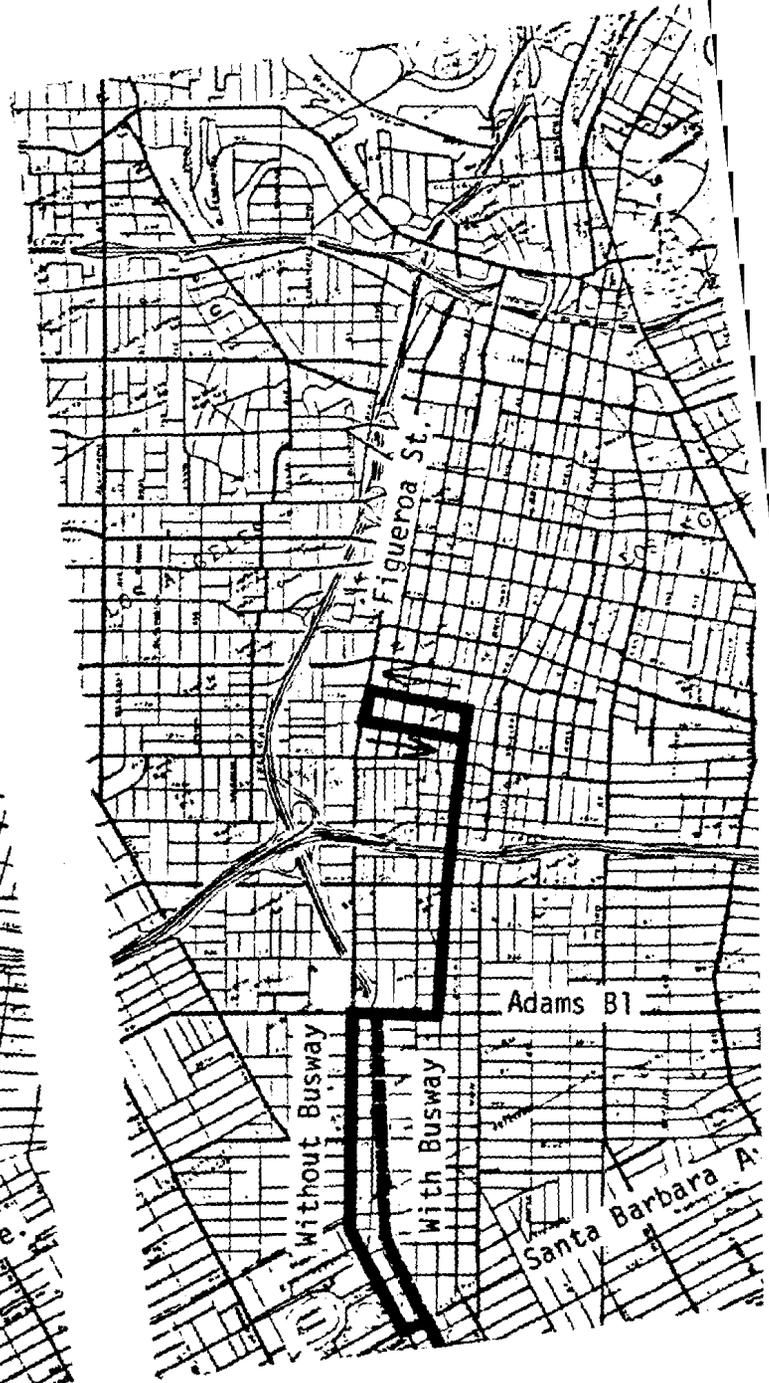
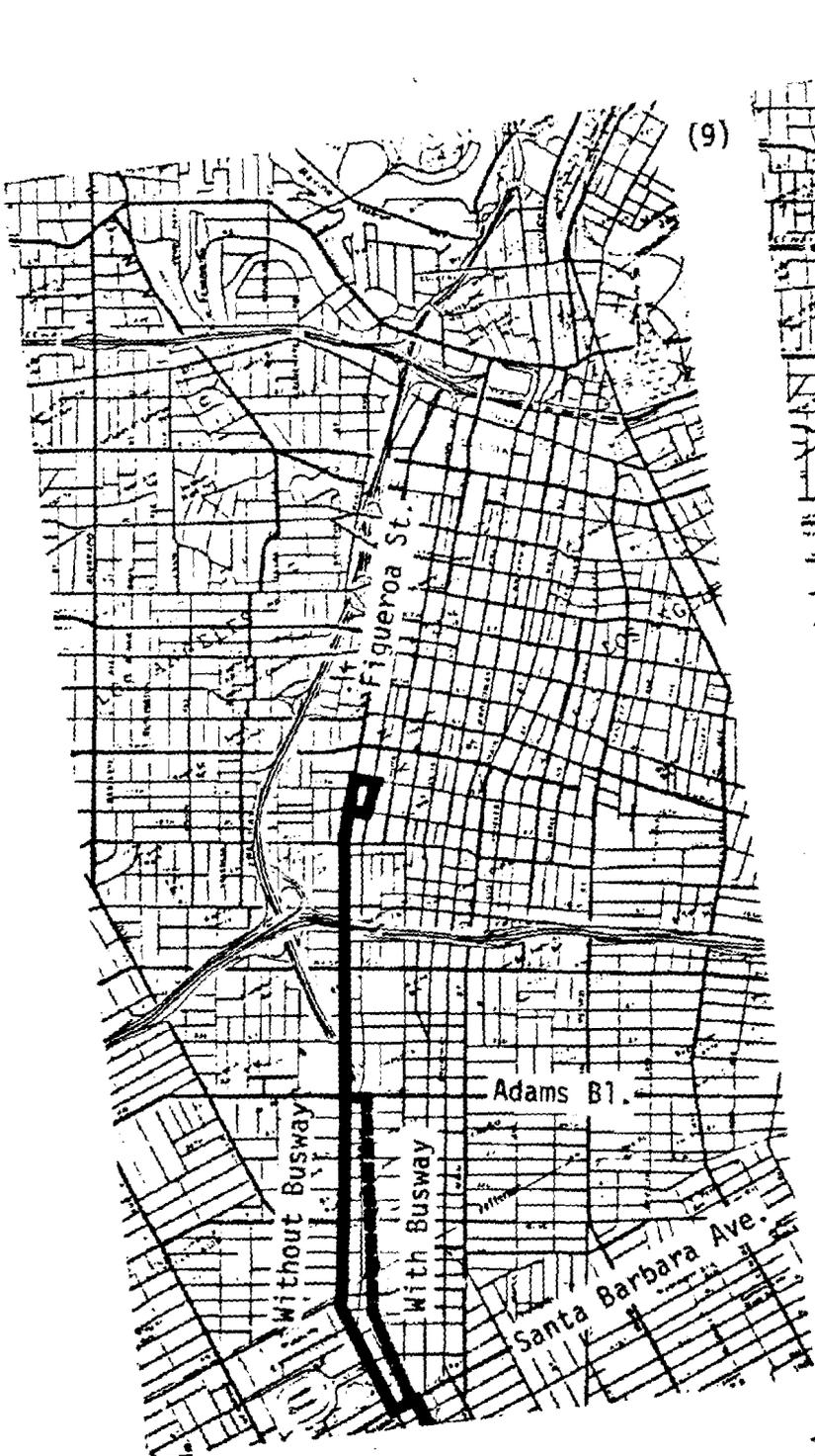


SIP PLAN EXPRESS LINES  
HARBOR FREEWAY

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.

NOTE: • 100% of Bus Trips Intercepted

NOTE: • 100% of Bus Trips Intercepted



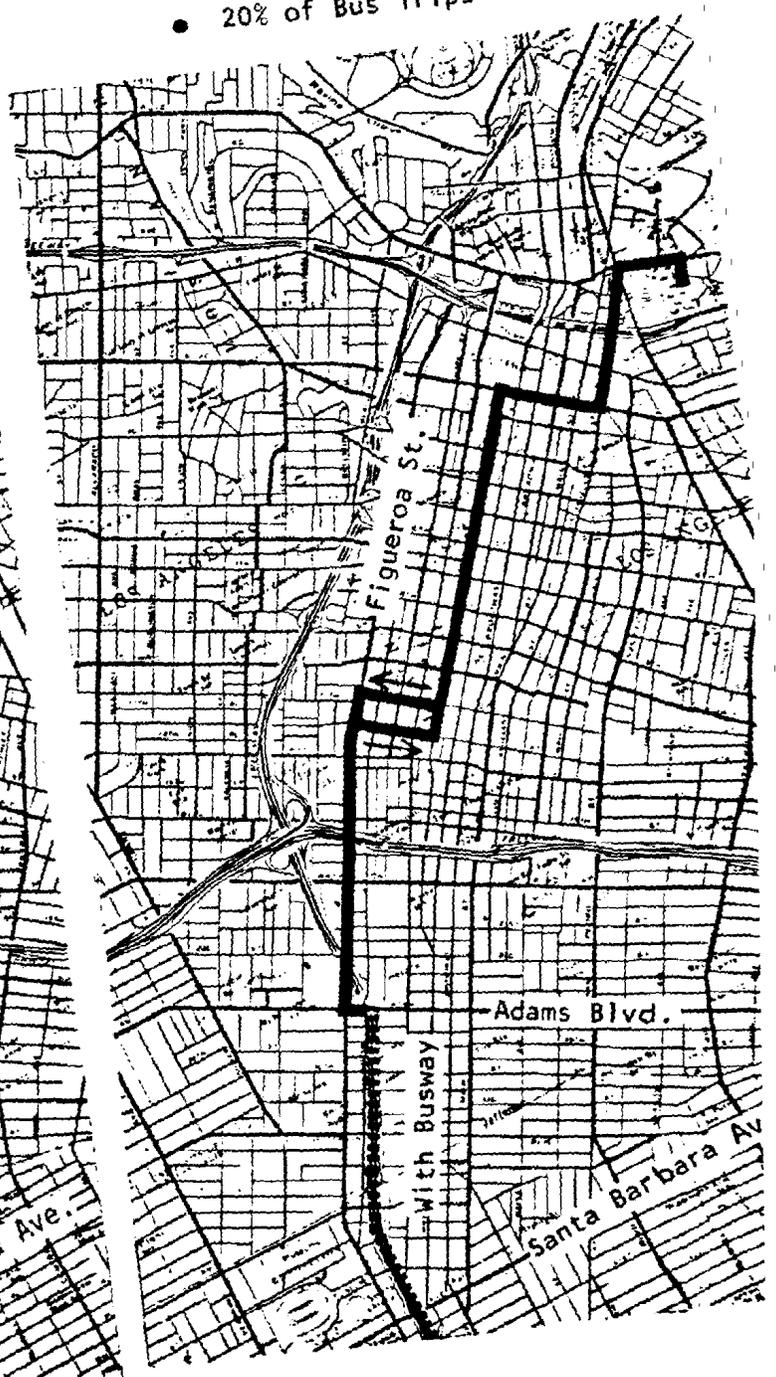
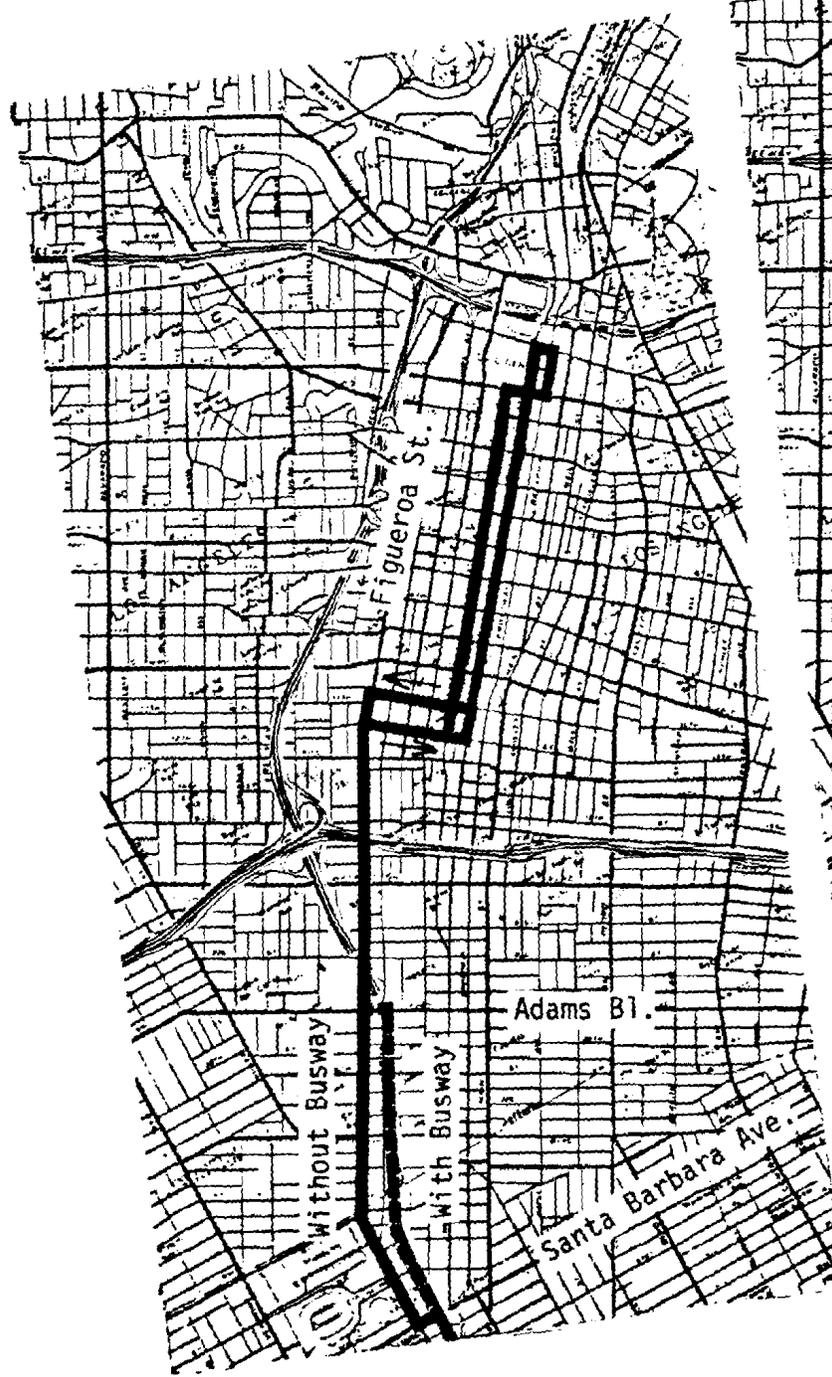
SIP PLAN EXPRESS LINES  
HARBOR FREEWAY

RTDP Element III  
L. A. CBD Bus Planning  
By SCRTD Planning Dept.

NOTE: ● 20% of Bus Trips Intercepted

NOTE: Modified by February 1981 Proposed Harbor-Century Transitway Bus Routings

● 20% of Bus Trips Intercepted



BUS OPERATION CONCEPTS AND SPECIFIC SERVICE AT DPM  
TERMINAL STATIONS AND VICINITIES

ACKNOWLEDGEMENTS

Contributors:

Byron Lee  
Associate Planner

Haim Geffen  
Management Trainee

Milton Brame  
Planning Analyst

Overall Direction:

Daniel Miller  
Senior Planner

RTD Planning Department  
April 1981

CBD BUS PLAN FOR DPM  
CHAPTER V  
DPM BACKGROUND INFORMATION

Planning Department  
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT  
April, 1981

LOS ANGELES CENTRAL BUSINESS DISTRICT (CBD)  
BUS PLAN FOR DOWNTOWN PEOPLE MOVER (DPM)

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V	DPM BACKGROUND INFORMATION

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DOCUMENTATION OF BUS SERVICE LEVEL FOR DPM PATRONAGE  
MODELLING (MAY 1980)



May 30, 1980

Mr. Gil Hicks  
Community Redevelopment  
Agency  
727 West 7th Street  
Los Angeles, California 90017

Dear Gil:

As per your request, enclosed are the bus network maps for the Los Angeles Central Business District. The maps indicate the routes, noon and P.M. headways, and bus stop locations for three time horizons: 1980, 1985, 1990.

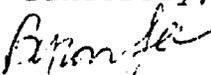
The following are brief descriptions of each horizon:

1980: Assumed to be the routes, bus stop and headways in existence on June 1, 1980.

1985: Routes and bus stops assumed to be unchanged. Headways shortened to reflect the following increases in trips/hour: local trips increased by 5% over 1980 level; express trips increased by 15% over 1980 level. Express lines intercepted at a rate of 20%. Local lines passing Union Station also intercepted 20%.

1990: Routes assumed to be that shown in the recently adopted West Los Angeles Sector Improvement Plan. Bus stops have been "created" by Planning staff. Headways have been factored up to reflect increases of 10% for local and 30% for express over the respective presently adopted levels. The Starter Line is assumed to be operating. The Bus-On-Freeway program is assumed to have been implemented. 20% of total express lines have been intercepted at the Convention Center. 45% of all express lines at Union Station intercepted. 20% of all local lines passing either Union Station or Convention Center intercepted.

Also included are the attached tables indicating 1980, 1985 and 1990 headways, and trips per hour for each line, and also a listing of those lines being intercepted in 1985 and 1990.

Sincerely,  
  
Byron Lee

Attachments

DEPARTMENTAL

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**

425 SOUTH MAIN STREET  
LOS ANGELES

DO NOT INCLUDE MORE THAN ONE  
SUBJECT IN THIS COMMUNICATION

DATE: May 30, 1980

TO: **File**

FROM: *MJR* Milton Brane and Byron Lee

SUBJECT: 1985 Intercept Lines

The following is a listing of express trips and intercepted express trips into the CBD. Since the only requirement in the selection of intercepted trips is that they total 20% of all trips, emphasis has not been given toward choosing those that are operationally feasible. Therefore, those that have been selected may not necessarily be realistic for actual interception.

SAN BERNARDINO FREEWAY

<u>LINE #</u>	<u># 1985 TRIPS</u>	<u># INTERCEPTED</u>
480	8	8
482	5	
483-5	8	
484	5	
486	5	
487-89-91	9	
490	6	
492-3-4	5	5
760-64	9	
496	1	
TOTAL	61	13

SANTA MONICA FREEWAY

601, 602, 604, 605, 606, 607, 608	22	4
TOTAL	22	4

May 30, 1980

HARBOR FREEWAY

<u>LINE #</u>	<u>#1985 TRIPS</u>	<u># INTERCEPTED</u>
810	5	3
813-14	8	
	<u>    </u>	<u>    </u>
TOTAL	13	3

UNION STATION (LOCAL)

420	4	4
422	6	
426	5	
428	6	
	<u>    </u>	<u>    </u>
TOTAL	21	4

cc: D. G. Miller

· MB/BL/ydh

DEPARTMENTAL

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**

425 SOUTH MAIN STREET  
LOS ANGELES

DO NOT INCLUDE MORE THAN ONE  
SUBJECT IN THIS COMMUNICATION

DATE: May 19, 1980

TO: **File**

FROM: Milton J. Brame

SUBJECT: 1985 Headway for Input into CRA Model

The attached tables are adjustment computation of 1985 headways for use in the CRA model.

We arrived at 1985 Headway by using the present trips/hour, adding 5% to all local lines and 15% was added to all express lines.

Attachments

MJB/ydh

1985 ADJUSTMENTS TO HEADWAY

(For CRA Model)

<u>LINE#</u>	<u>LOCAL</u> (1)	<u>EXPRESS</u> (2)	<u>PRESENT HEADWAY</u>	<u>PRESENT TRIPS/HR.</u>	<u>1985 TRIPS/HR.</u>	<u>1985 HEADWAY</u>
2	X	NB	20.0 (3)	3.0	3.2	19.0
			6.7 (4)	9.0	9.3	6.4
		SB	20.0 (3)	3.0	3.2	19.0
			10.0 (4)	6.0	6.3	9.5
3	X	NB	7.4	8.1	8.5	7.1
			6.8	8.8	9.2	6.5
		SB	7.4	8.1	8.5	7.1
			4.3	13.9	14.6	4.1
4	X	NB	7.5	8.0	8.4	7.1
			3.5	17.1	17.9	3.3
		SB	7.4	8.1	8.5	7.1
			4.0	15.0	15.7	3.3
5	X	NB	10.0	6.0	6.3	9.5
			6.3	9.5	10.0	6.0
		SB	10.0	6.0	6.3	9.5
			5.4	11.1	11.6	5.2
5X		NB	None	---	---	---
			None	---	---	---
		SB	None	---	---	---
			10.2	5.9	6.7	8.9
6	X	NB	10.0	6.0	6.3	9.5
			7.0	8.6	9.0	6.6
		SB	10.0	6.0	6.3	9.5
			7.2	8.3	8.7	6.9
7	X	NB	15.5	3.9	4.1	15.0
			9.0	6.6	6.9	8.7
		SB	15.0	4.0	4.2	14.0
			7.1	8.4	8.8	6.8

(1) Assumes 5% increase in trips over 6/1980 level

(2) Assumes 15% increase in trips over 6/1980 level.

(3) Noon hour headway, unless otherwise noted

(4) PM Peak hour headway, unless otherwise noted

<u>LINE #</u>	<u>LOCAL</u> (1)	<u>EXPRESS</u> (2)	<u>PRESENT HEADWAY</u>	<u>PRESENT TRIPS/HR.</u>	<u>1985 TRIPS/HR.</u>	<u>1985 HEADWAY</u>
8	X		NB 20.0	3.0	3.2	19.0
			12.2	4.9	5.1	12.0
			SB 20.0	3.0	3.2	19.0
			10.5	5.7	6.0	10.0
9	X		NB 10.0	6.0	6.3	9.5
			3.6	16.6	17.4	3.4
			SB 10.0	6.0	6.3	9.5
			7.1	8.4	8.8	6.8
12	X		NB 20.0	3.0	3.2	19.0
			10.0	6.0	6.3	9.5
			SB 20.0	3.0	3.2	19.0
			8.6	7.0	7.3	8.2
24	X		NB 20.0	3.0	3.2	19.0
			15.2	3.9	4.1	15.0
			SB 20.0	3.0	3.2	19.0
			10.0	6.0	6.3	9.5
5	X		NB 15.6	3.8	4.0	15.0
			6.0	10.0	10.5	5.7
			SB 15.3	3.9	4.1	15.0
			14.0	4.3	4.5	13.0
26	X		NB 5.0	12.0	12.6	4.8
			3.9	15.4	16.2	3.7
			SB 5.0	12.0	12.6	4.8
			3.0	20.0	21.0	2.8
28	X		NB 10.0	6.0	6.3	9.5
			4.8	12.5	13.1	4.6
			SB 10.0	6.0	6.3	9.5
			4.6	13.0	13.6	4.4
29	X		NB 10.0	6.0	6.3	9.5
			6.6	9.1	9.5	6.3
			SB 10.0	6.0	6.3	9.5
			4.9	12.2	12.8	4.7
33	X		NB 30.0	2.0	2.1	29.0
			24.6	2.4	2.5	24.0
			SB 30.0	2.0	2.1	29.0
			16.2	3.7	3.9	15.0

<u>LINE #</u>	<u>LOCAL (1)</u>	<u>EXPRESS (2)</u>	<u>PRESENT HEADWAY</u>	<u>PRESENT TRIPS/HR.</u>	<u>1985 TRIPS/HR.</u>	<u>1985 HEADWAY</u>
34	X		NB 60.0	1.0	1.05	57.0
			43.6	1.4	1.5	40.0
			SB 60.0	1.0	1.05	57.0
			32.3	1.8	2.0	30.0
35		X	NB 20.0	3.0	3.4	18.0
			6.5	9.2	10.6	5.7
			SB 21.5	2.8	3.2	19.0
			7.2	8.3	9.5	6.3
36		X	NB 30.0	2.0	2.3	26.0
			20.0	3.0	3.4	18.0
			SB 30.0	2.0	2.3	26.0
			14.2	4.2	4.8	12.0
39	X		NB 12.0	5.0	5.2	11.0
			9.5	6.3	6.6	9.1
			SB 11.8	5.1	5.3	11.0
			12.0	5.0	5.2	11.0
39X		X	NB 19.0*	3.1	3.6	17.0
42	X		NB 7.4	8.1	8.5	7.1
			4.0	15.0	15.7	3.8
			SB 6.6	9.1	9.5	6.5
			6.1	9.8	10.3	5.8
42X		X	NB 25.0*	2.4	2.8	21.0
44	X		NB 10.0	6.0	6.3	9.5
			6.0	10.0	10.5	5.7
			SB 10.0	6.0	6.3	9.5
			5.8	10.3	10.8	5.5
44X		X	NB 25.0*	2.4	2.8	21.0
47	X		NB 15.0	4.0	4.2	14.0
			10.8	5.5	5.8	10.3
			SB 15.0	4.0	4.2	14.0
			9.5	6.3	6.6	9.1
49	X		NB 20.0	3.0	3.2	19.0
			11.0	5.4	5.7	10.5
			SB 20.0	3.0	3.2	19.0
			9.1	6.6	6.9	8.7

\* PM Peak-hour

<u>LINE #</u>	<u>LOCAL</u> <sup>(1)</sup>	<u>EXPRESS</u> <sup>(2)</sup>	<u>PRESENT HEADWAY</u>	<u>PRESENT TRIPS/HR.</u>	<u>1985 TRIPS/HR.</u>	<u>1985 HEADWAY</u>
56	X		NB 30.0	2.0	2.1	29.0
			9.1	6.6	6.9	8.7
			SB 30.0	2.0	2.1	29.0
			35.0	1.7	1.8	33.0
75	X		NB 15.0	4.0	4.2	14.0
			10.0	6.0	6.3	9.5
			SB 15.0	4.0	4.2	14.0
			12.0	5.0	5.2	11.0
83	X		NB 3.0	20.0	21.0	2.8
			2.9	20.7	21.7	2.8
			SB 3.0	20.0	21.0	2.8
			2.9	20.7	21.7	2.8
86	X		NB 20.3	2.9	3.0	20.0
			9.8	6.1	6.4	9.4
			SB 20.0	3.0	3.2	19.0
			19.6	3.1	3.2	19.0
91	X		NB 10.0	6.0	6.3	9.5
			4.6	13.0	13.6	4.4
			SB 10.0	6.0	6.3	9.5
			4.3	13.9	14.6	4.1
91X		X	NB 10.0*	6.0	6.9	8.7
92	X		NB 20.0	3.0	3.2	19.0
			10.6	5.6	5.9	10.2
			SB 20.0	3.0	3.2	19.0
			8.2	7.3	7.7	7.8
92A	X		NB 20.0**	3.0	3.2	19.0
			SB 20.0*	3.0	3.2	19.0
93X		X	NB 15.0	4.0	4.6	13.0
			5.3	11.3	13.0	4.6
			SB 15.6	3.8	4.4	14.0
			7.5	8.0	9.2	6.5
94	X		NB 10.0	6.0	6.3	9.5
			7.5	8.0	8.4	7.1
			SB 10.0	6.0	6.3	9.5
			8.6	7.0	7.3	8.2

\* PM Peak hour

\*\* Noon Peak hour

<u>LINE #</u>	<u>LOCAL</u> (1)	<u>EXPRESS</u> (2)	<u>PRESENT HEADWAY</u>	<u>PRESENT TRIPS/HR.</u>	<u>1985 TRIPS/HR.</u>	<u>1985 HEADWAY</u>
121		X	NB 18.3*	3.3	3.9	15.0
122		X	NB 30.0*	2.0	2.3	26.0
			SB 60.0*	1.0	1.15	52.0
144		X	SB 9.0*	6.6	7.6	7.9
420	X		NB 20.0	3.0	3.2	19.0
			17.5	3.4	3.6	17.0
			SB 20.0	3.0	3.2	19.0
			20.0	3.0	3.2	19.0
422	X		NB 20.0	3.0	3.2	19.0
			10.0	6.0	6.3	9.5
			SB 17.0	3.5	3.7	16.0
			23.5	2.5	2.6	23.0
426	X		NB 20.0	3.0	3.2	19.0
			12.5	4.8	5.0	12.0
			SB 20.0	3.0	3.2	19.0
			20.0	3.0	3.2	19.0
428	X		NB 20.0	3.0	3.2	19.0
			10.0	6.0	6.3	9.5
			SB 20.0	3.0	3.2	19.0
			20.0	3.0	3.2	19.0
432	X		NB 20.0	3.0	3.2	19.0
			18.8	3.3	3.5	17.0
			SB 20.0	3.0	3.2	19.0
			20.0	3.0	3.2	19.0
480		X	NB 20.0	3.0	3.4	18.0
			11.4	5.2	5.9	10.0
			SB 20.0	3.0	3.4	18.0
			20.0	3.0	3.4	18.0
482		X	NB 13.3*	4.5	5.2	11.0
			SB 29.5*	2.0	2.3	26.0
483-485		X	NB 10.0	6.0	6.9	8.7
			8.6	7.0	8.0	7.5
			SB 10.0	6.0	6.9	8.7
			10.0	6.0	6.9	8.7
484		X	NB 30.0	2.0	2.3	26.0
			15.0	4.0	4.6	3.0
			SB 30.0	2.0	2.3	26.0
			19.0	3.1	3.6	17.0

\* PM Peak hour

<u>LINE #</u>	<u>LOCAL</u> (1)	<u>EXPRESS</u> (2)	<u>PRESENT HEADWAY</u>	<u>PRESENT TRIPS/HR.</u>	<u>1985 TRIPS/HR.</u>	<u>1985 HEADWAY</u>
486		X	NB 13.3*	4.5	5.2	11.0
			SB 30.0*	2.0	2.3	26.0
487-9-1		X	NB 15.0	4.0	4.6	13.0
			7.3	8.2	9.4	6.4
			SB 13.3	4.5	5.2	11.0
			10.0	6.0	6.9	8.7
490		X	NB 30.0	2.0	2.3	26.0
			12.0	5.0	5.7	10.5
			SB 30.0	2.0	2.3	26.0
			30.0	2.0	2.3	26.0
492-3-4		X	NB 15.0*	4.0	4.6	13.0
496		X	NB & SB 60.0**	1.0	1.15	52.0
600's		X	NB 30.0	2.0	2.3	26.0
			8.6	7.0	8.0	7.5
			SB 30.0	2.0	2.3	26.0
			3.2	18.7	21.5	2.8
716		X	NB 26.3*	2.3	2.6	23.0
721		X	NB 17.6*	3.4	3.9	15.0
737		X	SB 20.0*	3.0	3.4	18.0
755		X	NB 10.0*	6.0	6.9	8.7
757		X	SB 6.4*	9.4	10.8	5.5
758		X	SB 15.0*	4.0	4.6	13.0
760-4		X	NB 8.0*	7.5	8.6	7.0
762		X	NB 9.6*	6.2	7.1	8.4
770		X	NB 30.0	2.0	2.3	26.0
			6.8	8.8	10.1	5.9
			SB 30.0	2.0	2.3	26.0
			15.0	4.0	4.6	13.0
801		X	NB 60.0	1.0	1.15	52.0
			15.6	3.8	4.4	14.0
			SB 60.0	1.0	1.15	52.0
			33.0	1.8	2.1	29.0
800-2		X	NB 30.0	2.0	2.3	26.0
			15.0	4.0	4.6	13.0
			SB 30.0	2.0	2.3	26.0
			30.0	2.0	2.3	26.0

\* PM Peak hour

\*\* Noon & PM Peak hour

<u>LINE#</u>	<u>LOCAL (1)</u>	<u>EXPRESS (2)</u>	<u>PRESENT HEADWAY</u>	<u>PRESENT TRIPS/HR.</u>	<u>1985 TRIPS/HR.</u>	<u>1985 HEADWAY</u>	
810		X	NB 30.0	2.0	2.3	26.0	
				27.5	2.2	2.5	24.0
			SB 30.0	2.0	2.3	26.0	
				13.3	4.5	5.2	11.0
813-14		X	NB & SB 30.0**	2.0	2.3	26.0	
				8.6*	6.9	7.9	7.5
820		X	NB 20.0	3.0	3.4	18.0	
				5.8	10.3	11.8	5.1
			SB 20.0	3.0	3.4	18.0	
				15.3	3.9	4.5	13.0
871	X		NB 30.0	2.0	2.1	29.0	
				29.5	2.0	2.1	29.0
			SB 30.0	2.0	2.1	29.0	
				15.0	4.0	4.2	14.0
202	X		NB 5.2	11.5	12.1	5.0	
				7.7	7.8	8.2	7.3
			SB 5.0	12.0	12.6	4.8	
				8.0	7.5	7.9	7.5
47+	X		NB 15.0	4.0	4.2	14.0	
				9.3	6.4	6.7	8.9
			SB 15.0	4.0	4.2	14.0	
				9.7	6.2	6.5	9.2
495+		X	NB 20.0	3.0	3.4	18.0	
				20.0	3.0	3.4	18.0
				20.0	3.0	3.4	18.0
				11.6	5.2	5.9	10.2
481+		X	NB 10.0*	6.0	6.9	8.7	

(1) Assumes 5% increase in trips over 6/1980 level.

(2) Assumes 15% increase in trips over 6/1980 level.

\* PM Peak hour

\*\* Noon & PM Peak hour

+ New routes implemented in the June 15, 1980 shake-up.

DEPARTMENTAL

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**

425 SOUTH MAIN STREET  
LOS ANGELES

DO NOT INCLUDE MORE THAN ONE  
SUBJECT IN THIS COMMUNICATION

DATE: June 4, 1980

TO: File  
FROM: Milton J. Brame  
SUBJECT: 1990 Intercepted Trips

The following tables indicate local, limited and express 1990 trips and intercepted trips in the CBD. Our responsibility was to select intercepted trips that total 20% for the Convention Center and a 45% rate for Union Station. Emphasis has not been given toward choosing those that are operationally feasible. Therefore, those that have been selected may not necessarily be realistic for actual interception.

MJB/ydh  
Attachments

UNION STATION

(No Route Modification Needed)

<u>LOCAL &amp; LIMITED LINES #</u>	<u>#1990 TRIPS</u>	<u>#INTERCEPTED</u>
S28	17	
S70	8	
S71	8	
L330	4	
	<hr/>	<hr/>
<u>TOTAL</u>	37	-0- *

(Requires Route Modification)

S31	17	
S75	7	
S80	4	4
S81	4	
L332	4	
	<hr/>	<hr/>
<u>TOTAL</u>	36	4

CONVENTION CENTER

(No Route Modification Needed)

<u>LOCAL &amp; LIMITED LINES #</u>	<u>#1990 TRIPS</u>	<u>#INTERCEPTED</u>
S30	17	
S31	17	
S44	13	
S65	2	
	<hr/>	<hr/>
<u>TOTAL</u>	49	0 *

(Requires Route Modification)

S28	17	
S33	10	10
S35	10	
S37	11	
S38	10	
L311	8	
	<hr/>	<hr/>
<u>TOTAL</u>	66	10

\* NOTE: These routes pass the DPM Station at either Union Station or at Convention Center but are unsuited for intercept; they are either through routes, limited routes or provide service to other than the west side of the CBD.

UNION STATION

<u>SAN BERNARDINO FREEWAY EXPRESS LINES #</u>	<u>#1990 TRIPS</u>	<u># INTERCEPTED</u>
X475	5	
480	4	
481	8	8
482	3	
483-85	8	8
484	4	
486	3	
487-89-91	8	8
488	3	
490	3	3
492-93-94	5	
495	4	
496	1	
	<hr/>	<hr/>
<u>TOTAL</u>	59	27

CONVENTION CENTER

<u>SANTA MONICA FREEWAY EXPRESS LINES #</u>	<u>#1990 TRIPS</u>	<u># INTERCEPTED</u>
X430	4	4
X434	4	
X436	7	
X437	4	
X439	4	
	<hr/>	<hr/>
<u>TOTAL</u>	23	4

HARBOR FREEWAY  
EXPRESS LINES #

#1990 TRIPS

# INTERCEPTED

x448

5

3

813-814

9

.

TOTAL

14

3

MB/ydh  
6/4/80

DEPARTMENTAL

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**

425 SOUTH MAIN STREET  
LOS ANGELES

DO NOT INCLUDE MORE THAN ONE  
SUBJECT IN THIS COMMUNICATION

DATE: May 23, 1980

TO: File

FROM: Milton J. Brame

SUBJECT: 1990 Headway for Input into CRA Model

The following tables are adjustment computations from the 1980 proposed Sector improvements for 1990 headways projection for use in the CRA Model.

We arrived at 1990 headways by using the proposed (1980 Sector improvements) trip/hour, adding 10% to all local and limited lines and 30% was added to all express lines.

Original lines that were not changed in the 1980 Sector improvements, used present trips/hour rather than proposed trips/hour.

Attachments

MJB:cym

1990 HEADWAY ADJUSTMENT  
(For CRA Model)

NEWLY-PROPOSED LINES

<u>LINE #</u>	<u>LOCAL</u> (1)	<u>EXPRESS</u> (2)	<u>LIMITED</u> (1)	<u>PROPOSED HEADWAY</u>	<u>PROPOSED TRIPS/HR.</u>	<u>1990 TRIPS/HR.</u>	<u>1990 HEADWAY</u>
S1	X		Noon	10.0	6.0	6.6	9.1
			PM	4.0	15.0	16.5	3.6
S2	X		Noon	20.0	3.0	3.3	18.0
			PM	15.0	4.0	4.4	14.0
S3	X			Weekend Service Only			
S4	X		Noon	10.0	6.0	6.6	9.1
			PM	7.5	8.0	8.8	6.8
S10	X		Noon	10.0	6.0	6.6	9.1
			PM	6.5	9.2	10.1	5.9
S11	X		Noon	10.0	6.0	6.6	9.1
			PM	6.5	9.2	10.1	5.9
S12	X		Noon	20.0	3.0	3.3	18.0
			PM	12.0	5.0	5.5	10.9
S14	X		Noon	10.0	6.0	6.6	9.1
			PM	5.0	12.0	13.2	4.5
S16	X		Noon	5.0	12.0	13.2	4.5
			PM	5.0	12.0	13.2	4.5
S18	X		Noon	7.5	8.0	8.8	6.8
			PM	3.0	20.0	22.0	2.7
S20	X		Noon	15.0	4.0	4.4	14.0
			PM	12.0	5.0	5.5	10.9
S21	X		Noon	7.5	8.0	8.8	6.8
			PM	6.0	10.0	11.0	5.4
S22	X		Noon	15.0	4.0	4.4	14.0
			PM	12.0	5.0	5.5	10.9
S25	X		Noon	10.0	6.0	6.6	9.1
			PM	7.0	8.6	9.5	6.3
S26	X		Noon	10.0	6.0	6.6	9.1
			PM	7.0	8.6	9.5	6.3

(1) Assumes 10% increase in trips over proposed 6/1980 level.

(2) Assumes 30% increase in trips over proposed 6/1980 level.

LINE #	LOCAL (1)	EXPRESS (2)	LIMITED (1)	PROPOSED HEADWAY	PROPOSED TRIPS/HR.	1990 TRIPS/HR.	1990 HEADWAY
S27	X		Noon	10.0	6.0	6.6	9.1
			PM	5.0	12.0	13.2	4.5
S28	X		Noon	7.5	8.0	8.8	6.8
			PM	4.0	15.0	16.5	3.6
S30	X		Noon	10.0	6.0	6.6	9.1
			PM	4.0	15.0	16.5	3.6
S31	X		Noon	10.0	6.0	6.6	9.1
			PM	4.0	15.0	16.5	3.6
S33	X		Noon	12.0	5.0	5.5	10.9
			PM	7.0	8.6	9.5	6.3
S35	X		Noon	10.0	6.0	6.6	9.1
			PM	7.0	8.6	9.5	6.3
S37	X		Noon	10.0	6.0	6.6	9.1
			PM	6.0	10.0	11.0	5.4
3	X		Noon	10.0	6.0	6.6	9.1
			PM	7.0	8.6	9.5	6.3
S40	X		Noon	10.0	6.0	6.6	9.1
			PM	8.0	7.5	8.2	7.5
S41	X		Noon	20.0	3.0	3.3	18.0
			PM	16.0	3.7	4.1	15.0
S42	X		Noon	20.0	3.0	3.3	18.0
			PM	16.0	3.7	4.1	15.0
S44	X		Noon	10.0	6.0	6.6	9.1
			PM	5.0	12.0	13.2	4.5
S45	X		Noon	20.0	3.0	3.3	18.0
			PM	15.0	4.0	4.4	14.0
S46	X		Noon	20.0	3.0	3.3	18.0
			PM	15.0	4.0	4.4	14.0
S47	X		Noon	15.0	4.0	4.4	14.0
			PM	10.0	6.0	6.6	9.1
S48	X		Noon	15.0	4.0	4.4	14.0
			PM	7.5	8.0	8.8	6.8
S50	X		Noon	20.0	3.0	3.3	18.0
			PM	15.0	4.0	4.4	14.0

<u>LINE #</u>	<u>LOCAL</u> (1)	<u>EXPRESS</u> (2)	<u>LIMITED</u> (1)	<u>PROPOSED HEADWAY</u>	<u>PROPOSED TRIPS/HR.</u>	<u>1990 TRIPS/HR.</u>	<u>1990 HEADWAY</u>
S51	X		Noon	20.0	3.0	3.3	18.0
			PM	15.0	4.0	4.4	14.0
-36-		X	Noon	30.0	2.0	2.6	23.0
			PM	18.3	3.3	3.6	17.0
S53	X		Noon	7.5	8.0	8.8	6.8
			PM	5.0	12.0	13.2	4.5
S55	X		Noon	15.0	4.0	4.4	14.0
			PM	10.0	6.0	6.6	9.1
S56	X		Noon	15.0	4.0	4.4	14.0
			PM	8.0	7.5	8.2	7.3
S58	X		Noon	20.0	3.0	3.3	18.0
			PM	10.0	6.0	6.6	9.1
S60	X		Noon	7.5	8.0	8.8	6.8
			PM	3.0	20.0	22.0	2.7
S65	X		Noon	30.0	2.0	2.2	27.0
			PM	30.0	2.0	2.2	27.0
S70	X		Noon	15.0	4.0	4.4	14.0
			PM	8.0	7.5	8.2	7.3
S71	X		Noon	15.0	4.0	4.4	14.0
			PM	8.0	7.5	8.2	7.3
S75	X		Noon	15.0	4.0	4.4	14.0
			PM	10.0	6.0	6.6	9.1
S80	X		Noon	20.0	3.0	3.3	18.0
			PM	15.0	4.0	4.4	14.0
S81	X		Noon	20.0	3.0	3.3	18.0
			PM	15.0	4.0	4.4	14.0
S84	X		Noon	20.0	3.0	3.3	18.0
			PM	10.0	6.0	6.6	9.1
S85	X		Noon	20.0	3.0	3.3	18.0
			PM	10.0	6.0	6.6	9.1
S87	X		Noon	20.0	3.0	3.3	18.0
			PM	15.0	4.0	4.4	14.0
S88	X		Noon	20.0	3.0	3.3	18.0
			PM	15.0	4.0	4.4	14.0
S90	X		Noon	60.0	1.0	1.10	54.0
			PM	20.0	3.0	3.3	18.0

<u>LINE #</u>	<u>LOCAL</u> <sup>(1)</sup>	<u>EXPRESS</u> <sup>(2)</sup>	<u>LIMITED</u> <sup>(1)</sup>	<u>PROPOSED HEADWAY</u>	<u>PROPOSED TRIPS/HR.</u>	<u>1990 TRIPS/HR.</u>	<u>1990 HEADWAY</u>
S91	X		Noon	60.0	1.0	1.10	54.0
			PM	20.0	3.0	3.3	18.0
S94	X		Noon	15.0	4.0	4.4	14.0
			PM	15.0	4.0	4.4	14.0
S96	X		Noon	10.0	6.0	6.6	7.3
			PM	8.0	7.5	8.2	7.3
S97	X		Noon	20.0	3.0	3.3	18.0
			PM	15.0	4.0	4.4	14.0
L303			X Noon	--	--	--	--
			PM	15.0	4.0	4.4	14.0
L306			X Noon	--	--	--	--
			PM	8.0	7.5	8.2	7.3
L308			X Noon	15.0	4.0	4.4	14.0
			PM	6.0	10.0	11.0	5.4
L309			X Noon	15.0	4.0	4.4	14.0
			PM	12.0	5.0	5.5	10.9
L310			X Noon	30.0	2.0	2.2	27.0
			PM	20.0	3.0	3.3	18.0
L311			X Noon	--	--	--	--
			PM	8.0	7.5	8.2	7.3
L315			X Noon	--	--	--	--
			PM	10.0	6.0	6.6	9.1
L317			X Noon	--	--	--	--
			PM	12.0	5.0	5.5	10.9
L320			X Noon	--	--	--	--
			PM	15.0	4.0	4.4	14.0
L330			X Noon	--	--	--	--
			PM	15.0	4.0	4.4	14.0
L332			X Noon	--	--	--	--
			PM	15.0	4.0	4.4	14.0
L338			X Noon	--	--	--	--
			PM	15.0	4.0	4.4	14.0
X405	X		Noon	--	--	--	--
			PM	30.0	2.0	2.6	23.0

<u>LINE #</u>	<u>LOCAL</u>	<u>EXPRESS</u>	<u>LIMITED</u>	<u>PROPOSED HEADWAY</u>	<u>PROPOSED TRIPS/HR.</u>	<u>1990 TRIPS/HR.</u>	<u>1990 HEADWAY</u>
X406		X	Noon	--	--	--	--
			PM	30.0	2.0	2.6	23.0
X410		X	Noon	20.0	3.0	3.9	15.0
			PM	20.0	3.0	3.9	15.0
X411		X	Noon	20.0	3.0	3.9	15.0
			PM	20.0	3.0	3.9	15.0
X412		X	Noon	--	--	--	--
			PM	30.0	2.0	2.6	23.0
X420		X	Noon	15.0	4.0	5.2	11.0
			PM	8.0	7.5	9.7	6.2
X421		X	Noon	--	--	--	--
			PM	20.0	3.0	3.9	15.0
X422		X	Noon	--	--	--	--
			PM	20.0	3.0	3.9	15.0
25		X	Noon	15.0	4.0	5.2	11.0
			PM	6.0	10.0	13.0	4.6
X426		X	Noon	--	--	--	--
			PM	7.0	8.5	11.0	5.4
X427		X		--	--	--	--
				1 trip	--	--	--
X429		X	Noon	20.0	3.0	3.9	15.0
			PM	8.0	7.5	9.7	6.2
X430		X	Noon	30.0	2.0	2.6	23.0
			PM	20.0	3.0	3.9	15.0
X434		X	Noon	60.0	1.0	1.30	46.0
			PM	20.0	3.0	3.9	15.0
X436		X	Noon	--	--	--	--
			PM	12.0	5.0	6.5	9.2
X437		X	Noon	30.0	2.0	2.6	23.0
			PM	20.0	3.0	3.9	15.0
X439		X	Noon	30.0	2.0	2.6	23.0
			PM	20.0	3.0	3.9	15.0
X442		X	Noon	30.0	2.0	2.6	23.0
			PM	10.0	6.0	7.8	7.7

<u>LINE #</u>	<u>LOCAL</u> (1)	<u>EXPRESS</u> (2)	<u>LIMITED</u> (1)	<u>PROPOSED HEADWAY</u>	<u>PROPOSED TRIPS/HR.</u>	<u>1990 TRIPS/HR.</u>	<u>1990 HEADWAY</u>
X444		X	Noon	--	--	--	--
				PM	30.0	2.0	2.6
X448		X	Noon	30.0	2.0	2.6	23.0
				PM	15.0	4.0	5.2
X449		X	Noon	--	--	--	--
				PM	30.0	2.0	2.6
X455		X	Noon	--	--	--	--
				PM	2 trips	--	--
X475		X	Noon	--	--	--	--
				PM	15.0	4.0	5.2
900-901		X	Noon	7.5	8.0	10.4	5.7
				PM	5.0	12.0	15.6
910-911		X	Noon	7.5	8.0	10.4	5.7
				PM	5.0	12.0	15.6
920		X	Noon	15.0	4.0	5.2	12.0
				PM	10.0	6.0	7.8
930-931		X	Noon	7.5	8.0	10.4	5.7
				PM	5.0	12.0	15.6
940		X	Noon	15.0	4.0	5.2	12.0
				PM	10.0	6.0	7.8

(1) Assumes 10% increase in trips over Proposed 6/1980 Level

(2) Assumes 30% increase in trips over Proposed 6/1980 Level

CURRENT LINES (Unchanged by 1980 Sector Plan)

<u>LINE #</u>	<u>LOCAL</u> (1)	<u>EXPRESS</u> (2)	<u>LIMITED</u> (1)	<u>6/1980 HEADWAY</u>	<u>6/1980 TRIPS/HR.</u>	<u>1990 TRIPS/HR.</u>	<u>1990 HEADWAY</u>
480		X	Noon	20.0	3.0	3.9	15.0
				PM	20.0	3.0	3.9
482		X	Noon	--	--	--	--
				PM	29.5	2.0	2.6
483-5		X	Noon	10.0	6.0	7.8	7.7
				PM	10.0	6.0	7.8

LINE	LOCAL <sup>(1)</sup>	EXPRESS <sup>(2)</sup>	LIMITED <sup>(1)</sup>	6/1980 HEADWAY	6/1980 TRIPS/HR.	1990 TRIPS/HR.	1990 HEADWAY
484		X	Noon	30.0	2.0	2.6	23.0
			PM	19.0	3.1	4.0	15.0
486		X	Noon	--	--	--	--
			PM	30.0	2.0	2.6	23.0
487-9-91		X	Noon	13.3	4.5	5.8	10.3
			PM	10.0	6.0	7.8	7.7
488		X	Noon	--	--	--	--
			PM	30.0	2.0	2.6	23.0
490		X	Noon	30.0	2.0	2.6	23.0
			PM	30.0	2.0	2.6	23.0
492-3-4		X	Noon	--	--	--	--
			PM	15.0	4.0	5.2	11.0
496		X	Noon	60.0	1.0	1.30	46.0
			PM	60.0	1.0	1.30	46.0
716		X	Noon	--	--	--	--
			PM	25.3	2.3	2.9	21.0
717		X	Noon	--	--	--	--
			PM	17.6	3.4	4.4	14.0
737		X	Noon	--	--	--	--
			PM	20.0	3.0	3.9	15.0
755		X	Noon	--	--	--	--
			PM	10.0	6.0	7.8	7.7
757		X	Noon	--	--	--	--
			PM	6.4	9.3	12.1	4.9
758		X	Noon	--	--	--	--
			PM	15.0	4.0	5.2	11.0
760-4		X	Noon	--	--	--	--
			PM	8.0	7.5	9.7	6.2
762		X	Noon	--	--	--	--
			PM	9.6	6.2	8.1	7.4
770		X	Noon	30.0	2.0	2.6	23.0
			PM	15.0	4.0	5.2	11.0
800-2		X	Noon	30.0	2.0	2.6	23.0
			PM	30.0	2.0	2.6	23.0
771		X	Noon	60.0	1.0	1.30	46.0
			PM	33.0	1.8	2.3	26.0
813-4		X	Noon	30.0	2.0	2.6	23.0
			PM	8.6	6.9	8.9	6.7
820		X	Noon	20.0	3.0	3.9	15.0
			PM	15.3	3.9	5.1	11.0

LINES ORIGINATED IN THE JUNE 15, 1980 SHAKE-UP

<u>LINE #</u>	<u>LOCAL</u> <sup>(1)</sup>	<u>EXPRESS</u> <sup>(2)</sup>	<u>LIMITED</u> <sup>(1)</sup>	<u>6/1980 HEADWAY</u>	<u>6/1980 TRIPS/HR.</u>	<u>1990 TRIPS/HR.</u>	<u>1990 HEADWAY</u>
481		X	Noon	--	--	--	--
			PM	10.0	6.0	7.8	7.6
495		X	Noon	20.0	3.0	3.9	15.0
			PM	20.0	3.0	3.9	15.0

(1) Assumes 10% increase in trips over Present 6/1980 Level

(2) Assumes 30% increase in trips over Present 6/1980 Level

CBD TRAVEL PROJECTIONS: BACKGROUND DATA

EARLY DPM PATRONAGE ANALYSIS

DEPARTMENTAL

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**

425 SOUTH MAIN STREET  
LOS ANGELES

DO NOT INCLUDE MORE THAN ONE  
SUBJECT IN THIS COMMUNICATION

DATE: November 11, 1977

TO: File

FROM: Dan Miller *DM*

SUBJECT: RTDP Element III--DPM Patronage Projections: Bus Diversion Impacts

This memo supplements DPM bus division background data provided in the November 8 memo (with the two tables repeated).

DPM patronage projections were based on two basic categories, as follows:

<u>TOTAL WEEKDAY ONE-WAY PERSON-TRIPS ON DPM</u>	
Distribution Trips	56,000
Circulation Trips	<u>25,000</u>
Total	81,000

The CRA data indicates that the 25,000 CBD circulation trips made on the DPM (which trips are assumed not to cross the cordon line) would almost entirely represent diversions from auto trips. For this reason, my chart shows projected diversion from RTD for circulation trips to be zero or none. However, it can be reasoned that, assuming an increase in CBD employment population from 200K to 230K, the RTD bus share of circulation trips would be greater without the DPM. On the other hand, the DPM can be seen to cause a net increase in transit's share of CBD circulation trips (bus+DPM) both in relative and absolute numbers. Such stimulation of transit trip making for CBD circulation purposes could result in a patronage net increase to CBD surface buses compared to the same CBD population level without a DPM.

For distribution trips, the CRA data indicates that 48,748 (or 87%) would come from regional transit trips. The balance of 7,252 (or 13%) would come from regional auto users. For convenience of the bus diversion analysis, the 48,748 has been rounded up to 50,000.

In summary, the projected diversion of regional transit (bus) users to the DPM looks like this:

DPM DISTRIBUTION TRIPS (=56,000)

<u>REGIONAL BUS USERS TO DPM</u>	<u>AS PERCENT OF 1976 BUS CORDON COUNT (311,456)</u>	<u>AS PERCENT OF 1.15 EXPANSION OF 1976 (=230K, 1990 CBD EMPLOYMENT POP.)</u>
50,000	$\frac{50}{311} = 16.1\%$	$\frac{50}{358} = 13.0\%$

To gain a better perspective on the issue, the tables that follow show breakdowns between express/freeway flyer and local buses by peak period (prevailing direction and reverse) and balance of day. The lines included in the express/freeway flyer category are shown in a table included herein.

Given a 50,000 diversion figure, the several tables show how these passengers might be "reasonably" spread. The starting point was to intuitively assume maximum reasonable diversion factors for peak period express and local bus service, with the balance allocated to off peak. These intuitive diversion factors were .33 for express and .20 for local services during peak periods.

In development of the DPM bus support plan, the level of service conditions studied will result, hopefully, in realistic estimates of passengers transferring from regional bus to the DPM at the two terminal stations, as well as more limited transferring at the intermediate stations.

Given present RTD services, the busway lines appear to offer maximum opportunity for bus intercept, whereby a certain portion of busway buses would terminate at the DPM. This is because passengers can make convenient transfers at El Monte Station (also the University station) and thereby obtain additional options for CBD and suburban routing combinations. Without the use of suburban transportation centers (like El Monte Station) passengers do not have the chance to sort themselves out between a DPM bus intercept bus (terminates at DPM) and a self-distribute bus. Accordingly, if the inherent transit disincentive of transfers is to be minimized, only limited bus intercept, as compared to bus interface, will be advisable.

-----

cc Nadeem Tahir  
Paul Taylor (plus circulation as desired)

DGM/mjc

SPRING 1976 RTD BUS L.A. CBD CORDON COUNT

Bus Trips	Total			Flyer/Express			Local		
	In	Out	Total	In	Out	Total	In	Out	Total
6:00A - 9:20P	1,911	1,456	3,367	573	144	717	1,338	1,312	2,650
9:20A - 4:00P	2,009	1,972	3,981	273	283	556	1,736	1,689	3,425
4:00P - 6:20P	1,121	1,567	2,688	110	511	621	1,011	1,056	2,067
6:20P - 8:00P	383	395	788	61	60	121	322	335	657
<b>Total</b>	<b>5,424</b>	<b>5,390</b>	<b>10,814</b>	<b>1,017</b>	<b>998</b>	<b>2,015</b>	<b>4,407</b>	<b>4,392</b>	<b>8,799</b>

Peak Hour

7:00A - 8:00A	930			272			658		
4:40P - 5:40P		916			282			634	

Peak 20 Minute Period

7:20A	246			82			164		
4:40P		253			97			156	

Bus Passengers

6:00A - 9:20P	70,148	26,456	96,604	18,236	2,227	20,463	51,912	24,229	76,141
9:20A - 4:00P	54,707	53,136	107,843	3,856	4,373	8,229	50,851	48,763	99,614
4:00P - 6:20P	24,623	63,270	87,893	1,606	16,034	17,640	23,017	47,236	70,253
6:20P - 8:00P	6,570	12,546	19,116	635	705	1,340	5,935	11,841	17,776
<b>Total</b>	<b>156,048</b>	<b>155,408</b>	<b>311,456</b>	<b>24,333</b>	<b>23,339</b>	<b>47,672</b>	<b>131,715</b>	<b>132,069</b>	<b>263,784</b>

Peak Hour

7:00A - 8:00A	33,264			9,544			23,720		
4:40A - 5:40A		33,389			12,765			20,624	

Peak 20 Minute Period

7:20A	11,620			3,350			8,270		
4:20P		10,415			2,743			7,672	

Plng. Dept.  
11/11/77  
DGM/dmg

LA CBD BUS CORDON COUNT

1976 BUS PERSON TRIPS

Peak Period (Prevailing Dir. Only)		<u>Local</u>	<u>Express</u> ( <u>Surface &amp; Fwy.</u> )	<u>Total</u>
		(1) AM Inbound	51,912	18,236
(2) PM Outbound	47,236	16,034	63,270	
(3) Subtotal	99,148	34,270	133,418	
(4) Balance of 16-hr. Period	164,636	13,402	178,038	
(5) Total	263,784	47,672	311,456	

PERCENTAGES\*

(1)	16.7	5.9	22.5
(2)	15.2	5.1	20.3
(3)	31.8	11.0	42.8
(4)	52.9	4.3	57.2
(5)	84.7	15.3	100.0

(\* ) Of all CBD bus cordon trips = 311,456

Planning Department - 11/11/77  
DM:mez



DPM DISTRIBUTION TRIPS (50,000)  
HYPOTHETICAL ALLOCATION OF DPM BUS DIVERSION  
EXPRESS/LOCAL SPLIT

Independent Variables:

Total Diversion to DPM =  
 Approx. 50,000

Local Peak Period Diversion  
 Rates

= .20 for prevailing dir.  
 = .20 for reverse dir.

1976 CBD Employment Population

Peak Period

	<u>LOCAL</u>			<u>EXPRESS</u>			<u>TOTAL</u>		
	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>
<u>Prevailing Dir.</u>									
Inbound AM	55,559	.20	11,112	14,589	.513	7,484	70,148	.26	18,596
Outbound PM	50,443	.20	10,089	12,827	.513	6,580	63,270	.26	16,669
SUB-TOTAL	106,002	.20	21,201	27,416	.513	14,064	133,418	.26	35,265
<u>Reverse Direction</u>									
Outbound AM	24,674	.20	4,935	1,782	.312	556	26,456	.21	5,491
Inbound PM	23,339	.20	4,668	1,284	.312	401	24,623	.21	5,069
SUB-TOTAL	48,013	.20	9,603	3,066	.312	957	51,079	.21	10,560
Balance of 16-Hour Period	119,304	.02	2,386	7,655	.312	2,388	126,959	.04	4,774
<u>TOTAL</u>	273,319	.12	33,190	38,137	.456	17,409	311,456	.16	50,599

Planning Department - 11/77  
 DM/mez  
 Revised 3/81  
 MJB/ydh

DPM DISTRIBUTION TRIPS : (50,000)  
HYPOTHETICAL ALLOCATION OF DPM BUS DIVERSION  
EXPRESS/LOCAL SPLIT

Independent Variables:

Total Diversion to DPM =  
 Approx. 50,000

Local Peak Period Diversion  
 Rates

- = .20 for prevailing dir.
- = .20 for reverse dir.

1976 CBD Employment Population

Peak Period

Prevailing Direction

	<u>LOCAL</u>			<u>EXPRESS</u>			<u>TOTAL</u>		
	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>
Inbound AM	55,559	.20	11,112	14,589	.631	9,219	70,148	.29	20,331
Outbound PM	50,443	.20	10,089	12,827	.613	7,864	63,270	.28	17,953
SUB-TOTAL	106,002	.20	21,201	27,416	.623	17,083	133,418	.29	38,284

Reverse Direction

Outbound AM	24,674	.20	4,935	1,782	.312	556	26,456	.21	5,491
Inbound PM	23,339	.20	4,668	1,284	.312	401	24,623	.21	5,069
SUB-TOTAL	48,013	.20	9,603	3,066	.312	957	51,079	.21	10,560

Balance of 16-Hour Period	119,304	.01	1,193	7,655	.010	77	126,959	.01	1,270
<u>TOTAL</u>	273,319	.12	31,997	38,137	.480	18,117	311,456	.16	50,114

Planning Department - 11/77  
 DM/mez  
 Revised 3/81  
 MJB/ydh

DPM DISTRIBUTION RIPS : (50,000)  
HYPOTHETICAL ALLOCATION OF DPM BUS DIVERSION  
EXPRESS/LOCAL SPLIT

Independent Variables:  
 Total Diversion to DPM =  
 Approx. 50,000  
 Local Peak Period Diversion  
 Rates  
 = .20 for prevailing dir.  
 = .20 for reverse dir.

1976 CBD Employment Population

Peak Period

Prevailing Direction

	<u>L O C A L</u>			<u>E X P R E S S</u>			<u>T O T A L</u>		
	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>
Inbound AM	55,559	.20	11,112	14,589	.648	9,466	70,148	.29	20,578
Outbound PM	50,443	.20	10,089	12,827	.611	7,839	63,270	.28	17,928
<u>SUB-TOTAL</u>	106,002	.20	21,201	27,416	.631	17,305	133,418	.29	38,506

Reverse Direction

Outbound AM	24,674	.20	4,935	1,782	.312	556	26,456	.21	5,491
Inbound PM	23,339	.20	4,668	1,284	.312	401	24,623	.21	5,069
<u>SUB-TOTAL</u>	48,013	.20	9,603	3,066	.312	957	51,079	.21	10,560

Balance of 16-Hour Period	119,304	.01	1,193	7,655	.010	77	126,959	.01	1,270
<u>TOTAL</u>	273,319	.12	31,997	38,137	.481	18,339	311,456	.16	50,336

Planning Department - 11/77  
 DM/mez  
 Revised 3/81  
 MJB/ydh

V-35

DPM DISTRIBUTION RIPS : (50,000)

HYPOTHETICAL ALLOCATION OF DPM BUS DIVERSION

EXPRESS/LOCAL SPLIT

Independent Variables:

Total Diversion to DPM =  
Approx. 50,000

Local Peak Period Diversion  
Rates

= .20 for prevailing dir.  
= .13 for reverse dir.

With 15% Patronage Growth (=230K Employment Population)

	<u>L O C A L</u>			<u>E X P R E S S</u>			<u>T O T A L</u>		
	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>
<u>Peak Period</u>									
<u>Prevailing Direction</u>									
Inbound AM	63,893	.20	12,779	16,777	.452	7,599	80,670	.25	20,378
Outbound PM	58,009	.20	11,602	14,752	.444	6,560	72,761	.25	18,162
SUB-TOTAL	121,902	.20	24,381	31,529	.449	14,159	153,431	.25	38,540
<u>Reverse Direction</u>									
Outbound AM	28,374	.13	3,689	2,050	.312	640	30,424	.14	4,329
Inbound PM	26,838	.13	3,489	1,478	.312	460	28,316	.14	3,949
SUB-TOTAL	55,213	.13	7,178	3,528	.312	1,100	58,741	.14	8,278
Balance of 16-Hour Period	137,200	.01	1,372	8,803	.312	2,740	146,003	.03	4,112
<u>TOTAL</u>	314,315	.10	32,931	43,858	.410	17,990	358,174	.14	50,930

Planning Department- 11/77  
DM/mez  
Revised 3/81  
MJB/ydh

DPM DISTRIBUTIVE RIPS : (50,000)  
HYPOTHETICAL ALLOCATION OF DPM BUS DIVERSION  
EXPRESS/LOCAL SPLIT

Independent Variables:

Total Diversion to DPM =  
 Approx. 50,000

Local Peak Period Diversion  
 Rates

= .20 for prevailing dir.  
 = .13 for reverse dir.

With 15% Patronage Growth (=230K Employment Population)

Peak Period

Prevailing Direction

	<u>L O C A L</u>			<u>E X P R E S S</u>			<u>T O T A L</u>		
	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>
Inbound AM	63,893	.20	12,779	16,777	.530	8,899	80,670	.27	21,678
Outbound PM	58,009	.20	11,602	14,752	.497	7,340	72,761	.26	18,942
SUB-TOTAL	121,902	.20	24,381	31,529	.515	16,239	153,431	.26	40,620

Reverse Direction

Outbound AM	38,377	.13	3,689	2,047	.312	639	30,424	.14	4,328
Inbound PM	26,845	.13	3,490	1,471	.312	459	28,316	.14	3,949
SUB-TOTAL	55,213	.13	7,179	3,528	.310	1,098	58,741	.14	8,277

Balance of 16-Hour Period	137,200	.01	1,372	8,803	.010	88	146,003	.01	1,460
<u>TOTAL</u>	314,315	.10	32,932	43,858	.397	17,425	358,174	.14	50,357

Planning Department - 11/77  
 DM/mez  
 Revised 3/81  
 MJB/ydh

DPM DISTRIBUTION TRIPS : (50,000)  
HYPOTHETICAL ALLOCATION OF DPM BUS DIVERSION  
EXPRESS/LOCAL SPLIT

Independent Variables:

Total Diversion to DIM =  
 Approx. 50,000

Local Peak Period Diversion  
 Rates

= .20 for prevailing dir.  
 = .13 for reverse dir.

With 15% Patronage Growth (=230K Employment Population)

Peak Period

Prevailing Direction

	<u>LOCAL</u>			<u>EXPRESS</u>			<u>TOTAL</u>		
	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>	<u>Psgr.</u>	<u>Div. Factor</u>	<u>Psgr. to DPM</u>
Inbound AM	63,893	.20	12,779	16,777	.505	8,483	80,670	.26	21,262
Outbound PM	58,009	.20	11,602	14,752	.515	7,611	72,761	.26	19,213
SUB-TOTAL	121,902	.20	24,381	31,529	.510	16,094	153,431	.26	40,475

Reverse Direction

Outbound AM	28,377	.13	3,689	2,047	.312	639	30,424	.14	4,328
Inbound PM	26,845	.13	3,490	1,471	.312	459	28,316	.14	3,949
SUB-TOTAL	55,213	.13	7,179	3,528	.311	1,098	58,741	.14	8,277

Balance of 16-Hour Period	137,200	.01	1,372	8,803	.010	88	146,003	.01	1,460
<u>TOTAL</u>	314,315	.11	32,932	43,858	.393	17,280	358,174	.14	50,212

Planning Department - 11/77  
 DM/mez  
 Revised 3/81  
 MJB/ydh

DEPARTMENTAL

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**

425 SOUTH MAIN STREET  
LOS ANGELES

DO NOT INCLUDE MORE THAN ONE  
SUBJECT IN THIS COMMUNICATION

DATE: March 17, 1978

TO: Paul Taylor  
FROM: Dan Miller *DM*  
SUBJECT: Bus-to-DPM Passenger Projections

As a part of the bus-DPM support plan we are doing for CRA, estimates of DPM patronage from RTD passengers for 1990 are needed. It is desired that these figures be as realistic as possible. In an effort to obtain these estimates, a number of possibilities have been hypothesized and the figures for each have been projected for 1990.

Several assumptions were made for use in the determinations:

1. As agreed upon by the local planning bodies under SCAG aegis, the downtown employment population will expand by fifteen percent by 1990. The proportion of that expansion using public transportation is assumed to remain constant under the low CBD transit usage forecast, and, therefore, represents a fifteen percent expansion from our present CBD patronage.
2. Eighty percent of the passengers on local service buses entering the CBD terminate their trips there and all of the passengers on express service buses do so. (The basis for this assumption comes in part from 1976 work by CRA consultants, who, in turn, used WSA data developed for RTD in 1975. For the general CBD plan work, further investigation is warranted, but, for now, the assumption appears intuitively reasonable for the more general projections being employed in DPM bus support plans).
3. The express service patronage diversion would be maintained at twenty percent for all except prevailing-direction, peak-hour trips.

4. The total diversion from local service patronage would be assumed to be ten percent, with the resulting passenger figures divided among the periods (prevailing peak, reverse peak, and balance) on the same percentages as express passengers. (It is questionable how much local bus service diversion we should show. Perhaps five percent would be a more realistic estimate at this point).

Four total diversion figures were chosen: 36,000; 30,000; 20,000; and 15,000. Thirty-six thousand is the latest CRA figure (from the blue book, Moving People in Los Angeles, June 1977). The 30,000 figure has been used by RTD in formal statements on the subject -- as appearing reasonable, since it represented ten percent of the present total CBD bus passenger cordon volumes. The 20,000 and 15,000 figures were arbitrarily chosen as two levels which were under the other figures. Note: Only express passenger volumes were used to yield these bus transfer estimates. Where local diversion is shown, it is in excess of this base figure.

The projected fifteen percent increase in CBD patronage was prorated in two ways. One situation was postulated with an equal split of this expanded ridership between express and local service; a second situation was postulated with thirty percent of this increase going to the express line ridership and the remainder to the local line ridership.

The figures shown on the attached sheets (as noted above) are based on an increase in transit riding in proportion to the projected fifteen percent increase in the CBD employment population. RTD will cite for CRA low, medium and high range figures for bus passenger transfer volumes, with the medium and high figures based on shifts in the mode split in favor of public transportation.

These figures are presented for your comments and those of other members of the Planning Department staff.

Attachment

cc: Group Managers

DGM/MJC/dmg



SITUATION ONE\*\*

PERCENTAGE DIVERSIONS NECESSARY

TO PRODUCE BUS TRANSFERS OF 15, 000; 20,000; 30,000; and 36,000 TO DPM FROM EXPRESS LINES

	EXPRESS			LOCAL			TOTAL	EXPRESS ONLY			LOCAL & EXPRESS	
	Passengers	Div Factor	Psgrs. to DPM	Passenger	Div Factor	Psgrs. to DPM	Passengers	Div Factor	Psgrs. to DPM	Div Factor	Psgrs to DPM	
Total CBD 1976 Cordon Count	47,672			263,784			311,456					
Less Through Passengers***	0			52,757			52,757					
Revised Total	47,672			211,027			258,699					
Plus Projected CBD Trip Growth	7,152			31,654			38,805					
Revised Total	54,823			242,631			297,504					
<b>15,000 Projections</b>												
Prevailing Peak	39,418	.302	11,904	87,913	.198	17,446	127,331	.093	11,904	.231	29,350	
Reverse Peak	4,386	.20	877	44,405	.044	1,951	48,791	.018	877	.058	2,828	
Balance	11,019	.20	2,204	110,363	.044	4,871	121,382	.018	2,204	.058	7,075	
Total	54,825		14,985	242,631		24,268	297,504		14,985		39,253	
<b>20,000 Projections</b>												
Prevailing Peak		.429	16,909		.198	17,446		.133	16,909	.27	34,355	
Reverse Peak		.20	877		.044	1,951		.018	877	.058	2,828	
Balance		.20	2,204		.044	4,871		.018	2,204	.058	7,075	
Total			19,990			24,268			19,990		44,258	
<b>30,000 Projections</b>												
Prevailing Peak		.68	26,803		.198	17,446		.211	26,803	.348	44,249	
Reverse Peak		.20	877		.044	1,951		.018	877	.058	2,828	
Balance		.20	2,204		.044	4,871		.018	2,204	.058	7,075	
Total			29,884			24,268			29,884		54,152	
<b>36,000 Projections</b>												
Prevailing Peak		.835	32,913		.198	17,446		.258	32,913	.396	50,359	
Reverse Peak		.20	877		.044	1,951		.018	877	.058	2,828	
Balance		.20	2,204		.044	4,871		.018	2,204	.058	7,075	
Total			35,994			24,268			35,994		60,262	

\*With possible 10% diversion from local service shown.

\*\*With a 15% local/15% Express split of the projected 15% CBD employment growth.

\*\*\*0% Express/20% Local passengers presumed through trips.

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SITUATION TWO\*\*

PERCENTAGE DIVERSIONS NECESSARY

TO PRODUCE BUS TRANSFERS OF 15, 000; 20,000; 30,000; and 36,000 TO DPM FROM EXPRESS LINES

	EXPRESS			LOCAL			TOTAL	EXPRESS ONLY			LOCAL & EXPRESS	
	Passengers	Div Factor	Psgrs. to DPM	Passenger	Div Factor	Psgrs. to DPM		Passengers	Div Factor	Psgrs. to DPM	Div Factor	Psgrs to DPM
Total CBD 1976 Cordon Count	47,672			263,784			311,456					
Less Through Passengers***	0			52,757			52,757					
Revised Total	47,672			211,027			258,699					
Plus Projected CBD Trip Growth	14,302			24,503			38,805					
Revised Total	61,974			235,530			297,504					
<b>15,000 Projection</b>												
Prevailing Peak	45,559	.258	11,496	82,773	.205	16,931	127,331	.09	11,496	.231	28,427	
Reverse Peak	4,958	.20	992	43,833	.043	1,894	48,791	.02	992	.059	2,886	
Balance	12,457	.20	2,491	108,924	.043	4,728	121,382	.02	2,491	.059	7,219	
Total	61,974		14,979	235,530		23,553	297,504		14,979		38,532	
<b>20,000 Projection</b>												
Prevailing Peak		.37	16,489		.205	16,931		.129	16,489	.262	33,420	
Reverse Peak		.20	992		.043	1,894		.020	992	.059	2,886	
Balance		.20	2,491		.043	4,728		.020	2,491	.059	7,219	
Total			19,972			23,553			19,972		43,525	
<b>30,000 Projection</b>												
Prevailing Peak		.595	26,513		.205	16,931		.208	26,513	.341	43,444	
Reverse Peak		.20	992		.043	1,894		.020	992	.059	2,886	
Balance		.20	2,491		.043	4,728		.020	2,491	.059	7,219	
Total			29,996						29,996		53,549	
<b>36,000 Projection</b>												
Prevailing Peak		.73	32,528		.205	16,931		.255	32,528	.388	49,459	
Reverse Peak		.20	992		.043	1,894		.020	992	.059	2,886	
Balance		.20	2,491		.043	4,728		.020	2,491	.059	7,219	
Total			36,011						36,011		59,564	

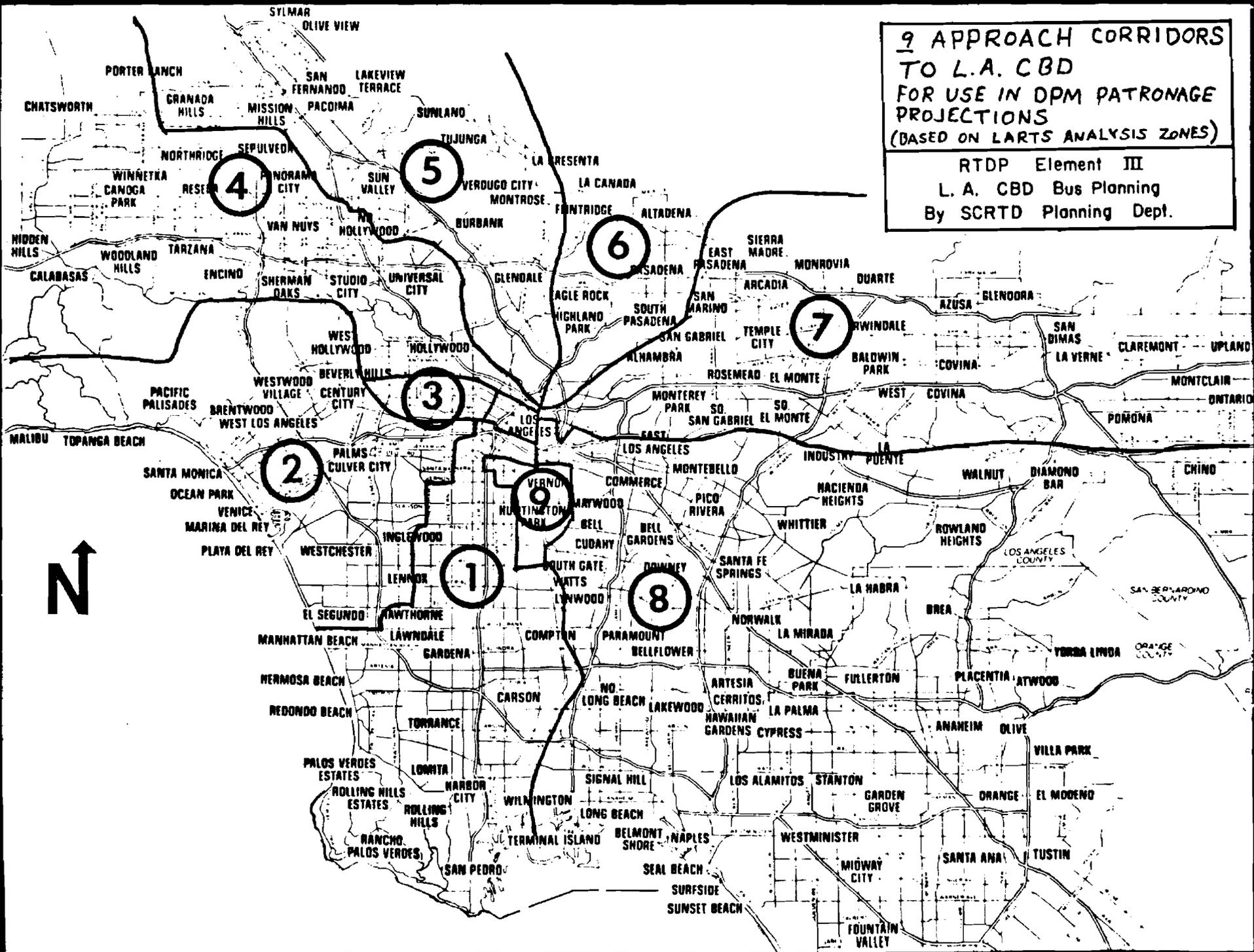
\*With possible 10% diversion from local service shown.

\*\*With an 11.6% local/30% Express split of the projected 15% CBD employment growth.

\*\*\*0% Express/20% Local passengers presumed through trips.

**9 APPROACH CORRIDORS  
TO L.A. CBD  
FOR USE IN DPM PATRONAGE  
PROJECTIONS  
(BASED ON LARTS ANALYSIS ZONES)**

RTDP Element III  
L.A. CBD Bus Planning  
By SCRTD Planning Dept.



378  
**CBD BUS SERVICE - BY CORRIDOR**  
**TRIPS AND PASSENGERS**  
**ALL DAY AND P.M. PEAK HOUR**

CORRIDORS	TRIPS						PASSENGERS					
	ALL DAY			P.M. PEAK HOUR			ALL DAY			P.M. PEAK HOUR		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
<b>NO. 1</b>												
<u>Lines</u>												
5	102	92	194		10		3,922	4,270	8,192			658
6s	86	85	171		8		3,428	3,173	6,601			463
7s	76	74	150		7		2,611	2,309	4,920			335
8s	47	44	91		4		1,425	1,075	2,500			201
33	40	38	78		4		497	464	961			81
49W	51	50	101		5		1,778	1,789	3,567			53
5X*	11	10	21		7		465	441	906			77
7X*	11	6	17		4		281	106	387			54
509(1)*	1	1	2		1		46	46	92			46
509(3)*	1	1	2		1		41	41	82			41
737*	3	3	6		2		66	88	154			54
810*	37	32	69		5		721	700	1,421			138
813*	28	27	55		3		307	367	674			111
814*	10	11	21		4		227	248	475			111
Express*	102	91	193		27		2,154	2,037	4,191			632
Local	402	383	785		38		13,661	13,080	26,741			1,791
<b>TOTAL</b>	<b>504</b>	<b>474</b>	<b>978</b>		<b>65</b>		<b>15,815</b>	<b>15,117</b>	<b>30,932</b>			<b>2,423</b>
<b>NO. 2</b>												
<u>Lines</u>												
9W	87	84	171		7		2,771	2,793	5,564			339
12s	59	59	118		7		2,473	2,431	4,904			389
44s	96	96	192		10		3,011	2,985	5,996			606
75s	73	74	147		7		2,599	2,436	5,035			487
601*	4	4	8		1		56	40	96			17
602*	8	8	16		2		138	111	249			58
604*	9	8	17		6		329	263	592			171
605*	8	7	15		2		129	103	232			35
606*	5	4	9		3		138	78	216			39
607*	28	28	56		3		235	203	438			60
608*	3	3	6		2		46	41	87			12
776*	52	53	105		4		673	500	1,173			38
871	30	31	61		4		478	457	935			140
Express*	117	115	232		23		1,744	1,339	3,083			430
Local	345	344	689		35		11,332	11,102	22,434			1,961
<b>TOTAL</b>	<b>462</b>	<b>459</b>	<b>921</b>		<b>58</b>		<b>13,076</b>	<b>12,441</b>	<b>25,517</b>			<b>2,391</b>

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SIDERS	ALL DAY		P.M. PEAK		TOTAL		ALL DAY		P.M. PEAK		TOTAL		T
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	
<b>NO. 3</b>													
Lines													
3W	106	111	217	12	12	12	5	199	120	319	50		732
4S	129	115	244	14	115	2299	5	1877	39,530	81,507	7396		727
4N	125	122	247	13	117	2311	117	42,076	39,750	81,826	7,446		727
4L	122	133	255	23									80
5S	41	142	83	18									180
26S	188	178	366	18									1,366
28W	110	109	219	11									1,642
29W	88	94	182	11									718
44N*	106	98	204	10									678
44X*		5	12	2									50
83	213	206	419	12									760
83L	42	51	93	19									515
Express*	7	5	12	2									50
Local	1160	1,139	2,299	115									7396
TOTAL	1,167	1,144	2,311	117				42,076	39,750	81,826	7,446		7,446
<b>NO. 4</b>													
Lines													
35*	67	70	137	9									355
42*	124	118	242	14									768
42X*	5	6	11	3									228
75N	68	62	130	6									285
91X*	109	115	224	16									205
93X*	10	8	18	6									454
93XU*	63	65	128	3									42
93X0	9	5	16	3									436
94	50	5	110	7									61
123*	80	81	161	7									40
144*	11	11	22	5									35
505(1)*	11	11	22	1									35
505(2)*	11	11	22	1									35
505(3)*	11	11	22	1									35
716*	15	15	10	2									72
Express*	180	184	364	42									1,512
Local	381	376	757	41									2,266
TOTAL	561	560	1,121	83				17,522	17,546	35,067	3,778		3,778

C. IDORS	TRIPS						PASSENGERS							
	ALL DAY			P.M. PEAK			OUR	ALL DAY			P.M. PEAK			
	IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL	
<b>NO. 5</b>														
<u>Lines</u>														
7N	74	72	146			7	2,433	2,006	4,439				322	
24	46	45	91			4	1,322	1,486	2,808				157	
39	73	68	141			6	1,854	1,721	3,575				357	
39X*	2	2	4			2	53	56	109				56	
56	27	33	60			6	952	1,062	2,014				272	
56X*	4	3	7			3	99	66	165				66	
86	43	43	86			7	1,530	1,350	2,880				356	
86X*	3	3	6			2	85	72	157				48	
121*	4	5	9			3	110	92	202				59	
122*	6	5	11			2	111	130	241				73	
511*	1	1	2			1	36	36	72				36	
721*	7	7	14			4	239	236	475				102	
790*	16	13	29			1	4	14	18				1	
Express*	43	39	82			18	737	702	1,439				447	
Local	263	261	524			30	8,091	7,625	15,716				1,464	
<b>TOTAL</b>	<b>306</b>	<b>300</b>	<b>606</b>			<b>48</b>	<b>8,828</b>	<b>8,327</b>	<b>17,155</b>				<b>1,911</b>	
<b>NO. 6</b>														
<u>Lines</u>														
6N	84	80	164			8	3,222	3,015	6,237				404	
8N	44	47	91			4	932	1,011	1,943				173	
12N	57	59	116			6	2,148	2,223	4,371				297	
25N	62	65	127			9	2,226	2,092	4,318				519	
92N	80	77	157			6	2,559	2,825	5,384				332	
483*	46	41	87			5	953	928	1,881				176	
485*	39	42	81			4	588	717	1,305				112	
770*	35	35	70			6	1,002	975	1,977				256	
Express*	120	118	238			15	2,543	2,620	5,163				544	
Local	327	328	655			33	11,087	11,166	22,253				1,725	
<b>TOTAL</b>	<b>447</b>	<b>446</b>	<b>893</b>			<b>48</b>	<b>13,630</b>	<b>13,786</b>	<b>27,416</b>				<b>2,269</b>	



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RIDORS	ALL DAY			P.M.		HOOR TOTAL	ALL DAY			P.M.		HOOR TOTAL
	IN	OUT	TOTAL	IN	OUT		IN	OUT	TOTAL	IN	OUT	
<b>NO. 8</b>												
<u>Lines</u>												
2A E	111	111	222			13		4,523	4,422	8,945		820
34X*	1	1	2			1		67	43	110		0
36*	37	38	75			2		1,312	1,161	2,473		166
47s	70	65	135			7		2,305	2,157	4,462		371
501*	1	1	2			1		43	43	86		43
503*	1	1	2			1		35	35	70		35
508*	1	1	2			1		44	44	88		44
755*	9	8	17			6		310	321	631		156
757*	18	17	35			7		557	636	1193		314
758*	18	8	18			4		269	238	507		100
800*	18	17	35			2		503	543	1,046		82
801*	26	24	50			4		484	550	1,034		139
802*	17	17	34			2		382	432	814		56
820*	63	68	131			10		1,633	1,570	3,203		427
Express*	202	201	403			41		5,639	5,616	11,255		1,562
Local	181	176	357			20		6,828	6,579	13,407		1,191
<b>TOTAL</b>	<b>383</b>	<b>377</b>	<b>760</b>			<b>61</b>		<b>12,467</b>	<b>12,195</b>	<b>24,662</b>		<b>2,753</b>
<b>NO. 9</b>												
<u>Lines</u>												
2 E	60	56	116			3		2,317	1,883	4,200		130
3 E	120	114	234			9		3,277	3,353	6,630		345
9 E	87	94	181			13		4,211	4,466	8,677		932
29 E	94	86	180			8		3,057	3,258	6,315		442
34 E	16	16	32			2		299	365	664		71
49 E	51	49	100			5		1,299	1,512	2,811		375
92s	59	57	116			7		1,682	1,886	3,568		401
Express*	0	0	0			0		0	0	0		0
Local	487	472	959			47		16,142	16,723	32,865		2,696
<b>TOTAL</b>	<b>487</b>	<b>472</b>	<b>959</b>			<b>47</b>		<b>16,142</b>	<b>16,723</b>	<b>32,865</b>		<b>2,696</b>

# RECAP. . .ULATION OF 1978 CBD BUS SERVICE - BY CORRIDOR

CORRIDORS	TRIPS						PASSENGERS					
	ALL DAY			P.M. PEAK HOUR			ALL DAY			P.M. PEAK HOUR		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
1	Express	102	91	193		27	2,154	2,037	4,191		632	
	Local	402	383	785		38	13,661	13,080	26,741		1,791	
	TOTAL	504	474	978		65	15,815	15,117	30,932		2,423	
2	Express	117	115	232		23	1,744	1,339	3,083		430	
	Local	345	344	689		35	17,332	16,102	22,434		1,961	
	TOTAL	462	459	921		58	13,076	12,441	25,517		2,391	
3	Express	7	5	12		2	199	120	319		50	
	Local	1,160	1,139	2,299		115	41,877	39,630	81,507		7,396	
	TOTAL	1,167	1,144	2,311		117	42,076	39,750	81,826		7,446	
4	Express	180	184	364		42	5,338	5,292	10,630		1,512	
	Local	381	376	757		41	12,184	12,253	24,437		2,266	
	TOTAL	561	560	1,121		83	17,522	17,545	35,067		3,778	
5	Express	43	39	82		18	737	702	1,439		447	
	Local	263	261	524		30	8,091	7,625	15,716		1,464	
	TOTAL	306	300	606		48	8,828	8,327	17,155		1,911	
6	Express	120	118	238		15	2,543	2,620	5,163		544	
	Local	327	328	655		33	11,087	11,166	22,253		1,725	
	TOTAL	447	446	893		48	13,630	13,786	27,416		2,269	
7	Express	287	272	559		59	6,559	6,536	13,095		2,354	
	Local	503	509	1,012		56	13,715	14,294	28,009		2,935	
	TOTAL	790	781	1,571		115	20,274	20,830	41,104		5,289	
8	Express	202	201	403		41	5,639	5,616	11,255		1,562	
	Local	181	176	357		20	6,828	6,579	13,407		1,191	
	TOTAL	383	377	760		61	12,467	12,195	24,662		2,753	
9	Express	0	0	0		0	0	0	0		0	
	Local	487	472	959		47	16,142	16,723	32,865		2,696	
	TOTAL	487	472	959		47	16,142	16,723	32,865		2,696	
TOTAL EXPRESS	1,058	1,025	2,083		227	24,913	24,262	49,175		7,531		
TOTAL LOCAL	4,049	3,988	8,037		415	134,917	132,452	267,369		23,425		
GRAND TOTAL	5,107	5,013	10,120		642	159,830	156,714	316,544		30,956		

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# 1990 TSM CBD BUS SERVICE - BY CORRIDOR

## TRIPS AND PASSENGERS ALL DAY AND P.M. PEAK HOUR

CORRIDORS	TRIPS						PASSENGERS					
	ALL DAY			P.M. PEAK HOUR			ALL DAY			P.M. PEAK HOUR		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
<b>NO.1</b>												
<u>Lines</u>												
5	113	102	215				4,353	4,740	9,093			730
6s	96	94	190				3,805	3,522	7,327			514
7s	84	82	166				2,898	2,563	5,461			472
8s	52	49	101				1,582	1,193	2,775			223
33	44	42	86				552	515	1,067			90
49w	57	56	113				1,974	1,986	3,960			59
5x*	14	13	27				605	573	1,178			100
7x*	14	8	22				365	138	503			70
509(a)*	1	1	2				60	60	120			60
509(b)*	1	1	2				53	53	106			53
737*	4	4	8				86	114	200			70
810*	48	42	90				937	910	1,847			179
813*	36	35	71				399	477	876			144
814*	13	14	27				295	322	617			144
Express*	131	118	249				2800	2,647	5,447			820
Local	446	425	871				15,164	14,519	29,683			2,088
<b>TOTAL</b>	<b>577</b>	<b>543</b>	<b>1,120</b>				<b>17,964</b>	<b>17,166</b>	<b>35,130</b>			<b>2,908</b>
<b>NO.2</b>												
<u>Lines</u>												
9w	97	93	190				3,076	3,100	6,176			376
12s	66	66	132				2,745	2,698	5,443			432
44s	107	107	214				3,342	3,313	6,655			673
75s	81	82	163				2,885	2,704	5,589			541
601*	5	5	10				73	52	125			22
602*	10	10	20				179	144	323			75
604*	12	10	22				428	342	770			222
605*	10	9	19				168	134	302			46
606*	7	5	12				179	101	280			51
607*	36	36	72				306	264	570			78
608*	4	4	8				60	53	113			16
776*	68	63	137				875	650	1,525			49
871	33	34	67				531	507	1,038			155
Express*	152	148	300				2,268	1,740	4,008			559
Local	384	382	766				12,579	12,322	24,901			2,177
<b>TOTAL</b>	<b>536</b>	<b>530</b>	<b>1,066</b>				<b>14,847</b>	<b>14,062</b>	<b>28,909</b>			<b>2,736</b>

V-53

RIDERS	ALL DAY			P.M.		Hour	ALL DAY			P.M.		Hour
	IN	OUT	TOTAL	IN	OUT		IN	OUT	TOTAL	IN	OUT	
<b>NO. 3</b>												
Lines												
3W	118	123	241			13			5,805	4,454	10,259	813
4s	143	128	271			16			5,173	4,622	9,795	1,108
4N	139	135	274			14			4,553	4,047	8,600	1,807
4L	13	14	27			2			602	497	1,099	88
25s	46	47	93			3			896	697	1,593	200
26s	209	198	407			20			7,882	7,510	15,392	1,516
28W	122	121	243			12			4,853	4,220	9,073	713
29W	96	104	202			12			4,029	3,752	7,781	797
44N	118	109	227			11			4,833	4,393	9,226	753
44X*	9	7	16			3			259	156	415	65
83	236	229	465			13			6,304	7,364	13,668	844
83L	47	57	104			10			1,554	2,432	3,986	572
Express*	9	7	16			3			259	156	415	65
Local	1,289	1,265	2,554			126			46,484	43,988	90,472	8,211
TOTAL	1,298	1,272	2,570			129			46,743	44,144	90,887	8,276
<b>NO. 4</b>												
Lines												
35*	87	91	178			12			2,496	2,790	5,286	462
42	138	131	269			16			4,441	4,551	8,992	851
42X*	7	8	15			4			191	230	421	114
75N	76	69	145			7			1,715	1,144	2,859	253
91	121	128	249			16			4,415	4,908	9,323	927
91X*	13	10	23			8			510	410	920	267
93X*	82	85	167			8			2,594	2,414	5,008	590
93XU*	12	12	24			4			341	285	626	70
93XO*	7	7	14			4			234	224	458	55
94	89	90	179			8			2,954	2,997	5,951	483
123*	1	1	2			1			39	39	78	39
144*	14	14	28			7			152	122	274	79
504*	1	1	2			1			52	52	104	52
505(1)*	1	1	2			1			46	46	92	46
505(2)*	1	1	2			1			53	53	106	53
506(3)*	1	1	2			1			46	46	92	46
716*	7	7	14			3			187	170	357	94
Express*	234	239	473			55			6,941	6,881	13,822	1,967
Local	424	418	842			47			13,525	13,600	27,125	2,514
TOTAL	658	657	1,315			102			20,466	20,481	40,947	4,481

C RIDORS	TRIPS						PASSENGERS						
	ALL DAY			P.M. PEAK			ALL DAY			P.M.			HOURL
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	
<b>NO.5</b>													
Lines													
7N	82	80	162		8		2,701	2,227	4,928				357
24	51	50	101		4		1,467	1,650	3,117				174
39	81	76	157		7		2,058	1,910	3,968				396
39X*	3	3	6		3		69	73	142				73
56	30	37	67		7		1,057	1,179	2,236				302
56X*	5	4	9		4		129	86	215				73
86	48	48	96		8		1,698	1,499	3,197				395
86X*	4	4	8		3		111	94	205				62
121*	5	7	12		4		143	120	263				77
122*	8	7	15		3		144	169	313				103
511*	1	1	2		1		47	47	94				47
721*	9	9	18		5		311	307	618				133
790	21	17	38		1		5	18	23				1
Express*	56	52	108		24		959	914	1,873				569
Local	292	291	583		34		8,981	8,465	17,446				1,624
TOTAL	448	343	691		58		9,940	9,379	19,319				2,193
<b>NO.6</b>													
Lines													
6N	93	89	182		9		3,576	3,347	6,923				448
8N	49	52	101		4		1,035	1,122	2,157				192
12N	63	66	129		7		2,384	2,468	4,852				330
25N	69	72	141		10		2,471	2,322	4,793				576
92N	89	86	175		7		2,841	3,136	5,977				369
483*	60	53	113		6		1,239	1,206	2,445				229
485*	51	55	106		5		764	932	1,696				146
770*	46	46	92		8		1,303	1,268	2,571				333
Express*	157	154	311		19		3,306	3,406	6,712				708
Local	363	365	728		37		12,307	12,395	24,702				1,915
TOTAL	520	519	1,039		56		15,613	15,801	31,414				2,623

TRIDORS

TOTAL

PASSENGER

RIDERS	ALL DAY			P.M.			P.M.			ALL DAY			P.M.		
	LN	OUT	TOTAL	LN	OUT	TOTAL	LN	OUT	TOTAL	LN	OUT	TOTAL	LN	OUT	TOTAL
NO. 7															
Lines															
2N	63	67	130						1,933	2,348	4,281				517
26N	191	199	390						6,538	6,510	13,048				1,023
47N	71	72	143						1,223	1,061	2,284				283
420	44	44	88						1,122	1,937	2,059				143
422	53	54	107						1,509	1,657	2,161				437
426	50	48	98						1,303	1,426	2,729				350
428	48	46	94						1,896	1,043	2,939				290
432	38	36	74						705	1,834	1,539				214
480*	69	66	135						1,707	2,087	3,794				542
482*	17	18	35						512	477	989				226
482X*	4	4	8						135	100	235				66
484*	56	47	103						1,101	1,092	2,193				261
486*	17	13	30						499	473	972				222
487*	44	42	86						684	620	1,304				159
488*	17	20	37						347	400	747				146
489*	17	14	31						274	320	594				165
490*	42	43	85						841	822	1,663				302
491*	42	39	81						732	781	1,513				231
492*	4	4	8						172	106	278				85
493*	4	4	8						101	121	222				308
494*	4	4	8						113	82	195				75
496*	17	16	33						312	339	651				49
507*	1	1	2						46	46	92				46
760*	13	13	26						421	410	831				282
764	7	7	14						237	222	459				103
Express*	375	355	730						8,234	8,498	16,732				3,268
Local	558	566	1,124						15,224	15,866	31,090				3,257
TOTAL	933	921	1,854						23,458	24,364	47,822				6,525

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CORRIDORS	ALL DAY			P.M.	PE	HOURS	ALL DAY			IN	OUT	TOTAL
	IN	OUT	TOTAL				IN	OUT	TOTAL			
<b>NO. 8</b>												
Lines												
28E	123	123	246			14	5,021	4,008	9,929			310
34X*	1	1	2			1	87	56	143			56
36*	48	43	97			3	1,706	1,509	3,215			216
47s	78	72	150			8	2,559	2,394	4,953			412
501*	1	1	2			1	56	56	112			56
503*	1	1	2			1	46	46	92			46
508*	1	1	2			1	57	57	114			57
755*	12	10	22			8	403	417	820			203
757*	23	22	45			9	724	827	1,551			408
758*	13	10	23			5	350	309	659			130
800*	23	22	45			3	654	706	1,360			107
801*	34	31	65			5	629	715	1,344			181
802*	22	22	44			3	497	562	1,059			73
820*	82	88	170			13	2,123	2,041	4,164			555
Express*	261	258	519			53	7,332	7,301	14,633			2,088
Local	201	195	396			22	7,580	7,302	14,882			1,322
<b>TOTAL</b>	<b>462</b>	<b>453</b>	<b>915</b>			<b>75</b>	<b>14,912</b>	<b>14,603</b>	<b>29,515</b>			<b>3,410</b>
<b>NO. 9</b>												
Lines												
2s	67	62	129			3	2,572	2,090	4,662			144
3c	133	127	260			10	3,638	3,722	7,360			383
9E	97	104	201			14	4,674	4,957	9,631			1,034
29E	104	96	200			9	3,393	3,616	7,009			491
34	18	18	36			2	332	405	737			79
49E	57	54	111			6	1,442	1,678	3,120			416
92s	66	64	130			8	1,867	2,094	3,961			445
Express*	0	0	0			0	0	0	0			0
Local	542	525	1,067			52	17,918	18,562	36,480			2,992
<b>TOTAL</b>	<b>542</b>	<b>525</b>	<b>1,067</b>			<b>52</b>	<b>17,918</b>	<b>18,562</b>	<b>36,480</b>			<b>2,992</b>

# RECAPITULATION

OF

## 1990 TSM CBD BUS SERVICE - BY CORRIDOR

CORRIDORS	TRIPS						PASSENGERS					
	ALL DAY			P.M. PEAK HOUR			ALL DAY			P.M. PEAK HOUR		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
1 Express Local TOTAL	131	118	249			34	2800	2647	5447			820
	446	425	871			42	15,164	14,519	29,683			2,088
	577	543	1,120			76	17,964	17,166	35,130			2,908
2 Express Local TOTAL	152	148	300			31	2268	1,740	4,008			559
	384	382	766			39	12,579	12,322	24,901			2,177
	536	530	1,066			70	14,847	14,062	28,909			2,736
3 Express Local TOTAL	9	7	16			3	259	156	415			65
	1,289	1,265	2,554			126	46,484	43,988	90,472			8,211
	1,298	1,272	2,570			129	46,743	44,144	90,887			8,276
4 Express Local TOTAL	234	239	473			55	6,941	6,881	13,822			1,967
	424	418	842			47	13,525	13,600	27,125			2,514
	658	657	1,315			102	20,466	20,481	40,947			4,481
5 Express Local TOTAL	56	52	108			24	959	914	1,873			569
	292	291	583			34	8,981	8,465	17,446			1,624
	348	343	691			58	9,940	9,379	19,319			2,193
6 Express Local TOTAL	157	154	311			19	3306	3,406	6,712			708
	363	365	728			37	12,307	12,395	24,702			1,915
	520	519	1,039			56	15,613	15,801	31,414			2,623
7 Express Local TOTAL	375	355	730			80	8,234	8,498	16,732			3,268
	558	566	1,124			63	15,229	15,866	31,090			3,257
	933	921	1,854			143	23,458	24,364	47,822			6,525
8 Express Local TOTAL	261	258	519			53	7,332	7,301	14,633			2,088
	201	195	396			22	7,580	7,302	14,882			1,322
	462	453	915			75	14,912	14,603	29,515			3,410
9 Express Local TOTAL	0	0	0			0	0	0	0			0
	542	525	1,067			52	17,918	18,562	36,480			2,992
	542	525	1,067			52	17,918	18,562	36,480			2,992
TOTAL EXPRESS	1,375	1,310	2,685			299	32,099	31,543	63,642			10,044
TOTAL LOCAL	4,499	4,432	8,931			462	149,762	147,019	296,781			26,100
GRAND TOTAL	5,874	5,763	11,637			761	181,861	178,562	360,423			36,144

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1978  
**CBD BUS SERVICE - BY DIRECTION**  
**TRIPS AND PASSENGERS**  
**ALL DAY AND P.M. PEAK HOUR**

DIRECTION	TRIPS						PASSENGERS					
	ALL DAY			P.M. PEAK HOUR			ALL DAY			P.M. PEAK HOUR		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
<b>NORTH</b>												
<b>Express</b>												
<b>Golden State</b>												
39X	2	2	4		2		53	56	109			56
66X	3	3	6		2		85	72	157			48
121	4	5	9		3		110	92	202			59
122	6	5	11		2		111	130	241			79
511	1	1	2		1		36	36	72			36
721	7	7	14		4		239	236	475			102
790	16	13	29		1		4	14	18			1
Subtotal	39	36	75		15		638	636	1,274			381
<b>Glendale</b>												
56X	4	3	7		3		99	66	165			66
Subtotal	4	3	7		3		99	66	165			66
<b>Pasadena</b>												
770	35	35	70		6		1,002	975	1,977			256
Subtotal	35	35	70		6		1,002	975	1,977			256
<b>Local</b>												
6N	84	80	164		8		3,222	3,015	6,237			404
7N	74	72	146		7		2,433	2,006	4,439			322
8N	44	47	91		4		932	1,011	1,943			173
12N	57	59	116		6		2,148	2,223	4,371			297
24	46	45	91		4		1,322	1,486	2,808			157
25N	62	65	127		9		2,226	2,092	4,318			519
39	73	68	141		6		1,854	1,721	3,575			357
56	27	33	60		6		952	1,062	2,014			272
86	43	43	86		7		1,530	1,350	2,880			356
Subtotal	510	512	1,022		57		16,619	15,966	32,585			2,857
<b>NORTH EXP.</b>	78	74	152		24		1,739	1,677	3,416			703
<b>NORTH LOCAL</b>	510	512	1,022		57		16,619	15,966	32,585			2,857
<b>TOTAL FOR NORTH</b>	<b>588</b>	<b>586</b>	<b>1,174</b>		<b>81</b>		<b>18,358</b>	<b>17,643</b>	<b>36,001</b>			<b>3,560</b>

V-58

SECTION	ALL DAY			P. M.		HOURS			ALL DAY			P. M.		A. M.	
	IN	OUT	TOTAL	IN	PE	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	TOTAL
<b>SOUTH</b>															
<b>Express</b>															
<b>Harbor</b>															
5X	11	10	21			7			465	441	906				77
7X	11	6	17			4			281	106	387				54
509 (1)	11	1	2			1			46	46	92				46
509 (5)	11	1	2			1			41	41	82				41
737	3	3	6			2			66	88	154				54
810	37	32	69			5			721	700	1,421				138
813	28	27	55			3			307	367	674				111
814	10	11	21			4			227	248	475				111
<b>Subtotal</b>	<b>102</b>	<b>91</b>	<b>193</b>			<b>27</b>			<b>2,154</b>	<b>2,037</b>	<b>4,191</b>				<b>632</b>
<b>Local</b>															
28	60	56	116			3			2,317	1,883	4,200				130
3E	120	114	234			9			3,277	3,353	6,630				345
5	102	92	194			10			3,922	4,270	8,192				658
6s	86	85	171			8			3,428	3,173	6,601				463
7s	76	74	150			7			2,611	2,309	4,920				335
8s	47	44	91			4			1,425	1,075	2,500				201
9E	87	94	181			13			4,211	4,466	8,677				932
29E	94	86	180			8			3,057	3,258	6,315				442
33	40	38	78			4			497	464	961				81
34	16	16	32			2			299	365	664				71
49E	51	49	100			5			1,299	1,512	2,811				375
49W	51	50	101			5			1,778	1,789	3,567				53
92s	59	57	116			7			1,682	1,886	3,568				401
871	30	31	61			4			478	457	935				140
<b>Subtotal</b>	<b>919</b>	<b>886</b>	<b>1,805</b>			<b>89</b>			<b>30,281</b>	<b>30,260</b>	<b>60,541</b>				<b>4,627</b>
<b>SOUTH EXPRESS</b>	<b>102</b>	<b>91</b>	<b>193</b>			<b>27</b>			<b>2,154</b>	<b>2,037</b>	<b>4,191</b>				<b>632</b>
<b>SOUTH LOCAL</b>	<b>919</b>	<b>886</b>	<b>1,805</b>			<b>89</b>			<b>30,281</b>	<b>30,260</b>	<b>60,541</b>				<b>4,627</b>
<b>TOTAL FOR SOUTH</b>	<b>1,021</b>	<b>977</b>	<b>1,998</b>			<b>116</b>			<b>32,435</b>	<b>32,297</b>	<b>64,732</b>				<b>5,259</b>
<b>EAST</b>															
<b>Express</b>															
<b>Santa Ana</b>															
501	1	1	2			1			43	43	86				43
503	1	1	2			1			35	35	70				35
508	1	1	2			1			44	44	88				44
757	18	17	35			7			557	636	1,193				314
758	10	8	18			4			269	238	507				100
800	18	17	35			2			503	543	1,046				82
801	26	24	50			4			484	550	1,034				139
802	17	17	34			2			382	432	814				56
<b>Subtotal</b>	<b>92</b>	<b>86</b>	<b>178</b>			<b>22</b>			<b>2,317</b>	<b>2,521</b>	<b>4,838</b>				<b>813</b>

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SECTION	ALL DAY			P.M.	P.E.	HOUR			ALL DAY			P.M.	P.E.	HOUR		
	IN	OUT	TOTAL			IN	OUT	TOTAL	IN	OUT	TOTAL			IN	OUT	TOTAL
<b>EAST (CONT)</b>																
<i>Buc way</i>																
480	53	51	104			8			1,538	1,605	3,143				417	
482	13	14	27			5			394	367	761				174	
482X	3	3	6			2			104	77	181				51	
483	46	41	87			5			953	928	1,881				176	
484	43	36	79			5			847	840	1,687				201	
485	39	42	81			4			588	717	1,305				112	
486	13	10	23			5			384	364	748				171	
487	34	32	66			3			526	477	1,003				122	
488	13	15	28			4			267	308	575				112	
489	13	11	24			3			211	246	457				127	
490	32	33	65			5			647	632	1,279				232	
491	32	30	62			4			563	601	1,164				178	
492	3	3	6			2			132	81	213				65	
493	3	3	6			2			78	93	171				77	
494	3	3	6			2			87	63	150				58	
496	13	12	25			1			240	261	501				38	
507	1	1	2			1			35	35	70				35	
760	10	10	20			5			324	315	639				217	
764	5	5	10			2			182	171	353				79	
Subtotal	372	355	727			68			8,100	8,181	16,281				2,642	
<i>Pomona</i>																
820	63	68	131			10			1,633	1,570	3,203				427	
Subtotal	63	68	131			10			1,633	1,570	3,203				427	
<i>Long Beach</i>																
34X	1	1	2			1			67	43	110				0	
36	37	38	75			2			1,312	1,161	2,473				166	
755	9	8	17			6			310	321	631				156	
Subtotal	47	47	94			9			1,689	1,525	3,214				322	
<i>Local</i>																
26N	57	60	117			9			1,741	2,115	3,856				466	
27N	172	179	351			18			5,890	5,865	11,755				922	
28E	111	111	222			13			4,523	4,422	8,945				820	
47N	64	65	129			6			1,102	956	2,058				255	
47S	70	65	135			7			2,305	2,157	4,462				371	
92N	80	77	157			6			2,559	2,825	5,384				332	
420	40	40	80			3			1,011	844	1,855				129	
422	48	49	97			6			1,355	1,493	2,848				394	
426	45	43	88			5			1,174	1,285	2,459				315	
428	43	41	84			6			807	985	1,792				261	
432	34	32	66			3			635	751	1,386				193	
Subtotal	764	762	1,526			82			23,102	23,698	46,800				4,458	
EAST EXP.	574	556	1,130			109			13,739	13,797	27,536				4,204	
EAST LOCAL	764	762	1,526			82			23,102	23,698	46,800				4,458	
TOTAL FOR EAST	1,338	1,318	2,656			191			36,841	37,495	74,336				8,662	

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REGION	ALL PAY		P.M. P.B.A.		P.M. P.M.		P.M. P.M.		Hour TOTAL
	IN	OUT	IN	OV.	IN	OV.	IN	OV.	
WEST	67	70	137		9		2,146	4,066	355
Express	57	65	112		3		1,777	3,224	88
High Speed	10	5	128		6		1,200	3,190	50
42X	3	8	18		6		3,157	7,052	205
44X	3	5	18		3		1,857	3,852	54
91X	3	5	10		3		1,722	3,552	42
93XU	1	1	22		15		30	211	30
93XO	1	1	22		1		94	280	61
123	1	1	22		1		40	70	40
144	1	1	22		1		35	82	35
504	1	1	22		1		41	70	41
505(1)	1	1	22		1		35	82	35
505(2)	1	1	22		1		35	70	35
505(3)	1	1	22		1		35	70	35
716	1	1	10		2		131	275	72
Subtotal	187	189	376		44		5,412	10,949	1,562
Santa Monica	4	4	8		1		40	96	17
601	8	8	17		2		111	249	58
602	8	7	15		2		63	592	171
605	8	4	15		3		203	232	35
606	8	5	9		3		78	216	39
607	2	2	5		2		203	438	60
608	3	3	6		2		41	87	22
776	5	5	10		4		500	1,173	138
Subtotal	117	115	232		23		1,339	3,083	430
Local	10	11	21		12		40	96	32
3W	2	2	4		1		164	224	99
4W	2	2	4		3		646	748	27
4S	1	1	2		2		448	990	80
4L	1	1	2		7		793	564	39
9W	8	8	17		7		2,431	4,904	99
12S	5	5	10		3		628	1,435	80
25S	4	4	8		1		766	1,867	66
26S	1	1	2		8		3,580	8,174	42
28W	1	1	2		7		1,010	2,101	71
29W	1	1	2		1		312	674	87
42	1	1	2		0		312	674	87
44W	1	1	2		10		558	1,226	60
44S	1	1	2		6		985	2,196	60
75W	6	6	13		7		2,985	5,996	87
75S	7	7	14		1		436	935	28
83L	2	2	4		2		634	1,313	60
81	4	4	8		1		191	391	7
94	1	1	2		1		422	859	15
Subtotal	187	182	368		187		6,252	12,744	1,483
WEST EXP	3	3	6		6		751	1,492	11
WEST LOCAL	1	1	2		1		528	1,143	11
TOTAL FOR WEST	2160	2132	4292		254		69,279	141,475	13,475

# RECAPITULATION OF 1978 CBD BUS SERVICE - BY DIRECTION

DIRECTION	T R I P S						P A S S E N G E R S					
	ALL DAY			P.M.	PEAK	HOUR	ALL DAY			P.M.	PEAK	HOUR
	IN	OUT	TOTAL									
<b>NORTH</b>												
Express	78	74	152		24		1,739	1,677	3,416		703	
Local	510	512	1,022		57		16,619	15,966	32,585		2,857	
<b>TOTAL</b>	<b>588</b>	<b>586</b>	<b>1,174</b>		<b>81</b>		<b>18,358</b>	<b>17,643</b>	<b>36,001</b>		<b>3,560</b>	
<b>SOUTH</b>												
Express	102	91	193		27		2,154	2,037	4,191		632	
Local	919	886	1,805		89		30,281	30,260	60,541		4,627	
<b>TOTAL</b>	<b>1,021</b>	<b>977</b>	<b>1,998</b>		<b>116</b>		<b>32,435</b>	<b>32,297</b>	<b>64,732</b>		<b>5,259</b>	
<b>EAST</b>												
Express	574	556	1,130		109		13,739	13,797	27,536		4,204	
Local	764	762	1,526		82		23,102	23,698	46,800		4,458	
<b>TOTAL</b>	<b>1,338</b>	<b>1,318</b>	<b>2,656</b>		<b>191</b>		<b>36,841</b>	<b>37,495</b>	<b>74,336</b>		<b>8,662</b>	
<b>WEST</b>												
Express	304	304	608		67		7,281	6,751	14,032		1,992	
Local	1,856	1,828	3,684		187		64,915	62,528	127,443		11,483	
<b>TOTAL</b>	<b>2,160</b>	<b>2,132</b>	<b>4,292</b>		<b>254</b>		<b>72,196</b>	<b>69,279</b>	<b>141,475</b>		<b>13,475</b>	
Total Express	1,058	1,025	2,083		227		24,913	24,262	49,175		7,531	
Total Local	4,049	3,988	8,037		415		34,917	32,952	67,363		23,425	
<b>GRAND TOTAL</b>	<b>5,107</b>	<b>5,013</b>	<b>10,120</b>		<b>642</b>		<b>159,830</b>	<b>156,714</b>	<b>316,544</b>		<b>30,956</b>	

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# CBD BUS SERVICE - BY DIRECTION

## TRIPS AND PASSENGERS ALL DAY AND P.M. PEAK HOUR

DIRECTION	T R I P S						P A S S E N G E R S					
	ALL DAY			P.M. PEAK HOUR			ALL DAY			P.M. PEAK HOUR		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
<b>NORTH</b>												
<b>Express</b>												
Golden State												
39X	3	3	6		3		69	73	142			73
86X	4		8		3		111	94	205			62
121	5	7	12		4		143	120	263			77
122	8	7	15		3		144	169	313			103
511	1	1	2		1		47	47	94			47
721		9	18		5		311	307	618			133
790	21	17	38		1		5	18	23			1
Subtotal	51	48	99		20		830	828	1,658			496
<b>Glendale</b>												
56X	5	4	9		4		129	86	215			73
Subtotal	5	4	9		4		129	86	215			73
<b>Pasadena</b>												
770	46	46	92		8		1,303	1,268	2,571			333
Subtotal	46	46	92		8		1,303	1,268	2,571			333
<b>Local</b>												
6N	93	89	182		9		3,576	3,347	6,923			448
7N	82	80	162		8		2,701	2,227	4,928			357
8N	49	52	101		4		1,035	1,122	2,157			192
12N	63	66	129		7		2,384	2,468	4,852			330
24	51	50	101		4		1,467	1,650	3,117			174
25N	69	72	141		10		2,471	2,322	4,793			576
39	81	76	157		7		2,058	1,910	3,968			396
56	30	37	67		7		1,057	1,179	2,236			302
86	48	48	96		8		1,698	1,499	3,197			395
Subtotal	566	570	1,136		64		18,447	17,724	36,171			3,170
<b>NORTH EYP</b>	102	98	200		32		2,262	2,182	4,444			902
<b>NORTH LOCAL</b>	566	570	1,136		64		18,447	17,724	36,171			3,170
<b>TOTAL FOR NORTH</b>	<b>668</b>	<b>668</b>	<b>1,336</b>		<b>96</b>		<b>20,709</b>	<b>19,906</b>	<b>40,615</b>			<b>4,072</b>

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V-64

	IN	OUT	TOTAL		TOTAL		TOTAL		TOTAL
<b>SOUTH</b>									
<b>Express</b>									
Subtotal	131	118	249	34	2,800	2,647	5,447	820	
<b>Local</b>									
2s	67	62	129	3	2,572	2,090	4,662	144	
3E	133	127	260	10	3,638	3,722	7,360	383	
5	113	102	215	11	4,353	4,740	9,093	730	
6s	96	94	190	9	3,805	3,522	7,327	514	
7s	84	82	166	8	2,898	2,563	5,461	472	
8s	62	49	101	4	1,582	1,193	2,775	223	
9E	97	104	201	14	4,674	4,957	9,631	1,034	
29E	104	96	200	9	3,393	3,616	7,009	491	
33	44	42	86	4	552	515	1,067	90	
34	18	18	36	2	332	405	737	79	
49E	57	54	111	6	1,442	1,678	3,120	416	
49W	57	56	113	6	1,974	1,986	3,960	59	
92s	66	64	130	8	1,867	2,094	3,961	445	
871	33	34	67	4	531	507	1,038	155	
Subtotal	1,021	984	2,005	98	33,613	33,588	67,201	5,235	
SOUTH EXPRESS	131	118	249	34	2,800	2,647	5,447	820	
SOUTH LOCAL	1,021	984	2,005	98	33,613	33,588	67,201	5,235	
TOTAL FOR SOUTH	1,152	1,102	2,254	132	36,413	36,235	72,648	6,055	
<b>EAST</b>									
<b>Express</b>									
Sanita Ann									
501	1	1	2	1	56	56	112	56	
503	1	1	2	1	46	46	92	46	
508	1	1	2	1	57	57	114	57	
757	23	22	45	9	724	827	1,551	408	
758	13	10	23	5	350	309	659	130	
800	23	22	45	3	654	706	1,360	107	
801	34	31	65	5	629	715	1,344	181	
802	22	22	44	3	497	562	1,059	73	
Subtotal	118	110	228	28	3,013	3,278	6,291	1,058	

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ST (CONT)	LN	OUT	TOTAL	LN	TOTAL	LN	OUT	TOTAL	LN	TOTAL
<b>Busway</b>										
480	69	66	135	10	1,707	2,087	3,794	542		
482	17	18	35	7	512	477	989	226		
482X	4	4	8	3	135	100	235	66		
483	60	53	113	6	1,239	1,206	2,445	229		
484	56	47	103	7	1,101	1,092	2,193	261		
485	51	55	106	5	764	1,932	1,696	146		
486	17	13	30	7	499	473	972	222		
487	44	42	86	4	684	620	1,304	159		
488	17	20	37	5	347	400	747	146		
489	17	14	31	4	274	320	594	165		
490	42	43	85	7	841	822	1,663	302		
491	42	39	81	5	732	781	1,513	231		
492	4	4	8	3	172	106	278	85		
493	4	4	8	3	101	121	222	308		
494	4	4	8	3	113	82	195	75		
496	17	16	33	1	312	339	651	49		
507	1	1	2	1	46	46	92	46		
760	13	13	26	7	421	410	831	282		
764	7	7	14	3	237	222	459	103		
<b>Subtotal</b>	<b>486</b>	<b>463</b>	<b>949</b>	<b>91</b>	<b>10,237</b>	<b>10,636</b>	<b>20,873</b>	<b>3,643</b>		
<b>Pomona</b>										
820	82	88	170	13	2,123	2,041	4,164	555		
<b>Subtotal</b>	<b>82</b>	<b>88</b>	<b>170</b>	<b>13</b>	<b>2,123</b>	<b>2,041</b>	<b>4,164</b>	<b>555</b>		
<b>Long Beach</b>										
34X	1	1	2	1	87	56	143	56		
36	48	49	97	3	1,706	1,509	3,215	216		
755	12	10	22	8	403	417	820	203		
<b>Subtotal</b>	<b>61</b>	<b>60</b>	<b>121</b>	<b>12</b>	<b>2,196</b>	<b>1,982</b>	<b>4,178</b>	<b>475</b>		
<b>Local</b>										
2N	63	67	130	10	1,933	2,348	4,281	517		
26N	191	199	390	20	6,538	6,510	13,048	1,023		
28C	123	123	246	14	5,021	4,908	9,929	910		
47N	71	72	143	7	1,223	1,061	2,284	283		
47s	78	72	150	8	2,559	2,394	4,953	412		
92N	89	86	175	7	2,841	3,136	5,977	369		
420	44	44	88	3	1,122	937	2,059	143		
422	53	54	107	7	1,504	1,657	3,161	437		
426	50	48	98	6	1,303	1,426	2,729	350		
428	48	46	94	7	896	1,093	1,989	290		
432	38	36	74	3	705	834	1,539	214		
<b>Subtotal</b>	<b>848</b>	<b>847</b>	<b>1,695</b>	<b>92</b>	<b>25,645</b>	<b>26,304</b>	<b>51,949</b>	<b>4,948</b>		
<b>EAST EXPRESS</b>	<b>747</b>	<b>721</b>	<b>1,468</b>	<b>144</b>	<b>17,569</b>	<b>17,937</b>	<b>35,506</b>	<b>5731</b>		
<b>EAST LOCAL</b>	<b>848</b>	<b>847</b>	<b>1,695</b>	<b>92</b>	<b>25,645</b>	<b>26,304</b>	<b>51,949</b>	<b>4,948</b>		
<b>TOTAL FOR EAST</b>	<b>1,595</b>	<b>1,568</b>	<b>3,163</b>	<b>236</b>	<b>43,214</b>	<b>44,241</b>	<b>87,455</b>	<b>10,679</b>		

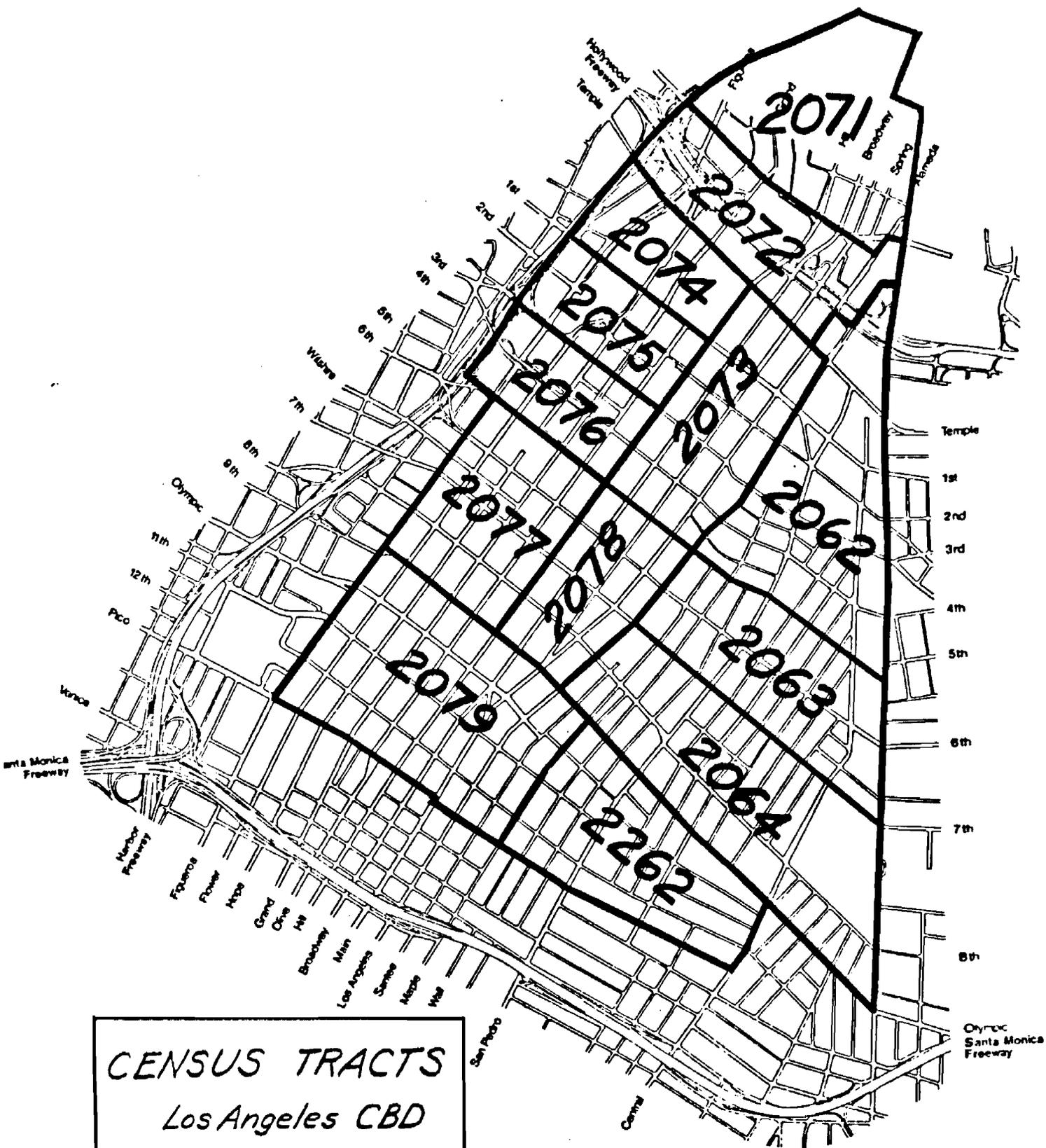
# REGISTRATION OF 1990 TSM CBD BUS SERVICE - BY DIRECTION

DIRECTION	TRIPS						PASSENGERS					
	ALL DAY			P.M. PEAK HOUR			ALL DAY			P.M. PEAK HOUR		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
<b>NORTH</b>												
Express	102	98	200		32		2,262	2,182	4,444		902	
Local	566	570	1,136		64		18,447	17,724	36,171		3,170	
<b>TOTAL</b>	<b>668</b>	<b>668</b>	<b>1,336</b>		<b>96</b>		<b>20,709</b>	<b>19,906</b>	<b>40,615</b>		<b>4,072</b>	
<b>SOUTH</b>												
Express	131	118	249		34		2,800	2,697	5,447		820	
Local	1,021	984	2,005		98		33,613	33,588	67,201		5,235	
<b>TOTAL</b>	<b>1,152</b>	<b>1,102</b>	<b>2,254</b>		<b>132</b>		<b>36,413</b>	<b>36,235</b>	<b>72,648</b>		<b>6,055</b>	
<b>EAST</b>												
Express	747	721	1,468		144		17,569	17,937	35,506		5,731	
Local	848	847	1,695		92		25,645	26,304	51,949		4,948	
<b>TOTAL</b>	<b>1,595</b>	<b>1,568</b>	<b>3,163</b>		<b>236</b>		<b>43,214</b>	<b>44,241</b>	<b>87,455</b>		<b>10,679</b>	
<b>WEST</b>												
Express	395	394	789		89		9,468	8,777	18,245		2,591	
Local	2,064	2,031	4,095		208		72,057	69,403	141,460		12,747	
<b>TOTAL</b>	<b>2,459</b>	<b>2,425</b>	<b>4,884</b>		<b>297</b>		<b>81,525</b>	<b>78,180</b>	<b>159,705</b>		<b>15,338</b>	
Total Express	1,375	1,331	2,706		299		32,099	31,543	63,642		10,044	
Total Local	4,499	4,432	8,931		462		149,762	147,019	296,781		26,100	
<b>GRAND TOTAL</b>	<b>5,874</b>	<b>5,763</b>	<b>11,637</b>		<b>761</b>		<b>181,861</b>	<b>178,562</b>	<b>360,423</b>		<b>36,100</b>	

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ST	LN	OUT	TOTAL	LN	TOTAL	LN	OUT	TOTAL	LN	TOTAL
<b>Express</b>										
<b>Holly wood</b>										
35	87	91	178	12	2,496	2,790	5,286	462		
42X	7	8	15	4	191	230	421	114		
44X	9	7	16	3	259	156	415	65		
91X	13	10	23	8	510	410	920	267		
93X	82	85	167	8	2,594	2,414	5,008	590		
93XU	12	12	24	4	341	285	626	70		
93XO	7	7	14	4	234	224	458	55		
123	1	1	2	4	39	39	78	39		
144	14	14	28	7	152	122	274	79		
504	1	1	2	1	52	52	104	52		
505(1)	1	1	2	1	46	46	92	46		
505(2)	1	1	2	1	53	53	106	53		
505(3)	1	1	2	1	46	46	92	46		
716	7	7	14	3	187	170	357	94		
Subtotal	243	246	489	58	7,200	7,037	14,237	2,032		
<b>Santa Monica</b>										
601	5	5	10	1	73	52	125	22		
602	10	10	20	3	179	144	323	75		
604	12	10	22	3	428	342	770	222		
605	10	9	19	3	168	134	302	46		
606	7	5	12	4	179	101	280	51		
607	36	36	72	4	306	264	570	78		
608	4	4	8	3	60	53	113	16		
776	68	69	137	5	875	650	1,525	49		
Subtotal	152	148	300	31	2,268	1,740	4,008	559		
<b>Local</b>										
3W	118	123	241	13	5,805	4,454	10,259	813		
4W	139	135	274	14	4,553	4,047	8,600	907		
4S	143	128	271	16	5,173	4,622	9,795	1,108		
4L	13	14	27	2	602	497	1,099	88		
9W	97	93	190	8	3,076	3,100	6,176	376		
12S	66	66	132	8	2,745	2,698	5,443	422		
25S	46	47	93	3	896	697	1,593	200		
26S	209	198	407	20	7,882	7,510	15,392	1,516		
28W	122	121	243	12	4,853	4,220	9,073	713		
29W	198	104	202	12	4,029	3,752	7,781	797		
42	138	131	269	16	4,441	4,551	8,992	851		
44W	118	109	227	11	4,833	4,303	9,136	753		
44S	107	107	214	11	3,342	3,313	6,655	673		
75N	76	69	145	7	1,715	1,144	2,859	253		
75S	81	82	163	8	2,885	2,704	5,589	541		
83	236	229	465	13	6,304	7,364	13,668	844		
83L	47	57	104	10	1,554	2,432	3,986	572		
91	121	128	249	16	4,415	4,908	9,323	927		
94	89	90	179	8	2,954	2,997	5,951	483		
Subtotal	2,064	2,031	4,095	208	72,057	69,403	141,460	12,747		
WEST EXPRESS	395	394	789	89	9,468	8,777	18,245	2,591		
WEST LOCAL	2,064	2,031	4,095	208	72,057	69,403	141,460	12,747		
TOTAL FOR WEST	2,459	2,425	4,884	297	81,525	78,180	159,705	15,338		

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**CENSUS TRACTS**  
*Los Angeles CBD*

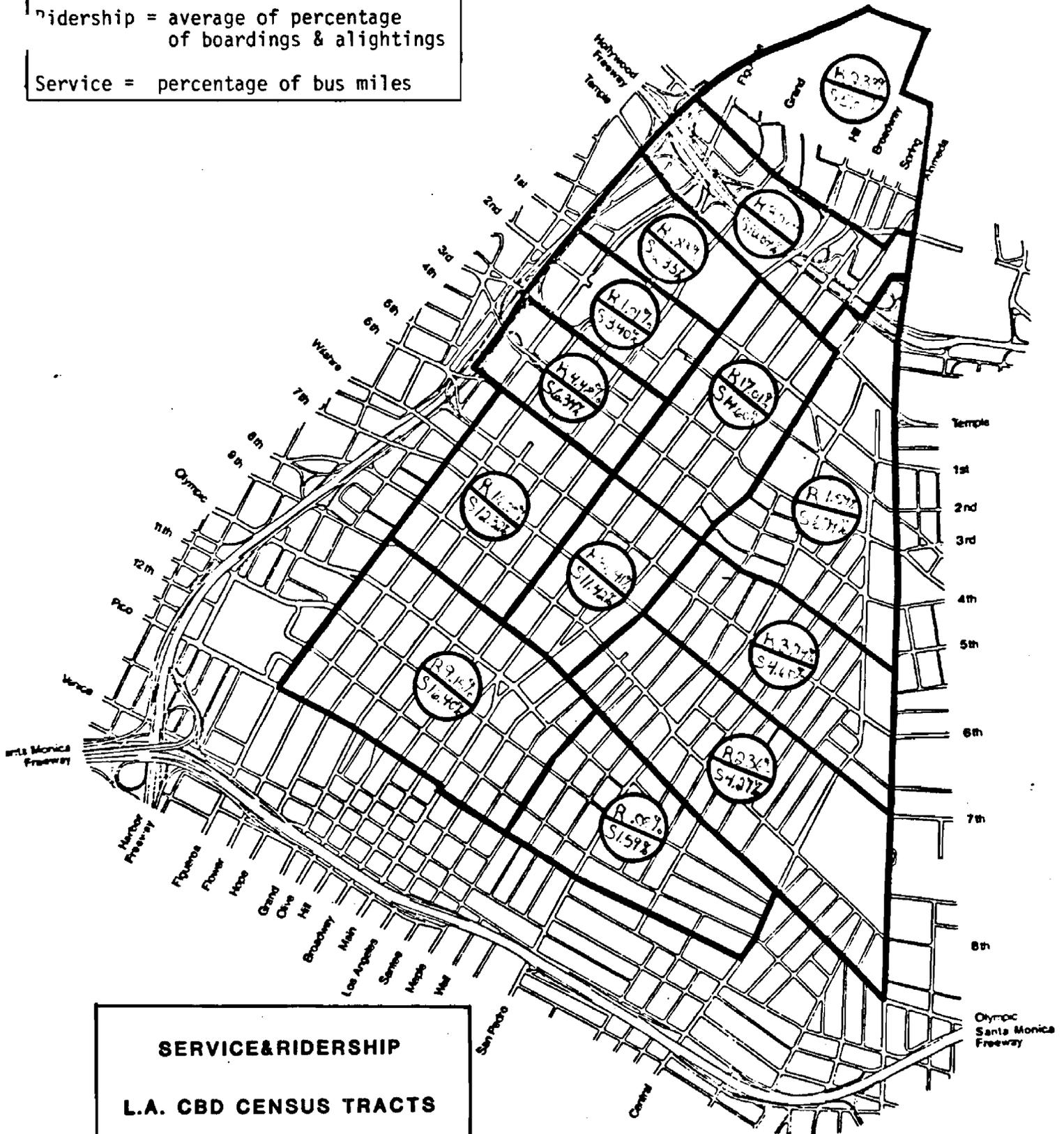
RTDP Element III  
 L. A. CBD Bus Planning  
 By SCRTPD Planning Dept.

Date:	Scale:
Rev:	

Service and Ridership  
 as percentage of all LA CBD  
 Census Tracts

Ridership = average of percentage  
 of boardings & alightings

Service = percentage of bus miles

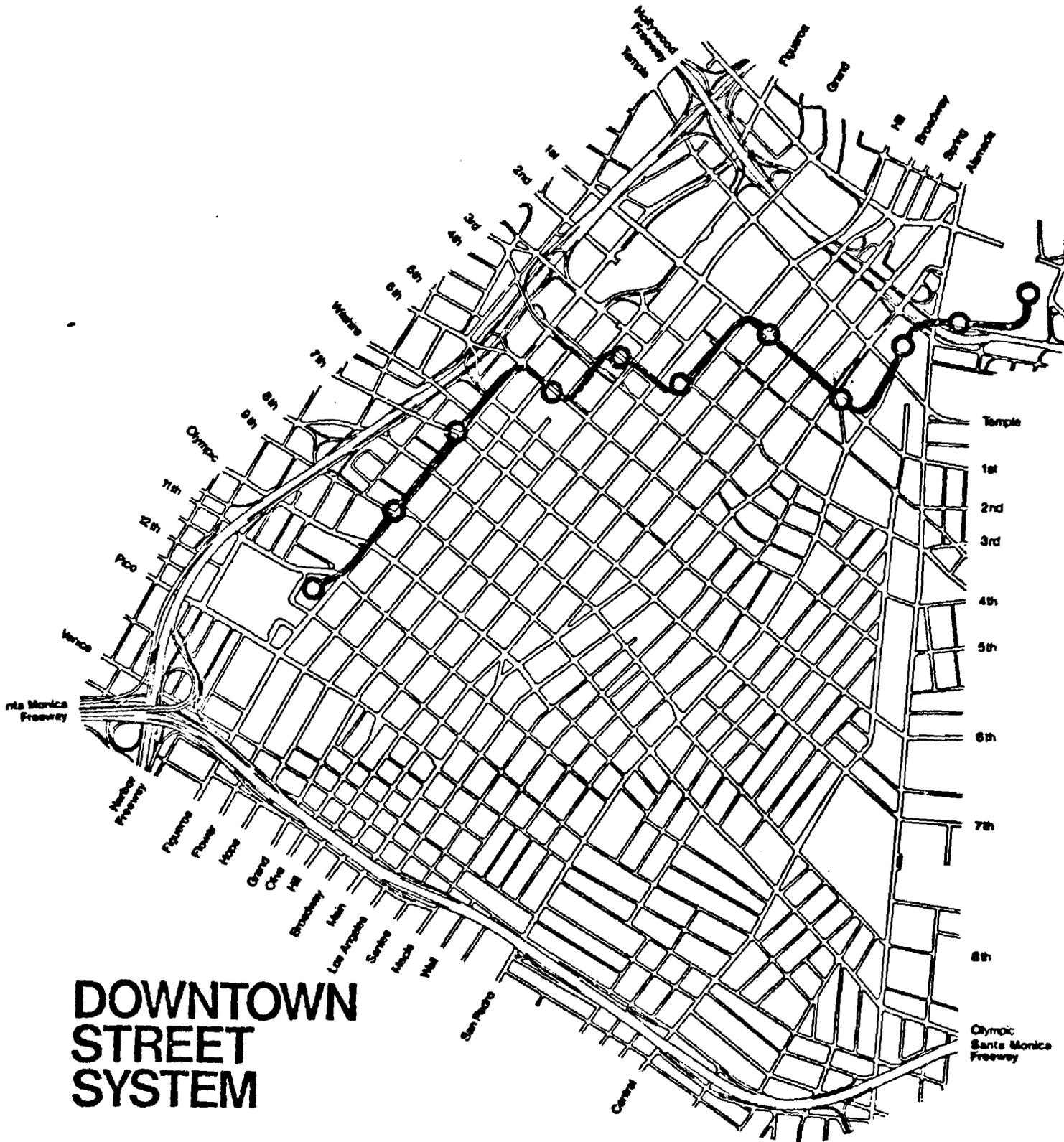


**SERVICE & RIDERSHIP**

**L.A. CBD CENSUS TRACTS**

RTDP Element III  
 L.A. CBD Bus Planning  
 By SCRTD Planning Dept.

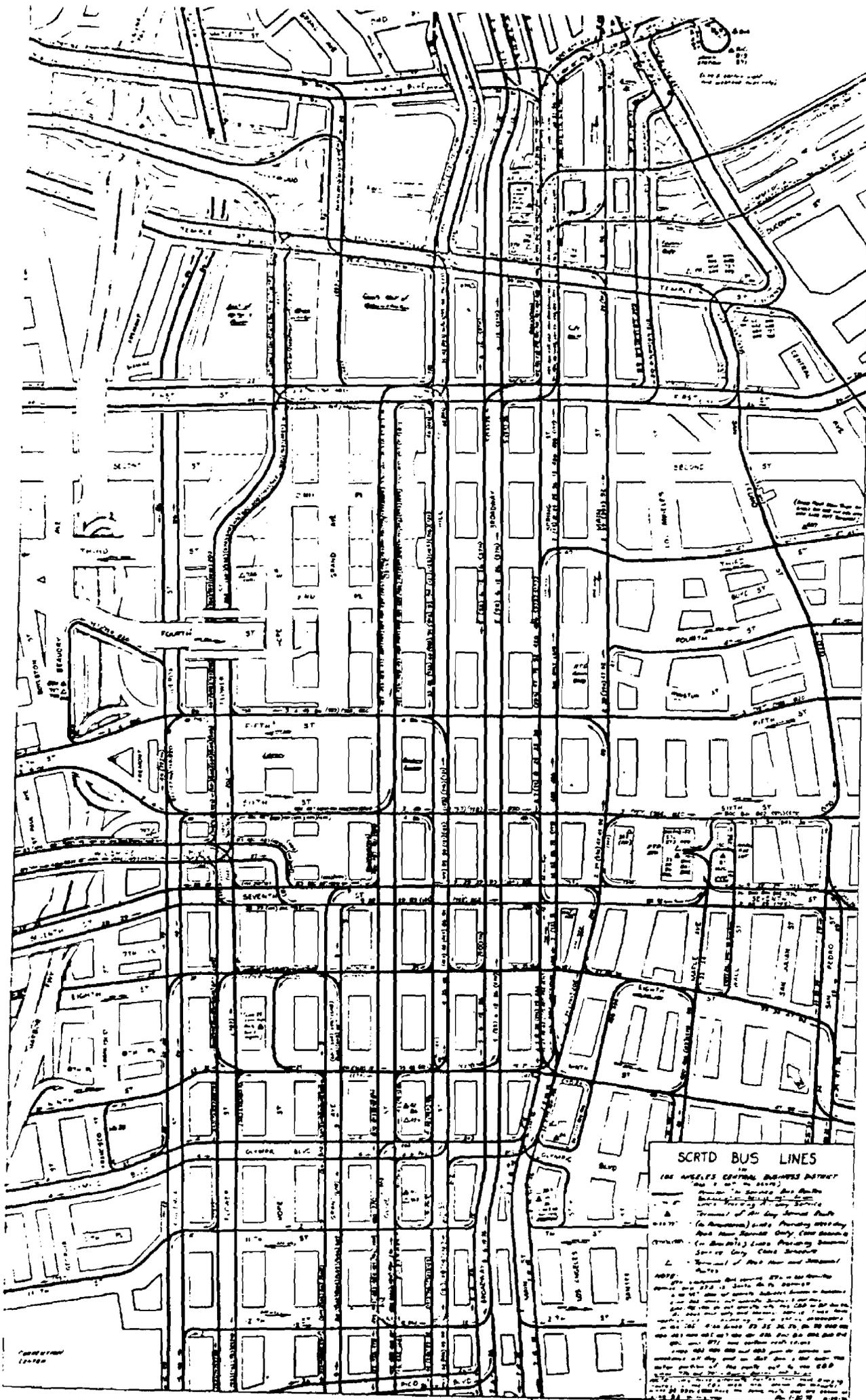
Date: 3/81      Scale:  
 Rev:



**DOWNTOWN  
STREET  
SYSTEM**

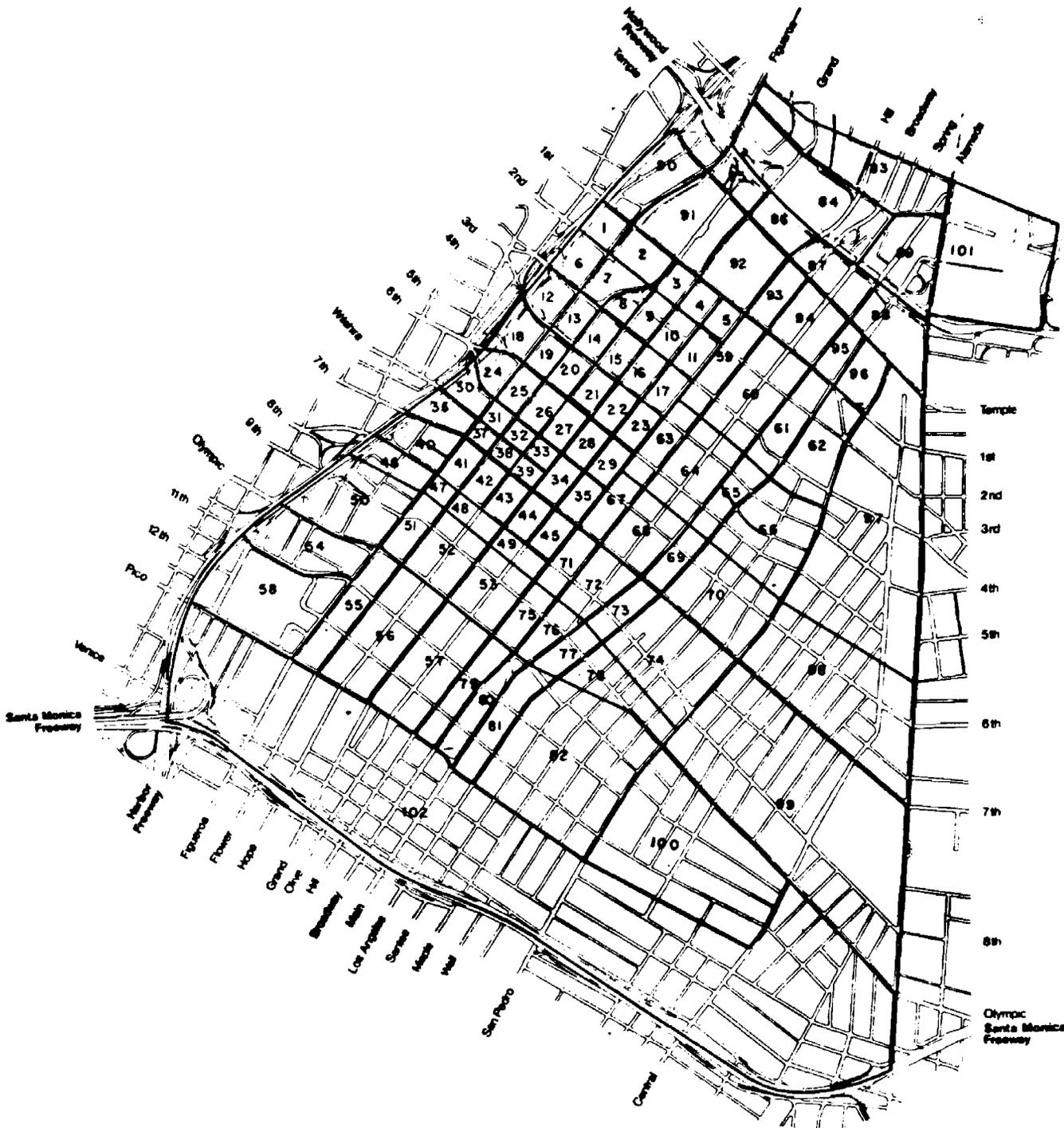
**ORIGINAL DPM ROUTE**



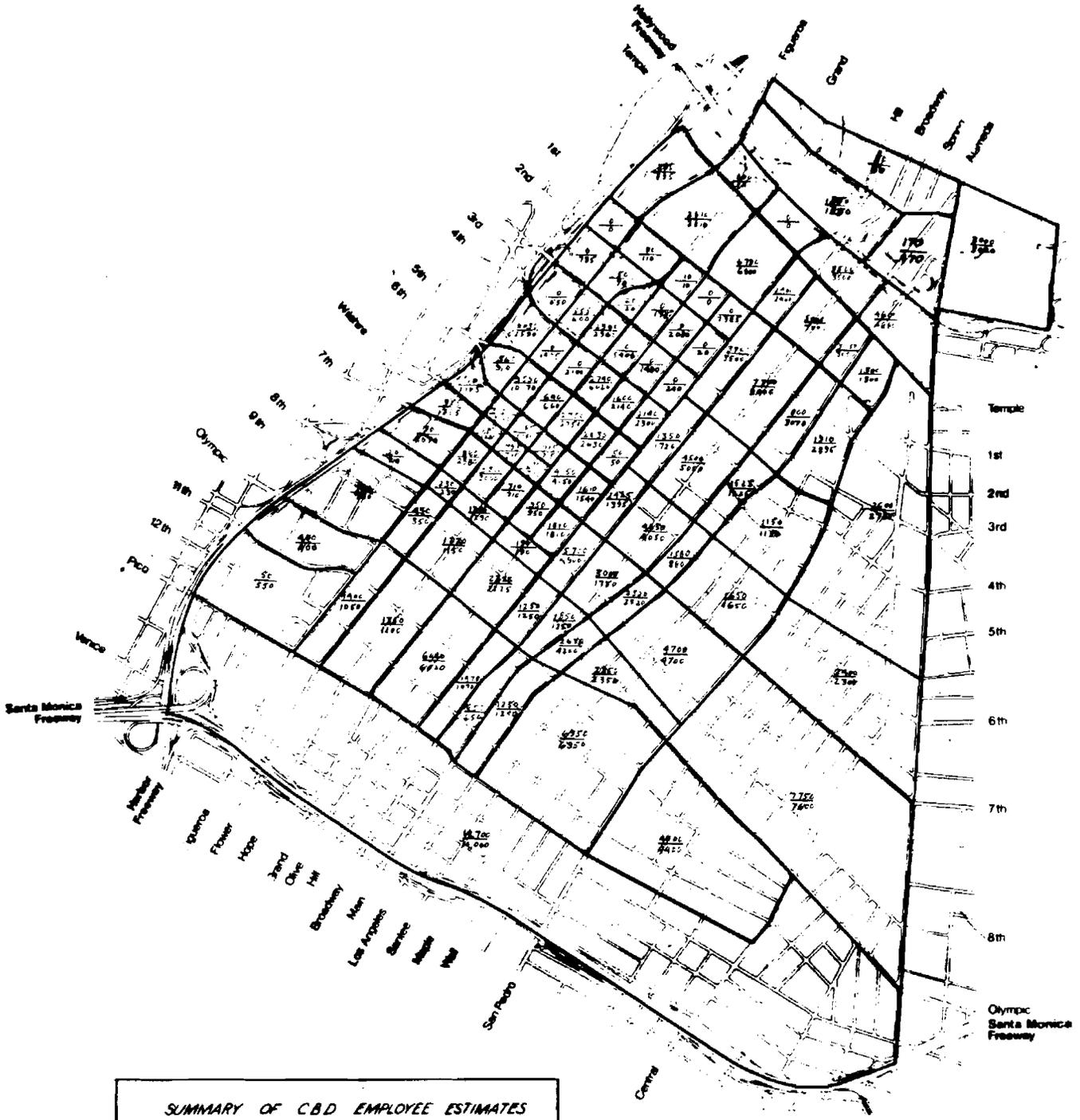


**SCRTD BUS LINES**  
 LOS ANGELES CENTRAL BUSINESS DISTRICT  
 (See Map of Los Angeles)  
 The Los Angeles City Council has authorized the Los Angeles City Council to establish a system of streetcar bus lines in the Los Angeles Central Business District. The system will consist of a number of lines connecting the various business centers of the city. The lines will be operated by the Los Angeles City Council. The system will be subject to the approval of the Los Angeles City Council. The system will be subject to the approval of the Los Angeles City Council.

**NOTE:**  
 The Los Angeles City Council has authorized the Los Angeles City Council to establish a system of streetcar bus lines in the Los Angeles Central Business District. The system will consist of a number of lines connecting the various business centers of the city. The lines will be operated by the Los Angeles City Council. The system will be subject to the approval of the Los Angeles City Council.



<p>102 ZONE LOS ANGELES CBD STUDY AREA          ENVIRONMENTAL BASELINE DATA UPDATE          TASK 4.01</p> <p>by WSA (May)      by L.A. CRA          May 15, 1978</p>	
<p>Regional Transit Development Program (RTDP)          Element III Los Angeles CBD Bus Planning          By SCRTP Planning Dept.</p>	
Date:	Scale:
Rev:	



**SUMMARY OF CBD EMPLOYEE ESTIMATES**

	EMPLOYEES	
	1975	1990
Study Area (Zones 1-101)	188,480	221,180
No. of Pico Bl. (Zone 102)	14,700	14,060
<b>CBD Total</b>	<b>203,180</b>	<b>235,240</b>

**LOS ANGELES CBD EMPLOYEES BY ZONE**

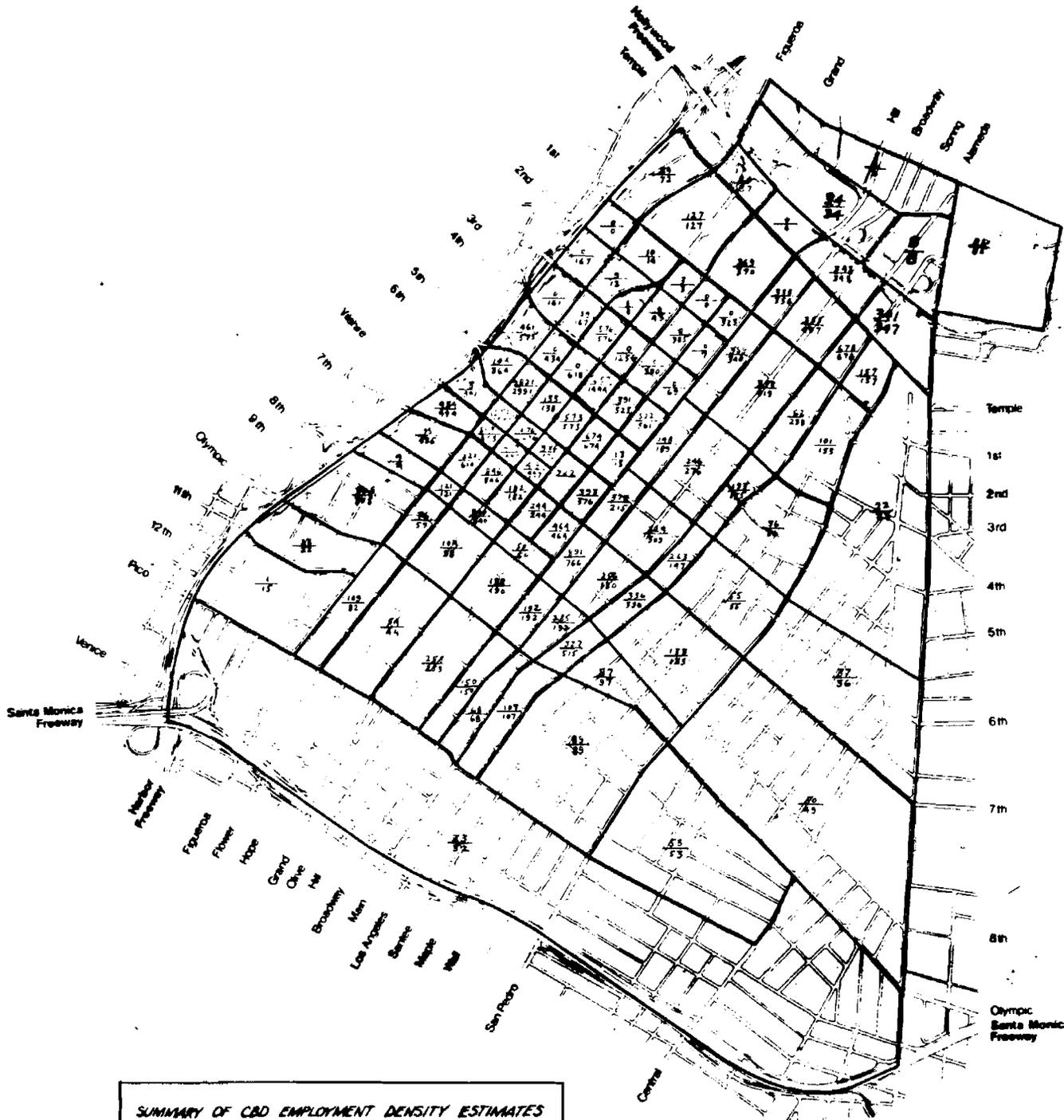
1975  
1990

ENVIRONMENTAL BASELINE DATA UPDATE  
Task 401 by WSA (Inup) for Los Angeles CMA  
May 15, 1978

Regional Transit Development Program (RTDP)  
Element III Los Angeles CBD Bus Planning  
By SCRTPD Planning Dept.

Date: \_\_\_\_\_  
Rev: \_\_\_\_\_

Scale: \_\_\_\_\_



**SUMMARY OF CBD EMPLOYMENT DENSITY ESTIMATES**

	Acres	EMPLOYEES PER ACRE (DENSITY)	
		1975	1990
Study Area (Tables 1-70)	1392	135	159
South Park II (Table 70)	440	33	32
<b>CBD Totals</b>	<b>1832</b>	<b>111</b>	<b>128</b>

**L. A. CBD EMPLOYMENT DENSITY BY ZONE**

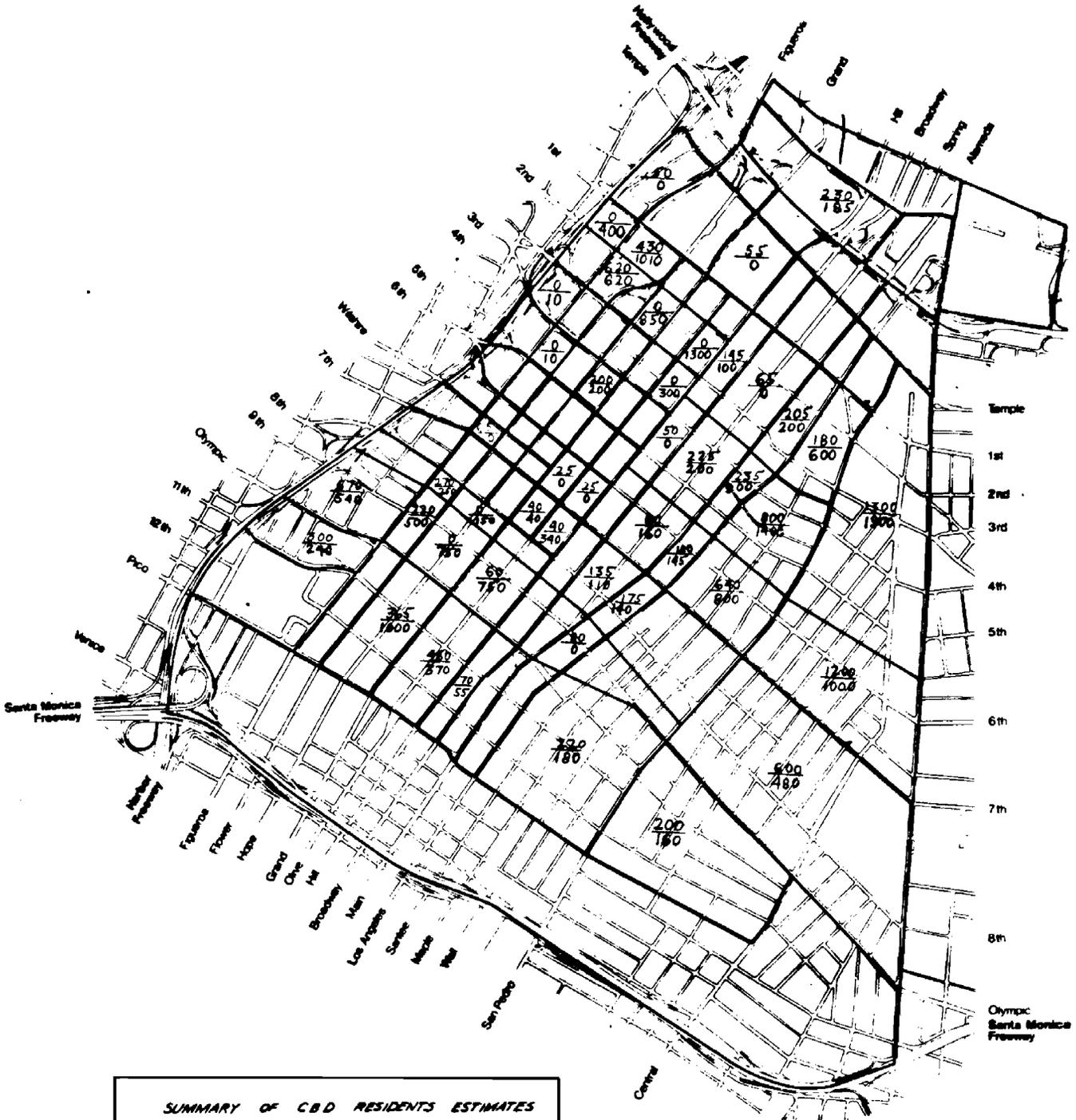
EMPLOYEES PER ACRE: 1975 / 1990

ENVIRONMENTAL BASELINE DATA UPDATE  
TASK 601 BY WSA (Map) for Los Angeles CRA  
May 15, 1978

Regional Transit Development Program (RTDP)  
Element III Los Angeles CBD Bus Planning  
By BCRTD Planning Dept.

Date: \_\_\_\_\_  
Rev: \_\_\_\_\_

Scale: \_\_\_\_\_



**SUMMARY OF CBD RESIDENTS ESTIMATES**

	RESIDENTS	
	1975	1990
Study Area (Zones 1-101)	10,970	18,345
So. of Pac Bl. (Zone 102)	N.A.	N.A.

**LOS ANGELES CBD RESIDENTS BY ZONE**

1975  
1990

ENVIRONMENTAL BASELINE DATA UPDATE  
TASK 601 By HSA (May) for Los Angeles CRA  
May 15, 1978

Regional Transit Development Program (RTDP)  
Element III Los Angeles CBD Bus Planning  
By SCRTD Planning Dept.

Date:	Scale:
Rev:	

WILBUR SMITH AND ASSOCIATES CBD  
EMPLOYMENT PROJECTION TABLES



RENEWING THE CITY/BUILDING THE FUTURE

THE COMMUNITY REDEVELOPMENT AGENCY  
OF THE CITY OF LOS ANGELES, CALIFORNIA  
727 West 7th St., Suite 400, Los Angeles, Ca. 90017 (213) 688-7520

P11.15.3  
FILE CODE

KURT W. MEYER, F.A.I.A.  
Chairman

ALAN A. GOLDSTEIN  
MARILYN W. HUDSON  
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ANDREW WALK  
DR. EUGENE T. WELLS  
JAMES M. WOOD

EDWARD N. HELFELD  
Administrator

MAY 17 1978

Mr. Paul C. Taylor  
Director of Bus Planning  
Southern California Rapid  
Transit District  
425 South Main Street  
Los Angeles, California 90013

Dear Mr. Taylor:

Enclosed are the updated population and employment projections developed by Wilbur Smith and Associates for the Downtown People Mover Program. These projections are in five-year increments from 1975 to 1990 and cover most of the central business district. They will be used in our modelling effort as well as for environmental impact analyses.

Please feel free to contact me if there are questions.

Best regards,

Marsha Rood  
Transportation Planner

gh  
enclosure

## THE COMMUNITY REDEVELOPMENT AGENCY OF THE CITY OF LOS ANGELES, CALIFORNIA

M E M O R A N D U M

May 15, 1978

TO: DANIEL T. TOWNSEND, C/DS PROGRAM MANAGER,  
MYRA FRANK, MARSHA ROOD, FRANCES BANERJEE, GILL HICKS

FROM: WILBUR SMITH AND ASSOCIATES

SUBJECT: ENVIRONMENTAL BASELINE DATA UPDATE, TASK 4.01

This memo is a final draft task termination report for our work on this task. Attached are final estimates of 1975 floor area and employment by land use type and population, by analysis zone for the 101-zone system, and projections of population and floor area and employment by land use type for 1981, 1985, and 1990. These tables reflect comments and additional information received from CRA and City Planning staff since our initial memo and tables submitted on March 30th.

Initial sources included previous studies by Keyser-Marston (1976), the draft market analyses for Bunker Hill by Taylor Dark and Company, a review of joint development opportunities by Marsha Rood of CRA, and information from John Curry of CRA. Information subsequently received and considered included the following:

- Estimated and projected population and total employment by census tract as supplied by City Planning;
- Comments by City Planning on initial office and retail employment projections;
- Comments from CRA staff (S. Grinnel, A. Sikora, and G. Williams), responsible for various areas;
- Spot checks on land use and building occupancy in LACBD by WSA staff;
- Results of a recent employment survey of members by the Central City Association; and
- Spot checks by phone of Caltrans, City Board of Education, and the U.S. Postal Service, where data gaps were believed to exist.

EMPLOYMENT TRENDS

Table 4.1A summarizes the projected changes in employment in LACBD (extended to include the Union Station Area) between 1975 and 1990. Total employment in the 101-zone study area is projected to increase from about 188,480 in 1975 to about 221,180 in 1990. Total employment for the entire CBD, which includes the area south of Pico Boulevard to the Santa Monica Freeway, is projected to increase from approximately

203,000 in 1975 to approximately 235,400 in 1990.

The main difference between the current forecasts and the previous Task 19 forecasts is the assumption of stability in manufacturing and wholesaling. The previous projections assumed a continuing decline in CBD manufacturing and wholesale employment, based on decentralization and automation trends. The current revival of both the garment industry and manufacturing jewelry in LACBD was not anticipated.

#### UPPER AND LOWER LIMITS OF PRIVATE OFFICE EMPLOYMENT

The new West Side private office development (planned office buildings in Bunker Hill, the Mixed Use Project, etc.) is expected to draw some employment from the East Side. A net gain of 20,000 office workers is projected. However, it is possible that half of these would come from other LACBD buildings. A lower limit of 95,000 private office employees is projected on this basis.

There are other uncertainties in the number and distribution of downtown employees. Construction of at least 5,000,000 square feet of new office floor space appears marketable if recent trends continue, and an additional 1,000,000 square feet of new floor area is likely with allowance for normal developer optimism.\* Because these figures refer to net square feet, about 7,500,000 additional square feet of gross floor area is therefore projected. In this estimate we have assumed that 800,000 square feet of new office buildings will be constructed on parcels R, S, and T of Bunker Hill. There are alternative uses for this property, including residential and hotel space. The hotel market would not likely develop until after 1990, and residential development would require a change in the plan as adopted by the City Council. It is possible that these parcels (R, S, and T) would still be vacant in 1990. In that case, there would be about 6,700,000 square feet of new gross square feet (about 5,000,000 net). Total LACBD office employment would be 2,000 less (about 102,500).

The employment projections assume a ratio of one employee per 400 gross square feet of office space (300-350 net square feet). A higher concentration of employees is possible (one per 200-250 net square feet or 250-280 gross square feet). More important is the question of Spring Street office space which is now vacant. The projections assume some gradual re-occupancy of Spring Street buildings by financial insurance and professional offices in the area near the Stock Exchange and by Latin-oriented professional offices in the area north of Sixth Street. If this does not occur, the private office employment forecasts should be reduced by 5,000 to 10,000.

\* These net square foot figures are derived from a draft report on Bunker Hill parcel market potentials by Taylor Dark and Company. Conversion to gross assumes a utilization factor of 0.8.

The upper limit of private office employment (120,000) therefore assumes full development of Bunker Hill, re-use of Spring Street buildings, and more intensive use of new office space than presently practiced. The lower limit would involve somewhat less construction in Bunker Hill and continued high vacancy rates on Spring Street.

#### PUBLIC OFFICE EMPLOYMENT

The public office employment projections assume construction of two new State office buildings in the Civic Center area. This is considered to be a definite commitment insofar as square feet of building space is concerned. However, the intensity of use of the floor area may vary. Passage of the Jarvis-Gann Initiative, for example, could result in reduction of public office employment below current levels. Continued expansion along the lines of past trends could result in higher-than-projected employment. The most likely estimate for 1990 is about 47,000 public employees in LACBD (including 3,000 in the Union Station-Terminal Annex zone). The lower limit (with Jarvis-Gann) would be about 40,000 and the upper limit 50,000.

#### RETAIL EMPLOYMENT

Very little change in LACBD retail employment is projected (10,500 to 11,800) between 1975 and 1990. The projections assume a reduction of intensity in some stores (e.g., moving out of mail-order operations in Bullocks or the May Company) as new floor area opens up, and possibly conversion of some upper floors to storage from active retailing (as presently seems to be the case with Barker Brothers on Seventh Street). New retail activity is expected to focus on ground-floor development in office buildings and mixed-use complexes on the West Side. On the East Side, it is possible that bazaar-type operations with many small specialty shops may replace many of the existing large stores which may move.

#### HOTEL, SERVICE, AND INSTITUTIONAL EMPLOYMENT

The prospect of the Olympic Games is stimulating downtown hotel prospects. In addition to the recently opened Bonaventure and New Otani, major hotels are planned for the Seventh-Figueroa Site (formerly the Centrum), the MAT Complex at Figueroa and Fourth, and the Convention Center. An additional hotel catering to bilingual guest needs is planned for the Angel's Flight area of Bunker Hill at Hill and Fourth Streets. Hotel, restaurant, service, and institutional employment in LACBD is accordingly projected to grow from about 8,500 in 1975 to about 12,000 in 1990. With the opening of the Bonaventure, current (1978) hotel and service employment is estimated at 9,700. In view of the short-term nature of Olympic activity,

some hotel overbuilding may occur, resulting in adjustments in the supply of rooms as a result. Any adjustment would likely be felt by older hotels (such as the Alexandria), which might in that event be converted to elderly housing. The upper and lower limits of hotel employment are estimated at 13,000 and 10,000 reflecting these uncertainties.

#### INDUSTRIAL AND WHOLESALE EMPLOYMENT

As indicated by the current Cal Mart expansion plans, the long-term decline in LACBD manufacturing and wholesaling employment has been reversed. Stability or small growth is projected for the 1975-1990 period (43,000 to 46,000). It is recognized that this forecast may be overly conservative in regard to growth. However, it is understood that both the garment and manufacturing jewelry industries are labor intensive. (This is one reason that these industries have previously located in the economically depressed areas of Southeastern New England.) Growth in these industries will therefore be very sensitive to immigration-naturalization legislation and its enforcement. These public policies are still being formulated, and cannot be predicted over a 12-year time span since entry into and exit from these industries is simple and inexpensive. In the event of tighter immigration, entrepreneurs and some employees will likely relocate to Northern Mexico. Continuation of the status quo or more liberal immigration policies would stimulate growth. A range from a lower limit of 40,000 to an upper limit of 50,000 is therefore projected. This employment will be distributed around the East and South sides of LACBD, and the workers will likely not use the People Mover.

#### POPULATION FORECASTS

The population of the 101-zone area, now estimated at approximately 11,000, is projected to increase to approximately 18,300 by 1990. These figures do not include county jail, which has an average population of about 3,000. The 7,300 additional residents will live in: (1) the market-rate residential developments now under contract for Bunker Hill (1,500-1,800 people); (2) the elderly housing in Bunker Hill (1,600 people); (3) the conversion of the PTT and Arcade buildings to housing (450-500 people); and (4) South Park (initially 1,500 people and ultimately over 4,000). In addition, the population in low price housing in the skid row area would be maintained by rehabilitation of older buildings (e.g., King Edward Hotel), to improve its quality.

The housing units in the Bunker Hill area are assured to construction, and the market for rehabilitation and conversion of old hotel and office buildings is also strong. Together with the initial phase of South Park, these would set a minimum of about 15,000 people for the area. If the South Park Development is successful, the CBD population could be as high as 20,000. The precise figure will depend on dwelling unit occupancy and household size.

TABLE 4.1A  
EMPLOYMENT PROJECTIONS  
101-ZONE STUDY AREA

<u>Land Use</u>	<u>1975</u>	<u>1990 Mean</u>	<u>1990 Upper</u>	<u>1990 Lower</u>
Private Office	84,160	104,625	120,000	95,000
Government Office*	42,340	46,670	50,000	40,000
Retail/Commercial	10,465	11,805	12,000	9,000
Hotels, Service, etc.	8,375	12,020	13,000	10,000
Industrial/ Wholesale	<u>43,140</u>	<u>46,060</u>	<u>50,000</u>	<u>40,000</u>
Total Study Area	188,480	221,180	245,000	195,000
Area South of Pico Boulevard	<u>14,700</u>	<u>14,060</u>	<u>15,000</u>	<u>11,625</u>
TOTAL CBD	203,180	235,240	260,000	206,625

TABLE 11  
LACBD POPULATION ESTIMATES  
101 ZONE BASIS  
1975 - 1990

<u>101 ZONE NUMBER</u>	<u>POPULATION</u>				<u>REMARKS</u>
	<u>1975</u>	<u>1981</u>	<u>1985</u>	<u>1990</u>	
1	0	200	400	400	Bunker Hill A
2	430	920	990	1,010	Bunker Hill E1, E3, & E4
3	0	0	0	0	Bunker Hill K
4	0	0	0	0	Bunker Hill Q
5	0	0	0	0	Bunker Hill W1 & W2
6	0	0	0	0	Bunker Hill B
7	620	620	620	620	Bunker Hill E2
8	0	0	0	0	Bunker Hill H
9	0	470	680	850	Bunker Hill L & M
10	0	0	0	0	Bunker Hill R & S
11	0	1,100	1,300	1,300	Bunker Hill X1 & X2
12	0	10	10	10	Hotel Staff; Bunker Hill C
13	0	0	0	0	Bunker Hill F
14	0	0	0	0	Bunker Hill I
15	0	0	0	0	Bunker Hill N & O
16	0	0	0	0	Bunker Hill T & U
17	0	0	300	300	Bunker Hill Y1 & Y2
18	0	0	0	0	Bunker Hill D
19	0	10	10	10	Hotel Staff; Bunker Hill G
20	0	0	0	0	Bunker Hill J1 & J2
21	200	200	200	200	Old Apartments
22	0	0	0	0	Bunker Hill V
23	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
SUB-TOTAL	1,250	3,530	4,510	4,700	

TABLE 11, CONTINUED  
 LACBD POPULATION ESTIMATES

101 ZONE NUMBER	POPULATION				REMARKS
	1975	1981	1985	1990	
24	0	0	0	0	
25	↓	↓	↓	↓	
26	↓	↓	↓	↓	
27	↓	↓	↓	↓	
28	↓	↓	↓	↓	
29	↓	↓	↓	↓	
30	↓	↓	↓	↓	Cathedral Site
31	↓	↓	↓	↓	
32	↓	↓	↓	↓	
33	↓	↓	↓	↓	
34	25	0	0	0	
35	25	0	0	0	
36	0	0	0	0	
37	65	0	0	0	
38	0	0	0	0	
39	0	0	0	0	
40	0	0	0	0	
41	0	0	0	0	
42	0	0	0	0	
43	0	0	0	0	
44	40	40	40	40	
45	40	340	340	340	Old PTT, Hotels
46	0	0	0	0	
47	270	260	260	250	Old Hotels
48	0	0	150	150	South Park - Phase One
49	0	0	0	0	South Park
50	<u>670</u>	<u>625</u>	<u>585</u>	<u>540</u>	Old Apts, Fringe Zone
SUB-TOTAL	2,385	4,795	5,885	6,020	V-85

TABLE 11, CONTINUED  
 LACBD POPULATION ESTIMATES

101 ZONE NUMBER	POPULATION				REMARKS
	1975	1981	1985	1990	
51	220	230	400	500	South Park - Phase One
52	0	0	470	750	South Park - Phase One
53	60	290	520	750	South Park
54	300	280	260	240	Old Apts. - Hotels
55	0	0	0	0	
56	365	575	785	1,000	South Park
57	460	430	400	370	Old Apts. - Hotels
58	0	0	0	0	
59	145	135	120	100	Old Hotels
60	65	0	0	0	Old Hotels
61	205	200	200	200	Old Hotels
62	180	320	460	600	Little Tokyo
63	50	0	0	0	
64	225	210	205	200	Old Hotel
65	235	500	700	900	Rehab.
66	800	1,000	1,200	1,400	South of Little Tokyo
67	0	0	0	0	
68	60	130	160	160	Arcade Building Conversion
69	180	165	155	145	Old Hotels
70	640	720	800	800	Old Hotels
71	0	0	0	0	
72	135	120	120	110	Old Hotels
73	175	160	155	140	Old Hotels
74	0	0	0	0	
75	0	0	0	0	
76	0	0	0	0	
77	80	0	0	0	
SUB-TOTAL	6,965	10,260	12,995	14,385	

TABLE 11, CONTINUED  
LACBD POPULATION ESTIMATES

101 ZONE NUMBER	POPULATION				REMARKS
	1975	1981	1985	1990	
78	80	0	0	0	
79	70	65	60	55	Old Hotels
80	0	0	0	0	
81	0	0	0	0	
82	220	205	195	180	Old Hotels
83	0	0	0	0	Out of CBD (Chinatown)
84	230	215	200	185	Brd. of Educ. Sunset Blvd. Area
85	0	0	0	0	
86	0	0	0	0	
87	*	*	*	*	Hall of Justice Courts
88	0	0	0	0	
89	0	0	0	0	
90	50	0	0	0	County Health Center
91	0	0	0	0	
92	55	0	0	0	County
93	0	0	0	0	
94	0	0	0	0	
95	0	0	0	0	
96	0	0	0	0	
97	1,300	1,500	1,700	1,900	Little Tokyo
98	1,200	1,120	1,040	1,000	Old Hotels
99	600	560	520	480	Old Hotels
100	200	185	175	160	Old Hotels
101	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
RAND TOTAL	10,970	14,110	16,885	18,345	

\* Jail, estimated at 3,050 persons (not included in total).

TABLE 12  
TOTAL EMPLOYMENT SUMMARY  
101 ZONE BASIS

ZONE MBER	TOTAL EMPLOYMENT				REMARKS
	1975	1981	1985	1990	
1	0	0	0	0	Residential
2	80	90	100	110	Residential + Service
3	10	10	10	10	Parking
4	0	0	0	0	Parking
5	0	0	0	2,385	LA Co./LA Times
6	0	735	735	735	Exchange Square (office; restaurant)
7	50	50	70	70	Residential + Service
8	20	20	20	20	Central Heating Plant
9	0	0	175	175	Residential
10	0	0	0	2,080	500 Rm Hotel w/Commercial
11	0	0	20	20	Elderly Housing; Social Services
12	0	20	520	550	MAT Hotel Site
13	555	575	580	600	World Trade Center
14	2,360	2,360	2,360	2,360	Security Pacific Bank
15	0	2,050	4,150	5,400	Maguire Development
16	0	0	150	1,400	Office
17	0	80	240	240	Soc. Serv.; Hotel; Commercial; Angel's Flight
18	2,030	2,030	2,030	2,530	Union Bank Square
19	0	1,325	1,475	1,475	Bonaventure Hotel
20	0	0	1,540	2,100	Garage + Offices
21	2,740	3,020	6,020	6,020	One Bunker Hill; Pacific Mutual
22	1,600	2,120	2,140	2,140	Pacific Telephone
23	<u>2,140</u>	<u>2,250</u>	<u>2,250</u>	<u>2,300</u>	Subway Terminal Bldg; Auditorium Bldg.
B-TOTAL	11,585	16,735	24,585	32,720	

TABLE 12, Continued  
TOTAL EMPLOYMENT SUMMARY

1 ZONE ER	<u>1975</u>	<u>1981</u>	<u>1985</u>	<u>1990</u>	<u>REMARKS</u>
24	360	560	910	910	Coldwell-Banker; Jonathan Club
25	9,590	10,140	10,170	10,170	ARCO Plaza
26	640	660	660	660	Bank of Calif.; 1/2 Library; California Club
27	2,750	2,750	2,750	2,750	1/2 Library; Crocker Bank Bldg.
28	2,630	2,630	2,630	2,630	Biltmore Hotel; Pacific Mutual
29	50	50	50	50	Pershing Square
30	10	1,105	1,105	1,105	Cathedral Site
31	3,100	3,100	3,100	3,100	
32	5,085	5,085	5,085	5,085	UCB & Mobil
33	715	715	715	715	University Club
34	4,150	4,150	4,150	4,150	One Wilshire, Etc.
35	1,610	1,540	1,540	1,540	Athletic Club; Jewelry Mart
36	1,355	1,355	1,355	1,355	Hilton Hotel Center
37	1,280	1,280	1,280	1,280	
38	795	795	795	795	
39	670	695	745	795	
40	70	1,835	4,070	4,070	Mixed Use
41	860	860	860	2,380	
42	3,300	3,300	3,300	3,300	Broadway Plaza; Hyatt Regency
43	710	710	710	710	Robinsons
44	950	950	950	950	Brooks Bros; Lane Bryant
45	1,810	1,860	1,860	1,860	
46	20	20	20	20	
47	230	230	230	230	
	<u>1,290</u>	<u>1,290</u>	<u>1,290</u>	<u>1,290</u>	South Park
-TOTAL	55,615	64,400	74,915	84,620	

TABLE 12, Continued  
TOTAL EMPLOYMENT SUMMARY

ZONE NUMBER	1975	1981	1985	1990	REMARKS
49	190	190	190	190	South Park
50	700	700	700	700	4 Hotels + Salvation Army
51	450	450	450	350	Kent Inn; South Park
52	1,220	1,220	1,150	1,150	South Park
53	2,320	2,245	2,235	2,225	South Park
54	400	400	400	400	South Park
55	1,400	1,050	1,050	1,050	South Park; Holiday Inn
56	1,350	1,300	1,200	1,100	South Park
57	6,020	6,020	6,020	6,020	South Park; Occidental Bldg.
58	50	50	50	550	Convention Center
59	3,700	3,650	3,550	3,500	State of California Building
60	7,700	8,000	8,500	9,000	Spring St.; Caltrans; Co. Eng.; Bradbury, etc.
61	800	800	3,070	3,070	New State Office Building
62	1,910	2,310	2,895	2,895	New Otani--Little Tokyo
63	1,350	1,820	1,820	1,720	1/2 Jewelry Court/old building
64	4,500	5,025	5,025	5,050	Alexandria Hotel; SCRTD, Skid Row
65	1,525	1,425	1,325	1,225	Skid Row
66	1,150	1,150	1,150	1,150	Skid Row
67	2,425	2,595	1,495	1,395	1/2 Jewelry Center
68	4,250	4,150	4,050	4,050	Bullocks (main store)
69	1,580	1,080	880	880	Old P.E. Building
70	1,650	1,650	1,650	1,650	RTD Terminal
71	5,700	5,400	5,100	4,900	May Company (main store)
72	3,000	2,450	2,050	1,750	
73	<u>2,320</u>	<u>2,320</u>	<u>2,320</u>	<u>2,320</u>	
TOTAL	113,275	121,850	133,240	142,910	

TABLE 12, Continued  
TOTAL EMPLOYMENT SUMMARY

01 ZONE   BER	1975	1981	1985	1990	REMARKS
74	4,700	4,700	4,700	4,700	Garment District
75	1,250	1,450	1,450	1,250	Garment District
76	1,850	1,450	1,350	1,250	Garment District
77	2,670	3,700	4,200	4,200	Garment District
78	2,350	2,350	2,350	2,350	Garment District
79	1,470	1,470	1,470	1,470	
80	650	650	650	650	
81	1,250	1,250	1,250	1,250	Garment District
82	6,950	6,950	6,950	6,950	Garment District
83	50	50	50	50	Boundaries Unclear
84	1,520	1,520	1,520	1,520	Board of Education Olvera Street
85	100	140	140	140	
86	0	0	0	0	
87	3,500	3,500	3,500	3,500	Hall of Justice Fed. Ct.; P. O.
88	4,600	4,630	4,630	4,680	Federal Building
89	0	0	0	0	Four-Level Fwy Interchange
90	795	795	895	895	Co. Health
91	2,810	2,810	2,810	2,810	D.W.P. Building
92	6,790	6,790	6,800	6,800	Co. Admin.
93	2,400	2,400	2,400	2,400	Hall of Rec.
94	5,000	7,000	7,000	7,000	City Hall; New State Bldg.; Criminal Courts
95	3,050	3,050	3,050	3,050	City Hall E. & S.
96	1,300	1,300	1,300	1,300	Police Department
97	<u>2,600</u>	<u>2,590</u>	<u>2,735</u>	<u>2,735</u>	Little Tokyo
UB- TOTAL	170,930	182,395	194,440	203,860	

TABLE 12, Continued

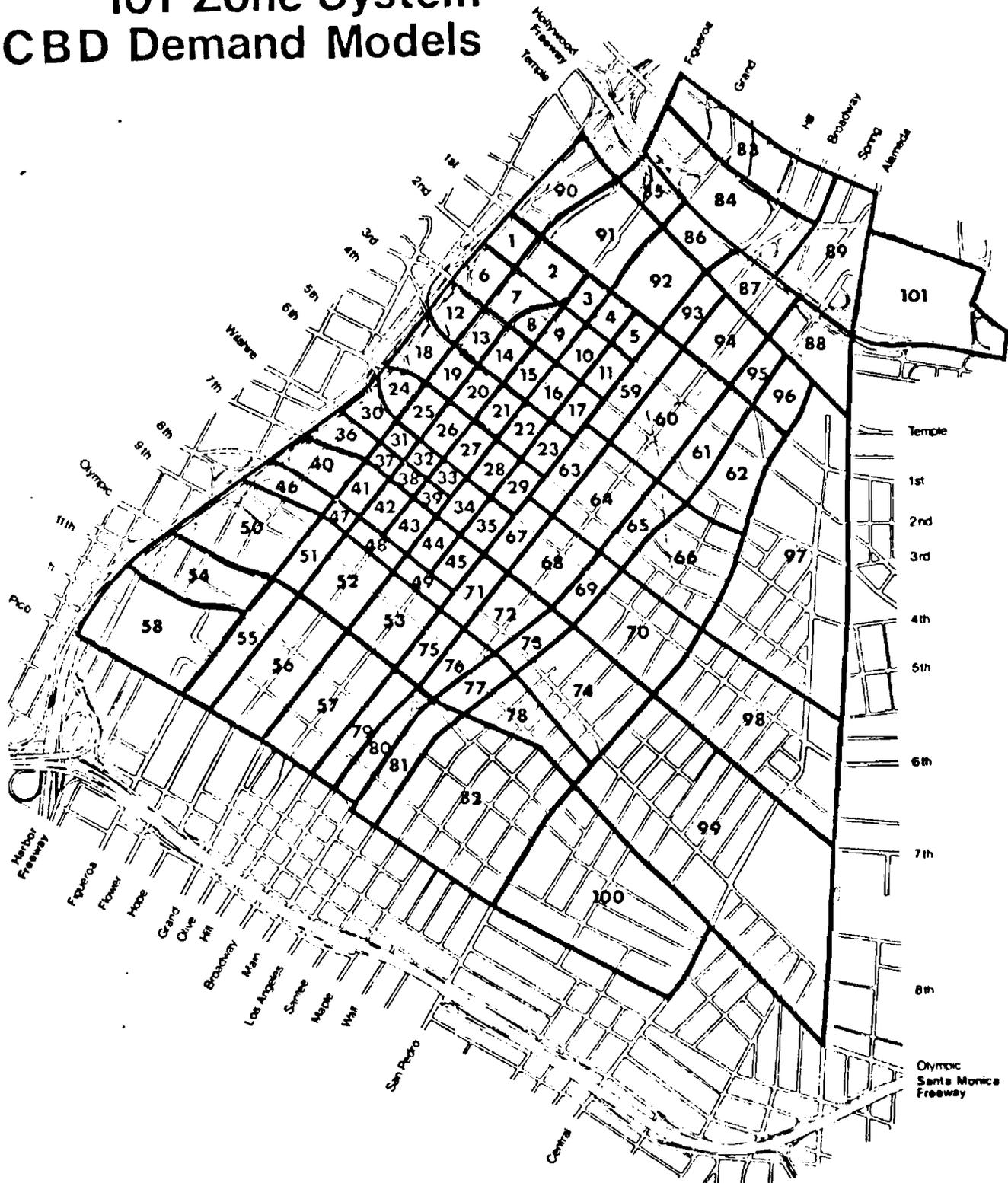
TOTAL EMPLOYMENT SUMMARY

<u>ZONE NUMBER</u>	<u>1975</u>	<u>1981</u>	<u>1985</u>	<u>1990</u>	<u>REMARKS</u>
98	2,400	2,350	2,300	2,300	Wholesale
99	7,750	7,700	7,650	7,600	Wholesale
100	4,400	4,400	4,400	4,400	Wholesale
101	<u>3,000</u>	<u>3,000</u>	<u>3,020</u>	<u>3,020</u>	Post Office & Union Station
RAND TOTAL	188,480	199,845	211,810	221,180	

# LAND ANALYSIS ZONES

## 101-Zone System

### CBD Demand Models



DPM  
PLANNING  
CORRESPONDENCE

DOCUMENTATION OF SCRTD SUPPORT FOR  
AND INVOLVEMENT IN DPM

SCRTD Support for  
and Involvement in  
CRA Downtown People Mover (DPM) Project

Selected Items (listed in chronological order)

- RTD staff to advise UMTA that CRA DPM grant application under serious consideration - SCRTD Board Resolution - August 1976
- Rapid Transit Staff Report to Board on DPM - August 1976 (No recommendation, status report only)
- RTD endorsement of DPM demonstration grant application - SCRTD Board Resolution - September 1977
- CRA letter (Ms. Banerjee) December 20, 1977 to RTD Planning which requests more formal RTD planning input
- CRA letter (Person) December 28, 1977 to RTD Planning which urges DPM bus intercept of proposed freeway transit buses
- RTD letter (Taylor) January 16, 1978 to CRA responding to CRA letters of December 20 and December 28: basic intercept policy outlined
- DPM-Bus Intercept policy - SCRTD Board Rapid Transit Committee resolution - February 9, 1978; also letter of transmittal (Taylor to Townsend) CRA
- Background outline: origins of RTDP

Attachments

DGM/dmg

2/22/78

Report of the General Manager Pro Tempore (continued)  
are responsive to the community - - also, a similar  
survey in the South Bay area.

Mr. Heinle also reported that the staff has  
been attempting to set up a joint meeting with the  
Board of Supervisors regarding the Fiscal Year 1977  
contract with the County but has been unsuccessful  
because of the Supervisors being unavailable, due  
to vacations, etc.

Line Ridership Report - Received and Filed

On motion duly made, seconded and unanimously  
carried, Agenda Item No. 26, the Line Ridership  
Report, was ordered "Received and filed."

Adoption of Resolution Advising UMTA that the  
Board of Directors has the People Mover Application  
of the City of Los Angeles Under Serious Consideration

Director Takei reported that the City of Los  
Angeles was submitting an application to UMTA on  
August 6 for a demonstration grant on the downtown  
people mover project, and suggested the Board support  
the proposal.

It was pointed out that the project had been  
included as a part of the Alternative Analysis  
Rapid Transit Starter Line presently under study  
with a report due within 30 days.

Resolution  
No. Assigned

Adoption of Resolution Advising UMTA that the Board of Directors has the People Mover Application of the City of Los Angeles Under Serious Consideration (continued)

Albert Perdon, Transportation Planner with the CRA, and Norman Emerson, Executive Assistant to the Mayor, appeared before the Board urging endorsement of the application; that the study has been underway for several years and has been integrated in the Alternative Analysis.

Director Takei moved to endorse the City's application to UMTA concept in principle, subject to RTD being the operator of the system, which motion was seconded.

The following are the principal points discussed in connection with the matter:

Would the RTD be the operator of the system and would the system be compatible with the Starter Line?

The RTD had endorsed the concept about three years ago and had transmitted a draft agreement to the CRA and the City. It was understood the agreement had been approved by the CRA but not by the Los Angeles City Council.

Would the people mover eventually exclude the District from constructing a subway in the downtown area; also, UMTA was concerned about duplication and this is a matter which should be determined before final action is taken.

City representatives stated it was not possible to wait until September on the Alternative Analysis report, since UMTA was considering 36 cities with three to be selected for possible people mover grants and the City's application had to go in immediately.

Resolution  
No. Assigned

Adoption of Resolution Advising UMTA that the Board of Directors has the People Mover Application of the City of Los Angeles Under Serious Consideration  
(continued)

The City contemplates local matching funding as follows:

\$15.3-million - State Prop. 5  
7.6-million from City } may or may not be  
7.6-million from County) Prop. 5 funds  
7.6-million - revenue bonds, etc.

(Director Brewster departed at 4:20 p.m.)

The District staff had not been furnished a copy of the application for review and study.

To include the RTD as the operator of the system would require additional action by the City Council and there was not time to obtain that action prior to filing the application.

SCAG and the County Board of Supervisors would also be asked to support the application.

Withholding of a decision by the Board until its August 25 meeting would be a problem to the City, since UMTA is making decisions in the next two or three weeks.

The original alignment of the line has now been changed from originating westerly of the CBD and thence through the Bunker Hill area to the CBD to an alignment from Union Station to the Convention Center, which could conflict with the alignment of the Starter Line.

After lengthy discussion, on substitute motion of Director Holen, seconded and carried as noted below, the following resolution was adopted:

Resolution  
No. Assigned

Adoption or Resolution Advising UMTA that the Board of Directors has the People Mover Application of the City of Los Angeles Under Serious Consideration  
(continued)

Ayes: Cook, Gregory, Holen, Lewis,  
Richter, Takei  
Noes: None  
Abstain: None  
Absent: Brewster, Gibbs, Neusom, Price,  
Ward

R-76-384

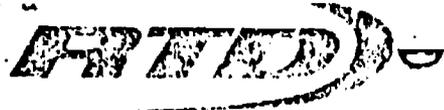
RESOLVED, that the staff is authorized to advise UMTA that this Board of Directors has under serious consideration the City of Los Angeles' application to UMTA for a demonstration grant for construction of a people mover system in the Los Angeles Central Business District, that the City's application has been referred to the Rapid Transit Advisory Committee (RTAC) and the District staff for a recommendation and the matter will be further considered at its Special Meeting on August 17, 1976;

RESOLVED FURTHER, that the District has previously endorsed the concept of a people mover system in the Los Angeles Central Business District on an alignment other than that being proposed in the aforementioned application.

Following the above discussion, Mr. Emerson stated he would have a copy of the City's application delivered immediately to the staff for study.

Director Gregory Report

Director Gregory reported this was her last meeting as a member of the Board and personally thanked many members of the staff for their cooperation and support during her tenure as a member of the Board.



**SOUTHERN CALIFORNIA  
RAPID TRANSIT DISTRICT**

1060 SOUTH BROADWAY • LOS ANGELES, CALIFORNIA 90015 • TELEPHONE (213) 749 6977

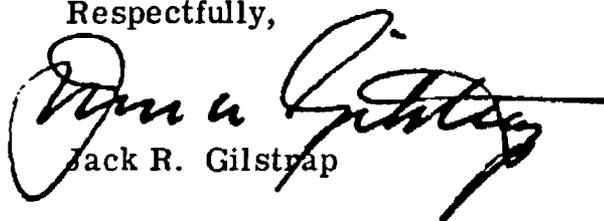
**JACK R. GILSTRAP**  
GENERAL MANAGER

August 16, 1976

**To: Members of the Board of Directors**  
**From: Jack R. Gilstrap, General Manager**  
**Subject: Report on Starter Line/Downtown People Mover Proposal**

Attached, in accordance with your request of August 4, find the Rapid Transit Staff's report containing comments on the City's Downtown People Mover Proposal.

Respectfully,

  
Jack R. Gilstrap

BY   
Richard Gallagher  
Manager, Rapid Transit Dept.

JRG:RG/sr

**Attachment**

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**

1080 SOUTH BROADWAY  
LOS ANGELES

DO NOT INCLUDE MORE THAN ONE  
SUBJECT IN THIS COMMUNICATION

DATE: August 13, 1976

TO: Jack R. Gilstrap, General Manager  
FROM: Richard Gallagher, Manager, Rapid Transit Dept *RG*  
SUBJECT: Overview of the City's Downtown People Mover Proposal

Per your Board's request, we herein review the way in which the Downtown People Mover has evolved as well as its relationship and compatibility to the District's present and adopted policies and programs for short and long term regional transportation improvements.

Original People Mover Plan

The people mover concept was originally conceived as the transportation element of the Bunker Hill Redevelopment Project of planned residential and commercial activities designed to revitalize that section of the urban core. As the project developed, it became readily apparent that projected parking spaces required could not be economically provided, on-site, for the parking and circulation needs of such high density development. This constraint led to the CRA's original idea of providing two, 4000 car, peripheral parking structures connected to the Bunker Hill Theme Building by a small car, fixed guideway shuttle system.

Modification Due to Proposed Enlargement of CRA Redevelopment Area

The original Bunker Hill People Mover project subsequently was redirected to consider the transportation needs of the enlarged downtown redevelopment area as proposed by the CRA (which is still the subject of controversy). The major issues to be resolved from this expanded concept include the following:

- Is the present CBD public transportation service adequate?

- What are the implications of improving the existing service?
- What are the other available options for improving public transit service in the CBD and implications thereof?
- How can these options be funded?

### Current Proposal

The City's proposed Downtown People Mover is the result of the CRA's endeavors to answer the above and other related questions. Their previous concern with downtown circulation is exemplified by their continued support of the District's Mini-bus operation. However, it is probable that the UMTA announcement of a people mover demonstration program has been the impetus behind the CRA's efforts -- as adequate funding was doubtful prior to the Federal government's announcement of its Demonstration Program to test the appropriateness of an automated shuttle service for urban centers. Unfortunately, this has placed the Starter Line Program and the DPM in competition for the same local funding.

The possibility of the concept being a success must be tempered with the realistic potential for failure due to the unproven ability of such a system to be both functional and compatible with the District's present and projected programs of regional bus and/or rail rapid transit improvements.

### CRA's Study Effort

Once the CRA's program was redirected to include the entire CBD, the CRA embarked on an Alternatives Analysis of circulation/distribution options therein. This analysis addressed the following policy options for transportation development in downtown Los Angeles:

- The Null Alternative: This alternative assumed that the downtown area would be able to adjust incrementally to accommodate transportation needs, without significant additional public transportation needs.
- Improved Bus Alternatives: This alternative consisted of a relatively moderate capital-intensive approach to improved transportation involving two distinct operational concepts. The first consisted of self-distributing buses operating as they do today. The second was a plan wherein about one-third of the freeway express buses coming into the CBD would be routed to intercept points with passengers transferring to a downtown bus system operating on preferential lanes.
- Bus/DPM Alternatives: This option combines the bus intercept theory (i. e., intercepting one-third of the freeway buses, none of the surface buses) with an automated guideway configuration for downtown distribution. Three alternative DPM alignments were then defined for comparative purposes, (1) Union Station to the Convention Center via the Westside of the CBD, (2) Union Station to Convention Center via the Eastside, and East-West Loop serving the World Trade Center, Bunker Hill, the RTD Greyhound Terminal and the Broadway Plaza/Hyatt Regency Hotel.

The DPM route selected by the City for submittal to UMTA is the first alignment described above. This alignment was chosen, however, contrary to the recommendation of the CRA's Citizen Advisory Panel which felt the eastside alignment would be more appropriate by serving as the catalyst for redevelopment in that sector of downtown. For illustrative and discussion purposes, we have prepared maps of the CRA's adopted alignment showing its relationship to the Starter Line options. (See Exhibits I and II).

#### Staff Comments on City's Proposal to UMTA

The proposal which the City has submitted to UMTA is a generally acceptable document supported by the year-long analysis of circulation/distribution options. Specific elements of the technical proposal warrant these comments.

- The Alternatives Analysis performed by CRA appears adequate to support a decision.
- The proposed DPM segment appears to be operationally feasible. However, it should be noted that the proposal calls for transit cars capable of carrying 80-85 passengers. These would seem to remove the system from the "small-car" people mover category.
- Their environmental assessment has recognized the potential visual, noise and construction impacts associated with placing a medium capacity system in aerial configuration in the CBD.
- The proposed project appears financially feasible in conjunction with either regional bus improvements alone or bus improvements plus a rail starter line. However, financial feasibility of the City's project depends upon contribution of State and County Proposition 5 funds as well as City funds. The problems associated with obtaining such a funding package are well known.

The total cost of the 1st phase DPM is estimated at \$167 million. They plan to issue \$7 million in Revenue Bonds to cover the cost of the parking structures. They indicate that the balance of the funds would come from the following sources:

"UMTA	\$131,200,000	
State, Prop. 5	16,400,000	
City, Prop. 5	7,700,000	
County, Prop. 5	7,700,000	
Value Capture	1,000,000"	
	<u>\$164,000,000</u>	(sic)

- Their Management Approach indicates that the SCRTD's only interface would be having one member on a 10 person Board of Control -- which Board would make all policy decisions.
- Regarding operation of the DPM, the proposal states only that "The City of Los Angeles will be responsible for the public passenger service of the system".

- They plan to pay the operating costs from fares, concessions, advertising, etc.
- 12% of transit patrons coming into the CBD via bus would find it advantageous to transfer to a westside people mover. The others would continue into and through the CBD on buses as at present.

Review of District CRA Agreement Developed in 1972-1973

A great deal of staff time and effort went into the drawing up of this for the administration of their original Bunker Hill Shuttle which was subsequently approved by the District Board and, I understand, the CRA Board. It never was approved by the City Council.

In that agreement the SCRTD, which was to operate the system, was assigned the major responsibility for design and construction. However, that agreement contains many provisions that need revision and it would not be appropriate for the current proposal.

RG/da

RESOLUTION NO. R-76-385

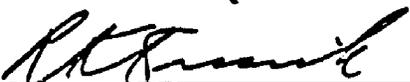
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

RESOLVED, that the Board of Directors of the Southern California Rapid Transit District endorses the application of the City of Los Angeles to the Department of Transportation, Urban Mass Transportation Administration, for a demonstration grant to construct a Downtown People Mover System, contingent on the District being the operator of the system and being involved in the planning and design of the system.

CERTIFICATION

The undersigned duly qualified and acting as Secretary of the Southern California Rapid Transit District certifies that the above is a true and correct copy of Resolution No. R-76-385 adopted at a legally convened meeting of the Board of Directors of the Southern California Rapid Transit held on August 17, 1976.

The undersigned further certifies that this resolution is in full force and effect and has not been rescinded or modified in any respect.

  
\_\_\_\_\_  
Secretary

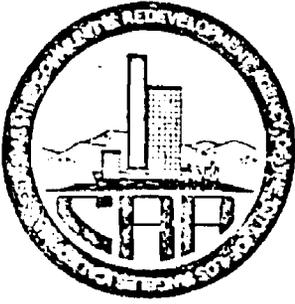
Dated: September 1, 1977

(SEAL)

DEC 23 1977

SURFACE PLNG.

## RENEWING THE CITY/BUILDING THE FUTURE



THE COMMUNITY REDEVELOPMENT AGENCY  
OF THE CITY OF LOS ANGELES, CALIFORNIA  
727 West 7th St., Suite 400, Los Angeles, Ca. 90017 (213) 688-7520

P11.15.2

FILE CODE

KURT W. MEYER, F.A.I.A.  
Chairman

ALAN A. GOLDSTEIN  
MARILYN W. HUDSON  
LUIS G. NOGALES  
T. "TOOT" UCHIDA  
ANDREW WALL  
DR. EVERETT T. WELMERS

EDWARD N. HELFELD  
Administrator

DEC 20 1977

Mr. Ben Urban, Chairman  
Operational Planning Subcommittee of ITC  
Southern California Rapid Transit District  
425 South Main Street  
Los Angeles, California 90013

Dear Ben:

I read the minutes of the November 29 meeting which we could not attend and was somewhat confused. The minutes referred to a "follow up version" of our goals and policies. It was my understanding that at the previous meeting no one had any comments regarding the goals and policies and I would provide to you 20 copies of them with a cover letter stating that no variations could be made until Preliminary Engineering began. You should have those 20 copies and I hope we have fulfilled all that is required of us on that task. The cover letter explains the relation of the material to subsequent Preliminary Engineering activities.

Regarding the downtown routing of the bus plan, I think we need more formal input from your staff before we can fully respond. Members of our staff have reviewed the proposed bus plan and have numerous questions that need to be addressed before we can comment on its adequacy. I am enclosing a list of these questions to give you some idea of items we would like to discuss. I thought it best not to submit this entire list to the Operational Committee because I do not want to cause delays in your work if they are possibly unnecessary.

At a previous meeting you and Al Holman said that the bus plan was conceptual and designed only to allow you to proceed with estimating line-haul service at a regional level. The overall intent was to obtain data to prepare a regional ballot measure. If in fact your intent is to support such a regional effort recognizing that a successful vote would lead to preparation of a much more careful operational bus plan for downtown, then we would not want to delay your work schedule. On the other hand if this concept will be used as a definitive downtown routing scheme for near term planning and analysis, then we do have concerns and will request a series of meetings the first of the year to review

Page Two

the bus plan in detail. As you know we are concerned about our EIR workschedule and we will rely upon our bus work to date as is unless the District plans an order of magnitude effort to provide within our time frame data at a comparable level of detail.

From previous conversations with you, I don't think we have an inter-agency problem and so that is why these questions were not submitted to your committee. SCRTD will have a hard enough time meeting the deadlines already set and we would like to work with you on a cooperative basis.

Best regards and happy holidays,

  
Frances T. Banerjee  
Transportation Planning Manager

enclosure



RENEWING THE CITY/BUILDING THE FUTURE

THE COMMUNITY REDEVELOPMENT AGENCY  
OF THE CITY OF LOS ANGELES, CALIFORNIA  
727 West 7th St., Suite 400, Los Angeles, Ca. 90017 (213) 688-7520

P11.15.2  
FILE CODE

KURT W. MEYER, F.A.I.A.  
Chairman

ALAN A. GOLDSTEIN  
MARILYN W. HUDSON  
T. "TOOT" UCHIDA  
ANDREW WALL  
DR. EVERETT T. WELNIERS  
JAMES M. WOOD

EDWARD N. HELFELD  
Administrator

DEC 28 1977

Mr. Ben Urban  
Southern California Rapid Transit District  
425 South Main Street  
Los Angeles, California 90013

Dear Mr. Urban:

As requested, I have reviewed the Conceptual Central Business District Alignments prepared by SCRTD for the Freeway Transit element of the Regional Transit Development Program. My primary concern regarding the two proposed concepts is that neither of them makes use of the intercept facilities proposed in the People Mover program to reduce the number of buses on downtown streets.

Our analysis indicates that more efficient routing could reduce the projected 6,500 daily bus trips on downtown streets by up to 700 trips. This could enable a savings in capital costs for bus acquisition of \$3 million, in addition to savings in annual operating costs of \$3 million. This routing would make use of the intercepts as real intercepts and not merely as another stop in a self-distributing bus scheme.

There appears to be considerable concern in the concept plan for "system service convenience" and "routing convenience." From an operator's perspective these are naturally important considerations. However, our interest in downtown is somewhat broader. Not only do we regard the bus to People Mover transfer at the intercept to be a convenience rather than an inconvenience, but also we feel that the needs of the transit rider must be balanced against the needs of the same rider, and others, once they are in downtown. Our analysis indicates that buses have a major disruptive impact on downtown as a business center and as a pedestrian activity center. Despite the many years of demonstrated public concern regarding deteriorating environmental quality, little has been done to alleviate the impact of the bus on its immediate surroundings. This is one of the many factors leading to the proposal for bus/auto intercepts and automated guideway transit.

Downtown streets will remain congested, no matter what we do, because of the nature of our auto-dominated transportation system. The People Mover has been proposed as an alternative to the auto and its relatively poor service characteristics on congested downtown streets. Likewise, buses are subject to the same service problems. On some express bus routes, while downtown represents 10 percent of the trip length, it represents 30 percent of the trip time. More effective use of the intercept strategy than proposed in the alignment concept could improve operating efficiency, reduce capital and operating cost, improve "system service convenience" and "routing convenience," and set a trend for improving environmental quality of downtown pedestrian space. While this is particularly important for near-term planning, it is significant also for conceptual planning leading toward community support for the Regional Transit Development Program.

The People Mover is more than a local circulation system. It is an element of a regional transportation plan. While bus routes to the CBD are currently oriented to serve downtown-destined travelers, most auto travel to the CBD is "through" travel. That is, most people entering downtown are destined to a location on the other side of the Central City. Clearly, the Freeway Transit element of the Regional Transit Development Program is directed at a market not now widely served by SCRTD. That market is the non-transit dependent -- the rider who would be riding by choice. Since a majority of that market entering downtown is not destined to downtown, freeway transit buses should be routed accordingly. The intercept strategy, which SCRTD itself is promoting at Los Angeles International Airport, is particularly effective for serving the non-CBD-destined traveler. The People Mover makes it possible to provide a high service level to the CBD-destined traveler as well.

I recommend that you thoroughly re-evaluate the conceptual alignments proposed. I also recommend that you evaluate the service and economy benefits associated with the intercept strategy as we have proposed, so as to confirm the results of our analyses. Finally, I recommend that you review the extensive quantity of data and plans developed as part of the Los Angeles Bunker Hill and Central Business District Circulation/Distribution Program. Much of the bus planning done as part of that program (by expert bus planners formerly employed by SCRTD) is directly applicable to the work you are now doing. These data have already been provided to SCRTD.

The staff here at CRA is anxious to work more closely with your staff so as to arrive at a bus plan that takes into consideration all of the important factors that have a bearing on the solution to transportation problems of the Central City.

Sincerely,



Albert Perdon, P.E.  
Program Coordinator  
Circulation/Distribution System



Southern California Rapid Transit District  
425 South Main St. Los Angeles, California 90013  
Telephone (213) 972-6000

January 16, 1978

Mr. Al Fardon  
Transportation Planner  
Community Redevelopment Agency  
727 West Seventh Street  
Los Angeles, California 90017

Dear Al:

In view of your December 28 letter, which followed a related letter of December 20 from Frankee Banerjee, it appears that a response is necessary on my part to clarify the status of our RTDP bus planning efforts. As Ben Urban's letter of December 29 to Frankee stated, possible CBD bus routes for freeway transit were drawn in order to obtain initial patronage and operating line haul costs at a regional level. In order to meet Caltrans' work schedule, this was done ahead of the rest of the RTDP Element III CBD bus planning.

According to the approved SCRTD work program, there are two major components of the SCRTD Planning Department's Element III work. First is the people mover bus support plan and second is a general CBD bus plan. The latter is intended to bring about CBD service changes that appear to be needed anyway before the projected start of people mover service. Both of these tasks require a review of alternative service concepts at the conceptual level prior to getting down to detailed analysis.

In order to keep this planning work within the "real world", capable of being implemented, as we have done with our suburban sector planning work, SCRTD's management staff and Board will review and approve the work as it progresses. At several major points in our Element III work, the ITC will also be reviewing the work, much as it has been doing to date with the freeway transit work and other RTDP elements.

The substantive CBD bus planning issues raised in the letters from you and Frankee should be addressed to everyone's satisfaction as the Element III CBD bus planning work

evolves. The factors determining the rate of this evolution will be the needs of the people mover project together with the availability of data and RTD staff. Details of the freeway transit element within the CBD will be included as a part of this analysis.

It appears to us that the DPM support plan (with the DPM, of course, a given) is likely to involve a self distribution service concept for some bus lines and interception of other trunk bus lines. Consistent with your people mover planning estimate of about 10% of RTD's CBD-bound passengers using the people mover, convenient interface with the DPM for the maximum number of freeway and surface trunk bus lines would be attempted with limited bus intercept. By "bus intercept", I mean stub ending or turnaround of the bus at the edge of the CBD (whether at DPM, rail or bus stations). In "bus interface", I see provision for convenient passenger transfers to and from bus lines but with the trunk bus line continuing through the CBD in a self distribution mode.

While our analysis must still demonstrate the likelihood, "intercepting" of buses may well result in some reduction in bus operating costs. Eliminating some buses from the CBD -- if they are not replaced by more autos -- would improve the CBD environment as a place to work, shop and live, with less noise and odor. On the other hand, any transfer -- whether vehicle-to-vehicle in the same mode or from mode-to-mode -- is an inherent disincentive to transit use. Forcing riders to transfer in order to make just a small segment of their total trip, regardless of the mode, may cause some potential bus riders to remain in their autos.

These opinions are merely our conjecture at this point in the RTDP planning work. From our point of view, they appear reasonable. In any event the possible freeway transit conceptual routing<sup>a</sup> recently reviewed by the ITC will be "re-evaluated", as you request, together with all other aspects of CBD bus planning (including the basic bus planning work already accomplished by the CRA consultants).

I take you at your word that you truly desire close CRA-SCRTD liaison and coordination on CBD bus planning work. The work won't be worth doing any other way. To be most

Mr. Al Perdon

-3-

January 16, 1978

effective, my staff needs to be involved with the bus aspects of your work at every step of your upcoming refinement phase -- including all work on refinement of patronage projections. Let's get together soon to decide how this can be accomplished.

Sincerely,

ORIGINAL SIGNED BY PAUL TAYLOR

Paul C. Taylor  
Director of Bus Planning

bc: Dan Miller  
Frank Schroder  
Ben Urban

PCT/dmg

February 20, 1978

Mr. Daniel T. Townsend  
Program Director  
Community Redevelopment Agency  
727 West 7th Street  
Suite 400  
Los Angeles, California 90014

Dear Dan:

I recently briefed our Board's Rapid Transit Committee on the status of our involvement in Element III of the Rapid Transit Development Program. The Committee provided a statement of direction for my staff; it also requested this be transmitted to CRA. I am enclosing herewith the Minutes of the Rapid Transit Committee meeting of February 9, 1978.

Should you or your staff have any questions regarding our Board's direction, do not hesitate to call.

Best regards,

Paul C. Taylor  
Director of Bus Planning

Enclosure

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

Minutes of Rapid Transit Committee Meeting  
February 9, 1978

Directors present: Gerald B. Leonard, Chairman  
Thomas G. Neusom, Vice-Chairman  
Byron E. Cook  
Jay B. Price  
George Takei

Staff present: Jack R. Gilstrap  
Richard Gallagher  
Paul Tayler  
Dan Miller  
George McDonald  
Richard K. Kissick  
Joe B. Scatchard

Also present: Members of the public  
Director Charles Storing  
Director Mike Lewis

The meeting was called to order at 1:55 a.m. by Chairman Leonard.

Agenda Item No. 1

The Committee was provided a status report on the District's participation in the Downtown People Mover Element of the RTDP. Topics discussed are shown in the attached Exhibit A.

Mr. Taylor reviewed the District's approved work program and the CBD bus planning issues and analysis.

Upon motion of Director Price, seconded and unanimously carried, the Committee recommended the following information be transmitted to the Community Redevelopment Agency:

"In an attempt to support the City's estimate of about 30,000 of RTD's CBD-bound passengers using the People Mover, convenient interface with the DPM for the maximum number of freeway and surface trunk bus lines would be attempted with bus intercept employed consistent with travel demands to, through and within the CBD, (that is, no inconvenience through forced transfer.)"

Agenda Item No. 1 (cont.)

"Bus intercept is taken to mean stub ending or turnaround of the bus at the edge of the CBD (whether at DPM, rail, or bus stations.) Bus interface means provision for convenient passenger transfers to and from bus lines, but with the trunk bus line continuing through the CBD in a self-distribution mode, with every attempt made to avoid the duplication of service along the people mover route."

Agenda Item No. 2

Mr. Gallagher reported data is currently being developed on the Regional Core Rapid Transit Alternatives Analysis.

-----  
The meeting adjourned at 2:58 p.m.

  
-----  
Committee Secretary

ORIGINS OF  
REGIONAL TRANSIT DEVELOPMENT PROGRAM (RTDP)

"Summit Meeting" Consensus September 1976

Under aegis of California Secretary of Bus Transportation Donald Burns Agreement reach on combined program, including

- Caltrans preference for greater use of buses on freeways
- City of Los Angeles desire for a downtown circulation distribution system and greater use of buses
- SCRTD's concept of expanded bus service with a small segment of rapid transit line (in corridor not adequately penetrated by freeways for express bus service)

US Secretary of Transportation William Coleman, December 22, 1976 letter authorizing to proceed on four point program

Elements

- I. Improved Bus Service using transportation systems management (TSM) techniques;
- II. Freeway Transit System, including bus/carpool exclusive lanes to provide free-flow service;
- III. A Los Angeles CBD Circulation/Distribution System; and
- IV. A Regional Core Rapid Transit Element

OTHER CORRESPONDENCE

DEPARTMENTAL

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

425 SOUTH MAIN STREET  
LOS ANGELES

DO NOT INCLUDE MORE THAN ONE  
SUBJECT IN THIS COMMUNICATION

DATE: April 13, 1978

TO: Gil Hicks  
FROM: Dan Miller *DM*  
SUBJECT: DPM Stations: Bus Loading and Lay Over Requirements

Following up on our April 3 meeting, this is written confirmation of RTD's preliminary estimates of bus interface requirements with the DPM stations. It should be understood that these estimates are simply best guesses at this time in advance of a more thorough review of likely and possible 1990 bus operating conditions within the Los Angeles CBD. Below is a summary statement followed by specifications of travel volume and route design assumptions.

You will note that quick freeway bus access to and from the DPM Union Station Terminal is deemed to be essential for good express bus interface with the terminal. It is suggested that, at least for one design option, CRA require the terminal design consultants to develop a station design that includes this two-way bus-freeway access, (both inbound and outbound). With this design alternative CRA could proceed to negotiate with CalTrans on this design issue.

SUMMARY OF BUS - DPM INTERFACE REQUIREMENTS

A. DPM Union Station Terminal

1. Busway/Freeway Transit Trunk Line Interface

Assumed peak hour bus volume (1990)

Prevailing Direction - 100; Reverse Direction - 35;  
Total - 135

Requested bus stalls: 12 (8 for through buses and 2  
for intercept buses, with  
2 extra stalls)

NOTE: In the operation of intercept buses it may be desirable, if not essential, to have available on-site bus parking spaces for short term or midday bus layovers. At assumed bus intercept volumes, this would add 2-4 bus parking spaces to the off street bus parking requirement for the surface bus lines terminating at stations.

2. Surface Lines Terminating at Station (Off Street Facilities)

Assumed peak hours bus volume (1990)

Bus arrivals - 40; Bus fit-ins - 30; Bus departures - 70

Requested bus loading spaces: 5

Requested bus parking spaces (for bus layover) - 12  
(10 for layover and 2  
for bus fit-ins)

3. Surface Lines with Adjacent On Street Bus Stop

Assumed peak hour bus volume (1990)

Prevailing Direction - 30; Reverse Direction - 15

Requested bus loading spaces: 3 (2 spaces plus one extra)

In each direction, curb side, (pedestrian overpass desirable, or mid block cross walk with traffic signal)

B. DPM Convention Center Terminal

1. Freeway Express/Freeway Transit Trunk Line Interface

Assumed peak hour bus volume (1990)

Prevailing Direction - 64; Reverse Direction - 20;  
Total - 84

Requested bus stalls: 8 (if only directional curb side treatment is provided in place of off street terminal, 6 stalls in each direction are requested.)

Otherwise requested bus stalls: 10 (6 for through buses and 2 for intercept buses, with 2 extra stalls)

NOTE: In the operation of intercept buses it may be desirable, if not essential, to have available on-site bus parking spaces for short term or midday bus layovers. At assumed bus intercept volumes, this would add 2-4 bus parking spaces to the off street bus parking requirement for the surface bus lines terminating at stations.

2. Surface Lines Terminating at Station (Off Street Facilities Preferred)

Assumed peak hour bus volume (1990)

Bus arrivals - 20; Bus fit-ins - 20; Bus departures - 40

Requested bus parking spaces (for bus layovers): 7  
(5 for layover and 2 for bus fit-ins)

Request bus loading spaces: 3

3. Surface Lines with Adjacent On Street Bus Stops

Assumed peak hour bus volume (1990)

Figueroa: Prevailing Direction - 6; Reverse Direction - 4;

Pico: Prevailing Direction - 24; Reverse Direction - 24;

Requested bus loading spaces

Figueroa: 2 spaces in each direction, curb side

Pico: 3 spaces in each direction, curb side  
(with pedestrian overpass desirable, if DPM terminal station in close proximity to Pico Blvd., say 500 feet)

C. DPM Third and Hill Streets Station

Assumed peak hour bus volume (1990)

Prevailing Direction - 100 buses; Reverse Direction - 60

Requested bus loading spaces for curb side loading

Northbound 8 spaces (with pedestrian overpass desirable  
or mid block cross walk with traffic signal)

Southbound 6 spaces

D. Other Intermediate DPM Stations

Projected bus volume dependent upon location but wherever regular bus service operates, a minimum of 2 bus loading spaces is desirable, curbside in each direction, with or without special bus loading bays.

## CONCEPT OF BUS OPERATION\*

### Three Types of Bus - DPM Connections

The two DPM terminal stations at Union Station and Convention Center should be designed to handle three types of bus - DPM connections for maximum passenger convenience and efficient bus operations:

- (1) Busway and Freeway Express or Freeway Transit Trunk Line Service

DPM connections with through routed service

DPM connections with intercepted buses  
(buses terminate service at DPM station)

- (2) Surface bus lines terminating at station in off street facilities (may or may not be operated together with bus trunk line terminal)

- (3) Surface bus lines with adjacent on street bus stop

### Surface Bus Lines Terminating at DPM Terminal Stations

The function of handling freeway bus service connections is first priority. However provision for connections between the DPM and surface bus operations will increase the utility of the terminal stations as a general transportation center. In addition to the option of remaining on board the arriving bus for through routed self distributing. With proper surface bus route design, convenient surface bus connections will enable freeway bus patrons to transfer to several surface bus routes in addition to the DPM. This will increase CBD bus distribution and circulation trip options which will improve general mobility by public transportation within the CBD.

In order to increase options for surface bus connections to the DPM, provision for surface line terminal facilities is necessary. Ideally this interface should be operated as part of trunk bus line

\* Interface of the DPM with the station rail line is equally important, but this memo addresses bus - DPM interface only.

terminal facility. However an off street location adjacent to the main terminal will suffice, as long as a connecting bus ramp is provided so that buses can be shifted between express and local service routes (i.e. foreign line operation).

### Interface of CBD Through Buses versus Intercept Buses

For initial planning purposes, it is assumed that of all the express bus lines connecting to the DPM, about 80% of the bus trips will unload and load passengers at the DPM terminal and then continue on through the CBD operating in self distribution manner. The remaining 20% of the buses are assumed to be intercept buses. These buses will either return in service on the same route or else go out of service. Probably most of the intercept buses will go out of service or begin service at this point. Buses going into service at this point involve a staging requirement which is reflected in the request for bus stalls for intercept buses. In the operation of intercept buses it may be desirable, if not essential, to have available on site (off street) bus parking spaces for short term or midday bus layover. This bus parking requirement would be in addition to that cited for surface buses terminating at DPM terminal stations.

### Importance of Adequate Bus Capacity and Good Freeway Access for Buses

It is desirable that all express bus service passing through or adjacent to the DPM terminal stations stop at these stations. In order for this to be feasible 1) there must be adequate bus loading capacity and 2) pass through and unloading/loading delays must be minimized to avoid undue delay to through passengers not using the station. In order to route all corridor express service through DPM terminal stations it is suggested that maximum running time delay not exceed 3 minutes compared to a through routing which bypasses the DPM station on an adjacent street or freeway. Running time delays in excess of this amount can be expected to result in bypassing the terminal stations for some bus trips or perhaps for entire express bus routes in the corridor. Depending on how excessive the time delay is, all off peak bus trips and perhaps 1/3 - 2/3 of all peak period bus trips might have to bypass the station in order to avoid unacceptable service degradation in the form of increased trip time, to bus passengers not using the terminal stations. For the design of the Union Station - DPM terminal in

particular it appears a bus ramp to allow buses to access directly the freeway in both directions from the DPM bus terminal will be necessary to meet the above stipulated maximum acceptable time delay. Without provision for quick access to and from the freeway at this DPM terminal, RTD planning staff considers the terminal design deficient to the point of severely limiting the extent that express buses can be routed to serve the terminal. Similarly, depending on bus volumes without adequate bus capacity some buses would have to bypass DPM stations.

#### Through Surface Bus Lines with Curbside Bus Stops

For the curbside DPM bus connections at both terminal and intermediate DPM stations, off street terminal facilities are not requested nor probably desirable. Avoidance of running time delay is of paramount importance for these connecting bus lines, at the same time improving the waiting environment for transferring passengers and perhaps reducing walking distance and grades. Bus bays, if sufficiently long enough, given bus volumes, to enable buses to stop parallel to the curb, would be desirable. Bus shelters should be considered. Also depending upon projected volume of transferring passengers, pedestrian overpasses may be warranted, or mid block cross walks with traffic signal protection should be provided.

#### Provision for High Capacity Buses

To be consistent with emerging RTDP freeway transit plans, all terminal bus stops or stalls for express buses should be designed to handle both articulated and double decker buses as well as the current standard 40-foot transit bus. Also since a portion of the surface local bus fleet may use articulated buses in the future, these interface facilities should also be designed to handle these buses. While double decker buses are not at this time being considered for local surface bus service, roof overhangs, etc. probably should be designed to accommodate these taller buses.

### Bus Passenger Transfer Volumes

Further review and refinements are underway jointly by RTD-CRA as to bus passenger transfer volumes projected. These refinements impact projected bus trips per hour, waiting area space requirements and number of buses to be loaded per stall per hour. For the latter two aspects, the higher the bus passenger volumes projected, the greater is the requirement for passenger platform space, and the lower is the number of buses that can be loaded per stall per hour.

### Bus Operations Review of Terminal Designs

It is essential that the bus operating management staff review in detail the developing bus terminal designs at all major milestones, for example there needs to be adequate consideration of bus turning movement logistics, bus operating safety requirements, bus traffic control and dispatching, transit information and ticket sales (if any), fare collection (if any), transit security requirements, bus driver waiting areas and restrooms, public restrooms (if any), etc.

## ESTIMATING METHODS

As a starting point the formula and results from the El Monte Busway Station capacity analysis from the Second Year Busway Evaluation Report was reviewed. The formula used therein is stated as follows:

$$(\text{no. of bus stalls}) \quad (3600/TT) \quad (1-\text{discount})$$

Where 3600 is the number of seconds/hr., TT is the total time required to process a bus through the station, and the discount is a fudge factor applied to account for irregularity of bus arrivals.

Actual stop watch measurements, taken in February, 1975 show only a little over 100 seconds total delay per bus, but this was well a flat face (no fare zones or distance increments). If we hypothesize an additional 60-90 seconds delay per bus for the fare zone check, it turns out that the El Monte station capacity, using the above formula, is about 150 buses per hour or 15 buses per stall per hour. This equates to 4 minutes per bus per stall, which intuitively may appear to be an unreasonably low volume. Yet at present peak hour station volumes of only 2/3 of this 150 derived bus capacity, congestion and bus queing are sometimes observed during the peak 15-20 minutes of the peak hour. So, 15 buses per stall per hour is considered a mid range figure for these bus capacity estimates. In another format, 15 buses/stall/hour is equivalent to 6.66 bus loading spaces per 100 bus trips per hour. This rough estimate was employed generally for all three bus loading requirements: full terminal, off street terminal for surface lines terminating at DPM station and curb side loading.

The intercept buses at the DPM terminal stations, estimated at 20% of prevailing peak direction buses, require a staging movement from the division or other) bus parking area. A two minute bus reporting line ("spot time") was assumed with a minimum of two bus stalls required for bus intercepts.

Layover requirements for the surface buses terminating at the DPM terminal stations were estimated as follows:

$$60 \div ([BA] [15 \text{ min.}])$$

Where 60 is the number of minutes/hr, BA is bus arrivals, excluding fit-in buses, and 15 minutes is the assumed average layover time per bus.

In addition, each bus fit-in was assumed to require a 2 minute reporting time ("spot time") with a minimum of two bus stalls required for this purpose. . v-128

## TOTAL CBD TRANSIT PATRONAGE PROJECTIONS 1990

These DPM bus interface estimates herein are based on the 1990 low transit patronage estimates, being developed for the RTDP Element III, CBD bus planning work. Starting with the SCAG regional consensus projected 15% growth in CBD employment population, 30% growth in express bus and 10% growth in local bus services for the CBD is projected. Medium and high transit patronage forecasts will be included in the CBD bus planning work. These are substantially higher than the modest 30%/10% growth levels. However for purposes of recommending bus interface capacity requirements, RTD bus planning staff believes the low estimates are the most realistic. Furthermore, if the number of bus parking and loading spaces which are requested herein are provided in the station designs, there will be room for some growth above the low CBD bus transit patronage forecasts. This additional capacity can be obtained with special transit operations management efforts.

DEPARTMENTAL

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**

425 SOUTH MAIN STREET  
LOS ANGELES

DO NOT INCLUDE MORE THAN ONE  
SUBJECT IN THIS COMMUNICATION

DATE: April 19, 1978

TO: Al Perdon, CRA Staff and Chairman, ITC  
Subcommittee on Intermodal Stations

FROM: Paul C. Taylor

SUBJECT: RTD Planning Input for Design of DPM  
Terminal Stations

In order to provide your station design consultants with bus operations input on a timely basis, we have had to jump ahead of the completion of some of our analysis for the joint RTD-CRA proposed DPM bus support plan. A range of bus operating options for support of the DPM have been under review from zero to 100 percent bus intercept. Given the constraints of site selection and cost, our input to you reflects a desire for a station design at each DPM terminal which will permit maximum flexibility of transit operations (local bus, express/freeway bus, DPM and possible rail) under a reasonable range of varying conditions in 1990.

With respect to station design input for rail interface, an appendix prepared by Nadeem Tahir of Dick Gallagher's staff is included. Your final station designs, of course, will have to be compatible not only with good bus interface but also with the RTDP Element IV regional core program.

At your April 13 meeting, I was pleased to hear the direction that the conceptual design of the DPM Union Station terminal seems to be taking. The Planning Department strongly endorses the concept of an on-line, on-freeway bus station for through routed express/freeway buses and a separate but linked off line bus terminal for intercept buses (i.e., buses that begin and end their trips at this point).

As outlined by the members of my staff (Messrs. Miller & Urban) at your April 13 meeting, we feel comfortable at this time with an estimate that of all the peak period buses connecting with the DPM terminal stations, about 20% would be intercept buses and 80% would be through-routed buses. At

April 19, 1978

this point. I doubt that any of us has a clear idea of how many regional bus passengers the DPM will attract. A strong attraction rate would suggest that more than 20% would be intercept buses. On the other hand, we believe the on-line station ought to have a capacity to handle 80% of all the regional buses in the corridor.

Provision for adequate capacity on an "80%-through/20%-intercept" split, based on the assumed peak hour bus volumes, will help insure that all express buses in the corridor interface with the DPM Union Station terminal. We believe it is highly desirable that all bus trips stop at the station in order to maximize bus-DPM transfer opportunities. As stated in our April 13 memo (Miller to Hicks), some through-routed buses probably would have to bypass the DPM terminal if delays there are excessive - say, in excess of 3 minutes per trip. An on-line bus station, on or adjacent to the freeway, would minimize these delays to the point we could and would operate all regional express buses that were not to be intercepted into the on-line station regardless of possible low bus transfer rates to the DPM. For this to happen, there must be adequate on-line station capacity (i.e., adequate platform lengths).

Assuming an on-line and off-line station concept, we recommend some additional bus capacity for the off-line terminal. This would permit a shift in the "intercept/through" proportion from 20/80 to, say, 40% intercept and 60% through-buses, should bus/DPM passenger transfer volumes so warrant. The attached table breaks down the bus unloading/loading requirements and desired bus parking (for layover) between the proposed on-line and off-line bus stations at Union Station. The numbers are the same as the April 13 memo (Miller to Hicks), except that we have added two more bus loading spaces to provide for a possible greater future use of intercept buses than the estimated initial 20/80 split.

At the April 13 meeting, several staff members from other agencies commented on the lack of a concept of operation for the CBD buses in relation to the DPM. This is understandable since we have not yet gone to the ITC with a progress report on the RTDP CBD bus plan. However, internally, the CBD bus planning has evolved to the point where we do believe we have a clear conceptual idea of how the bus system will support the DPM. Hopefully, at least as it relates to the design requirements, this understanding is conveyed in our April 13 memo, a copy of which is attached.

April 19, 1978

Should you need additional clarification as to where we stand on our bus planning efforts in developing the DPM bus support plan, please feel free to call on Dan Miller, particularly regarding specifics that may not be covered in our on-going exchange of information. Specifically, for the design of the two terminal stations, it may be helpful for my staff to sit down with appropriate CRA staff and your design consultants to go over the details of the plans as to bus planning and operations aspects in advance of formal presentations to inter-agency staff. Dick Gallagher and his staff are available to provide you similar input for the required rail interface.

Finally, I want to reiterate our feeling that integral to the bus operation concept proposed for supporting the DPM is the bus layover requirement. Given site and cost constraints, we are mindful that we have to be flexible in our request on these points. However, high-volume bus interface operations, as contemplated, particularly when in part they involve peak period intercept buses (tripper services), require considerable space for temporary staging of buses as well as layovers.



cc: RTD: Dick Gallagher  
Planning Group Managers  
Al Styffe  
Nadeem Tahir

CRA: Gil Hicks

#### Attachments

- Table on Bus Interface Requirements at Union Station
- Appendix Rail Interface Requirements at Union Station\*
- April 13 Miller-to-Hicks memo: Bus Loading and Layover Requirements

PCT:DGM:mlp

\*To follow

DPM UNION STATION TERMINAL:  
Summary of Bus Interface Requirements  
With Separate On & Off Line Stations

Bus Spaces In/At Station	On Line Station for DPM Connections to Through Routed Freeway Buses	Off Line Station for DPM Connections to Intercept Freeway Buses	<u>Subtotal</u>	<u>Surface Buses Terminating at DPM Terminal**</u>	<u>Total</u>
Unloading/ Loading	6*	2	8	5	13
Spot Line	0	2	2	2	4
Expansion of Loading Capacity or Additional Spot Time Capacity	0	2	2	0	2
Subtotal	6*	6	12	7	19
Bus Parking For Layover**	0	2	2	10	12
TOTAL					31

Notes: \* 6 spaces in each direction assuming parallel bus lanes with center or side platforms

\*\* May be adjacent to terminal, rather than integral part of station loading/unloading area.

DGM/cor  
4-17-78

CURBSIDE BUS LOADING  
FOR THROUGH ROUTED SURFACE LOCAL LINES  
COVERED IN APR 13 MEMO



**Southern California Rapid Transit District**  
425 South Main St., Los Angeles, California 90013  
Telephone (213) 972-6000

JACK R. GILSTRAP  
General Manager

August 9, 1978

Mr. Daniel T. Townsend  
Program Director  
Circulation/Distribution  
System Program  
Community Redevelopment Agency  
727 West 7th Street  
Los Angeles, California 90017

Dear Mr. Townsend:

In response to your notice of CRA intent to prepare a Draft Environmental Impact Report, the District submits these comments relative to the District's responsibilities in connection with the proposed Downtown People Mover Project (DPM) for the Los Angeles Central Business District. We believe these concerns should be given appropriate attention as a part of the impact analysis of the Draft EIR.

In the opinion of RTD staff, at this time a subject in need of additional analysis is the DPM patronage estimates, in particular the number of regional bus riders projected to transfer to the DPM. As outlined in the attachment, such estimation of patronage can have a significant effect on the convenience and funding of the overall public transportation system for the downtown Los Angeles area.

The RTD staff has worked closely with the CRA staff in the latest DPM patronage refinement phase. It appears the work being performed is as technically correct as the state of the art of travel forecasting mathematical models allows at this time. In light of current experience, staff believes that your analysis may be over-estimating DPM riders from regional buses and possibly from regional parkers and internal circulation trips. For this reason, the RTD staff seeks a commitment from CRA to review in detail the RTD staff independent patronage analysis when it is completed by early fall. This independent review

August 9, 1978

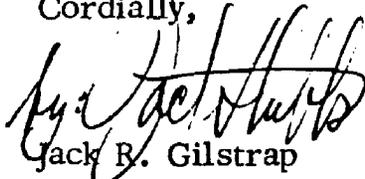
focuses upon present bus ridership factored up in proportion to CBD employment growth projections.

- As part of the joint RTD-CRA cooperative staff effort in planning for the DPM, the RTD staff has endeavored to meet CRA DPM project deadlines. We do not wish to cause any delay in getting this project before the Los Angeles City Council for final review as a part of the approval process. Since patronage estimates are a key item for design work in a transportation project of this nature, it appears impractical at this point in the conceptual design work to introduce another patronage review element. However, when the project receives final approval for construction by the Los Angeles City Council, together with the necessary local and federal funding commitments, further review of patronage projections as to their reasonableness in the light of present ridership levels is recommended. The work schedule for final design should provide for this.

As you know, the SCRTD Board of Directors has formally endorsed the proposed DPM project. In the opinion of the RTD staff, even if the DPM patronage projections were to be reduced, the remaining patronage could indicate that the DPM is still a worthwhile transit improvement project. Such downward revision of ridership estimates would, of course, require a reworking of the financial plan with respect to DPM fare revenues. The lower patronage estimates could open the door to additional system design options. On the other hand, to be conservative in allowing for maximum DPM ridership growth potentials, the larger system sizing requirements of the higher patronage projections could stand.

Other RTD staff comments, not requiring CRA response as part of the formal environmental review process, are also included in the attached staff memorandum, "General Considerations for Notice of Preparation of a Draft EIR for Proposed Downtown People Mover (DPM)". At the time your Draft EIR is submitted for public review, the District may have further comments on other environmental issues. The DPM will continue to have high priority for the RTD staff toward our goal of providing the CRA with good technical liaison on this project.

Cordially,



Jack R. Gilstrap

Attachment

General Considerations for  
Notice of Preparation of a Draft EIR  
for Proposed Downtown People Mover (DPM)

SCRTD Board Endorsement of Proposed DPM

The District Board of Directors endorsed CRA's UMTA demonstration grant application in September 1977. In February 1978, the Rapid Transit Committee of the Board set forth bus to DPM interface policy (i.e, voluntary bus to DPM transfer only) in the context of continued overall support for the proposed DPM project. Most recently the Board formally endorsed the CRA's proposed conceptual design for the Union Station DPM terminal complex and the bus operating concept upon which the design was predicated, with the proviso that convertibility to rail rapid transit be incorporated into the initial design.

General Environmental DPM Benefits

Major capital public transportation projects should make public transportation more convenient, compared to the status quo. Thus transit's share of the total market or total trips made should increase. Within downtown Los Angeles the proposed people mover can have a constructive role to play in increasing the attractiveness of public transportation compared to use of surface buses or private autos for some trips.

Bus Support of DPM

In line with adopted Board policy, the approach proposed by staff for bus route changes in support of the DPM, for the mutual benefit of both modes and riders, is one of voluntary transfer. This means that bus routes will continue to operate through and into the west side of downtown Los Angeles, although all opportunities to avoid needless route duplication and to save on bus operating costs will be pursued. As much as possible convenient transfer between bus and the DPM will be provided, but amount of bus intercept (in the sense of terminating the bus route at the Convention Center and Union Station DPM terminals) will depend on actual demand, as it develops after DPM starts operation.

### Independent DPM Patronage Review

As stated in the May status report to the SCRTD Board of Directors concerning the emerging DPM-bus support plan, copies of which have been provided to CRA, UMTA and other concerned agencies, the RTD bus planning staff is pursuing the reasonableness of the DPM patronage projections, independent of the patronage modeling work in which RTD is also assisting CRA. The RTD staff believes the CRA's current patronage refinement work is as sound and reasonable as the state of the art of modeling allows. However, the process has to grossly simplify variables involved in mode choice on the part of the traveling public. As a check on the model's projections, an independent review of the attractiveness of the DPM compared to other modes, focuses attention on present bus ridership patterns in order to estimate which bus riders would most likely be attracted to the DPM on a voluntary transfer basis. The work includes review of present boardings in the DPM passenger shed area from bus routes passing through the Convention Center and Union Station DPM corridors. Also included is consideration of comparative travel times in conjunction with possible perceived convenience (inconvenience) of bus to DPM transfers.

A similar independent review of that portion of DPM patronage projected to come from regional parkers and from internal CBD circulation trips, (largely current pedestrian trips) may be warranted. However, at this time the RTD staff is not reviewing this aspect of DPM patronage estimates.

At the time the DPM project is fully approved and funded, prior to commencement of final design, the RTD planning staff recommends complete review of the modeling projections from the standpoint of current travel patterns, for which considerable data in the form of auto and bus cordon counts are available. If possible, this review should include a second look at circulation trips attracted to the DPM, data for which is not as readily available.

The review should result in an explanation for the substantially higher patronage DPM forecasts compared to ridership levels obtained to date on similar, though "lower level" services. For example, daily CBD internal circulation trips allocated to

the DPM have been estimated at 25,000. By way of comparison, the downtown minibus circulation route currently carries 6,000 riders each weekday. The minibus and the planned DPM basically draw from the same pool of potential riders, as far as using either mode for CBD internal circulation trips. Currently, a major portion of the minibus riders are either persons who would otherwise walk or not make the trip at all. The combination of a slightly faster trip on the DPM, more development on the west side and joint development around DPM stations, point to greater patronage on the DPM compared to the present minibus service. But an independent patronage review should address the reasonableness of the model's projection of four times the present minibus ridership.

Independent patronage review could profitably be extended to include the ridership projected to be generated from regional parkers. Regional parkers using the two terminal stations are projected to generate 12,000 daily DPM rides. The model projects that the planned 3,750 parking places will generate about 12,000 rides, assuming full occupancy of the all-day spaces and the requisite turnover of the short-term parking spaces. By way of comparison, RTD's Convention Center parking and minibus shuttle service developed a peak demand for 700 parking spaces in 1974, at a time when parking shortages existed in the Bunker Hill area. However, by February 1977, when the fringe parking and minibus shuttle were terminated, demand was down to 50 parking spaces daily. The user charge for the package parking and minibus service was comparable to studied DPM parking charges (in current dollars).

DPM patronage from rapid transit transfers also merits special attention. At the point the studied rail and DPM alignments intersect, in the vicinity of 7th and Flower Streets, a rail station volume of about 70,000 passengers is projected (35,000 boardings and 35,000 alightings). Many of these rail passengers will walk to their final destinations and some will transfer to buses. Further analysis is necessary, but a significant number of persons could be transferring to and from the DPM and the rail station at this point. Assuming the starter line is built, DPM-rail transfers could make-up all or a portion of the lower patronage levels (generated from regional bus riders, regional parkers and CBD internal circulation) that may be indicated by the independent patronage review conducted by the RTD staff.

Consequences of Too Low DPM Patronage Estimates

Underestimation of DPM ridership, if it occurs, most probably will be the result of not having included the potentially high volumes of rail passengers transferring to the DPM. The effect would be to cause queuing and crowding at the station platform and mezzanine areas, and possible train delays due to overloading of cars. Overloading is at least somewhat a self-regulating function. Additional fare revenues would be generated which could perhaps be returned to joint development programs or other CBD related CRA activities. Higher fares would be a means of reduction of overcrowding.

Consequences of Too High DPM Patronage Estimates

Overestimation of DPM ridership could negatively impact the level and convenience of bus service in the Los Angeles CBD in two important ways:

- (1) Lower than expected ridership volumes from any or all of the three sources - regional bus rider, regional parkers or CBD circulation - could place pressure on RTD to abandon the voluntary transfer concept for regional buses interfacing with the DPM stations to force transfers through large scale use of the bus intercept concept. This would result in additional DPM patronage, and, in turn, generate additional DPM fare box revenues. But, it could decrease real and perceived passenger convenience in using public transportation and, in turn, result in a mode shift to use of private autos and/or avoidance of travel to the L.A. CBD.
- (2) A second possible consequence of item (1) would be to place pressure on the regional transit funding agencies to divert operating subsidy tax funds (either UMTA Section 5 or State TDA funds) to the DPM to compensate for lower than projected DPM fare box revenues. Such a shift in allocation of operating subsidy funds which otherwise would support RTD bus services would mean a lower level of bus service for the L.A. CBD.

Lastly, overestimation of DPM patronage may result in the construction of a larger than necessary DPM line, as to capacity, size and weight of cars, station sizes, bulk of the way structure, etc. This, of course, would mean a larger capital investment than necessary to carry the actual volumes of passengers and greater environmental impacts from the size of the aerial structure.

#### Miscellaneous Comments

- Current RTD - CRA Staff Cooperation. To date the RTD bus planning staff has found the CRA staff very receptive and supportive in the joint effort to develop a realistic DPM bus support plan. In particular, the CRA staff acceptance of a limited bus intercept concept and its strenuous efforts to develop conceptual DPM terminal station designs which, albeit a compromise, are deemed workable from the standpoint of bus operations, is recognized and lauded.
- Funding of DPM Capital Costs. Even if UMTA funding of the DPM were to decrease chances for UMTA starter line funding, such an outcome would be a result of a political decision deemed beyond the purview of the environmental impact review process. The use of Proposition 5 state gas tax funds, which more clearly does mean a reduction in available local matching funds for a starter rapid transit project is similarly a policy decision outside of normal environmental review comment.
- West Side CBD Alignment for DPM. Although UMTA's position on this point may be unclear, a decision in favor of funding the DPM would seem to mean that the starter rail line alignment will not coincide with the DPM alignment. RTD staff understands that CRA has concluded that the DPM will provide much greater opportunities for major joint development projects on the west side, which is one of the main benefits of the DPM. Also, because undeveloped sites still exist along some critical segments and

the relatively generous building setbacks on the west side DPM alignment, it appears that an aerial guideway structure would be less obtrusive on the west side, compared to an alignment on the east side. For these reasons, it appears there is no serious question that if the DPM is built, the DPM will be on the west side. However, even if this decision is accepted, it may be admissible to comment in the EIR as to the patronage impact of an east side versus west side CBD rail alignment, from the narrow perspective of impacts upon starter line patronage and the ability of the starter line to best serve regional core trip desires into the CBD.

- Rail Alignment. As far as the SCRTD is concerned, the final decision for the starter line rail alignment in relation to the DPM alignment in the Los Angeles CBD is a policy decision for the City of Los Angeles to make.
- Convertibility of DPM Union Station Terminal Facilities to Rail. As noted elsewhere, the SCRTD Board has endorsed the proposed conceptual design for Union Station. However, the endorsement is subject to the CRA's agreement to properly provide for the conversion of the Busway to rail rapid transit operation. It is our understanding this means that design for the DPM terminal complex will include provision for alteration of the upper busway level and of the second and third level bus station areas for appropriate uses as will be necessary with conversion of the busway to rail. As the starter rail line project progresses, the impact of rail upon the terminal complex including the scope of the remaining bus operations and how both rail and remaining bus will function must be addressed and resolved.
- Joint Development. Joint development opportunities exist for both the DPM and the starter line in downtown Los Angeles. Due to the larger passenger catchment area of the starter line compared to the

DPM (because of a no transfer ride) it appears the starter rail line will have stronger growth inducing impact. For this reason, the starter rail line may offer to developers greater incentives to joint development compared to the DPM, depending upon the attractiveness of station sites. This factor, coupled with the fact that the profile of the rail line will be in subway compared to an aerial structure for the DPM, can be viewed as reason for locating the rail alignment on the east side and the DPM on the west side. In any case, discussion of joint development trade-offs (east versus west side of the CBD) should be included in the impact analysis.

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**

425 SOUTH MAIN STREET  
LOS ANGELES

DO NOT INCLUDE MORE THAN ONE  
SUBJECT IN THIS COMMUNICATION

DATE: February 25, 1981

TO: Paul C. Taylor  
FROM: Dan Miller *DM*  
SUBJECT: Interagency Coordination Meeting on DPM Convention Center Terminal

As you directed, I have written up my understanding of the main points put forth at the meeting.

Attendance:

Frank Condos	DPMA
John Longendoen	DPMA
Gill Hicks	DPMA
Dick Matteson	DMJM
Murray Sutkin	DMJM
Dick Thompson	Archiplan
Sam Furuta	LAC DOT
Tom Jones	LAC DOT
Jerry Baxter	Caltrans
Milton Brame	RTD
Paul C. Taylor	RTD
Dan Miller	RTD

Main Points of Meeting

The purpose of the meeting was to clarify the RTD bus planning concept of operation for the DPM Convention Center Terminal and the resultant requirements.

From the bus planning standpoint, the main question is whether bus loading and unloading will take place on-street or off-street. The District's position is that on-street loading and unloading, provided there is enough of it, is adequate. Off-street loading provides passenger amenities not available in on-street loading but it also requires significant time delays for thru operated buses. If an off-street terminal was constructed it would be used by all buses intercepted at the DPM Terminal and perhaps by through operated buses, depending on the time delay. The greater the volume of intercepted buses, the more desirable is an off-street terminal.

District staff circulated a work sheet indicating about 68 peak hour express buses in the peak direction would be loading/unloading passengers on Figueroa Street at the DPM Terminal entrance. This translates to about 480 express bus trips each direction on an all-day basis. Under present planning policy, a low level of bus intercept is planned initially, on the order of 20-40% of all express buses passing through the corridor, with the balance through routed.

Gill Hicks produced documentation showing that RTD had previously indicated a need for eight spaces in each direction if curb side loading is used. Dan Miller concurred in this (see attached information sheet, dating back to April, 1978). Also attached is a revised estimate of bus layover and loading/unloading space requirements.

Projected land use development on either side of Figueroa Street between Pico Boulevard and 11th Street was addressed with respect to bus on-street and off-street terminals was discussed. Use of this valuable land for a bus off-street terminal may be deemed economically infeasible. On the other hand, high volume on-street bus loading may also be undesirable from the point of view of prospective developers. It was agreed that RTD, CRA and DPMA would need to closely coordinate their plans on this issue.

#### Meeting Follow-up

Following the suggestion of Gill Hicks, Dan Miller agreed to initiate preliminary discussion with Dick Walsh, General Manager, Convention Center, (741-1151), with respect to alternative solutions for bus loading/unloading and for bus layover in the vicinity of the Convention Center. Similar coordination will also be pursued with LAC DOT staff.

#### Next Steps

Pending new developments in the DPM program, a second ad hoc meeting can be convened to discuss RTD planning staff follow-up actions.

#### **Attachments**

cc: DPMA  
IMJM  
Archiplan  
LAC DOT  
Caltrans

SUMMARY OF RTD BUS LINES\* CONNECTING WITH  
CONVENTION CENTER D/M TERMINAL

Number of Bus Trips

<u>Local Lines</u>	<u>PM Peak Hour</u>		<u>Midday Hour</u>		<u>All Day Total</u>	
	<u>Inbound</u>	<u>Outbound</u>	<u>Inbound</u>	<u>Outbound</u>	<u>Inbound</u>	<u>Outbound</u>
Pico-Blvd. (Lines 30-31)	12	30	12	12	230	230
Figueroa St. (Lines 44-65)	8	14	8	8	134	134
<u>Express Lines</u>						
Harbor Fwy. Routes (Lines 444X-448X- 449X-740-750-755- 813-814)	14	50	12	12	369	369
Santa Monica Fwy. Routes (Lines 430- 434-436-437-439)	9	18	5	5	112	112
TOTAL	23	68	17	17	481	481
<u>Lines Terminating at Convention Ctr</u>						
Local Lines 70-71	8	16	8	8	135	135
Express Lines X475	-	4	-	-	8	8

\*Planned SIP lines & proposed Harbor-Century Transitway.

MJB:cym  
2/81

LAYOVER AND LOADING/UNLOADING

Projected Requirements for Convention Center  
DPM Terminal

Bus Spaces/Stalls Required

<u>Service</u>	<u>Loading/ Unloading</u>	<u>Layover</u>	<u>Spot</u>	<u>Total</u>
Express Buses				
Figueroa St. (On-Street Loading)				
- Midday	2	-	-	2
- Peak	5	-	(5)a	5
Local Buses				
Figueroa St.				
- Midday	1	-	-	1
- Peak	2	-	-	2
Pico Blvd.				
- Midday	1	-	-	1
- Peak	3	-	-	3
Lines Terminating at Convention Ctr Express & Local				
- Midday	(1)b	2	-	2
- Peak	(1)b	2	2	4

NOTES: a) This bus parking requirement is necessary if bus intercept is used. Forty bus trips intercepted equals a requirement for five bus parking spaces under the formula used.

b) Loading and unloading can occur at the layover location without additional spaces required.

DCM:cym  
2/81

LAYOVER AND LOADING/UNLOADING  
REQUIREMENTS  
METHODOLOGY

Layover

(# Bus Trips x 15 min. layover) ÷ 60 min. = spaces required

Loading/Unloading (L/U)

# Bus Trips x 3 min. L/U = Cumulative dwell time (CDT)

(CDT ÷ 60 min.) ÷ (1 - discount) = spaces required

Discount equals irregular bus flow factor (whether scheduled or unscheduled)  
Discount Factor Used: 1-.33 = .66

Spot Time

Each bus fit-in is assumed to require a reporting time ("spot time") with a minimum of two bus stalls required for this purpose.

# Bus Trips x 5 min. = cumulative dwell time (CDT)

(CDT ÷ 60 min.) ÷ (1 - discount) = spaces required

Discount Factor Used: 1-.33 = .66

NOTE: All fractions are rounded up to next whole number.

PROJECTED BUS INTERFACE REQUIREMENTS  
FOR DPM CONVENTION CENTER TERMINAL

B. DPM Convention Center Terminal

1. Freeway Express/Freeway Transit Trunk Line Interface

Assumed peak hour bus volume (1990)

Prevailing Direction - 64; Reverse Direction - 20;  
Total - 84

Requested bus stalls: 8 (if only directional curb  
side treatment is provided in place of off street  
terminal, 6 stalls in each direction are requested.)

Otherwise requested bus stalls: 10 (6 for through buses  
and 2 for intercept buses, with 2 extra stalls)

NOTE: In the operation of intercept buses it may be  
desirable, if not essential, to have available  
on-site bus parking spaces for short term or  
midday bus layovers. At assumed bus intercept  
volumes, this would add 2-4 bus parking spaces  
to the off street bus parking requirement for  
the surface bus lines terminating at stations.

2. Surface Lines Terminating at Station (Off Street Facilities  
Preferred)

Assumed peak hour bus volume (1990)

Bus arrivals - 20; Bus fit-ins - 20; Bus departures - 40

Requested bus parking spaces (for bus layovers): 7  
(5 for layover and 2 for bus fit-ins)

Request bus loading spaces: 3

3. Surface Lines with Adjacent On Street Bus Stops

Assumed peak hour bus volume (1990)

Figueroa: Prevailing Direction - 6; Reverse Direction - 4;

Pico: Prevailing Direction - 24; Reverse Direction - 24;

Requested bus loading spaces

Figueroa: 2 spaces in each direction, curb side

Pico: 3 spaces in each direction, curb side  
(with pedestrian overpass desirable, if DPM  
terminal station in close proximity to Pico Blvd.,  
say 500 feet)

LADPM Questions for Resolution at Intercepts

FEB 10 1981  
P.C.T.

I. Union Station

A. DPM Station

1. Final Busway design from Caltrans.
  - a. Guideway at-grade or aerial
  - b. Station at-grade or aerial
  - c. Required land taking?
  - d. Connection between DPM and Busway?
2. Connection to Amtrak tunnel.
3. Connection to local intercity buses.
4. Access to Union Station Terminal
5. Connection to SCRTD Metro Rail Station

B. Intercept

1. Program of areas
  - a. parking - initial surface parking?  
- future parking expansion?
  - b. Bus depot?
  - c. Retail?
  - d. Toilets?
2. Location of Intercept?
  - a. at-grade
  - b. above storage tracks
3. Location of future DPM station?
  - a. Near Macy Street?
  - b. SCRTD Headquarters?
  - c. Tech Center?

- d. Metro Rail Station?
- e. DC Transformer Vaults?
- f. Control Center/Computer facilities?
- 4. Size and shape of storage tracks?
- 5. Location of MASO building?
- 6. Surface access capacities?
  - a. Vigness
  - b. Macy
- 7. Limits of site?

II. Convention Center

A. DPII Station

- 1. Interface with local and regional RTD buses?
  - a. Turn out at curb side?
  - b. Off streets bus bays?

B. Intercept

- 1. Site location?
  - a. North east corner of Figueroa and Pico?
  - b. CRA participation purchase?
- 2. Freeway access?
  - a. Bus circulation
  - b. Auto circulation? (Is a new ramp required?)
- 3. Surface streets access and capacity?
- 4. Program of areas
  - a. Parking - initial no. of spaces (surface)?
    - future expansion?
    - above or below grade?
  - b. Retail?

- c. Toilets?
  - d. Bus depot?
5. Joint development with property owners?

DPM  
OPERATIONS  
PLANNING

DPM PASSENGER REVENUE ANALYSIS: 7-80

DPM PASSENGER REVENUE ANALYSIS  
(Assume RTD Regular Fare of 65¢ and 20¢ Transfer)

ALTERNATIVE TRANSFER FARES						REVENUE IMPACTS GAINS & LOSSES		TOTAL DPM PASSENGER REVENUES		NET DPM PASSENGER REVENUES			
Farebox Receipts on Bus & DPM	Inbound Read Down		Outbound Read Up		Round Trip Fare		Bus 20,000	Bus 36,000	Total DPM Boardings 40,000	72,000	40,000	72,000	
	Cash Fare	Transfer	Cash Fare	Transfer	Bus Only	Bus & DPM							
<b>NO TRANSFERS</b>													
BUS DPM	65¢ 25¢	-	65¢ 25¢	-	) )	\$1.30 \$1.80	BUS DPM	NC \$1,275,000	NC \$2,295,000	\$2,550,000	\$4,590,000	\$2,550,000	\$4,590,000
<b>ONE-WAY 10¢ TRANSFER WITH 40¢ CREDIT</b>													
BUS DPM	65 25	-	25 25	-	) )	1.30 1.50	BUS DPM	(1,020,000) 1,530,000	(1,836,000) 2,754,000	3,060,000	5,508,000	2,040,000	3,672,000
<b>10¢ TRANSFER WITH 25¢ CREDIT OUTBOUND</b>													
BUS DPM	65 -	10 -	40 25	-	) )	1.30 1.50	BUS DPM	( 382,500) 892,500	( 688,500) 1,606,500	1,785,000	3,213,000	1,402,500	2,524,500
<b>10¢ TRANSFER WITH 45¢ CREDIT OUTBOUND</b>													
BUS DPM	65 -	10 -	20 25	-	) )	1.30 1.30	BUS DPM	( 892,500) 892,500	(1,606,500) 1,606,500	1,785,000	3,213,000	892,500	1,606,500
<b>FREE TRANSFER WITH 25¢ CREDIT OUTBOUND</b>													
BUS DPM	65 -	-	40 25	-	) )	1.30 1.30	BUS DPM	( 637,500) 637,500	(1,147,500) 1,147,500	1,275,000	2,295,000	637,500	1,147,500
<b>ONE-WAY 10¢ TRANSFER WITH FULL FARE CREDIT</b>													
BUS DPM	65 25	-	- 25	-	) )	1.30 1.25	BUS DPM	(1,657,500) 1,530,000	(2,983,500) 2,754,000	3,060,000	5,508,000	1,403,000	2,524,500
<b>FREE TRANSFER WITH FULL FARE CREDIT</b>													
BUS DPM	65 -	-	- 25	-	) )	1.30 .90	BUS DPM	(1,657,500) 637,500	(2,983,500) 1,147,500	1,275,000	2,295,000	( 382,500)	311,500

(See Notes on Accompanying Page)

V-154

DPM PASSENGER REVENUE ANALYSIS  
FOOTNOTES

1. Full 25 cent fare is assumed with no discount fares. In actual operation, in all probability, some discount fares would be provided.
2. Fare analysis assumes use of cash fares only. Pass use impacts will require additional analysis.
3. One-way transfer alternatives, with transfers issued alighting from the DPM are shown. This is under the assumption that unmanned DPM stations will make acceptance of transfers when boarding the DPM difficult or infeasible. Analysis leading to selection of DPM fare equipment will determine whether this is the case. The use of tokens instead of paper transfers may make more feasible two-way use of transfers between the DPM and bus system.
4. To minimize cheating opportunities, it is assumed that the DPM transfer will be good only between DPM-bus transfers. Nevertheless, some revenue losses due to abuse of transfer will occur and an estimate of this loss should be allocated to DPM operating costs. There are potentially large revenue losses from cheating through use of free DPM-bus transfer, both for DPM revenues and especially for bus system revenues.
5. Current CRA patronage projections show 36,000 bus to DPM boardings out of 72,000 boardings per weekday. Lower numbers show revenue impacts of possible lower ridership levels. Revenue analysis is based on 255 average weekdays per year with passenger revenues from Saturday/Sunday DPM operation excluded.

DGM:cym  
7/7/80

DPM FARE COLLECTION EQUIPMENT  
CRITERIA: 11/80

DEPARTMENTAL

**SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT**

425 SOUTH MAIN STREET  
LOS ANGELES

DO NOT INCLUDE MORE THAN ONE  
SUBJECT IN THIS COMMUNICATION

DATE: November 25, 1980

TO: Paul C. Taylor  
FROM: Dan Miller *DM*  
SUBJECT: DPM Fare Collection Equipment

This memo documents the initial November 24th meeting we had with Foster Needels, Manager-Systems Engineering of the DPMA in regard to District input to the type of fare collection equipment the DPMA should acquire.

As I understand it from Foster, the DPMA needs to reach a decision in about a month as to the performance standards and/or design requirements of the fare collection equipment in order to proceed with formal equipment specifications.

As I also understand, Foster will return to District staff in early December to get District reactions to the DPMA's specification decisions leading to formal bidding for the equipment.

Suggested Staff Response

My response to this initial meeting with Foster is twofold. First, I suggest we seek to obtain immediately the staff preliminary reactions and input to DPMA fare collection equipment design parameters and requirements. This discussion can be initiated by the issue outline I have provided below. Secondly, I believe the District staff, via the District Board should express it's concern about apparent lack of adequate time to fully consider revenue impacts and logistical requirements for a properly integrated fare system between DPM and regional bus system. Further, it seem appropriate for the District Board to go on record as stating that if the DPM chooses to make unilateral decisions involving integration of DPM with the regional bus system and with other transportation elements, to include the Wilshre Rail Line, it does so, at peril of making the DPM incompatible with other transportation elements with which it is supposed to be coordinated and interfaced.

Paul C. Taylor

-2-

November 25, 1980

Next Steps

The attached issue outline and revenue impact table can be distributed to an ad hoc committee to get initial staff discussions underway. An alternative is to use the NSRB for this purpose, but I do not think such a large group is needed for these initial deliberations.

Attachments

DGM/ydh

cc: Byron Lee

## ISSUE OUTLINE

### DPM FARE COLLECTION SYSTEM

#### Objectives of integrated DPM-Bus fare structure, transfer procedure and fare collection equipment

- o The integrated fare structure and transfer system should provide for equalized fares between a bus trip entering the CBD without transfer to the DPM and a bus trip with DPM transfer.
- o If revenue losses between systems as a result of transfer arrangements make the above unobtainable, the fare differential for regional bus riders between those who transfer to the DPM and those who remain on board their arriving bus should be minimized.
- o As a result of transfer provisions, no revenue losses should occur to the regional bus system; compared to a no transfer fare structure.
- o As a result of transfer provisions, no revenue losses should occur to the DPM, compared to a no transfer fare structure.
- o If logistically feasible, for rider convenience and ease of understanding, transfers should be provided both ways instead of one way.
- o Logistical requirements should be minimized for the regional bus system in provision for DPM-bus transfer, to include driver training supervision (enforcement), new fares, new accounting requirements and new on-board equipment.
- o Logistical requirements should be minimized for the DPM in provision for DPM-bus transfers.
- o DPM fare collection equipment and related system and procedures should be designed to provide maximum flexibility for future changes in fare structure and procedures.

NOTE: This objective clearly conflicts with the previous objective.

- o The integrated DPM-bus fare system should be easy to understand for both DPM riders and bus riders.
- o The integrated DPM-bus fare system should provide ease of understanding and attractiveness for parkers using the line terminal stations.
- o The integrated DPM-bus fare system should provide for various Marketing opportunities with CBD businesses.

Logistical Considerations:

- o District operations expertise is particularly needed in reviewing fare collection options, especially for on board bus logistical requirements.
- o The DPMA apparently is favoring one way transfers from the bus to the DPM, using tokens or magnetically coded tickets (like BART). They are apparently assuming that the expense of equipment to issue tickets at DPM stations for transfer to the bus is unwarranted. (This assumption is made despite the use of simple machines to effect BART-SF muni transfers).
- o One-way transfers in the opposite direction, i.e. from the DPM to the bus, are assumed most feasible in the preliminary revenue impact estimates shown in the attached table. Tokens or tickets would be issued in the DPM stations (similar to BART) and accepted on board the buses.

Revenue Considerations

- o Attached table provides a simplified initial analysis of revenues and losses from several transfer schemes.
- o The revenue and losses shown assume no transfer payments between the DPM and the bus system.

ACKNOWLEDGEMENTS

FOR

BACKGROUND INFORMATION, CBD-BUS PLAN FOR DPM

CONTRIBUTORS

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April 1981