RAPID TRANSIT for Los Angeles

Summary Report of Consultants' Recommendations

RAPID TRANSIT FOR LOS ANGELES

SUMMARY REPORT OF CONSULTANTS' RECOMMENDATIONS

prepared for
THE SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
and THE CITIZENS OF THE LOS ANGELES REGION

by a
CONSULTANT TEAM
(listed on inside rear cover)

JULY 1973

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About this report

This report summarizes a technical study of rapid transit for Los Angeles which was conducted by a team of consultants for the Southern California Rapid Transit District. The study was undertaken as an element of the 1972–1973 unified transportation planning work program of the Southern California Association of Governments (SCAG).

The study has resulted in preliminary recommendations on an ultimate rapid transit system, an initial construction program, and a number of near-term transit improvements. It is anticipated that this summary report will provide a major source of information to concerned citizens of the region for evaluation of the findings, conclusions, and recommendations of the consultant team.

Detailed technical reports from which this summary has been prepared are available for review.

The recommendations in this report are tentative, subject to review by the District, as well as by public agencies, local communities, and the public.

During the coming months, meetings will be held with public agencies and local communities to present the results of the study and to obtain critical review of the recommendations, which may result in changes in route alignments and in the number and location of stations, or modifications in the extent of the initial construction program due to financing or other considerations. Other activities to be carried out include the development of additional details of the technical plan, preparation of an environmental impact report, and planning for a public referendum to finance the system. After the public votes favorably on the system, construction can begin.

PRINCIPAL CONCLUSIONS AND RECOMMENDATIONS

At the direction of the Southern California Rapid Transit District, an eight-month study of current and projected public transportation requirements of the Los Angeles region was undertaken by a team of consultants representing all appropriate areas of professional specialization. Significant contributions were also made by various city, county, state, and federal agencies and by the staff of the SCRTD. The principal conclusions and recommendations are as follows:

- A 250-mile rapid transit system is recommended, designed to serve all corridors of concentrated travel as they exist today and are projected in the future.

- Start-of-construction priorities have been determined for various segments of the overall system based on (1) urgent need to relieve current traffic congestion, (2) participation of public transportation in moving to eliminate pollution, unemployment, socioeconomic disparities and similar urban problems, and (3) the amount and rate-of-flow of public financing available to build and operate the system.

- Highest priority should be given to implementation of a coordinated two-part public transportation program:

1. Initial construction as soon as possible of 116 miles of mass rapid transit facilities (over-head, in subway or at ground level, as appropriate) and 24 miles of exclusive-lane busways to serve eight of the most heavily congested travel corridors in the Basin. Additional increments of the 250-mile system will be designed during the construction of the initial program, to prepare for further stages of development of the system.

2. An area-wide expansion of the bus service and bus equipment should begin immediately, designed in the near-term to provide improved service to passengers on existing and new bus lines. Included in this program will be additional park-and-ride facilities, express bus service on freeways and exclusive bus lanes in arterial streets. Ultimately, the bus system will also become an efficient feeder and distribution system for mass rapid transit.

- About 70% of all residents of Los Angeles County live or work within a ten-minute ride of the initial eight corridor rapid transit system. Because of this improved accessibility, over 1 million trips per day will be made on rapid transit in 1990.

- More than two-thirds of the cost of the priority system is expected to come from federal funds. Total rapid transit cost 1973 dollars: $3.3 billion. Projected construction cost over the 12-year construction period, including a 9% annual escalation factor: $6.6 billion.

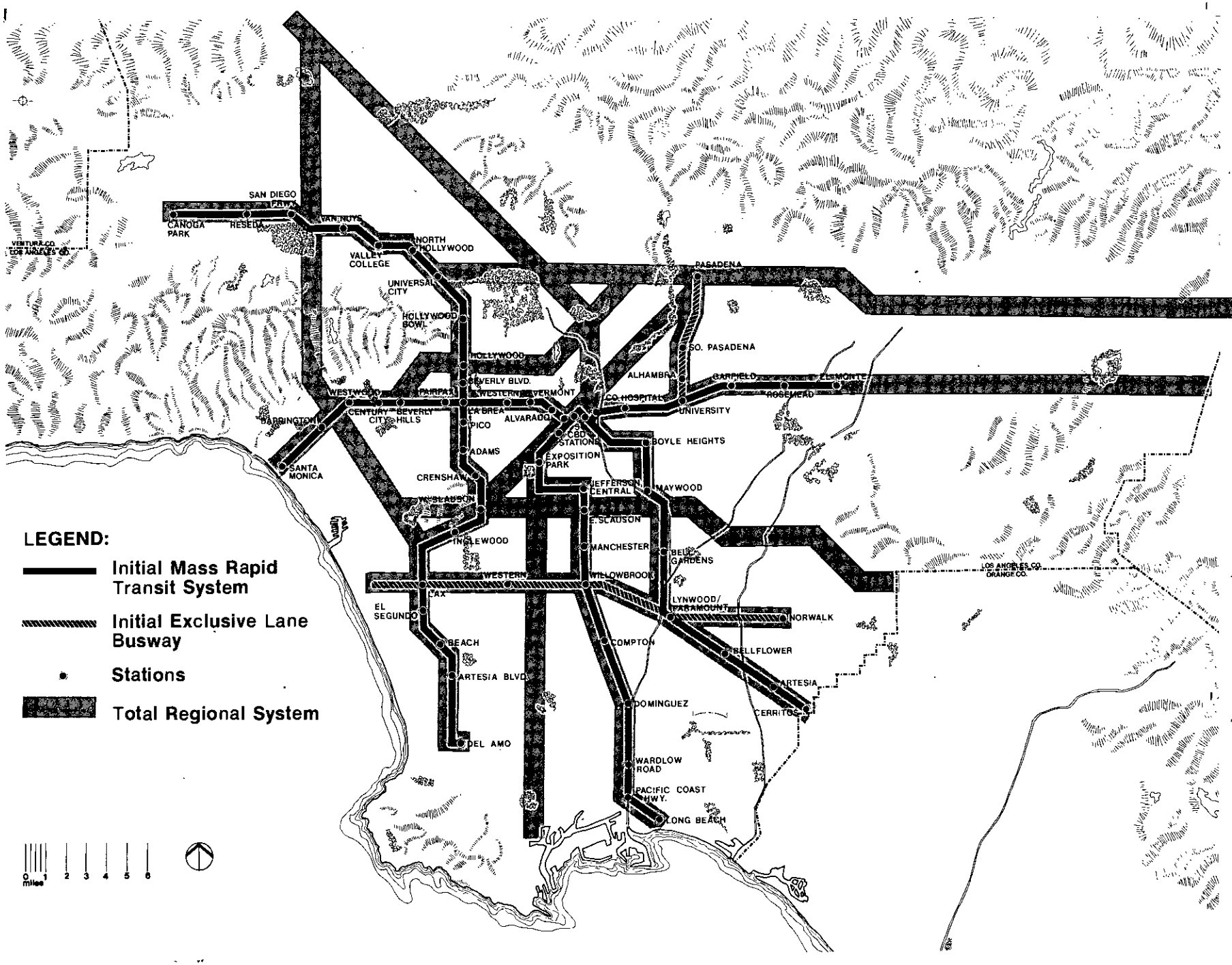
- Local tax funds required to build the system can be raised by adding ¾¢ to the local sales tax.

This report presents information on these conclusions and recommendations. Additional information is contained in supplemental technical reports on the engineering, patronage, environmental, cost, and financial details. A final report delineating SCRTD's master plan will be developed after more technical work is conducted and local community reviews are completed.

CONTENTS

fold out map

CONCLUSIONS, RECOMMENDATIONS AND SYSTEM MAP



INITIAL PROGRAM AND ULTIMATE SYSTEM

1. The Challenge

Why Do We Need Rapid Transit?

"Los Angeles has the most severe transportation problems of any urban area in the nation." This statement, made in a recent public meeting by the Honorable Claude S. Brinegar, U.S. Secretary of Transportation, is a view that is shared by all Southern Californians—by the man on the street as well as by the transportation expert.

How did this come about?

As a region that has grown up in the "automobile age," Los Angeles has provided to many the maximum freedom to live and work in locations of their choice. Over recent decades, ownership of a car was all one needed to achieve this freedom. Freeways were built, making it easy to travel long distances in reasonable travel times. One could choose to live in a wide variety of places and yet be within easy driving distance to work, shopping, the beaches, or the mountains.

But as population grew, so did the problems. Close-in housing became old and less attractive to residents. Existing residents moved farther out into the suburbs; new arrivals located there also. Much of the available land was taken up by extensive developments of single-family homes. Places of work became sometimes an hour or more from people's homes. Throughout the nation, Los Angeles has become known as the prime example of "urban sprawl." The recommended rapid transit system will provide Southern Californians the opportunity to focus growth in transit centers of accessibility and thus provide a greater variety of life styles.

Our freeway and surface street system is one of the most extensive systems of roads in the nation. Yet, it has become heavily congested. In many places the congestion continues over the entire day, not just during the commute hours. Rapid transit can reduce congestion by carrying large numbers of people in heavily traveled corridors.

As a major contributor to air pollution, the auto is being improved mechanically so that it will emit fewer pollutants. Yet, this will not solve the pollution problem in Los Angeles. Here, we travel longer distances than in other cities, and much of the time in stop-and-go traffic. Both situations create more air pollution. Whether by Federal directive or otherwise, actions must be taken to reduce pollution. The Environmental Protection Agency of the U.S. Government (EPA) is recommending drastic measures to reduce vehicle travel. Rapid transit can help reduce pollution by taking vehicles off the streets.

The growth of the auto-oriented society has left some people without the mobility that others have. Those who cannot drive or do not have access to an automobile, such as the poor, the old, the young, and the handicapped, lead a different life. Although the surface bus system is one of the largest in the nation, it cannot cover the vast area in the region and it cannot provide rapid door-to-door service. The result is that many who must rely on buses simply do not travel as much as the auto-owning citizen, and therefore, miss the benefits that mobility brings. Rapid transit can vastly improve mobility for those who must use public transportation.

Appearing almost overnight, the energy crisis is upon us with full force. Gasoline prices have increased. Stations run out of gas. Experts say that the growth in demand for fuel is outpacing our ability to produce it. In the final analysis, the automobile is a poor method of transportation, energy-wise. With new air pollution equipment, auto travel uses much more energy than bus and other transit travel. Rapid transit can help conserve energy. The President's Office of Emergency Preparedness is urging people to leave their cars at home and turn to mass transit systems.

Residents of Los Angeles have spoken out with increasing vigor against the undesirable environmental impact of freeways in urban communities, thus stalling major projects that, on mobility grounds, are needed. As a result, we find that, as population continues to grow, existing facilities become more heavily congested and travel times increase. Rapid transit can reduce the need for new freeways.

Rapid transit can also provide safer travel, reduce travel costs, speed the movement of people, reduce unemployment, and reduce noise and visual pollution.

What Will It Cost and How Will It Be Financed?

Building rapid transit in the Los Angeles region will be a major project that will cost billions of dollars.

A major source of the money—over two-thirds—is expected to come from the Federal government using funds of both the Urban Mass Transportation Administration (UMTA) and the Federal Highway Administration (FHWA). These federal programs are essential to the financing plan.

The remainder will come from State and local sources. Locally, it is proposed that the funds will come from a voter-approved increase of ¾¢ in the sales tax. The local contribution can be considered modest in relation to that in San Francisco Bay Area. The following tabulation compares their commitment to transit with Los Angeles:

Jurisdiction	1972–73 Per Capita Contribution to Transit Annually
City and County of San Francisco	$80.39
Alameda County	44.46
Contra Costa County	35.84
Los Angeles County	5.64

A financial plan is suggested that will complete the initial program of transit lines. The sales tax increase will cost the average resident only about $30.00 per year.

What Have Other Cities Done About Transit?

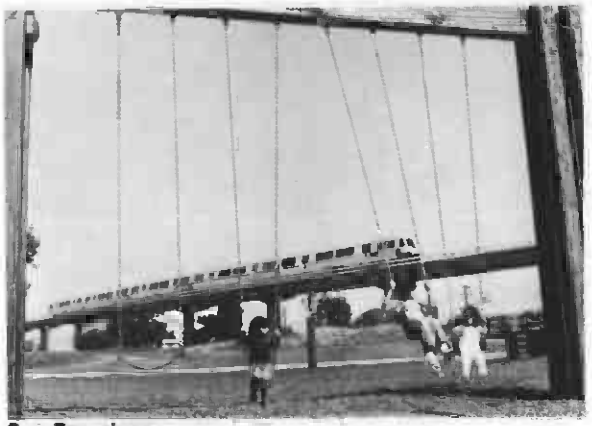
We are unique among the larger cities in the country in having no rapid transit system. New York, Chicago, Philadelphia, and Boston have had rapid transit for many years.

Many have said that the Los Angeles region cannot justify rapid transit because of the low density development. This is simply not the case. This study shows that rapid transit will attract large numbers of travelers.

Similar conclusions are being reached in other cities. Construction is under way or planning is in its final phases in cities such as Atlanta, Washington, D.C., Baltimore, and Pittsburgh. Other urban areas are actively considering rapid transit: Portland, Oregon; Miami; Houston; Dallas; Fort Worth; Detroit; Minneapolis; and more. In foreign countries, many large cities have rapid transit.

Nationally, people are realizing that an improved public transportation system is a requirement in urban areas.

Probably the best known project to Southern Californians is the BART system in the San Francisco Bay Area. This system is in partial revenue service at this writing, and shortly will be fully operational. It will provide high-speed travel from many parts of the Bay Area to centers of activity.



San Francisco

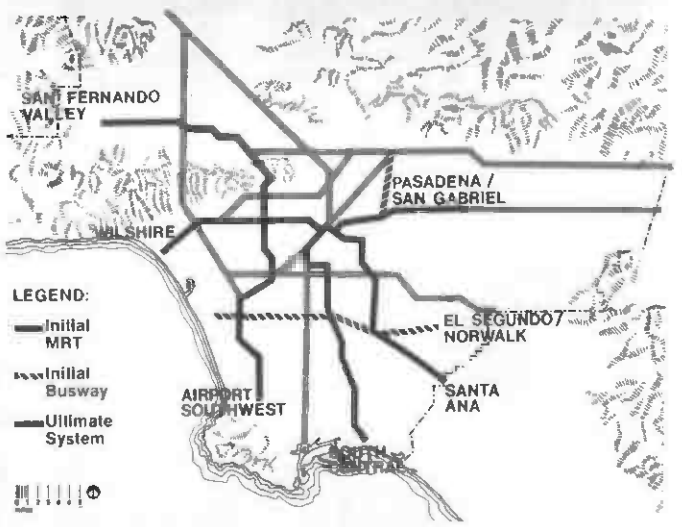
Paris

Stockholm

Chicago

Toronto

Philadelphia


SAN FERNANDO VALLEY
PASADENA / SAN GABRIEL
WILSHIRE
LEGEND:
Initial MRT
Initial Busway
Ultimate System
EL SEGUNDO
NORWALK
AIRPORT
SOUTHWEST
SANTA ANA


AIRPORT CENTER

2. The Initial Construction Program Recommendations

What Will the Initial Construction System Look Like?

The recommended initial construction program for rapid transit will serve eight of the most heavily used corridors of travel, as shown on the fold-out map in the front of this report. They are Wilshire Boulevard, Hollywood and the San Fernando Valley, the Los Angeles International Airport and localities southwest of the Los Angeles central business district (LA/CBD), the South Central area through Watts and Compton to Long Beach, a southeasterly corridor toward Orange County, an east-west corridor along the programmed El Segundo-Norwalk Freeway, along the San Bernardino Freeway, and in the northern extension of the Long Beach Freeway into Pasadena. Where possible, existing rights-of-way will be used.

In subsequent stages of construction, additional lines will be built to serve other corridors and extensions to the initial lines will be constructed as required.

Some of the system will be built underground. The rest will be on aerial structures or at-grade. Sixty-two stations are recommended. They will be carefully located to maximize access to and from the system.

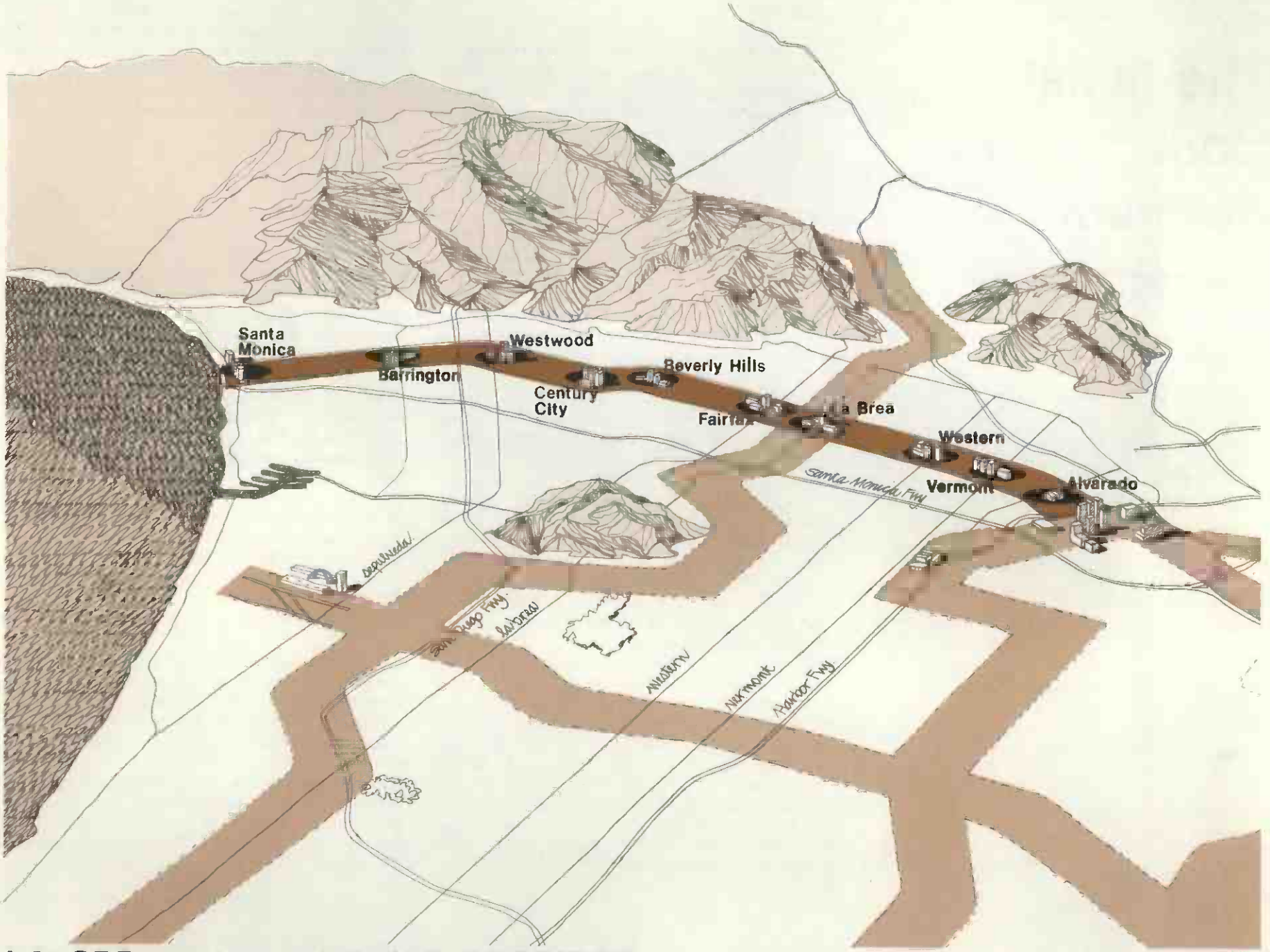
Two types of vehicles will be used in main line service, mass rapid transit (MRT) and buses. MRT will be used in most corridors. The 80 mph MRT vehicles will operate on a total of 116 route miles and offer service as frequently as every 90 seconds. The vehicles will be operated in trains, like the BART system in the San Francisco Bay Area. (The design of the vehicles has not yet been finalized.) Buses will operate on busways, which are separate lanes in freeways, similar to the operation on the San Bernardino Freeway. Twenty-four route miles of busway are recommended.

An integral part of the initial rapid transit program is an expanded bus system on surface streets to carry people to and from the rapid transit stations. The bus fleet will be increased from its present size of about 1,600 buses to 2,740. In certain locations, smaller aerial transit systems, called auxiliary transit, will be used to distribute travelers to destinations within activity centers from rapid transit stations.

This initial system will provide improved access to most of the centers of employment and population, as well as to shopping areas and recreational and cultural locations, in the Los Angeles region. Over one million travelers per day will use rapid transit. About 70 percent of the residents will be within 10 minutes of the system. It will provide faster and less costly travel than by automobile. It will also be much safer and will provide a very comfortable ride.

Because it will take about twelve years to build the initial system, actions are needed now to help alleviate some of our transportation problems. A near-term program consisting of substantially increased and improved bus service is recommended as an interim measure to meet pressing transportation needs. Some of these services will be supplanted by the rapid transit lines as they come into operation. Others will have a place in the ultimate integrated rapid transit and surface system.

Among the near-term projects are the following: giving buses priorities on surface arterial streets by reserving lanes for contra-flow operation and providing longer green signal time, establishing limited-stop and nonstop routes, building park-and-ride parking lots for bus patrons and providing nonstop service on freeways to major destinations, taking actions to speed up bus travel on freeways, and improving the efficiency of bus operations in the LA/CBD.



LA/CBD and the WILSHIRE CORRIDOR

Description of the Lines in the LA/CBD and the Wilshire Corridor

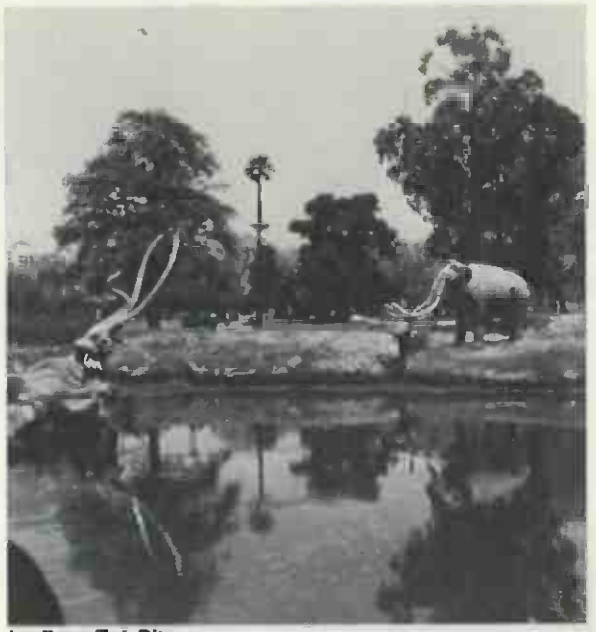
The studies show clearly that rapid transit from the LA/CBD along the Wilshire corridor will be the most heavily used of any line in the system since this line will serve the largest numbers of people and jobs.

In the LA/CBD, the recommended system will be in subway. One line coming from the San Gabriel corridor runs from the vicinity of Union Station into downtown and out toward Wilshire. Another line comes into the CBD from the South Central and runs out toward the east to become the Santa Ana line.

Stations in the LA/CBD are recommended near Union Station, the Civic Center, Bunker Hill, 8th and Hope, and near the Occidental Center. These stations would serve major employment and other activity centers.

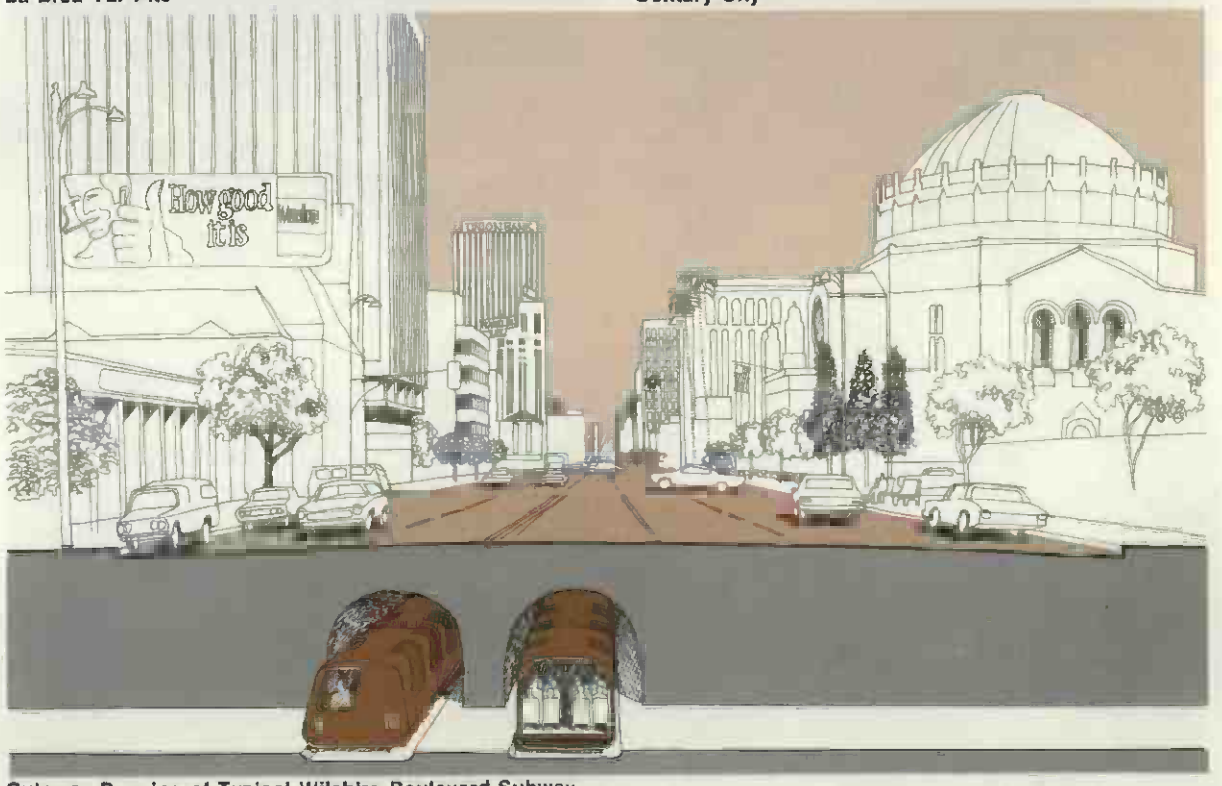
The Wilshire line will serve the rapidly growing centers of activity that are being referred to, in connection with the LA/CBD, as the "regional core." The Wilshire line will be underground throughout most of its length and will depart from Wilshire Boulevard only for a short distance to serve Century City. In addition to serving major centers of employment, it serves a wide range of income levels and a variety of ethnic groups.

Stations along Wilshire are recommended at Alvarado, Vermont, Western, La Brea, Fairfax, Beverly Hills, Century City, Westwood, Barrington, and near Lincoln Boulevard in Santa Monica. Among other locations, these stations will serve Wilshire Center and Miracle Mile, as well as regional entertainment and cultural centers. The stations will be designed as "walk-in" stations to be served as well by an expanded bus system.

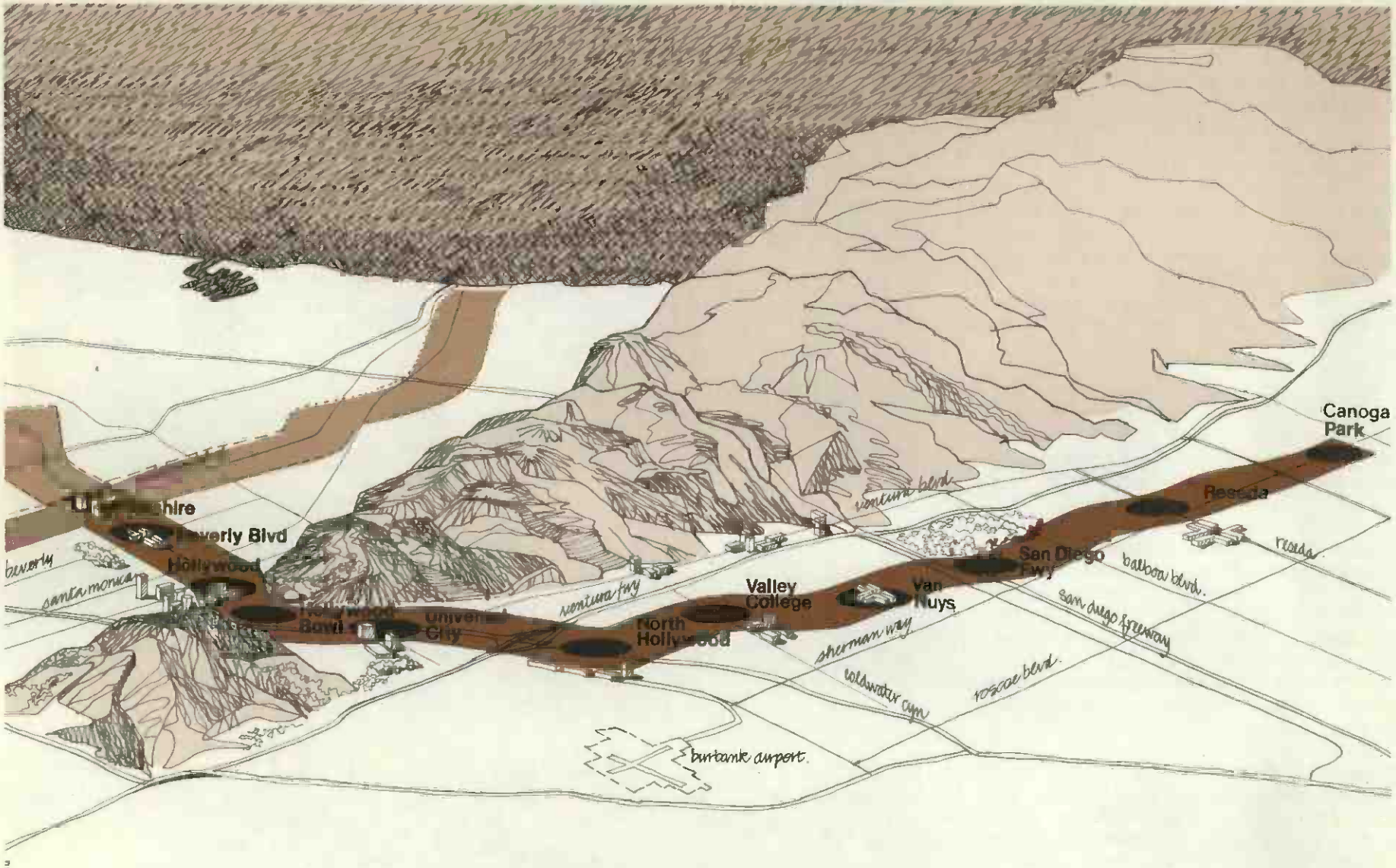


La Brea Tar Pits

Century City



Cutaway Drawing of Typical Wilshire Boulevard Subway



SAN FERNANDO VALLEY CORRIDOR

Description of the San Fernando Valley Line

The rapid transit line recommended for serving the San Fernando Valley will serve east-west trips in the valley, as well as those destined south of the Santa Monica Mountains such as to Hollywood, the Wilshire area, the LA/CBD, LAX, and Santa Monica.

The recommended San Fernando Valley line runs in common with the Wilshire line from the LA/CBD out Wilshire to La Brea. Then it will turn north on La Brea and run to the Hollywood Bowl. To this point the line will be underground. From the Hollywood Bowl it will run through Cahuenga Pass in the Santa Monica Mountains adjacent to the Hollywood Freeway. Then, in an aerial configuration, it will run northerly into North Hollywood to the Burbank Branch of the Southern Pacific Railroad, where it will turn west and follow the railroad to the Sepulveda Flood Control Area. Then, the line will move into the Los Angeles River Wash and continue west until it rejoins the railroad right-of-way and continues to its termination at Canoga Park.

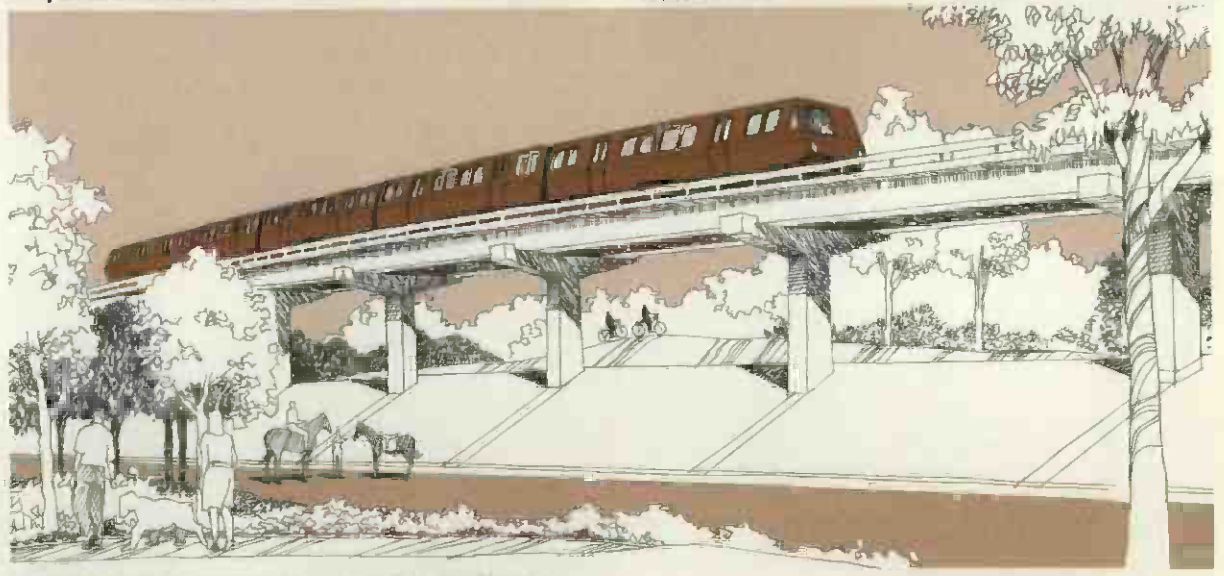
Starting north from Wilshire, stations are recommended at Beverly Boulevard, Hollywood Boulevard, the Hollywood Bowl, at Universal City, in North Hollywood near North Hollywood Park, near the Los Angeles Valley College, near Van Nuys Boulevard, at the San Diego Freeway, at Reseda, and in Canoga Park. These stations will be served by feeder bus lines and automobile parking facilities will also be provided at appropriate locations.

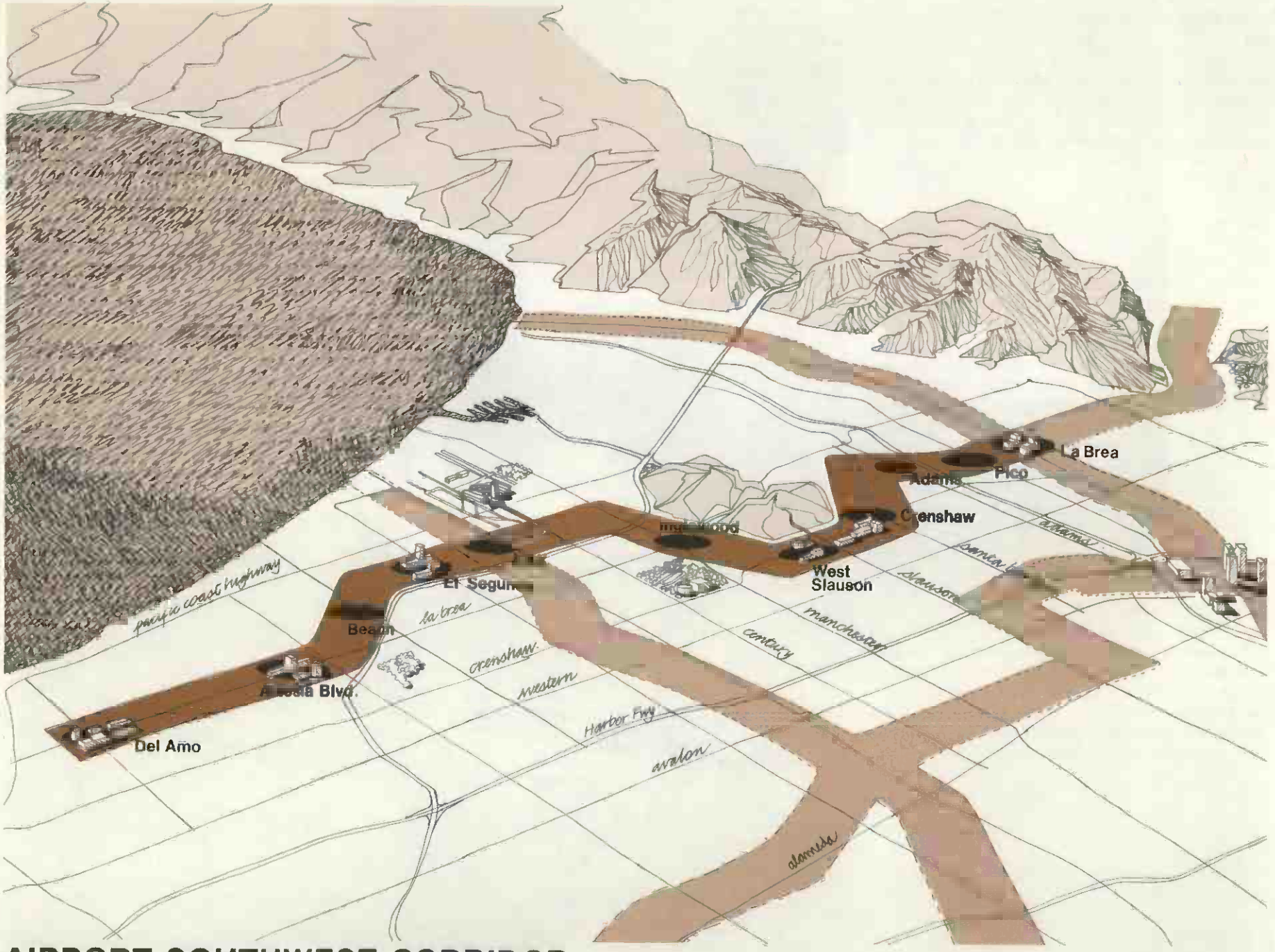
Universal Studios


Van Nuys


Hollywood Boulevard


Topanga Plaza


MRT Structure Integrated with Flood Control Channel



AIRPORT-SOUTHWEST CORRIDOR

Description of the Airport Southwest Line

The Airport Southwest line will serve a variety of needs, including work trips destined to such places as Wilshire and the LA/CBD and the aerospace industries in the airport area; shopping trips to a number of centers; and trips by air travelers and airport employees to the Los Angeles International Airport (LAX). The plan provides for through-train operation to the San Fernando Valley as well as to the LA/CBD.

The recommended Airport Southwest alignment will run from the LA/CBD along Wilshire in a common section out to La Brea. There it will turn south in a subway and run generally along La Brea to the Santa Monica Freeway. South of the freeway, it will follow La Brea for a short distance and then cut southeasterly, at which point the line will come up from a tunnel to become an aerial structure and continue to Crenshaw Boulevard. Running south along Crenshaw, the line will then turn southwest on an Atchison, Topeka, and Santa Fe (ATSF) right-of-way to Aviation Boulevard and then south to Rosecrans Avenue. Here, the line will turn southeast along another ATSF right-of-way to Hawthorne Boulevard where it will turn south and continue to the vicinity of the Del Amo Center.

The Airport Southwest line has stations recommended at Pico, Adams, at the Crenshaw shopping center, at Slauson Avenue, near the junction of La Brea Avenue and the ATSF in Inglewood, near LAX on Aviation Boulevard (where a connection with an auxiliary transit to the airport is suggested). This station will interface with the El Segundo-Norwalk line. Other stations are on El Segundo, Manhattan Beach Boulevard, at Artesia Boulevard, and at the Del Amo Center. In highly developed areas, stations will connect with feeder bus lines. Farther out, large park-and-ride lots will be available, as well.

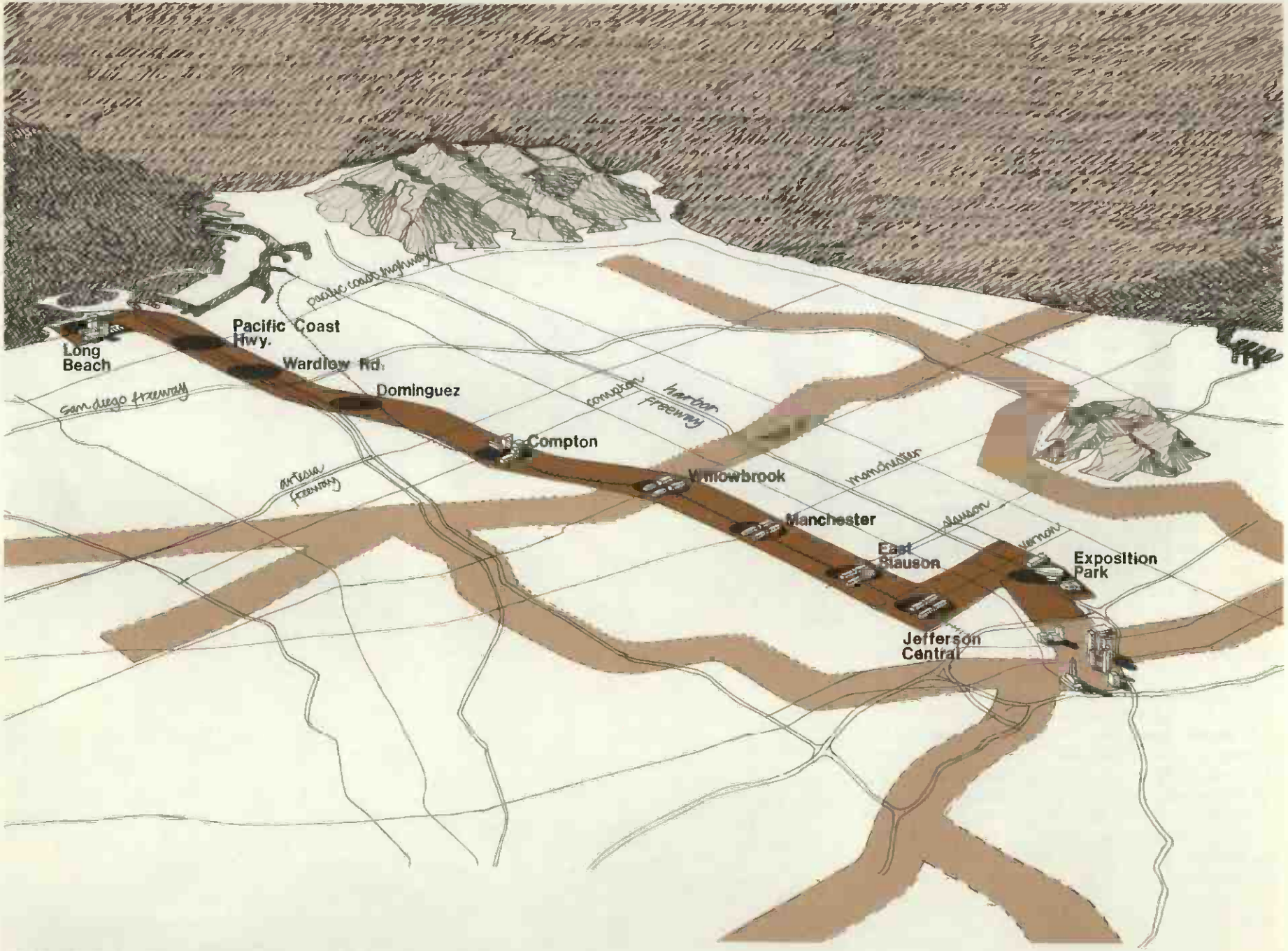
Crenshaw Shopping Center

Los Angeles Airport

Del Amo Shopping Center

Beach

View of Auxiliary Transit Serving Airport



SOUTH CENTRAL CORRIDOR

Description of the South Central Line

The South Central line will provide transit service to a major concentration of transit-dependent population in the region. It will run from the LA/CBD through the south central area and terminate in Long Beach.

The recommended alignment is as follows: Coming south from the LA/CBD in Olive Street, it will emerge from a tunnel south of the Santa Monica Freeway to become an aerial structure. The line will serve the University of Southern California and Exposition Park and then turn east to join a railroad right-of-way in Long Beach Avenue just west of Alameda Street. On this right-of-way, it will continue southward all the way to the San Diego Freeway. Then, it will proceed southward along the east bank of the Los Angeles River into Long Beach where it will turn east into the central business district in a subway.

Stations on the South Central line are recommended at the University of Southern California-Exposition Park location, near Jefferson and Central, at Slauson and at Manchester Avenues, at Willowbrook at the junction of the El Segundo-Norwalk busway, in Compton, in the Dominguez area, near the San Diego Freeway at Wardlow Road, at the Pacific Coast Highway, and in the Long Beach central business district.

The South Central line station designs will vary. At some, the design will emphasize handling of walk-in traffic; at others, the design will accommodate large numbers of feeder bus traffic or park-and-ride traffic.

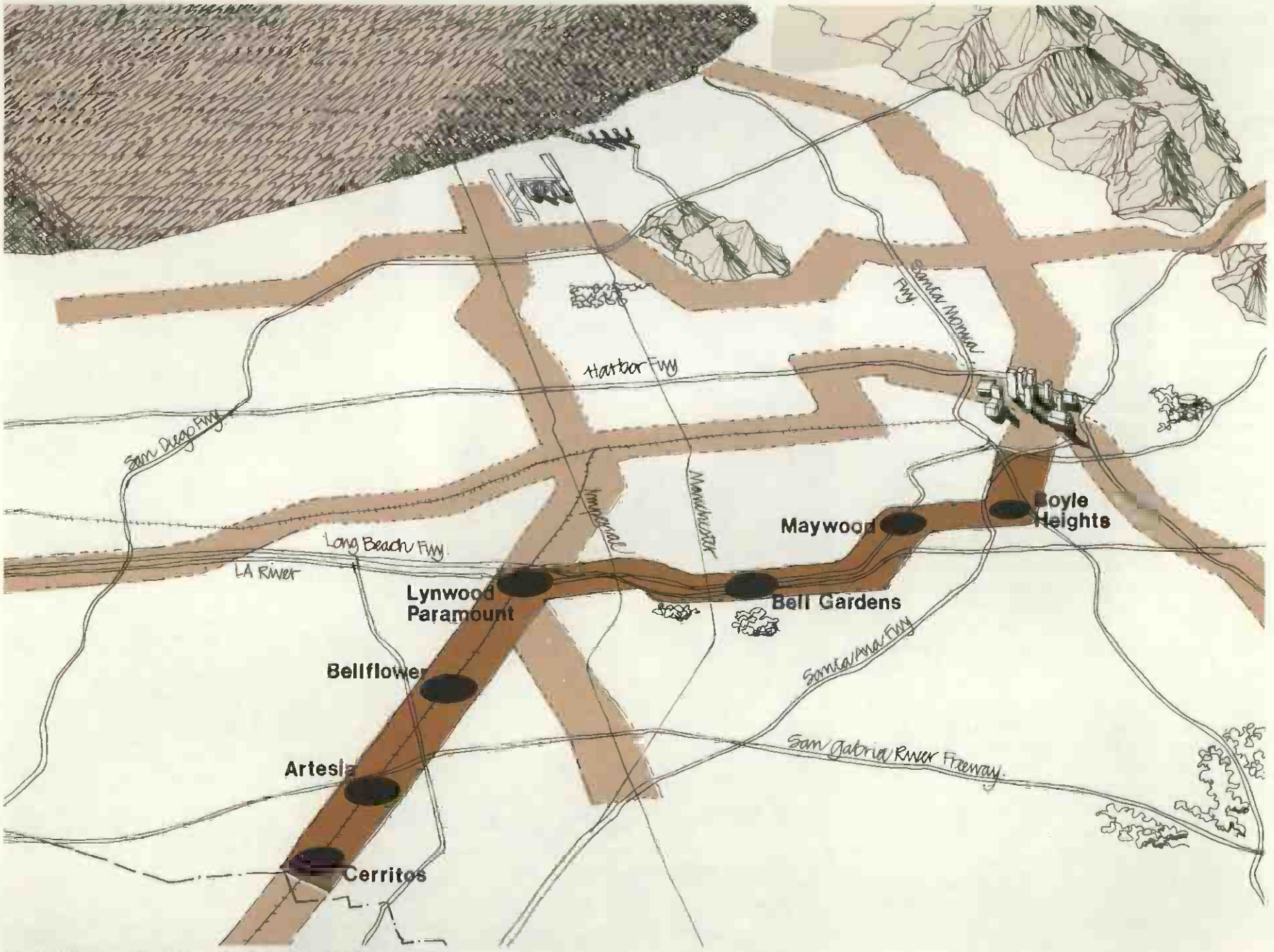
University of Southern California

Martin Luther King General Hospital

Watts Towers

Queen Mary-Long Beach

Aerial Structure Integrated with RR Tracks and a New Linear Park



SANTA ANA CORRIDOR

Description of the Santa Ana Line

The Santa Ana line will join Wilshire and the LA/CBD with Orange County. Final planning of that line will be coordinated with the Orange County Transit District.

Within Los Angeles County, the Santa Ana line would serve a major concentration of transit-dependent population, industrial areas, and residential communities.

The recommended line will run underground southeasterly from the LA/CBD into Boyle Heights under Whittier Boulevard. Near Esperanza Avenue, it will turn south, under the Santa Ana Freeway and portal to an aerial or at-grade alignment. Intersecting the Los Angeles River, it will follow that basin southerly through Maywood, Bell, Cudahy, and South Gate to a Southern Pacific Railroad line near Rosecrans Avenue, then, southeasterly along that railroad right-of-way to the Orange County boundary. This latter alignment depends on Orange County planning.

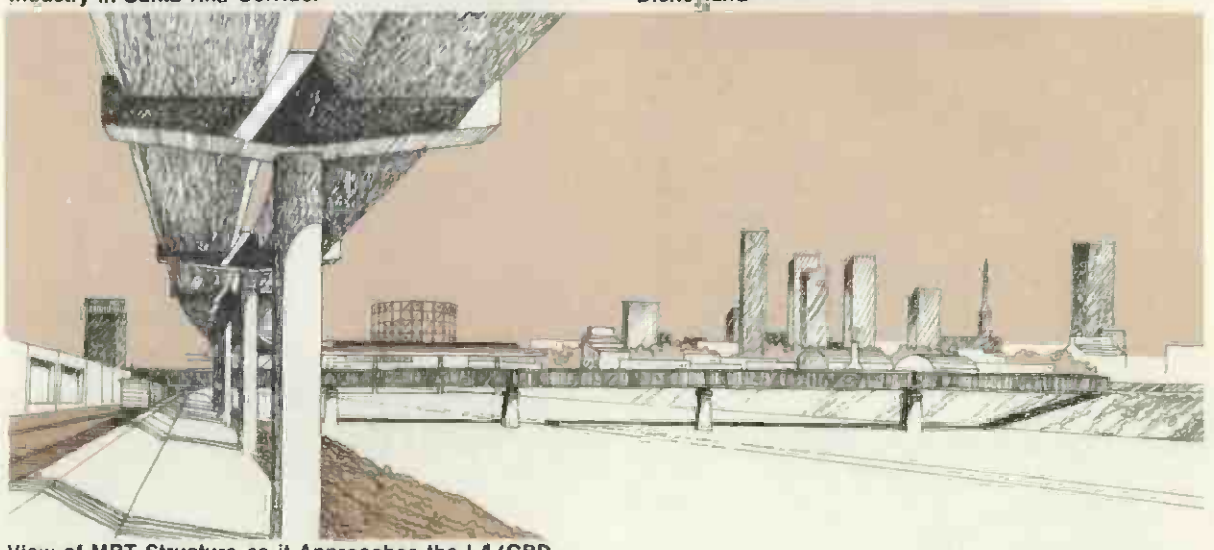
Stations are recommended in Boyle Heights (possibly near Soto Street), in Maywood at Slauson Avenue and the Los Angeles River, in Bell Gardens, near Lynwood and Paramount at the junction with the El Segundo-Norwalk busway, in Bellflower near the junction of the Artesia and San Gabriel River Freeways, in Artesia, and in Cerritos.

The design of each station will be matched to fit the types of traffic using the station.

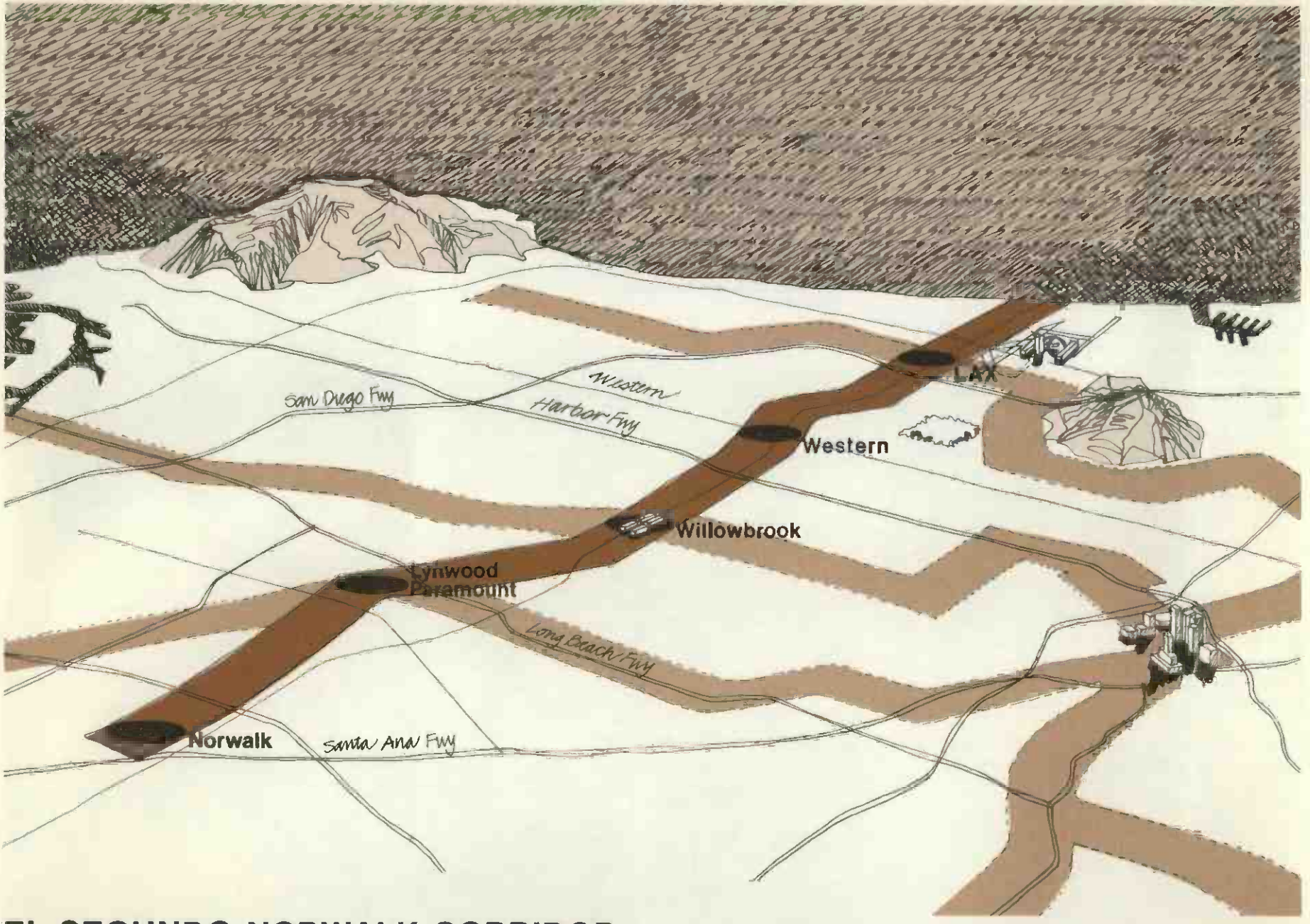
Whittier Boulevard

Industry In Santa Ana Corridor

Disneyland



View of MRT Structure as it Approaches the LA/CBD



EL SEGUNDO-NORWALK CORRIDOR

Description of the El Segundo-Norwalk Line

The recommended busway line planned for the El Segundo-Norwalk Freeway will serve as the east-west connector to other lines for travelers in the south half of the Los Angeles basin, thus providing a variety of routings that will satisfy a large number of origin-destination combinations.

The line will begin at its western extremity on Imperial Highway in the vicinity of LAX. It will proceed eastward within the alignment of the El Segundo-Norwalk Freeway (previously referred to as the Century Freeway) across the Los Angeles basin to Norwalk, stopping at the Santa Ana Freeway.

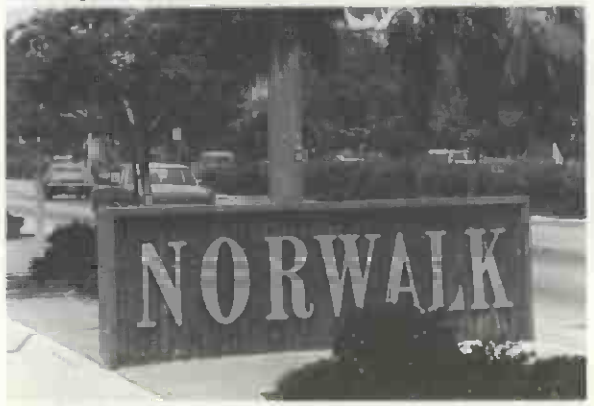
Stations will be located at the junctions with three other rapid transit lines—the Airport Southwest, the South Central, and the Santa Ana. These stations will be designed to efficiently handle the travelers who transfer between lines.

Other stations are recommended at Western Avenue, and in Norwalk near the Santa Ana Freeway. These stations will be designed as park-and-ride stations and also to connect with local bus lines.

Also, provisions will be made for buses to enter and leave the busway from collector street routes at the Harbor Freeway, the Long Beach Freeway, and the San Gabriel River Freeway as well as at the termini of the busway.

Los Angeles Airport

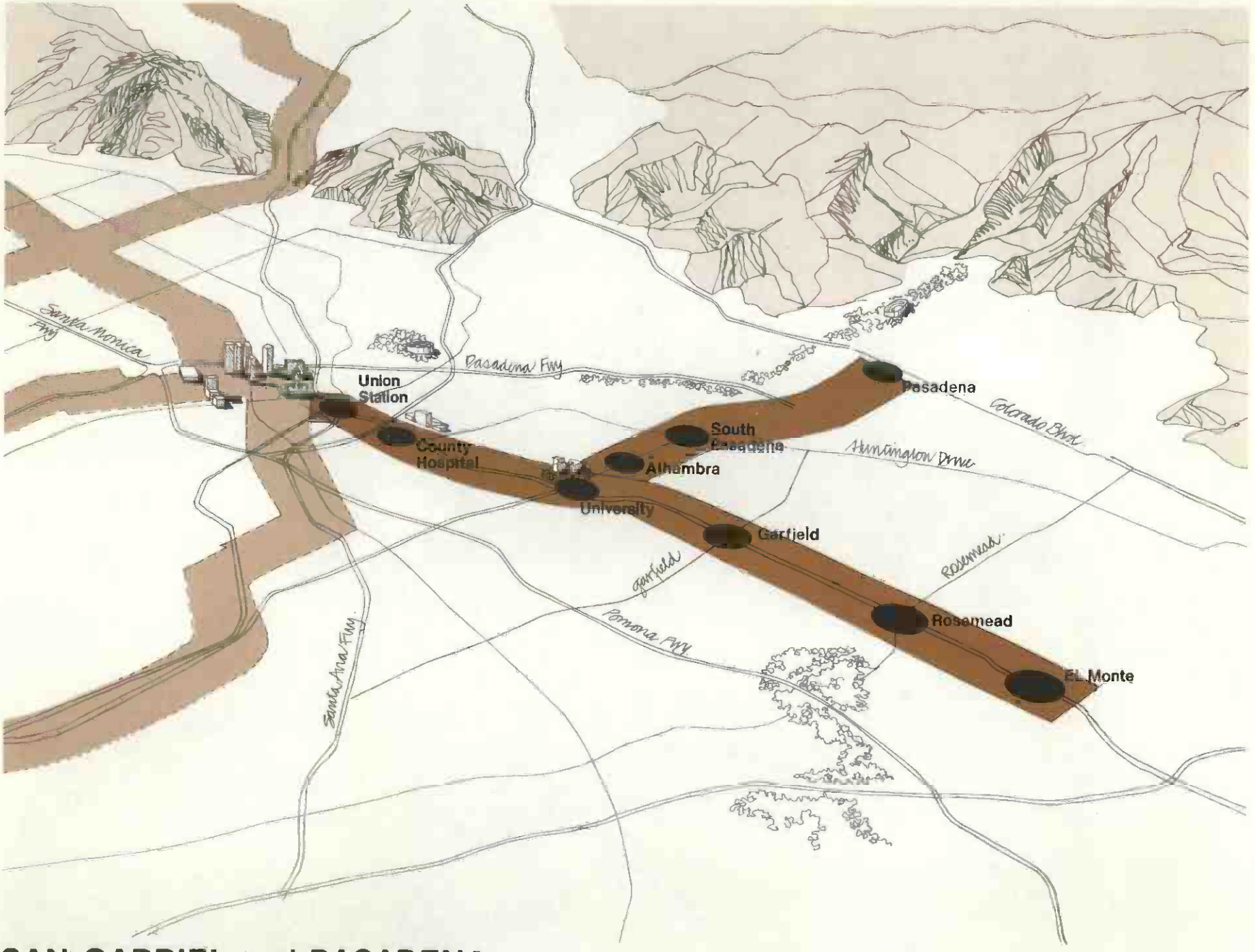
Hollywood Park



City of Norwalk

Aerospace Job Center

Proposed Exclusive-lane Busway in Operation



SAN GABRIEL and PASADENA

Description of the San Gabriel and Pasadena Corridors

A busway in the Northern Extension of the Long Beach Freeway into Pasadena is recommended for the initial rapid transit construction program. The busway lanes will be constructed within the freeway right-of-way.

As ridership grows, the consultant team recommends that the Los Angeles-El Monte busway be upgraded to an MRT line, generally along its present alignment.

Along the Long Beach Freeway, stations are recommended in Alhambra, and near the southern boundary of Pasadena. Buses will operate through to the Pasadena central business district.

When the Los Angeles-El Monte busway is converted to an MRT line, stations are proposed at El Monte, near Rosemead, at Garfield, in the vicinity of Cal State University at Los Angeles and near the L.A. County General Hospital.

LA County Hospital

San Gabriel Valley Employment Center

California State University at Los Angeles

El Monte Busway Converted to MRT Operation

Mass Rapid Transit

MRT is a general term used to describe transit vehicles designed to carry large numbers of people on a single line. The vehicles are operated in trains with fixed schedules. Trains can consist of up to eight vehicles. In Los Angeles, a high capacity MRT will carry about 24,000 seated passengers per hour at a speed of 80 mph.

Systems using these modern vehicles are in the San Francisco Bay Area, Montreal, Toronto, and Mexico City. MRT systems are also being designed for use in Pittsburgh, Baltimore, and Washington, D.C. The U.S. Department of Transportation is conducting research to develop MRT further—information from this program will help design the Los Angeles system. The MRT vehicles have wide, comfortable seats and are air conditioned; wide doors are provided for ease of passenger entry and exit. The vehicles are quiet. As a result of careful attention to design, they are a pleasure to ride.

A number of options are available as to the methods by which the vehicles can be suspended and propelled. Vehicles with either conventional steel wheels or rubber tires, are currently available, but suspension by new techniques using a magnetic field or a cushion of air are also candidates. Regarding propulsion, conventional rotary electric motors or new "linear" motors can be used. The magnetic and air cushion vehicles are not as highly developed, but they are potentially attractive. When final design activities are begun, choices on propulsion and suspension will be made.

The vehicles on the system will be automatically supervised by a central computer to provide safe, on-schedule travel.

BART'S Concord Line


Express Busway, Washington D.C.

Busway

A busway is a special reserved roadway designed for exclusive use of buses. Usually the roadways are built as part of a freeway, but special routes can be used, separate from freeways. Use of the reserved roadways permits the bus to carry passengers at high speeds, uninhibited by traffic congestion. Buses operate with close, yet safe spacing. As a result, a single busway can handle about 10,000 passengers per hour in one direction at speeds of 60 mph.

Another attractive feature of the busway concept is that the bus can pick up passengers in a neighborhood, using a route on city streets, and then get on the busway for fast travel to a central business district or other center of activity where it again moves onto streets to distribute travelers to their destinations.

The Los Angeles-El Monte busway is a typical example of such a system. Others are being used near Washington, D.C. and are being built in a number of cities. While conventional buses can be used effectively, other, newer types are under development to provide better service. If the buses are operated only on the special busway, wider and longer vehicles can be used to provide greater passenger comfort. Also, two vehicles can be connected together as in a two-car train to increase the hourly carrying capacity.

Each bus requires a driver; thus, they have relatively high operating costs. However, the busway itself can be constructed at a lower capital cost. Another advantage is that, under current regulations, busways can be financed with FHWA funds.

Feeder and Distribution Service

Feeder and distribution services provide access to and from the rapid transit stations. These services are essential to the success of rapid transit, because they are what makes rapid transit an area coverage system rather than a system of lines. Close coordination of feeder and rapid transit systems is essential to an efficient transit operation. To the individual, an attractive rapid transit system must consist of both a pleasant, easy ride on the system itself and an easy way of getting to and from the station.

Of course, travelers can use their own means of getting to and from the stations, such as by walking, by bicycle, or by auto. SCRTD will provide additional methods—improved surface bus service and auxiliary transit.

Improved Bus Service

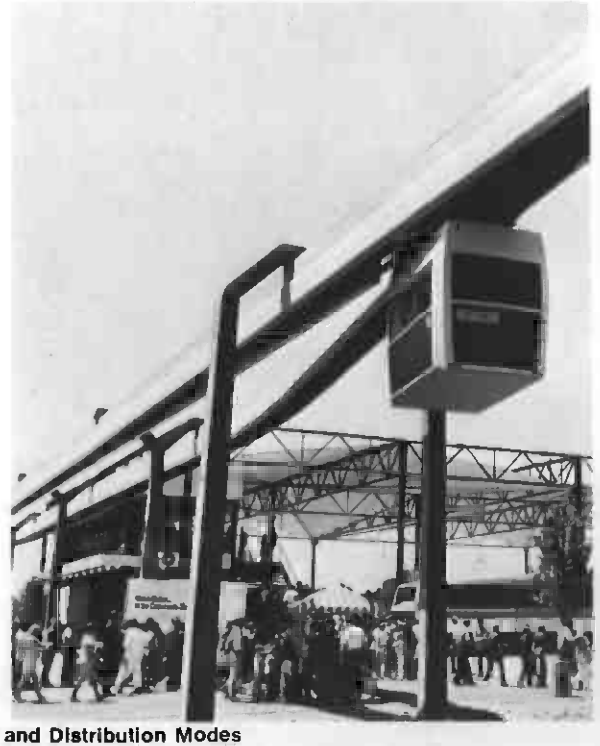
Improved bus service will be offered to travelers both in residential areas and areas of concentrated activity. As soon as rapid transit is approved, a program of improving the surface bus system will begin. Each year, new and extended services will be added so that by the time that rapid transit's initial construction is completed, some 1,100 buses will have been added to the system. To feed rapid transit, new bus lines will be placed into operation to provide direct service to rapid transit stations. Existing bus lines will be rerouted as necessary to provide access to rapid transit, yet still offering attractive service to travelers who need to use the bus for only short trips. Frequent service will be offered on the new lines and on the existing lines.

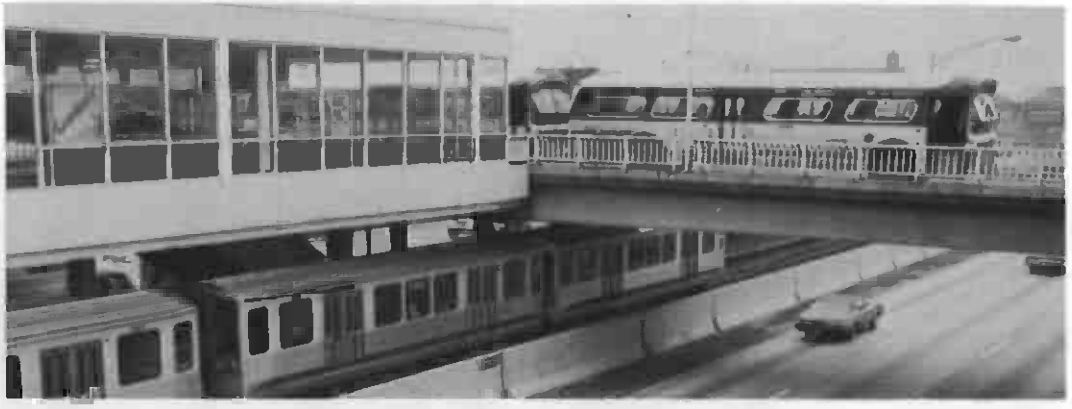
The bus vehicles will be selected to meet the needs of the service that they will provide: in some cases minibuses might be used; in other cases, buses designed especially for providing short distance feeder service might be used. In certain areas, the most effective feeder service may be that provided by dial-a-ride service such as is currently being operated in Orange County at La Habra.

Auxiliary Transit

Auxiliary transit is a general term that has been chosen in this study to refer to small vehicle, fixed guideway systems that are designed to serve a specific geographical area mainly as a feeder and distribution mode.

Auxiliary transit systems may be installed to provide specialized point-to-point transit service within a particularly intense center of activity.





Feeder and Distribution Modes

The systems can be designed to meet a wide range of requirements. They are attractive when relatively high volumes of travelers need to be moved to or from a particular point in a short period of time. Carrying capacities of up to 8,000 persons per hour and speeds up to 40 mph are easily obtained.

There are many locations in the Los Angeles region at which auxiliary transit might be installed. Installations are suggested at the following places: in the LA/CBD, providing internal circulation service and connections to fringe parking lots; at the Los Angeles International Airport; and in Century City. Other possible locations are in Long Beach, Santa Monica, and Westwood. Each installation would be linked to a rapid transit station so that travelers could use rapid transit and auxiliary transit to make their trips more easily.

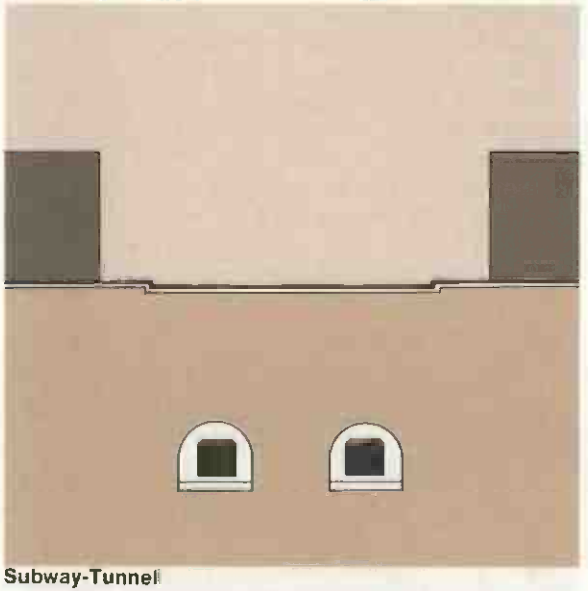
Rapid Transit Guideways

The guideways for rapid transit can be designed in a number of different ways, including those underground, made by tunneling or by the cut-and-cover method; at-grade; and aerial.

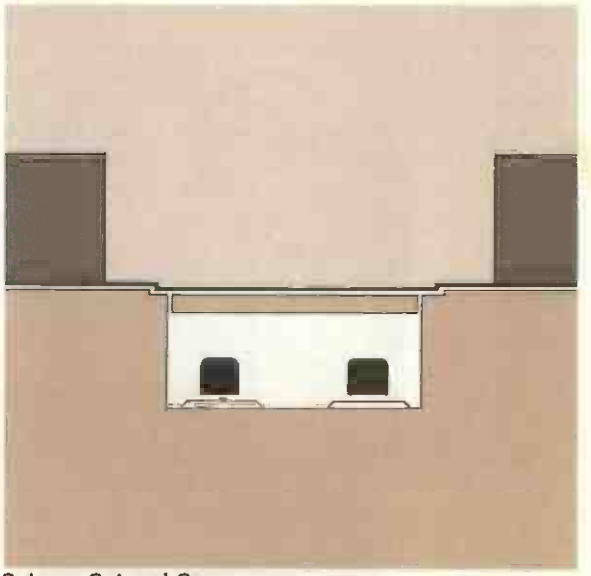
Underground construction is used in areas of highest density of activity. Although this is a high-cost method of construction, it is often the most practical way to pass through highly developed areas without affecting buildings and causing major visual impact.

Aerial construction separates the guideway from the street network and therefore provides maximum safety to vehicles and pedestrians. It takes a smaller amount of right-of-way than most at-grade guideways and, if carefully designed to blend with its surroundings, and if conditions permit, productive use can be made of the property below. Both the at-grade and aerial guideways will receive special architectural and landscaping attention.

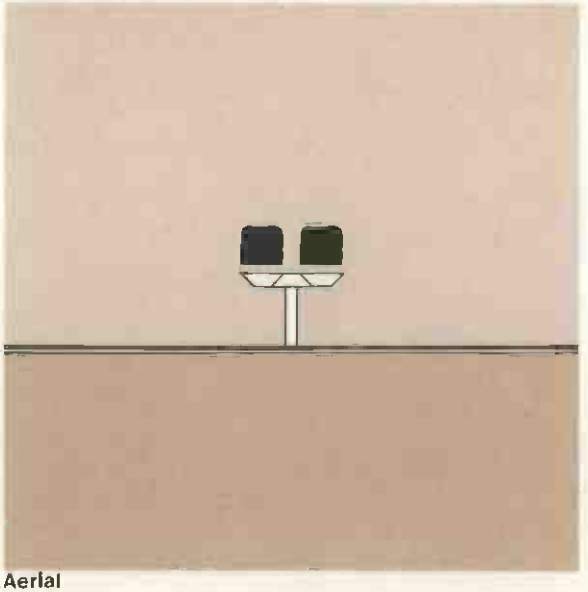
At-grade construction is usually the least costly way of building a rapid transit guideway especially if built in or alongside the freeway.



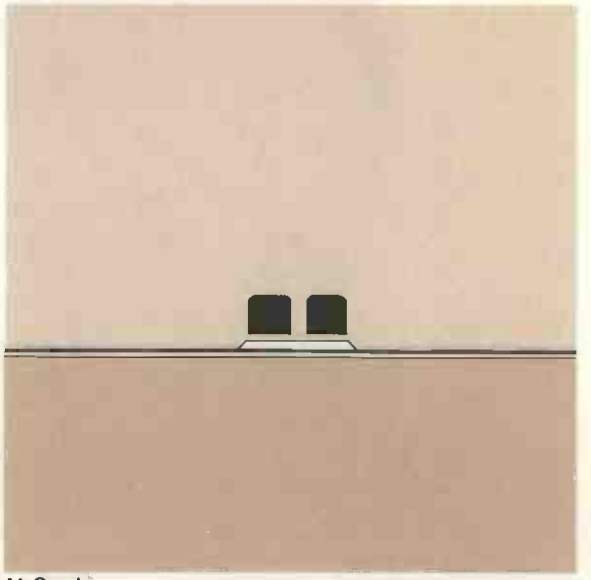
Subway-Tunnel



Subway-Cut and Cover



Aerial



At Grade

Stations

Functionally, stations for the rapid transit system will vary depending on whether the system is above or below ground and on the ways in which travelers are expected to travel to and from the system. The consultants recognize the need for carefully planned stations that conform to and are integrated with the communities that they serve.

Station platforms will be spaciously designed. Passageways to the platforms will also be wide, and elevators and escalators will be used to carry passengers between different levels in the stations. Provision for handicapped persons will be made.

In suburban areas, special attention will be given to the ways in which people will arrive at the station. Estimates of the numbers of travelers who will use buses, be driven to the station, will drive to the station and park, and will walk or arrive by bicycle will be used to design each station. These estimates will assure that adequate curb space and parking areas are provided. Feeder bus service will be designed to assure that bus travel to the rapid transit is an attractive alternative.

In more highly developed areas, most travelers will arrive at the stations on foot. In these cases, particular care will be taken to make pedestrian flow free and uncongested.

Chicago's Englewood Park/Ride Station

BART'S Berkeley Subway Station

Near-Term Transit Improvements

Recognizing the critical nature of transportation problems in Los Angeles, an important part of the consultant assignment was to develop plans for near-term, low-capital-intensive projects that will improve public transit service.

The SCRTD is systematically pursuing a comprehensive program of short-range operational improvements in order to provide the best possible bus service. Notable applications are the El Monte Busway, the Convention Center Park-and-Ride System, the Downtown Minibus Operation, an expanded San Fernando Valley service, the west side financial center subscription bus service, and intensified marketing and public information programs. The intent of the separate study was to supplement SCRTD's ongoing short-range program.

The improvements identified are vitally important to the long-range rapid transit plans since they represent the first steps in presenting the public with a transit service that begins to match the automobile in convenience. In addition to the new riders, the existing transit users also stand to benefit, since some of the improvements are aimed at improving bus travel times substantially on existing, heavily patronized bus lines.

The principal improvement concepts proposed for implementation are highlighted briefly on these pages. Projects such as described here are key elements of the overall bus system expansion program mentioned earlier.

Bus Priority Streets

Two special traffic control measures are recommended to speed up bus service on major arterials radiating from the central business district: reserved bus priority lanes, which gives buses first-in-line treatment at intersections; and bus priority signal operation, which provides longer effective green signal times. These two can be used effectively in combination on streets with heavy bus passenger traffic within a four- or five-mile radius of downtown Los Angeles. Pilot projects are recommended for Pico Boulevard and Flower Street. An expanded bus priority project will encompass some 40 miles of major arterial streets.

Intermediate Distance Surface Express

The surface express concept is designed to provide faster, more direct service to the LA/CBD and to other high activity centers from six to ten miles away. Well-designed new bus routes operating on smooth-flowing arterial streets and providing limited-stop or nonstop service from intermediate distance locations will be applied more widely to serve additional transit patronage. Two pilot surface express projects are proposed: the Sixth Street Express, serving the West Hollywood area; and the Hollywood Park Express, serving Inglewood and nearby suburbs with express buses from a special park-and-ride facility. If the projects are successful, the surface express concept will be expanded to other service areas.

Park-and-Ride Lots

The success in several U.S. locations of suburban park-and-ride lots, situated near freeways and served by express buses into the central business district, has been impressive. The concept is recommended for widespread application in Los Angeles to provide a transit alternative that is competitive with the automobile for longer distance commuter trips.

Fifteen general locations for park-and-ride lots have been identified which appear to offer substantial potential transit demand. Frequent express bus service into downtown and back will be operated during commuter periods. The initial projects recommended for immediate implementation are the Los Angeles Zoo lot and the Paxton Avenue lot to be constructed adjacent to the Golden State Freeway in Pacoima. Buses from these two lots will be operated into downtown via the Golden State and Pasadena Freeways. Ramp metering along the Golden State Freeway will speed the bus trip. Other similar new services are recommended in an on-going program.

Preferential Bus Operations on Freeways

Experience has shown that dramatic increases in transit patronage can occur if buses are given preferential treatment on freeways which provide them with a travel time advantage over cars. The most dramatic examples are on the Shirley Highway in Northern Virginia and on the approach to the Lincoln Tunnel on I-495 in New Jersey. Techniques such as contraflow operation, priority ramps on metered freeways, and reserved bus lanes are being pursued by SCRTD jointly with the California Division of Highways.

The initial projects recommended for immediate design efforts and timely implementation are: some form of preferential treatment for buses on the Hollywood Freeway; and contraflow operation on the Pasadena Freeway.

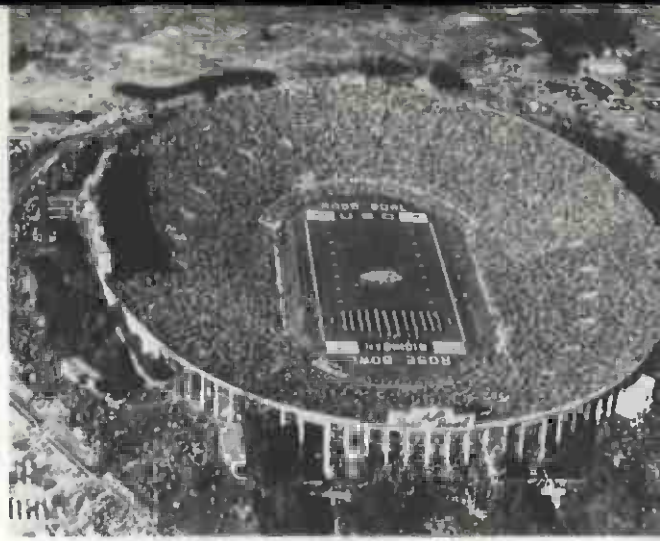
Major modifications in the distribution of bus passengers in the LA/CBD are needed in order to retain existing patrons and capture new riders. The dynamic growth of downtown, concentrated in the new west side financial core, makes essential the immediate planning and implementation of new services and changes in existing services. In particular, a fast downtown distribution route with adequate available curb space for loading and discharging should be developed for use by all the express buses. Special traffic control techniques designed to give preferential treatment to buses will be worked out with the City Department of Traffic to speed bus flow through the downtown area. The best solutions for now and for the short- and long-range future require the continuing technical efforts of all involved organizations.

Implementation Plan

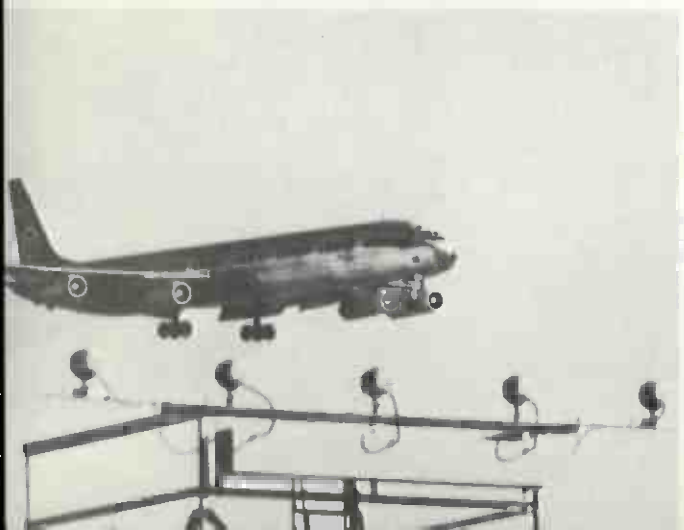
A five-year plan has been designed to implement the program. The first two years of the program, during which time pilot projects would be implemented and evaluated, are crucial to the success of the expanded five-year program of special projects. Cooperative efforts between a number of agencies will be required.

The total capital cost of the recommended special five-year operations program approximates $14 million. The program will result in about $750,000 per year additional operating cost. These expenditures should be returned many times by benefits to the traveling public.

The program will be continued and expanded beyond the five year period, bringing new and improved bus service to other communities in the Los Angeles region.




SAN FERNANDO VALLEY
PASADENA / SAN GABRIEL
WILSHIRE
LEGEND:
Initial MRT
Initial Busway
Ultimate System
EL SEGUNDO / NORWALK
AIRPORT SOUTHWEST
SANTA ANA




DISNEYLAND
3

3.
Traveling on Rapid Transit

Getting To and From the Station

Travelers will use a number of methods to get to rapid transit stations. From their homes, some people can walk a short distance to the nearest station. Others can use a local bus, whose route will be carefully designed to provide quick travel to the rapid transit lines. Still others can use an automobile, either parking their car in a parking lot or being dropped off at the station by someone else. In some cases, a traveler can use one of the auxiliary transit systems that were discussed earlier.

Plans for access to stations will be developed to fit the situation at each individual location. In some instances, emphasis will be placed on providing carefully coordinated bus routes so that travelers will be close to bus stops that are frequently served. Outside the densely urbanized areas, connecting bus service will be supplemented by making automobile access as convenient as possible with efficient parking lots and well-designed curbsides for passenger dropoff.

In the areas of concentrated development, such as employment centers, stations will be located as close to the center of activity as possible, thus affording a maximum number of travelers an easy walk to their destinations. In other areas where destinations are more widely spread out, auxiliary transit can be used to enable travelers to reach their final destinations. Planners believe that rapid transit will enable communities to concentrate development close to the stations where desired, thus making access to the system convenient for large numbers of travelers.

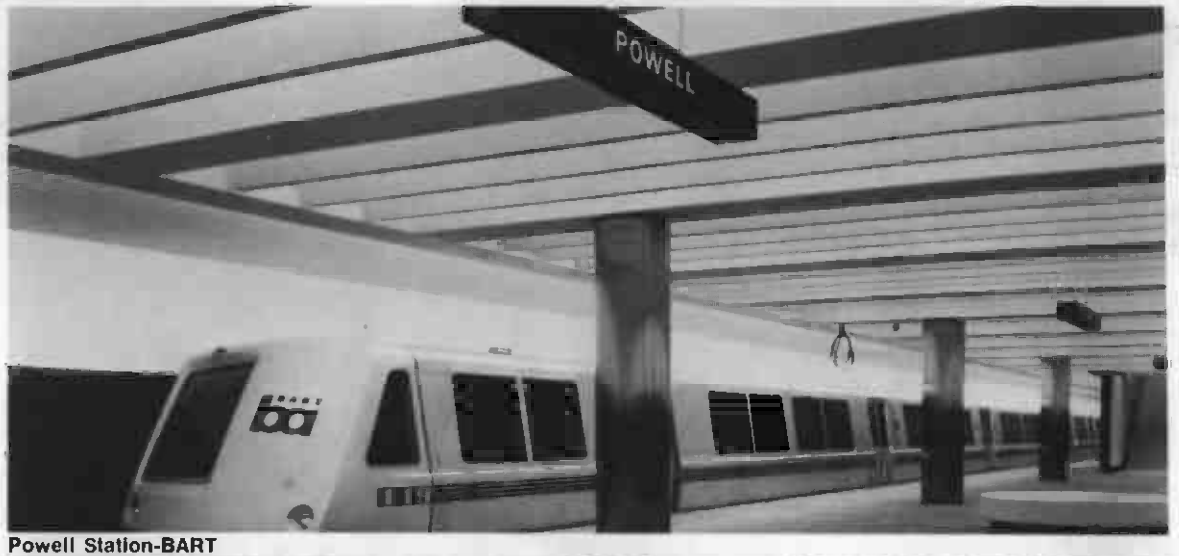
Passing Through the Stations

Rapid transit stations will be designed to make boarding the system safe, convenient, and pleasant. The stations will be carefully designed for efficient movement of travelers, including wide passenger platforms, escalators and elevators to ease the movement of elderly or handicapped persons or those with parcels or bags, and open areas to accommodate people arriving at the stations from buses or cars. Recently opened rapid transit systems, such as BART, Mexico City, and Montreal demonstrate that stations can be attractively designed. Pleasing color schemes, designs, and art work will also make stations attractive to use. Another important consideration is cleanliness. An adequate budget will be provided to assure that stations—and the rapid transit cars—are clean.

Rapid transit stations and other facilities will be designed so that travelers can easily recognize familiar signals for rapid transit service throughout the region. Colors, graphics, and explanatory symbols will be used to explain how to use the system, and more detailed information about the system will be provided on information panels. At each station, a supervisor will be available to help travelers.

Additional facilities to be provided at the stations include telephones, police and fire call boxes, drinking fountains, community bulletin boards, bike racks, newspaper vending machines, security systems, and other services.

At stations in areas of dense activity, designs will be developed so that the station is an integral part of a larger structure. Passageways will be provided to ease passenger flow; shops and stores will be conveniently located for easy stop-off.



Powell Station-BART

Ashby Station-BART

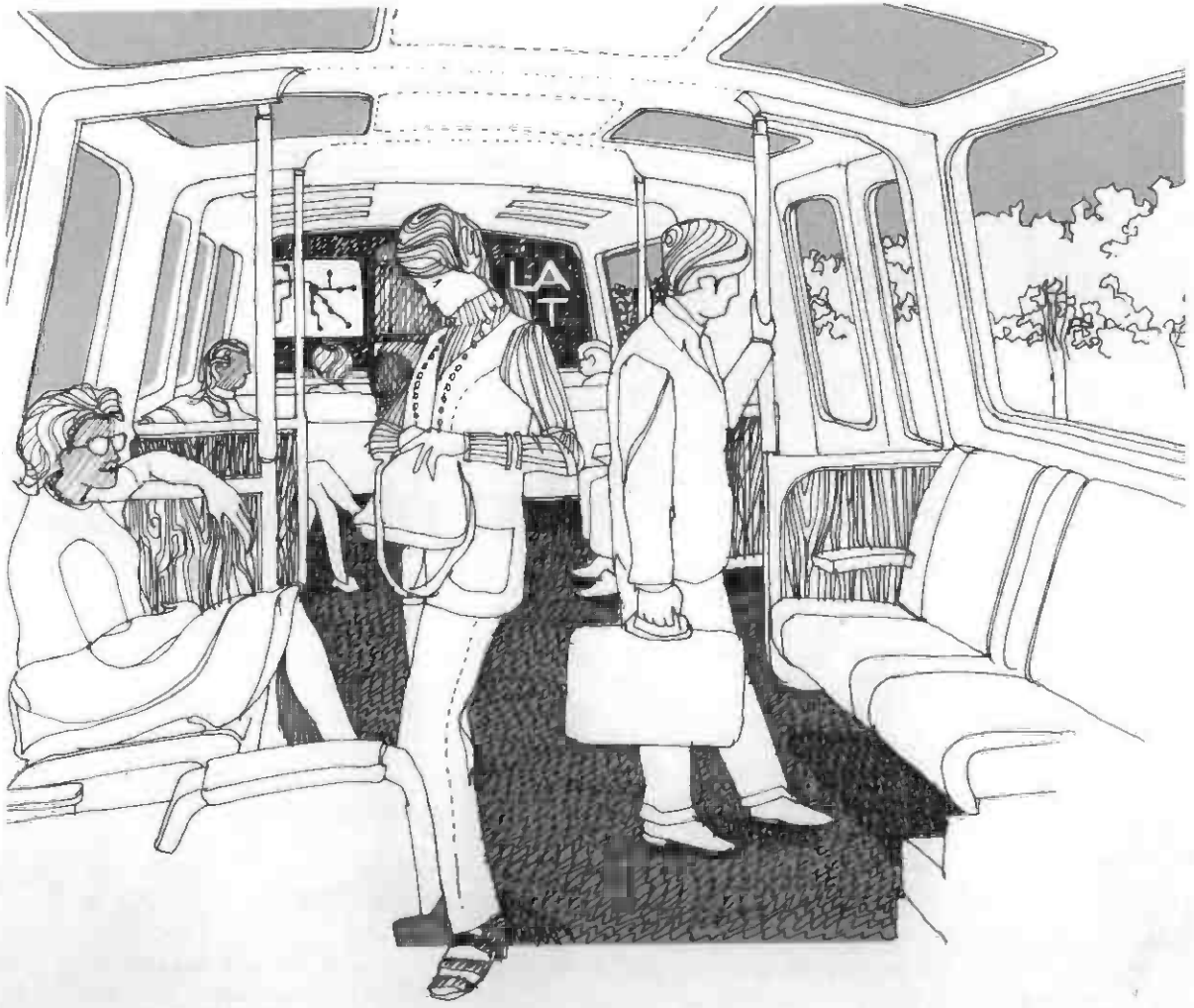

Fremont Station-BART

Riding the System

Rapid transit vehicles will also be designed to make riding the system a pleasant experience. Major attention will be given to providing spacious seats that are comfortable to sit in. Doors will be wide to permit easy boarding. Large windows will be provided for passengers. Cars will be air conditioned and decorated with attractive color schemes. Particular attention will be given to making the rapid transit system as quiet as possible.

Design of the control system for rapid transit will make riding the system as safe as possible, certainly much safer than traveling by automobile. The control system will be made redundant—so that if one part of the system should fail, another takes its place to provide uninterrupted, safe service.

In keeping with current SCRTD policy, fares for rapid transit will be maintained at low levels, thus making the system attractive in terms of cost as well as travel time and convenience. Special fares will be established for young people and for the elderly. In addition, ticket buying will be made easy through the use of automatic ticket dispensing machines and "charge account" type tickets.



Interior of an MRT Vehicle

Estimated Patronage

Because the system will provide an attractive means of travel, it is expected that large numbers of travelers will use it. Analysts have conservatively estimated that, on an average week day in 1990, some 1,050,000 persons will make rapid transit trips to and from a variety of places. Some 875,000 travelers will use the surface bus system for shorter trips, for trips not served by the rapid transit system, or for trips to and from the rapid transit lines. Line loadings on the various rapid transit lines are shown on the map on the opposite page.

Of the total of 1,050,000 rapid transit riders, 706,000 will be people who would otherwise use automobiles. As a result, congestion on freeways and arterial streets will be reduced. It is important to note that, because rapid transit will serve major corridors of rush hour travel, the reduction of congestion will take place where and when it is most needed. This will also reduce the emission of air pollutants by automobiles in areas where it is heaviest.

Much of the attractiveness of transit will be to people traveling to centers of activity. Today, for example, about 38 percent of work trips made to the LA/CBD are by transit. With rapid transit, this number will jump to 65 percent. The accompanying table shows the relative attractiveness of transit for work trips made to selected centers, as well as the total number of transit trips destined to those centers. The two largest concentrations of trip ends will be in the Wilshire district and in the LA/CBD. If no rapid transit were available, and if the trips had been made by automobile, it is estimated that roughly 155,000 parking spaces would have to be provided in these locations. In this regard, rapid transit makes land available for other uses.

Of course, most trips will be made during peak hours by people traveling to and from work. It is estimated that peak period ridership—from 7 to 9 a.m. and from 4 to 6 p.m.—will be about 65 to 75 percent of the total. The accompanying table shows the peak hour riders on each of the rapid transit lines. The data pertain to traffic flow in the direction of greatest flow, and at the point along the line (generally near the LA/CBD) at which there is the greatest number of riders.

The patronage projections reflect high levels of transit use that are comparable to patronage levels in other metropolitan areas which benefit from rapid transit service. These projections are based on the use of traditional modal split models that assume current conditions with respect to the availability and cost of automobile travel and the current modal choice propensities of the traveling public.

The world is faced with a serious crisis with respect to the availability of energy. This is particularly so in the United States where 6 percent of the world's population consumes over 33 percent of the world's energy.

This situation, together with serious concerns regarding environmental protection by the Environmental Protection Agency and others, makes it clear that a substantial reduction in the use of the automobile will result from either the restrictions being proposed by EPA or the substantial increase in gasoline prices now being projected because of the energy crisis. Under these circumstances, application of current conditions to the modal split process will grossly underestimate the utilization of public transportation and overestimate the use of the private vehicle. This all means that the actual patronage is likely to be much higher than the projections presented here.

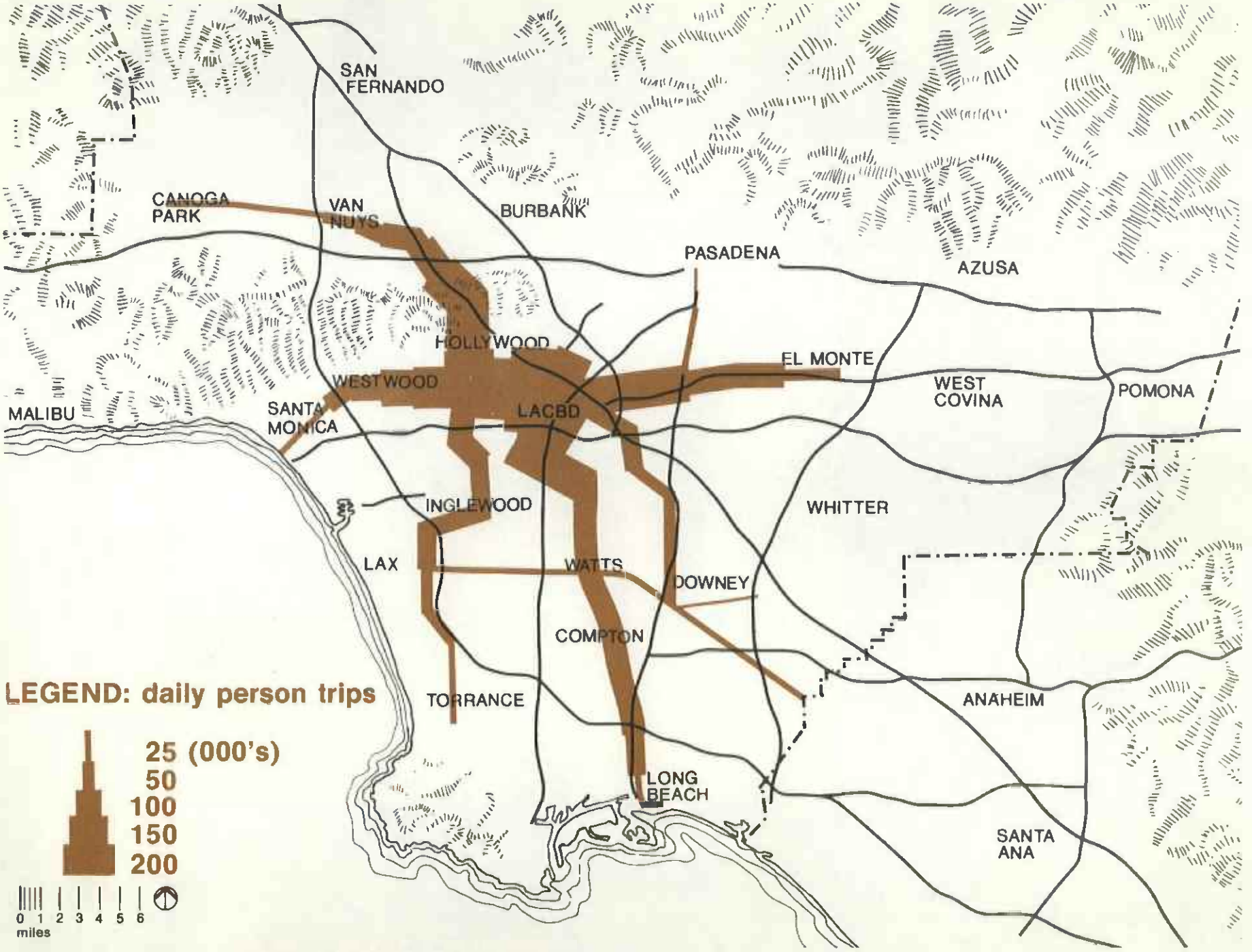
PEAK-HOUR RAPID TRANSIT LINE LOADINGS

Rapid Transit Line	One-Way Riders at Maximum Load Point
Wilshire, East of La Brea	42,000
Wilshire, West of La Brea	16,000
San Fernando Valley	28,000
Airport—Southwest	12,000
South Central	32,000
Santa Ana	12,000
San Gabriel Valley	26,000
El Segundo—Norwalk	5,000
Northern Extension—Long Beach Freeway	5,000

TRANSIT WORK TRIPS TO SELECTED CENTERS (1990)

Center	Daily One Way Transit Trips to the Center	Daily Average Percent Transit to the Center
LA/CBD	200,000	65%
Wilshire (Eastern Sector)*	74,000	37
Wilshire (Western Sector)**	36,000	24
Hollywood	25,000	24
LAX and El Segundo	9,500	18

* From LA/CBD to Miracle Mile.
** From Beverly Hills to Santa Monica.



1990 RAPID TRANSIT SYSTEM AVERAGE DAILY PATRONAGE


MARINELLO SCHOOL OF BEAUTY

4.
Benefits from Rapid Transit

Introduction

A major public investment such as recommended here will have an impact on virtually every member of the community. Those who continue to travel by auto as well as those who use the system will benefit. In addition to those living close to the rapid transit and feeder lines, those who live farther away will also be benefited. Members of the labor force will receive benefits, as will employers. Homeowners will benefit, as will renters. And the community in general will benefit from other, more widespread effects, such as improvements in the economy and in the environment.

On the other side of the ledger, there will be negative impacts that must also be taken into account.

Traveler Impacts

Many travelers will benefit from rapid transit, as shown in the box on this page. The major beneficiaries will be those who were former auto users or bus patrons and those who continue to use autos.

The rapid transit user who previously used the automobile for his trip will be one of the principal beneficiaries of the system. Before, travel by auto was made on surface streets and on freeways that were heavily congested. Thus, rapid transit will reduce frustration and inconvenience.

In shifting to rapid transit, the traveler will find that he saves time in traveling. If he makes a full accounting of his automobile operating costs, he will also find that the transit fare is less than his auto operating costs. It is important to remember that gasoline prices are likely to be much higher in 1990 than they are today. Other major items included in operating costs are oil, maintenance parts and labor, and tires. Operating costs, per mile of travel, are higher when traveling under congested conditions than under free-flow conditions. Thus, as the motorist shifts from congested freeway travel to transit, the savings will be especially significant.

Many families who use transit will find that they no longer need a second car—some will find that no car at all is needed. Travelers who use transit to travel to many of the regional centers (such as the LA/CBD) will also save parking fees, which by 1990 will be considerably higher than they are today because the land in these centers will be more precious. Since transit will provide much safer travel than the automobile, accident costs will be markedly reduced. Finally, rapid transit will provide a much more relaxing way of traveling. The rider will be able to read, play games, work, or even sleep on his trip rather than fight traffic.

The former bus patron will probably pay the same fare when he uses rapid transit as he paid on the bus. He will also save travel time and will have a more comfortable ride.

The table on the next page presents some typical trip comparisons of rapid transit travel with 1990 auto travel and current bus travel. The travel times shown are for rush hour periods. The cost savings sometimes represent the saving of a substantial auto parking fee. The figures represent access as well as line haul times and costs.

Many of the auto travelers who do not decide to switch to rapid transit will find that the freeways are less congested. This will be particularly true on the following freeways: Hollywood, Ventura, Santa Monica, Harbor, Santa Ana, and San Bernardino. Lesser, but noticeable effects will be on the Pasadena, San Diego, Long Beach, Pomona, and El Segundo-Norwalk Freeways. Near the LA/CBD, the freeway network will experience the maximum reduction of congestion. Reduced freeway congestion results in travel time savings and lower automobile operating costs.

Other travel benefits will be experienced by truckers, who will save time and have reduced operating costs due to reduced freeway congestion, and by visitors to the area who have come by air and will find they can get to and from the airport more easily.

TYPES OF TRAVELER BENEFITS

- Rapid Transit Patron—Former Auto Traveler
  - Travel time savings
  - Dollar savings—auto costs for operation, ownership, and parking; minus fares paid for transit
  - Reduced accidents
  - Reading time while riding transit
- Rapid Transit Patron—Former Bus Rider
  - Travel time savings
  - Increased comfort and convenience
- Auto Travelers Who Continue to Use Autos (In Transit Corridors)
  - Travel time savings
  - Dollar savings in auto operation

RAPID TRANSIT TIME AND COST SAVINGS

	Estimated Savings Resulting from Use of Rapid Transit			
	By Former Auto User		By Former Bus User	
	Travel Time (Minutes)	Travel Cost (Dollars)	Travel Time (Minutes)	Travel Cost (Dollars)
ORIGINS AND DESTINATIONS CLOSE TO RAPID TRANSIT				
Lakewood to LA/CBD	25	$2.14	48	Assumed
Inglewood to LA/CBD	15	1.86	18	to
Van Nuys to El Segundo	11	0.32	44	be
Beverly Hills to LA/CBD	25	1.81	32	equivalent
ORIGINS AND DESTINATIONS FARTHER AWAY FROM RAPID TRANSIT				
Arcadia to Wilshire Center	13	1.70	34	Assumed
Torrance to Hollywood	10	1.67	37	to
Burbank to El Segundo	30	0.47	86	be
Northridge to Century City	1	1.50	65	equivalent

Community Benefits

The existence of a vastly improved transit system in the Los Angeles region will benefit many members of the community, including employees, homeowners and renters, businesses, and others.

Aside from having an easier, safer, quicker, and less costly trip to work, many members of the labor force will find better jobs, because rapid transit will make employment centers more accessible. More important, however, is the fact that rapid transit will enable some unemployed people to find jobs. Today, many of the unemployed do not have an auto. Although bus service is usually available, the service provided by the bus makes job hunting difficult. Rapid transit will take these people to major employment centers where they can find jobs.

Since building the rapid transit system will be the largest single project ever undertaken in Los Angeles, employing upwards of 10,000 persons, unemployment in the construction industry and in other transit-related industries will virtually disappear during the period of construction.

Reduced unemployment will save taxpayers money by reducing welfare costs. It will also save businessmen money by reducing unemployment compensation costs.

The increased accessibility afforded to the residents of Los Angeles will be especially significant in the vicinities of rapid transit stations. Valuable potentials for new development will exist, thus providing opportunities for communities to restructure the intensities of activity in a variety of ways.

Businessmen will benefit from rapid transit because of better access to the labor supply, which will provide better matches of employee skills to job requirements. This will result in lower costs, higher profits, and, in some cases, reduced prices to consumers. These effects will be felt most by the garment industry, retail trade, insurance and banking, and the aerospace industry.

On the minus side of the ledger will be displacement and disruption. Homes and other buildings will have to be acquired for rapid transit right-of-way. Although current legislation to compensate property owners is much improved over previous years—providing fair payment for property taken and assistance in finding a new place to live—many impacts are simply not easily compensated for. Especially hard hit are those with low incomes and those in the upper age brackets. The study team has given attention to this problem and has attempted to find routes that will minimize displacement of people.

Disruption of activities during construction, such as along streets where the system will be underground, will be a problem. Although new techniques are available for minimizing disruption, the negative impacts cannot be completely avoided. Construction will be planned to keep disruption to acceptable levels.

Increased development of office buildings, retail stores, manufacturing, or high rise apartments around rapid transit stations will affect many people by making a new style of life possible. Persons who work in these areas can explore the area on foot and spend many interesting lunch hours in nearby shops. People who live in these areas will benefit from a richness of life not possible in suburban single-family house neighborhoods. So, a wider range of choice of life style will be available to Southern Californians.

In building rapid transit, park areas can be developed along side the lines where children can play and others can relax. These parks will be carefully landscaped to make the rapid transit structures an acceptable part of the neighborhood.

Many recreational and entertainment centers will be close to rapid transit stations, including the Los Angeles Convention Center, the Coliseum, museums, the Forum, the beaches in Santa Monica and Long Beach, the Hollywood Bowl, and movie studios. UCLA, USC, Cal State University, L.A., and L.A. Valley College will be on the rapid transit lines.

MRT in a Linear Park

Environmental Impacts

Environmental impacts include effects on air pollution, noise, visual or aesthetic values, energy, open space, and the creation of spoil.

Air pollution, one of the major problems in the Los Angeles basin, must be reduced. Since a significant part of air pollution comes from automobiles, it is obvious that every trip made by transit will be a trip not made by a smog-producing auto. Another fact is that pollution caused by remaining auto travelers will also be reduced, since congested driving creates much more air pollution than free-flowing driving. Over the entire basin, the percentage reduction of air pollution will not be large, because the majority of trips will still be made by automobile. However, in areas of intense traffic—in centers and along major travel corridors served by transit—the relative improvement in emission of pollutants will be significant. It is in these areas that the need for reduction of pollution is most intense.

Rapid transit systems recently installed in San Francisco and Mexico City demonstrate that they can be built to operate quietly. To minimize the noise, standards will be established to keep rapid transit at acceptable distances from residences and businesses. On the other hand, increased transit usage will result in somewhat less noise near freeways.

Visual impacts of transit—especially aerial structures—will receive most careful attention, including the aesthetic features of design, as well as the structural features. Landscaping the lines and the stations will help to make the rapid transit system acceptable to the communities that they serve.

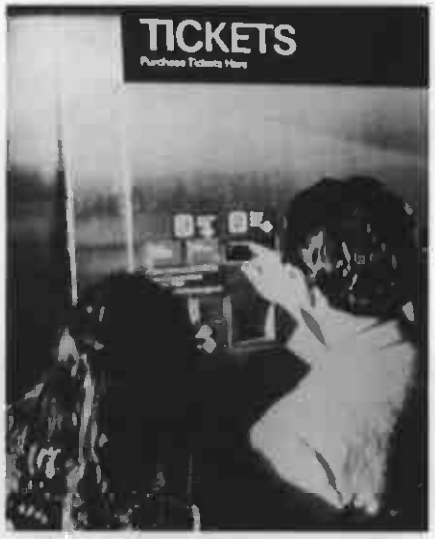
Energy conservation will be an important beneficial effect of rapid transit. Studies have shown that rapid transit is at least 6 times more efficient in the use of energy than the automobile. Thus, rapid transit trips mean more effective use of energy. Reduced auto congestion on freeways also saves energy, because gas is used more efficiently. Finally, since rapid transit cars are powered by electricity, a variety of different basic kinds of energy can be chosen, depending on the future availability of different resources.

As indicated earlier, rapid transit will create forces to concentrate development in centers of activity. These forces will relieve pressure for development elsewhere and give planners greater freedom to establish parks and open spaces and to preserve home neighborhoods.

Spoil, which is waste dirt produced by tunneling and other forms of rapid transit construction, must be disposed of. Because disposal of spoil can be costly, or if not done properly, can have negative environmental effects, it is a factor that must be considered. The study team has considered the impact of spoil and has recommended underground construction only where it appears necessary.

TYPES OF COMMUNITY AND ENVIRONMENTAL IMPACTS

- Improved life style and variety
- Reduced unemployment
- Increased construction industry employment
- Reduced welfare costs
- Reduced unemployment compensation costs
- Improved business productivity
- Increased property values
- Improved accessibility to recreation, shopping, entertainment
- Reduced air pollution
- Reduced energy consumption
- Better parks and open space
- Disruption and displacement due to construction
- More transit noise—less auto noise
- Visual impacts
- Disposal of spoil


TICKETS

5. Costs and Revenues

Capital Costs

Capital costs of the recommended system are those necessary to acquire the right-of-way; to build the physical facilities such as guideways, stations, yards, and the control system; to purchase the vehicles, and to develop engineering plans and manage the construction. The total capital cost also includes an allowance for contingencies.

These estimates were developed by the study team using a variety of sources of information, including the detailed engineering studies done in the preparation of the 1968 SCRTD rapid transit proposal, cost data developed by the California Division of Highways, experience in other cities, and special cost studies by SCRTD consultants.

Right-of-way costs include not only the actual costs to buy the required property, but also an allowance for relocation payments and assistance to families and businesses whose property is to be acquired.

Physical facilities costs were estimated individually for each line segment of the system and for stations, parking, and other separate facilities. Special attention was given to tunneling costs, since these are a major part of the total.

Vehicle costs were developed by analyzing the way that vehicles will be routed on the system and how many will be required to provide the required service, in combination with an estimate of how much each vehicle will cost.

The contingency allowance is included to provide for unforseen events that may cause the

cost to increase; therefore, the total cost might be lower than shown.

An accompanying table shows the breakdown of the capital costs of the initial construction program, estimated at 1973 price levels. The contingency allowance is included in the individual cost items. The MRT costs will be borne by SCRTD. The busway costs are assumed to be paid from available highway funds, with the exception of the buses themselves.

Construction of the initial system will start as soon as possible after passage of the referendum. But first, engineering plans for the first construction contract must be completed, put out for bid, and contractors selected and put under contract. The first construction activity could commence in 1975, if the public referendum is passed in 1974.

The construction program will be planned to complete the system as soon as possible. Vehicle and system testing will commence in 1982. Each of the lines will go into service as they are completed. Those that are at grade or aerial can be completed earlier. By 1987, all lines should be in operation.

Because of the time required for construction of the initial system, an adequate allowance must be provided for cost increases. This allowance is called escalation. Studies of construction costs in Southern California indicate that these costs are increasing rapidly and will continue to increase in the future. Accordingly, an escalation allowance of 9 percent per year was chosen. This allowance, together with similar estimates for vehicles and right-of-way (5 percent and 6 percent, respectively) were used to convert the 1973 costs to estimates of what the actual costs will be during the 12-year project. Escalation results in the following total cost of the MRT lines:

MRT Capital Cost (1973 Dollars)	$3,362,650,000
Escalation Allowance	3,279,390,000
Total MRT Cost Including Escalation	$6,642,040,000

To provide the expanded bus service described earlier, additional buses will be procured at the rate of 100 per year from 1975 through 1985. Also, replacement of the existing fleet will average about 100 per year during that period. From 1986 on, the fleet will be replaced at an annual rate of 200 per year and used both for the busways and the surface bus system. The capital costs are shown below through the year 1986.

Bus Capital Cost (1973 Dollars)	$108,000,000
Escalation Allowance	49,870,000
Total Bus Cost Including Escalation	$157,870,000

INITIAL CONSTRUCTION PROGRAM CAPITAL COSTS

Item	Capital Costs (1973 Dollars)
MRT Lines:	
Construction	$2,361,384,000
Engineering and Construction Management	306,980,000
Right-of-Way	289,154,000
Vehicles	405,132,000
Subtotal	$3,362,650,000
Busway Lines:*	
Construction	$ 108,000,000
Engineering and Construction Management	16,190,000
Right-of-Way (Stations and Yards Only)	11,000,000
Subtotal	$ 135,190,000
Total Costs, MRT plus Busway Lines	$3,497,840,000

* Construction concurrent with freeway construction. Excludes cost of buses.

Operating Costs

Operating costs include such items as labor, materials, power and fuel, and other costs necessary to operate and maintain the transportation system. They are estimated not only for the rapid transit system but for the surface bus system as well, to permit the financial analysts to compare total operating costs with total operating revenues.

As is the case with capital costs, operating costs are expected to increase with inflation. Estimates were made of the probable escalation rates and these estimates were used to develop the operating costs expected in the future.

A summary of the projected operating costs is presented in the accompanying table.

SCRTD OPERATING COSTS
First Year of Full System Operation (1987)

Item	Annual Operating Cost (1987 dollars)
Rapid Transit System Operations (Including Busways)	$226,780,000
Surface Bus System Operations	$285,340,000
Total Operating Cost	$512,120,000

Operating Revenues

Although some revenues accrue to SCRTD from secondary sources (such as advertising), the major source of operating revenue is the fare box.

Estimates of future revenues were prepared by the study team under the current SCRTD policies relating to fares. These policies attempt to keep fares as low as possible thus by making public transportation available to everyone. Based on these policies, it was assumed that modest increases in fares, at about one-half the rate at which the cost of operation is estimated to increase, will be necessary as a result of inflation.

Fares were estimated for the total system—rapid transit and the surface bus system—as of the first year of full system operation:

Rapid Transit and Surface Bus System Annual Operating Revenues in 1987 (1987 dollars)	$237,820,000

Net Operating Results

The net operating result is the difference between operating revenues and operating costs. A deficit operation is projected.

This deficit is a direct result of SCRTD's policies to keep public transportation available to all. Other policies could be followed to make revenues more nearly equal to costs, but, in the opinion of the District, such policies would not provide the transportation service required. The District's philosophy is the same as that of other transit operations: that public transportation is not a profit-making operation, it is a public service that must be provided, and that benefits accrue to the total community, users and nonusers alike.

The net operating results vary from year to year and are shown in the financial plan in the next section of this report. (See column labeled "M&O Support," which includes the net operating results plus nonoperating incomes such as from advertising.)

6.
Paying for Rapid Transit

Financial Plan for the Initial Construction Program

A viable financial plan is proposed to implement rapid transit in the Los Angeles Basin that will pay the capital cost of the initial rapid transit system and maintain and expand the operations of the present bus system. The plan results from a comprehensive examination of the financial resources of the region, of the total financial needs for constructing and operating the existing and future system, and of the alternative revenue sources that may be used. The financial plan addresses the long-term capital requirements for total construction costs and considers Federal grant participation, funding the local share, and annual operation and maintenance costs. General agreement is held that, since a new rapid transit system will provide beneficial impacts to both travelers and the community, it is equitable that both the travelers and the community should share in paying for its construction.

Revenues from other than the fare box must flow from Federal, State, and local sources. At the Federal level of government, a number of sources of capital funds are available. UMTA has a program to assist local communities in the construction of improved transit systems. Congress has authorized the expenditure of $3.1 billion and it is expected that this amount will be increased as the program is extended. Two-thirds of the eligible capital cost of a project can be funded by this program. In addition, the Federal Highway Administration will supply funds for highway facilities built for exclusive use of transit vehicles—busways—on interstate freeways. These funds are allocated on a 90 percent Federal, 10 percent local basis. The local funds are normally paid out of State gasoline taxes. It is assumed that the two busways in the recommended initial construction program will be funded entirely from this source, with the exception of the bus vehicle procurement.

The State of California has enacted legislation (commonly referred to as SB 325) that provides sales tax revenues for public transportation facilities. It is estimated that $40 million per year is currently available to SCRTD for capital and operating expenditures from this source.

Since it is not normally possible to meet the entire cost of construction of major transit systems from current revenues, some form of borrowing is usually required. This may take the form of general obligation bonds, revenue bonds, special tax pledges or revenue pledges, special assessments, and others.

The capital cost of the rapid transit system for the 12-year construction program, after accounting for probable cost increases due to inflation, is estimated at $6.6 billion. The capital cost of buses for expansion and maintenance of the bus system will require an additional $158 million. To undertake a project of this magnitude, two-thirds Federal grant participation is expected under the Urban Mass Transportation Act of 1970 and/or subsequent legislation. This is characteristic of the financial planning of mass transit projects in other metropolitan areas. The grant would amount to $4.5 billion. The remaining one-third must be raised locally.

SCRTD is committed, as a matter of policy, to continue its present program of improving service, maintaining its program of replacing and upgrading old and obsolete equipment and facilities, and providing reduced fares for those of limited means—senior citizens, school children, and the blind. Virtually all of the monies presently accruing to the District are committed to meet these commitments, as well as to meet the increasing requirements for expanded service throughout its vast service area.

No major public transportation system in the nation operates at a break-even position. The District's revenues and expense relationships are similar to those projected by other public transportation systems in the United States. Realistic projections of operating costs and revenue for the existing bus system, together with the rapid transit system, show a growing requirement to financially support maintenance and operating costs from sources other than the fare box.

Most other cities throughout the United States that are building urban transit systems have relied on a property tax, a sales tax, or both (although relatively recently some states have instituted gasoline taxes and automobile in-lieu taxes to be used for mass transit). Funds for the Los Angeles Basin system can be obtained using similar or other bases including state subventions and grants, or local income taxes. These and other revenue sources were analyzed and measured by financial evaluation criteria including availability and reliability. As a result of this analysis, a sales tax is recommended as the primary funding source. Sales tax revenue source is:

- A reliable base that possesses stability and growth,
- Easily understandable by the general public,
- Efficiently collected and administered,
- Easily lowered without major administrative change if other sources become available, and
- The only source with sufficient yield to fully fund the capital and operating costs of the rapid transit and surface bus system through the construction period.

The financial plan for the recommended initial construction program, shown on the next page, consists of a pay-as-you-go plan for approximately one-half of the construction period, and a bond program for the remainder. It proposes a new ¾ of 1 percent sales tax and the continued SCRTD share of revenues from SB 325. In addition, miscellaneous minor revenues from lease and rental of ancillary facilities and advertising have been estimated, and, together with the collection cost of the proposed sales tax have been taken into account in the maintenance and operation support category). Interest earnings on revenue proceeds prior to their expenditure are also shown.

Details of the financing plan during the 12-year construction period, including the estimated timing of capital needs, the maintenance and operating cost support needed for the recommended rapid transit and expanded surface bus system, sales tax revenues, SB 325 revenues, anticipated UMTA grants, and bond proceeds are shown in the table. Sales tax and SB 325 revenues will be accumulated during the first seven years of construction and used to provide the local share of construction costs, retire the District's outstanding indebtedness, support maintenance and operation of the existing transit system, and acquire the buses for the expanding bus system. These revenues will be supplemented during the latter five years of the initial construction program by long-term borrowing, utilizing sales tax revenue bonds. Debt repayment, with interest, and a year's reserve fund have been incorporated in the financial plan. No property taxes are used for either a revenue source or a guarantee of bonds.

Thus, the financing plan proposed for the 12-year construction period contains elements of funds from rapid transit patrons and from the general public which are allocated to pay the costs of construction and operation. The plan recognizes the prospect of continued inflation in both capital and operating costs.

The financial plan does not reflect localized auxiliary transit systems that benefit a specific development or area (e.g., Century City), which should be financed by a special local benefit zone.

Financial Implications Beyond the Construction Period

Beyond the 12-year period, continued rates of inflation will have a substantial impact on District finances. In 1987, the first year of full operation of the initial system, revenues from fares and from the sales tax and SB 325 have been compared with capital needs to continue bus replacement, bond service requirements, and operations and maintenance costs. This comparison shows that, while there will be no difficulty in meeting the bond service requirements, increased inflation will necessitate covering a net deficiency in funds.

It is likely that a number of other fund sources may develop prior to 1987. Legislation is before Congress at this writing to increase the Federal share of capital expenditures for transit. A program to permit the Federal government to fund operating subsidies has been considered and may be approved. Both Federal and State highway monies may be provided for rapid transit support. Such changes could improve the initial financial plan as well as assisting in meeting the financial requirements beyond the construction period.

At this writing, two proposed State constitutional amendments (SCA 15 and ACA 16) are being considered in the legislature which would permit the use of State gasoline taxes for transportation purposes other than highways. If either measure is submitted to the State's electorate at the November 1974 general election, and passes, a sizable sum of money could be diverted for transit.

If such sources do not develop, and if inflation continues at its high rate, it is necessary to contemplate that additional local funds will have to be generated to meet the operation and maintenance requirements of the system.

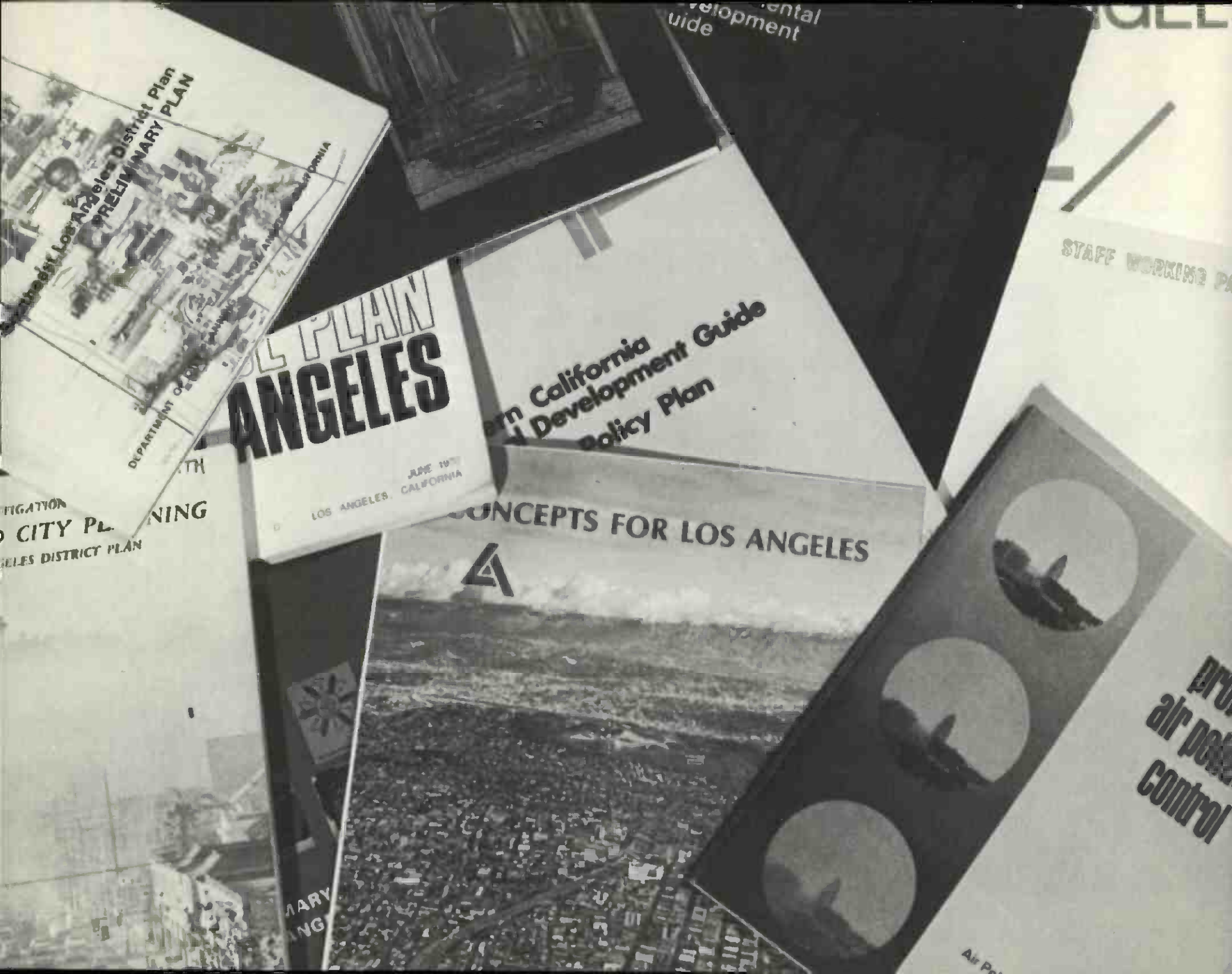
The more probable eventuality is that the additional fund sources will become available, thus providing a means for continuing the rapid transit program into subsequent stages of construction.

FINANCIAL PLAN

Initial Construction Program
(Thousands of Dollars)

	Outlays of Funds				Receipts of Funds						Residual
								UMTA Grants			
Year	Rapid Transit Construction Costs	Bus System Acquisition	M & O Support (Net)	Bond Service(3)	¼ of 1% Sales Tax (1)	SB 325	Bond Proceeds	Rapid Transit	Bus Acquisition	Interest Earnings (4)	Carry Over End of Yr.
1975	$ 14,590	$ 9,920	$ 73,135(2)	—	$155,700	$43,075	—	$ 9,715	$ 6,605	$ 2,640	$120,090
1976	100,700	10,420	61,495	—	160,375	44,360	—	67,065	6,935	7,790	234,000
1977	275,420	10,940	67,545	—	165,175	45,690	—	183,425	7,285	11,600	293,270
1978	412,210	11,490	75,565	—	170,150	47,060	—	274,530	7,650	13,195	306,590
1979	527,770	12,060	84,320	—	175,250	48,470	—	351,490	8,030	12,875	278,555
1980	801,780	12,660	92,940	—	180,500	49,920	—	533,985	8,430	9,505	153,515
1981	800,970	13,290	103,615	—	185,925	51,435	—	533,445	8,850	3,795	19,090
1982	873,370	13,950	115,330	—	191,500	52,970	160,000	581,660	9,290	770	12,630 5)
1983	954,450	14,650	127,090	11,625	197,250	54,570	225,000	635,660	9,755	990	28,040 5)
1984	979,190	15,380	162,170	27,970	203,150	56,190	285,000	652,140	10,240	1,950	52,000 5)
1985	575,720	16,150	225,870	48,675	209,250	57,890	215,000	383,425	10,755	2,845	64,750 5)
1986	325,870	16,960	286,950	64,295	215,525	59,610	205,000	217,025	11,295	3,595	82,725 5)
				79,190(6)							
TOTALS	$6,642,040	$157,870					$1,090,000	$4,423,565	$104,120		

(1) Escalated at 3% per year.
(2) Includes redemption of 1958 Rev. Bonds ($17,905,000 Required).
(3) Based upon 30 year maturity at 6%.
(4) Based upon return at 4½% per annum through 1981 and 5% per annum thereafter.
(5) Bond Reserve Fund.
(6) Level annual bond service requirements for 26 years.


Southeast Los Angeles District Plan
PRELIMINARY PLAN
DEPARTMENT OF CITY PLANNING
LOS ANGELES, CALIFORNIA
ANGELES
LOS ANGELES, CALIFORNIA
Policy Plan
CONCEPTS FOR LOS ANGELES
STAFF WORKING
air
control

7. Basis for the Recommendations

The History of Public Transportation in the Region

From the days of the first horse car, public transportation in Southern California was provided by a number of private companies. Two main systems were organized in 1911 to provide extensive service. They were the Pacific Electric Railway (PE) Company and the Los Angeles Railway Company. The PE operated a widespread network reaching as far as San Bernardino and Balboa, while the L. A. Railway Company operated local service in the central portion of the Los Angeles area.

These systems contributed in the early decades to the widespread development of the region, which was also affected by the increasing popularity of the automobile.

In the 1920s, motor coach services began to be placed into operation both to increase accessibility to new areas not served by the rail lines and to assist in making the rail lines more attractive for a larger number of trips.

Then, for a number of reasons, the motor coach began to replace the rail service. This trend continued until 1957, at which time only nine rail lines were in operation.

In 1951, the state legislature evidenced its concern for the development of a rapid transit system and created the Los Angeles Metropolitan Transit Authority (MTA). The legislation empowered MTA to build a single monorail line using revenue bond financing. This direction was changed in 1957, when MTA was empowered to acquire and consolidate the privately owned systems and to build a rapid transit system. From that time until the present, MTA and its successor, the SCRTD, have substantially expanded the bus system. Operations were extended into areas previously without service and many communities threatened with the loss of public transit as the result of financial failure of private operators have been assured of continued service by integration into the present system.

Upon its establishment as the area's transit operating agency in 1958, the MTA began developing essential, basic data on rapid transit needs of the Los Angeles area and exploring the feasibility of constructing rapid transit facilities within its limited financing powers—that is, solely from anticipated fare revenues. When it became apparent that this could not be accomplished, the legislature in 1964 created a new agency, the Southern California Rapid Transit District, as the successor to the MTA. The 1964 act authorized submission to the electorate of a rapid transit financing plan under which a bond issue for construction would be funded by a property tax or by a general sales tax.

In carrying out this assignment, a report detailing a proposed 89-mile, five-corridor rapid transit system was developed and the plan, which proposed a $2.5 billion bond issue to be retired by a sales tax, was submitted to the voters in the November 1968 general election. Although more than one million voters supported the proposition, the measure received only 45 percent of the vote. Sixty percent was required.

In 1969, the Federal Highway Administration (FHWA) adopted a policy which provided that, upon demonstrating a proper basis of planning, bus lanes could be incorporated in future links of the Federal Interstate Highway System. SCRTD's rapid transit planning studies had established the need for a high-capacity trunk transit route in the San Gabriel Corridor and the design feasibility of incorporating such a lane within and immediately adjacent to the San Bernardino Freeway. SCRTD moved immediately to bring together FHWA, UMTA, and the State Division of Highways in a coordinated program to develop an initial rapid transit facility for the Los Angeles area in that corridor. Approvals were secured, and the project, which includes 11 miles of two-lane exclusive bus roadways, a terminal station at El Monte with a 1,400-car parking lot, two on-line stations, and an expanded maintenance facility, is under construction and will be completed in the summer of 1974. Of a total cost of $58 million, all but a SCRTD share of approximately $4 million is being met by the state and Federal Governments, principally from highway funds.

The Current Planning Effort

The objective of this study was to develop recommendations for public transportation improvements in the Los Angeles region. The findings presented here resulted from an eight month intensive effort by SCRTD's consultant team, with critical review by advisory groups.

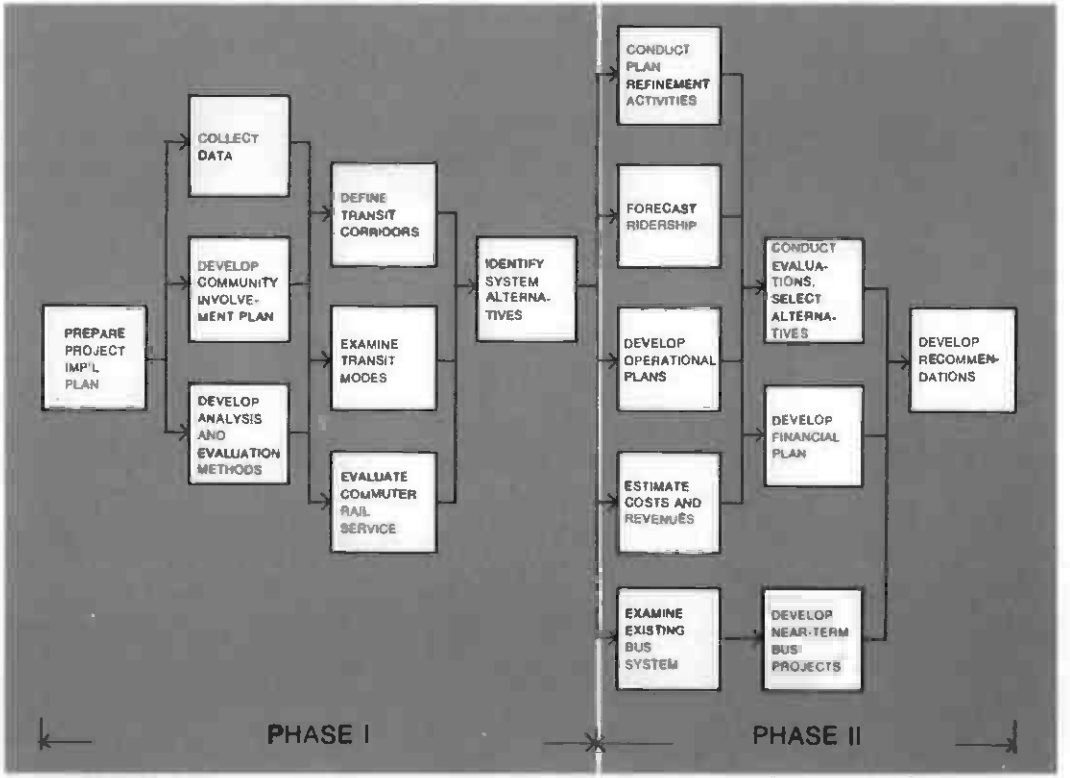
The study was divided into two phases. Phase I entailed a broad review of possible transportation corridors and of transportation modes that might be used in the corridors. Phase I resulted in the recommendation that eight specific corridors be further evaluated and that specific modes of transportation be studied in each corridor. Phase II developed a total system recommendation and a financing plan recommendation for transit, covering both the longer range rapid transit plan and a near-term set of projects that could be implemented more quickly. A simplified diagram of the project method is shown below.

Community Involvement

In order to achieve better understanding of the project and to develop recommendations that are responsive to the planning efforts of other agencies, a community involvement program was carried out as an integral part of the study. This centered in two areas—public meetings and governmental and private agency liaison.

During both phases of the project, an obligation for providing effective citizen response and guidance was recognized. A number of goals of such an effort were developed and open public meetings were held in a number of locations. At these meetings the public was notified of the study purpose, methods, and results; two-way discussions between SCRTD and the public were held and future plans were described.

A number of government and private agencies in the region have considerable interest in transportation and have undertaken significant planning efforts. To inform these agencies and to receive their suggestions and criticisms, a number of briefings and meetings were held. Among the groups involved were the Ad Hoc Committee on Transportation of the Los Angeles City Council, the City and County Transportation Advisory Committee—which met frequently during the eight-month project to conduct in-depth reviews—(see inside back cover), the Southern California Association of Governments' Comprehensive Transportation Committee, and others represented at briefings before the SCRTD Board of Directors.



Project Methodology

The Future of the Los Angeles Region

Los Angeles has become, in the eyes of the nation, the epitome of "urban sprawl" and unfortunately is associated with the negative aspects of the automobile: smog, congestion, inefficiency, and a monotonous physical environment.

However, the role of Los Angeles over the past decade has been changing—Los Angeles is maturing and has become an important world city. It has become a center of headquarters of banks and corporations. Its port is second in the nation in foreign commerce. It has the United States' greatest concentration of aerospace industries as well as being an important tourist and vacation center.

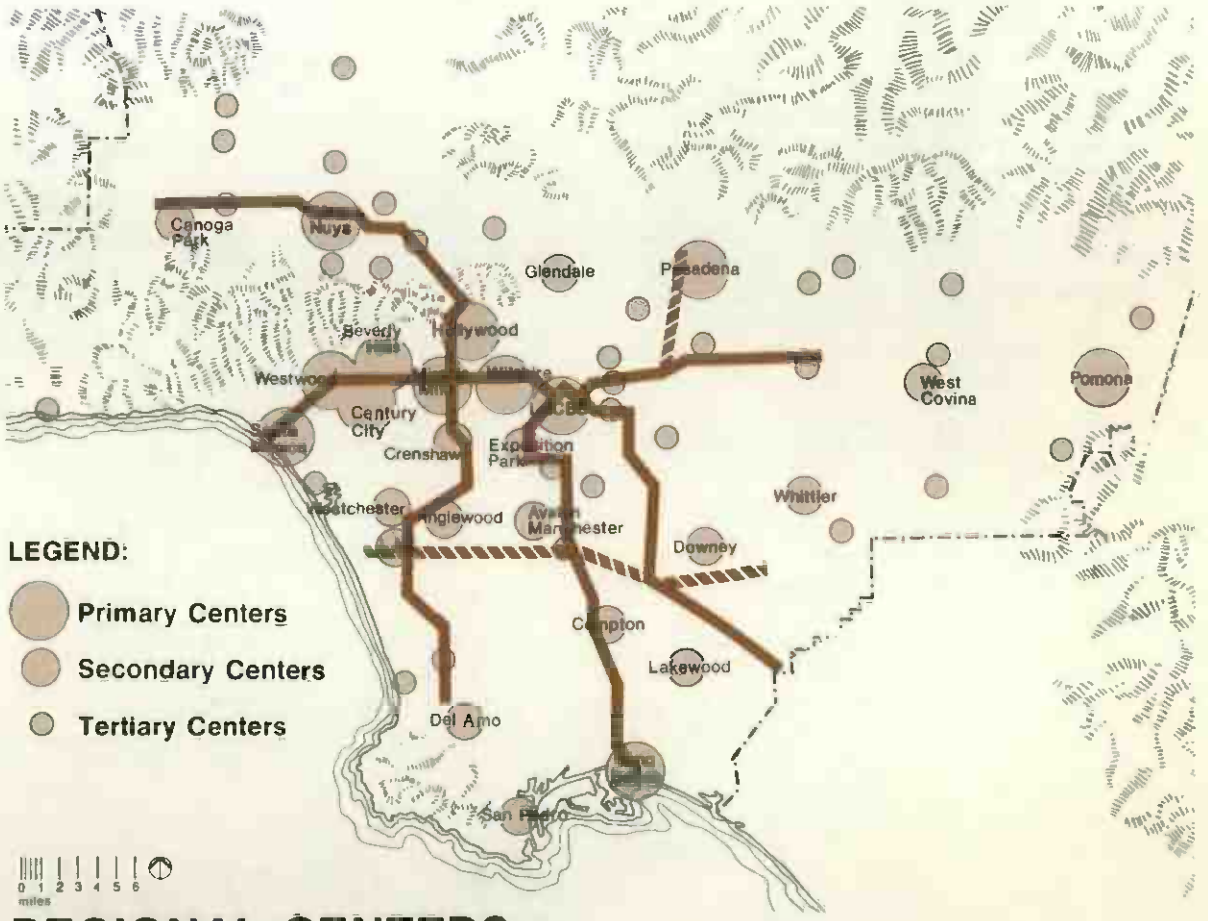
As the city's role changes it begins to physically resemble other great cities. Greater concentrations of people and activities are emerging. Downtown and the Wilshire corridor are undergoing tremendous "recycling" and by 1990 are expected to include one-fourth of the county's employment.

Planning activities carried out by SCAG, Los Angeles City and Los Angeles County planning agencies have resulted in the development of plans that recognize the advantages of concentrating activities, and the agencies have developed a concept for the future growth of the region that encourages future development to locate in center concentrations which will use land more efficiently, preserve low density areas and open space, and provide a greater variety in urban life style than is available today.

Some centers will be large, some smaller. The major centers have been labeled "Primary" and "Secondary." The plans call for the primary centers to grow by some 350,000 in employment and 140,000 in population, making them much more densely developed than at present. The secondary centers will grow by lesser amounts, but they will still be substantially more important than at present as attractors and generators of traffic.

In order of employment levels, the leading centers in 1990 will be:

Los Angeles CBD
Hollywood
Wilshire
Long Beach
Century City
Pasadena
Beverly Hills
Westwood
Santa Monica



REGIONAL CENTERS

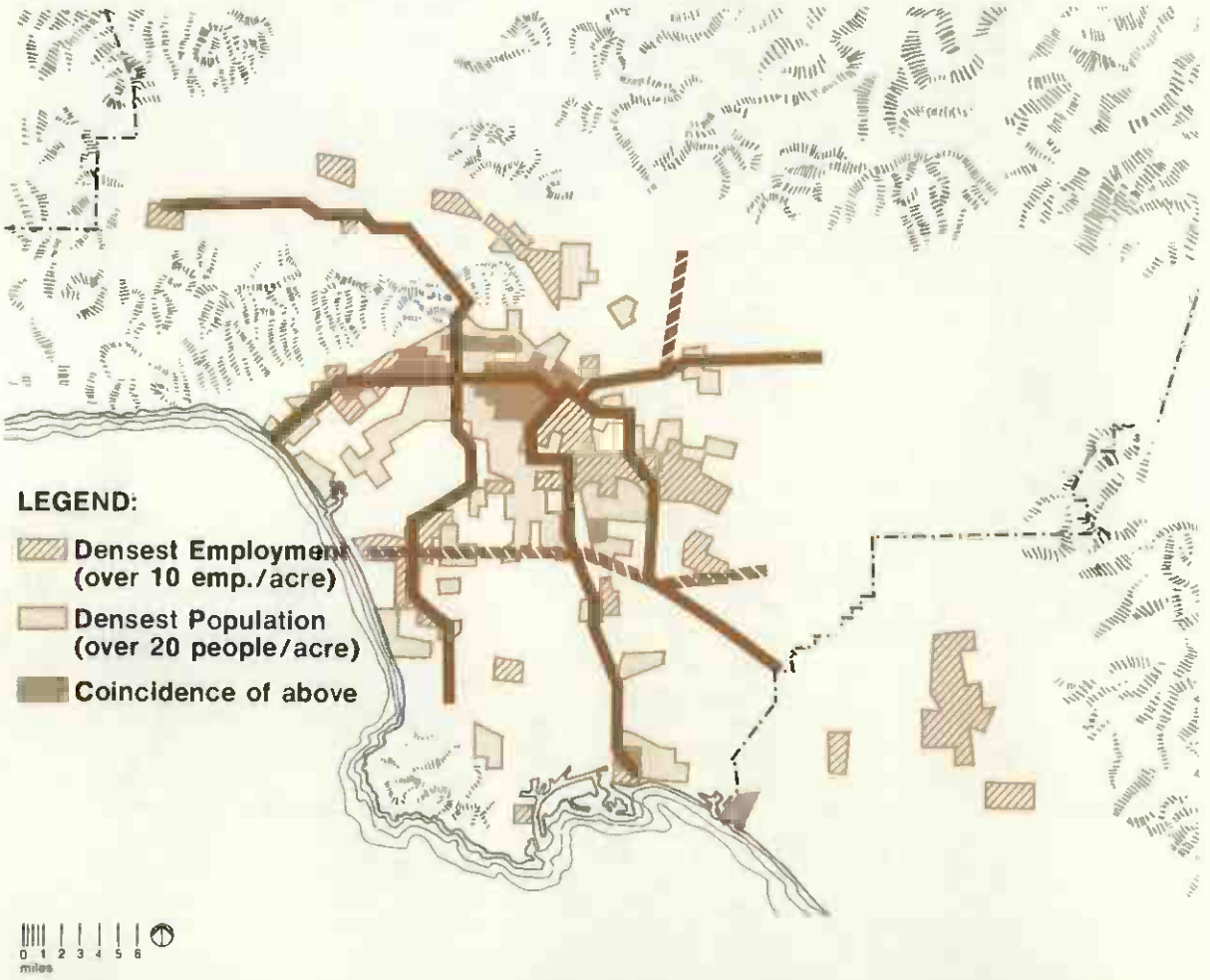
Thus, plans for the development of centers of activity enforce the need for transit, since the most efficient use of rapid transit occurs when areas of concentrated activity are served. As a matter of fact, rapid transit can play an important role in causing this development to take place.

Both City and County governments see the advantages of improved public transportation in helping to achieve broader urban goals. A rapid transit system can help to

- Preserve the low density character of Los Angeles, by providing concentration and thereby relieve pressure for increased development in places where such development is unwanted;
- Provide maximum convenience for residents in high density areas by providing better accessibility to places of interest;
- Provide better employment opportunities;
- Provide improved public services;
- Provide access to a full range of leisure time facilities;
- Conserve natural resources and amenities and attractive features of the environment;
- Enhance the physical environment, including renovation of blighted areas, and permit more widespread preservation of open space.

Accordingly, the City and the County of Los Angeles have supported rapid transit as a high priority need.

The map shows the population and employment distribution. The total population of the region is forecast to grow from 7,040,000 in 1970 to 8,661,000 in 1990; employment from 2,381,000 in 1967 to 4,044,000 in 1990. These figures are the current estimates used by the Los Angeles Regional Transportation Study (LARTS) as the basis for selecting the most attractive locations for rapid transit and for estimating patronage of the system.



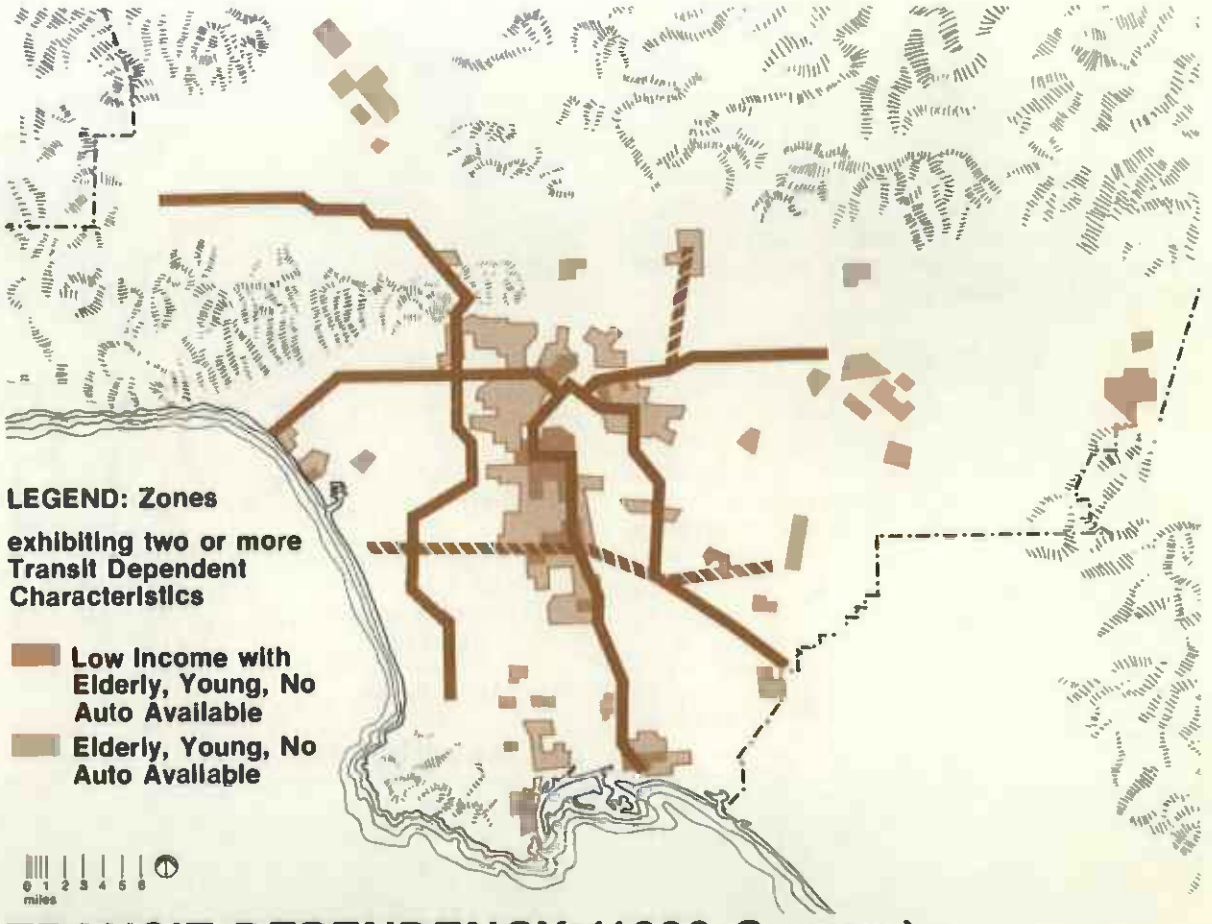
FORECAST POPULATION AND EMPLOYMENT CONCENTRATIONS 1990 (LARTS)

Transit-Dependent Groups

For a variety of reasons, planning for rapid transit must give special attention to providing service to areas that contain high concentrations of people who are dependent on public transportation for their personal mobility.

A number of indicators can be used to tell where such persons reside. The ones used in this study as primary indicators are the percent of dwelling units having no automobile, median family income, and age levels (both young age and old age) within individual census tracts. Secondary indicators of transit dependency are the level of rents paid, median home value, and percent unemployment. By mapping these indicators individually and then identifying their coincidence, an accurate picture can be drawn of concentrations of transit-dependent populations.

The following areas were identified as highly transit-dependent: south central Los Angeles extending from the central business district to Compton from an area just west of the Harbor Freeway to Alameda Street; central Long Beach; portions of Pasadena; a band eastward from Los Angeles in the vicinity of the San Bernardino Freeway; and Downtown and immediately north of Downtown.



TRANSIT DEPENDENCY (1990 Census)

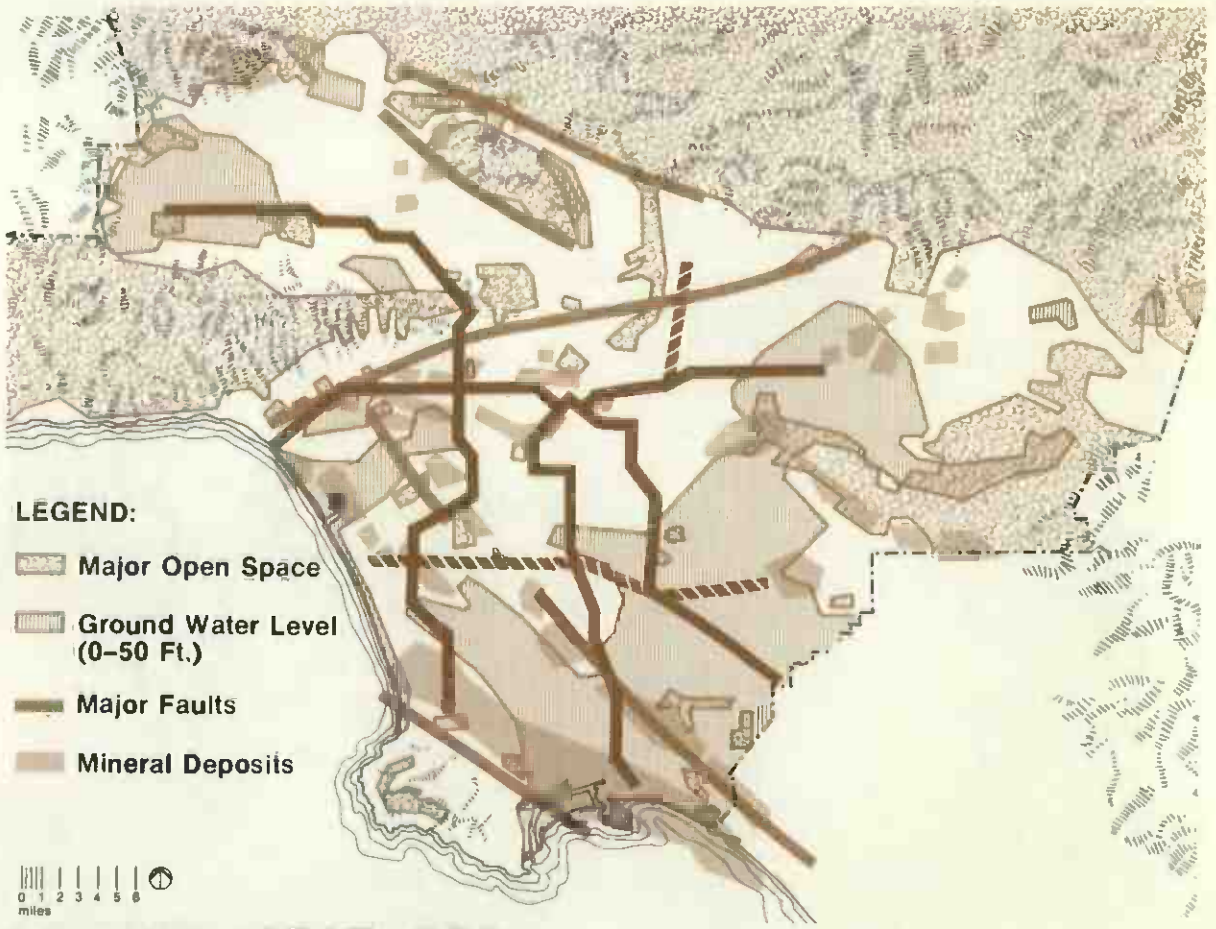
Natural Features

Another input in the planning of the system was an inventory of crucial natural aspects of the Los Angeles Basin: open space, geologic faults, hydrology and mineral deposits, as well as historic places and buildings, and archeological sites.

The adjacent summary map shows, at a gross level, the location of areas where careful planning will be necessary at the detailed level to avoid hazards and minimize disruption. The most critical problems appear to be between subway construction and hydrologic and geologic hazards in Wilshire, Hollywood, and Long Beach. Some conflict with existing open space and aerial structures warrants special attention in the San Fernando Valley and the Airport Southwest Corridor.

Archeological sites are not shown on the map as public disclosure of their location could lead to undesirable excavation and perhaps vandalization. No known sites are in conflict with a recommended line.

The Cultural Heritage Board of the City of Los Angeles has determined 65 buildings and properties to be worthy of preservation as historic-cultural monuments. They range from the Bradbury building in Downtown Los Angeles to the Chatsworth Community Church, to the Towers of Simon Rodia in Watts. It appears so far that only a few might be affected and these only peripherally. Close attention will be paid during detailed engineering.



NATURAL FEATURES

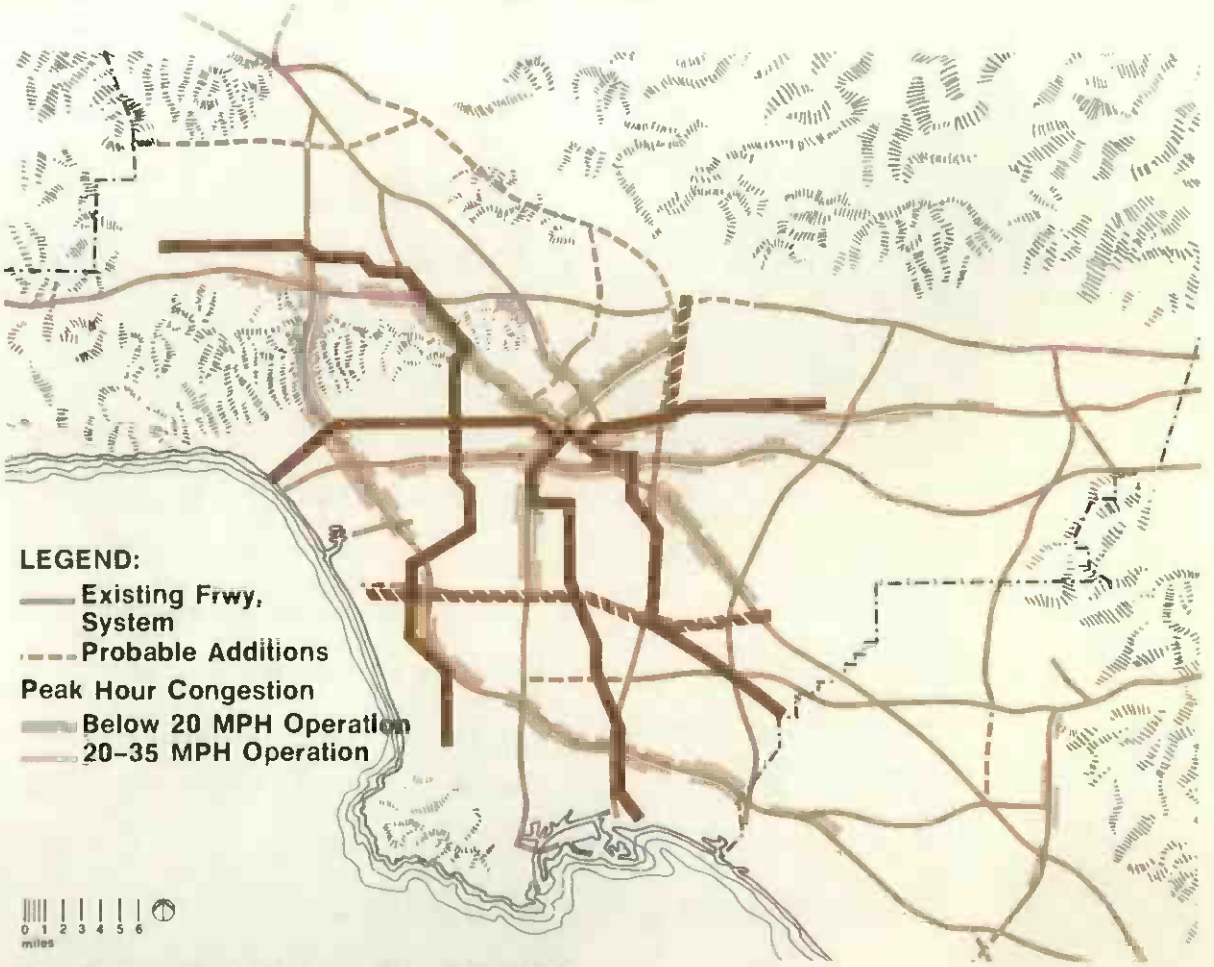
The Highway System

The freeway and street system in Los Angeles County is one of the finest and most extensive in the nation. The freeway network, which in 1973 totalled some 376 miles, provides region-wide controlled access travel, without traffic signals. Most locations are within fifteen minutes of a freeway.

The freeway access that is now available has been many years in building. The freeway program started in 1940 with the completion of the first segment of the Pasadena Freeway. From that beginning, with the assistance of Federal funds, the California Division of Highways has vigorously pursued freeway development.

In recent years, however, local residents not only in Los Angeles but elsewhere, as well, have begun to vigorously oppose new freeway construction. Among the reasons that have prompted resistance are the dislocation of homes and businesses, environmental pollution, division of neighborhoods, and visual impacts. Although planners have taken pains to recognize these problems in developing freeway proposals, local residents are continuing to oppose new construction.

In developing traffic estimates for rapid transit, the changing future of freeway construction has been taken into account. Beyond the existing system, only the following sections of new freeway were assumed to be in operation in the SCRTD by 1990: the Artesia Freeway from the Long Beach Freeway to the Harbor Freeway, the El Segundo-Norwalk Freeway, the northern extension of the Long Beach Freeway, the Foothill Freeway from San Fernando through Pasadena, the northern extension of the Glendale Freeway, the I-210 Freeway north of Pasadena, and the eastern extension of the San Fernando Valley Freeway.



THE HIGHWAY SYSTEM

Evaluation Procedure

The final system recommendation represents the results of an 8-month study that started without any preconceived assumptions as to what the most attractive system should be. The study team had to ask a number of basic questions, such as shown below.

To answer these questions, it was clear that two things needed to be done. First, a number of options or alternatives needed to be postulated for each question. Second, an evaluation procedure for measuring "goodness" was required.

The basic purpose of the evaluation procedure is to judge transportation systems on their ability to meet community goals. Note that we used community goals, and not more narrowly defined transportation measures, since transportation creates many more effects than simply transporting people.

The evaluation procedure used a number of measuring sticks, called "evaluation criteria," to indicate how much better or how much worse one alternative was, in relation to another. The evaluation criteria are shown in the box on the next page. They were developed by the study team to provide measurements that relate to broader goals statements of the City of Los Angeles, the County of Los Angeles, and the Southern California Association of Governments.

Also, the evaluation procedure provided information on how different groups are affected. As indicated earlier, special attention was given to transit-dependent groups. Information was developed to show how travelers in different parts of the region will be served by transit.

Also, effects on the transit operator — SCRTD—are separated from those on the transit user.

This procedure was used to make recommendations on the questions shown below. First, corridors and modes were selected. Then, other details of the system were considered. In making the technical recommendations, engineering, traveler, socioeconomic, and natural environment criteria were used. In developing the financing plan, financial criteria were used.

A description of the way in which the technical recommendations were developed is contained in the following pages.

- Where are the most attractive travel corridors for transit improvement?
- What modes or technologies are most applicable to the Los Angeles situation?
- Within each corridor, what (approximate) alignments are most attractive?
- How far should each line be extended into suburban regions?
- Should the Los Angeles-El Monte busway be upgraded to MRT?
- Should stations for the system be widely spaced or closely spaced?
- What is the attractiveness of a fine-grained network, rather than the more conventional rapid transit?
- What short-term measures can be installed to improve transit immediately?
- What is the most attractive way to finance the recommendations?

Engineering

- Capital Cost
- Operating Cost
- Flexibility
- Expandability
- Reliability
- Maintainability
- Availability
- System Safety
- Predictability
- Special Purposes
- Security

Traveler

Trip

- Travel Demand Satisfaction
- Door-to-Door Travel Time
- Accident Savings
- Net Traveler Use Costs
- Accessibility
- Special Mobility

Systems

- Simplicity
- Transferring
- Feeder/Distribution Services
- Fare Payment
- Station/Transfer Point Comfort
- Vehicle Comfort
- Psychological and Scenic Aspects
- Patronage
- Revenue

Socioeconomic/Cultural

- Displacement/Disruption/Change
- Population/Residential
- Employment/Commercial
- Institutions
- Community
- Cultural/Symbolic
- Aesthetic/Urban Design
- Regional Development Policies

Natural Environment

- Weather
- Geology/Soils
- Water/Hydrology
- Air Quality
- Noise/Vibration
- Vegetation/Wildlife

Financial

Fund Raising

- Availability
- Stability
- Purpose/Functions
- Interval
- Interest Rate/Cost

System Cost

- Applicability
- Capacity
- Cost
- Reliability

Selection of Corridors

Potential rapid transit corridors are channels or arteries that offer the possibility of attracting large numbers of riders. They were identified by analyses of both present and expected future levels of population, employment, and overall travel. In addition, corridors were judged important because of their level of transit dependency. Finally, corridors were tied to one another in an effort to design an efficient regionwide transit system.

Corridors of travel tend naturally to reveal themselves in major flows of travel, such as are represented by the existing freeway system, since origin-to-destination patterns and the locations of concentrations of employment, population, and other activity centers tend to develop in relation to the existing transportation system. However, major demands for travel capacity can also be found in locations not served by freeways.

Although freeway patterns frequently provide some indication of rapid transit travel potential, this does not mean that a rapid transit system should necessarily be aligned directly within or adjacent to freeways. Good arguments often can be made for locating rapid transit lines between two freeways that are separated by a number of miles; the final location must, however, be tested in relation to specific conditions. Corridors for rapid transit will tend to focus on the highest levels and densities of activity.

The analysis of travel characteristics considered present and forecasted transit and auto travel.

Future travel patterns were projected by LARTS. Major attractions are in the "regional core" and other activity centers. Employment is a strong determinant of trip attraction and employment is most dense in the LA/CBD. High density is also forecast just southeast of the LA/CBD, west of the CBD along Wilshire to the San Diego Freeway, and in Hollywood from Vine to La Brea between Melrose and Hollywood Boulevard. The CBD of Long Beach has comparable density projected. Other significant employment concentrations are in the Airport-El Segundo area, around the Santa Ana Freeway in the vicinity of Commerce, and along the east side of Alameda Street south to South Gate.

The consultant firms conducted separate evaluations of potential corridors for rapid transit. Each prepared priority lists of corridors that showed substantial points of similarity when compared. (See box on next page.) The consensus of the consultants indicated that six corridors appeared most attractive for first-stage rapid transit development. They are:

- Wilshire—from the LA/CBD in the vicinity of Wilshire Boulevard, west to Santa Monica;
- San Fernando West—from the LA/CBD through Hollywood and the Santa Monica Mountains to Van Nuys and possibly as far west as Canoga Park;
- San Gabriel—from the LA/CBD along the San Bernardino Freeway to El Monte and possibly as far east as Pomona;
- South Central—from the LA/CBD south through Watts and Compton to Long Beach;
- Santa Ana—southeast from the LA/CBD to Orange County; and
- Airport Southwest—from the LA/CBD or the Wilshire area to the Los Angeles International Airport and other centers directly south of the airport.

At a second level of priority, the study team identified the following corridors:

- El Segundo-Norwalk—from El Segundo to Norwalk in the general vicinity of the proposed freeway bearing that name;
- Northern Extension of the Long Beach Freeway—from the San Bernardino Freeway to Pasadena;
- West Central—from the LA/CBD or the Wilshire area south through the Crenshaw District and Inglewood to Torrance and San Pedro;
- Sepulveda—from Canoga Park through the Santa Monica Mountains to the Los Angeles International Airport;
- San Fernando East—from the CBD north through Burbank to San Fernando;
- Pasadena-Foothill—from the LA/CBD to Pasadena and into the San Gabriel Valley in the vicinity of the Foothill Freeway;
- Beverly Hills Freeway—from the Westwood area through Hollywood to the Golden State Freeway;
- North Hollywood-Pasadena — between these locations roughly along the corridor in which the Ventura, Route 134 Freeway lies;
- Slauson—in the vicinity of Slauson Avenue from the ocean to Whittier and beyond toward Orange County.

The set of corridors chosen for the initial construction program include the first six, plus the El Segundo-Norwalk and the Northern Extension of the Long Beach Freeway. The latter two were included because they can be financed as busways out of the highway trust fund.

CONSULTANTS' RANKING OF POTENTIAL CORRIDORS

Ranking	Engineering (KE/DMJM)	Travel (AMV)	Population/Employment (WMRT/KS)	Transit Dependency (WMRT/KS)
1	San Fernando West	Wilshire	Wilshire	South Central
2	Wilshire	San Fernando West	Airport Southwest	El Segundo-Norwalk
3	San Gabriel	San Gabriel	Santa Ana	San Gabriel
4	Santa Ana	Airport Southwest	Long Beach	L B Fwy., N. Ext
5	Sepulveda	Santa Ana	San Fernando East	West Central
6	Airport Southwest	South Central	San Fernando West	San Fernando East
7	West Central	Sepulveda	South Central	Santa Ana
8	San Fernando East	San Fernando East	—	Wilshire
9	South Central	El Segundo-Norwalk	—	Sepulveda
10	Pasadena-Foothill	LB Fwy., N. Ext.	—	—
11	El Segundo-Norwalk	N. Hollywood-Pasadena	—	—
12	N. Hollywood-Pasadena	—	—	—
13	Beverly Hills Freeway	—	—	—
14	L B Fwy., N. Ext.	—	—	—
Unranked	Slauson	—	—	—

Selection of Modes

In recent years, the number of potential mode technologies that might be used to provide public transportation service has increased greatly. Spurred by an increasing awareness on the part of the public of the need for improved transportation and by the expanding programs of the Urban Mass Transportation Administration, proponents have suggested new concepts, conducted research and development efforts, and carried out demonstrations. As a result, the search for technologies for application in the Los Angeles region has become more complex than in earlier efforts.

The engineering consultant conducted a broad inventory of mode technology candidates that might be applied to the Los Angeles situation, through searches of the literature and contacts with developers and manufacturers. SCRTD also sponsored a conference and show at which manufacturers presented their systems. As a result of these efforts, over 120 different modal technologies were identified and documented in a special report. The report describes the system operation, vehicle design, guideway design, command and control technique, maintenance aspects, security and surveillance methods, station design, environmental impact factors, unique features and potential supplies, and the time at which the system would be expected to be available for Los Angeles.

The first stage of analysis of modes entailed a review of costs, performance, and availability.

The results of this stage resulted in elimination of all but those shown in the box below.

Commuter Rail (Automated)	WABCO Monorail
Commuter Rail (Conventional)	Mini-Monorail
Rail Rapid Transit (Automated)	Minirail
Rail Rapid Transit (Conventional)	Skyrail
Single-Axle Rail	Jetrail
Rubber-Tire Rapid Transit	Monocab
Transit Expressway	Uniflo
Stata Guidala	TTI Hovair
Alweg Monorail	Aerospace PRT
Goodell Monorail	Bus on Busway
Safege Monorail	Bus on Metered Freeway
URBA Monorail	Rail-Highway Bus
Aerotrain	Guided Busway
Urban TACV	Conventional Bus
Magnetic Levitation Rapid Transit	Articulated Bus
Tracked Cable Car	Double Decker Bus
Teletrans	Minibus
Pullman-Standard Glide-Ride	PAS Marketeer
Dashaveyor	Greyhound Escorter
Vehicle Distribution System	Alden Self-Transit
Ford ACT	Electric Automobile
Boeing Morgantown	Minicar

After the initial narrowing, a more careful study was made of the remaining candidate modes. The team recognized that a wide range of factors should be considered in choosing modes. Accordingly, evaluations of the following factors were conducted for each mode: capital cost, operating cost, flexibility, expandability, reliability, maintainability, system safety, predictability, special purposes, door-to-door travel time, accessibility, comfort, aesthetic/urban design, air quality, noise, and vibration. The following classes of systems emerged as the most attractive for providing rapid transit in Los Angeles:

- Regional Line-Haul Systems
  - Mass rapid transit systems
    - Steel wheel vehicles
    - Rubber tire vehicles
    - Tracked air cushion vehicles
    - Magnetically levitated vehicles
  - Bus-on-busway
  - Personal rapid transit
- CBD Circulation Systems
  - Auxiliary transit
  - Bus/minibus
- Feeder Systems
  - Bus-on-busway
  - Auxiliary transit
  - Bus/minibus

These systems were further evaluated in connection with the specific corridors.

Personal Rapid Transit

One form of auxiliary transit that has received considerable interest in Los Angeles and elsewhere is called Personal Rapid Transit (PRT). PRT is a radically different concept that could provide a high quality form of transportation. While there are many versions of the concept, it basically involves providing nonstop or nearly nonstop service from a passenger's origin station to his destination station through the use of small vehicles operating on a fixed guideway. A network of guideways would be constructed with stations spaced close to one another. The rider would board a vehicle and press a button indicating his desired destination. A central computer would receive this signal and would provide an automatic control of movement of the vehicle by the best route to the destination.

The Federal government has shown considerable interest in PRT. Some versions were shown at the Department of Transportation's TRANSPO '72 convention and a prototype system is being installed at Morgantown, West Virginia. Foreign governments are also at work developing the concept.

The engineering and the environmental consultants conducted a careful review of PRT and some advanced versions designed for completely nonstop, single party travel service (Advanced PRT, called APRT). This review included independent studies and discusslons with organizations that have undertaken substantial research and development. Noteworthy among these is the Aerospace Corporation of El Segundo.

The review confirmed that PRT (and APRT), as conceptualized, would provide a highly attractive transportation service that offers the prospect of attracting large numbers of patrons. However, many problems were uncovered which could not be fully resolved.

The principal technical problem concerns the difficulty of handling large numbers of travelers in areas of dense activity such as in the LA/CBD and in the Wilshire Boulevard area. It was concluded that substantial congestion would be caused on the guideways and in the stations, much as congestion is now experienced on downtown streets. Additionally, especially in the case of APRT, vehicles would have to be very close spaced to achieve the required carrying capacity. Close spacing would require an advanced control system to solve a number of potentially serious safety problems. Such control systems are only in the concept stage at present.

Most PRT and APRT proposals suggest the use of elevated structures because of the need to separate the dense network from surface streets. Although careful design can minimize the adverse visual impact in many areas, it is believed that an intolerable situation would be created downtown, since one or two guideways would be needed on every block, along with closely spaced elevated stations. Psychological problems that might be faced by PRT riders have also been suggested, but not proven. In terms of economics, it is difficult to forecast the capital cost of the PRT systems, since none have been developed with the capability that appears to be required in the Los Angeles region. Almost all experts are in agreement that a considerable amount of research and development will be required before the more desirable versions can be considered to be "on the shelf." As a result, only limited use of PRT is visualized as part of the first stage system in Los Angeles and only in feeder and distribution, rather than line haul, service.

Ford's Activity Center Transit


Transportation Technology, Inc.

ROHR Industries' Monocab

Other Technical Recommendations

To develop recommendations regarding the other features of the initial rapid transit system, the consultant team developed a formal method of relating the evaluation criteria to one another. For each alternative, two overall index numbers were calculated. One was the capital cost divided by the patronage. This ratio, which represents the extra capital investment required to attract each additional trip, is abbreviated CC/R and shows the relative attractiveness of spending capital funds to obtain greater ridership. It allows one to exclude alternatives if they would require a large capital cost to serve only a small increase in ridership. The second summarized the weighting of each of the other criteria into a single number, called the noncostable rating. In weighting the various criteria, the study team judged that the socioeconomic and environmental criteria were more important than those in the other categories, and therefore weighted them three times as heavily as the others.

To come to a recommendation, the study team calculated the capital costs/patronage ratio and the noncostable rating, discussed the detailed information that was used to develop the index numbers, and weighed the pros and cons of each alternative before coming to a recommendation. In every case, 100% concurrence was reached by the consultants.

San Fernando Corridor

An example of the results of the evaluation procedure for the San Fernando Valley is shown below. In the Valley, the team considered three terminal points for the line: the San Diego Freeway, Canoga Park, and Chatsworth. As indicated on the table, extending the line from the San Diego Freeway to Canoga Park would attract a significant number of passengers, at a reasonable capital cost, so that the capital cost per rider is rather low ($0.79). However, extending it further to Chatsworth would be quite costly per passenger attracted ($6.13). Because of the big difference in costs, the team recommends stopping at Canoga Park.

A number of route alignments were studied, both in the western end of the line and as a means of getting through the Santa Monica Mountains. At the western end, a route alignment called the "L.A. River Wash" was chosen. Although this route is slightly less desirable than the base case in terms of the CC/R, it was more desirable in terms of construction difficulty and socioeconomic/environmental problems—especially disruption.

It appears more attractive to use the Cahuenga Pass than to tunnel through the Santa Monica Mountains, principally because the traveler would have a more pleasant ride and less spoil would be created.

As indicated in the tabulation, a number of ways of connecting to the Wilshire and Airport-Southwest lines were considered. The base case route straight south in the vicinity of La Brea is much more favorable than the other choices in terms of CC/R and was selected by the study team.

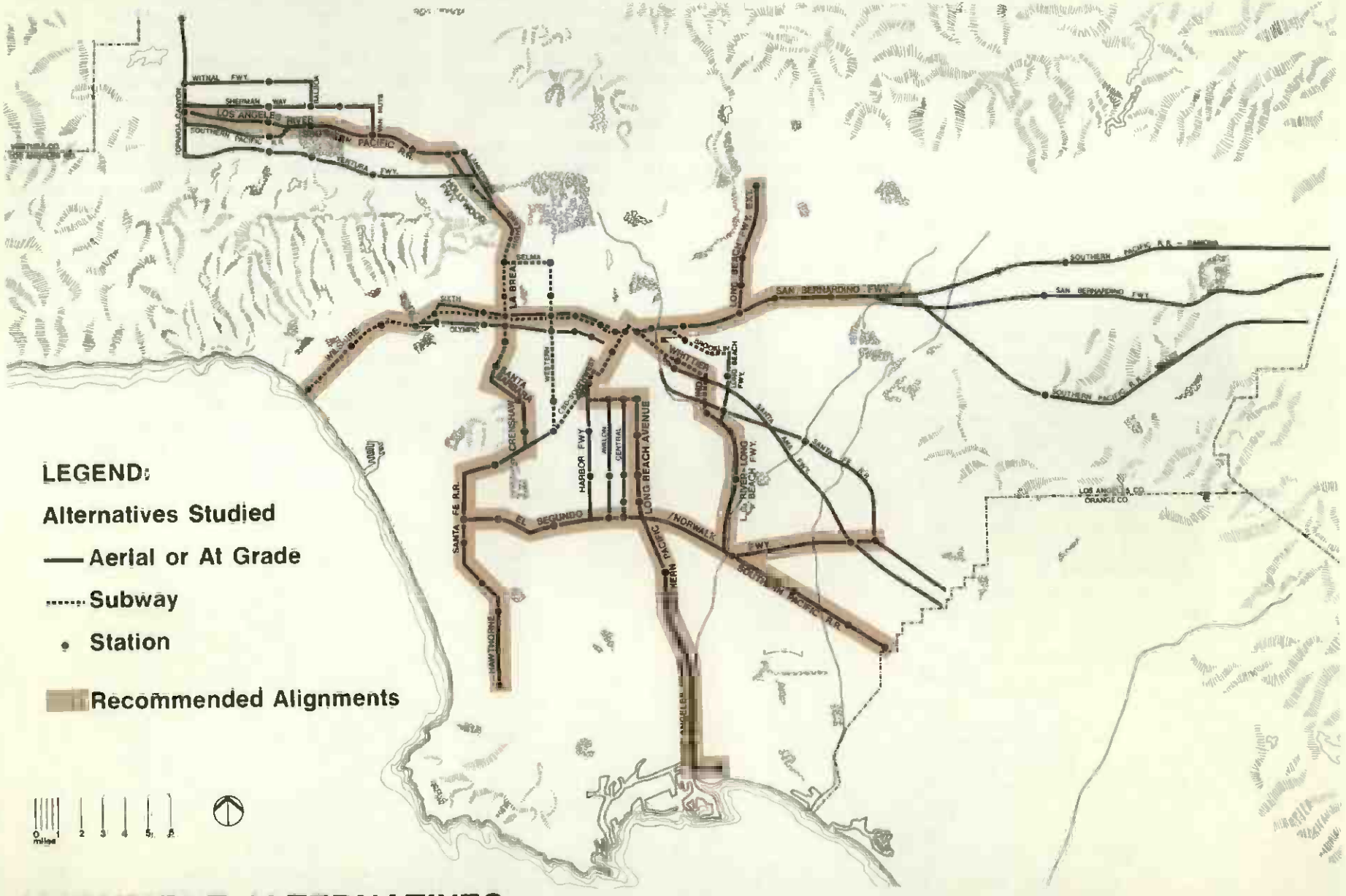
Regarding the question of mode—MRT or busway—consideration of two factors led to the selection of MRT in both the San Fernando Valley and on the Wilshire line. First and foremost, the projected patronage clearly favored MRT, even at an early point in the study. Second, the need for operational compatibility between the two lines and into the LA/CBD favored a common technology on the two lines.

EXAMPLE OF USE OF EVALUATION PROCEDURE: SAN FERNANDO VALLEY

Alternative	Capital Cost/ Patronage Ratio*	Noncostable Rating	Recommended Alternative
Route Extent:			
Extend line from San Diego Freeway to Canoga Park	$0.79	75	X
Extend line from Canoga Park to Chatsworth	$6.13	75	
Route Alignments in the San Fernando Valley:			
Sherman Way	Base Case	47	
Whitnall	Same as Base Case	45	
L.A. River Wash	-$0.08	70	X
Southern Pacific Railroad (Burbank Branch)	-$0.17	66	
Ventura Freeway	-$3.62	65	
Route Alignments through the Santa Monica Mountains:			
Tunnel	equivalent	56	
Cahuenga Pass		63	X
Connections with Wilshire and Airport Southwest Lines:			
La Brea Avenue	Base Case	61	X
Hollywood to Western, CBD-Southwest	$28.40	57	
Western Avenue	$6.19	61	

* A ratio of $1.00 means that $1.00 must be spent in capital costs to get each additional rider, in relation to a base case. Minus numbers are undesirable, because they indicate both higher capital cost and lower ridership. Of course, higher costs are less desirable than lower costs.

** One hundred points is a perfect score; zero points is the least possible.



ALIGNMENT ALTERNATIVES

The MRT-busway choice was not so clear in the other corridors; therefore, both options were subjected to total cost/ridership and noncostable rating procedures.

In addition to the San Fernando Valley alternatives shown in the box, other alternatives that were studied and recommendations that were made, using the index numbers, included the following:

Wilshire Corridor

In the Wilshire corridor, the team recommends that the line be extended to Santa Monica rather than stopping at Barrington Avenue, primarily because of a favorable CC/R ratio. The team recommends a tunnel under Wilshire rather than an elevated line one-half block off Wilshire or an elevated line on Olympic Boulevard augmented with an auxiliary transit system serving Wilshire. This recommended alignment would be more costly than the other alternatives, and patronage would not differ much. The predominant reasons for selecting the higher cost alternative is that it would create much less dislocation and would provide impetus toward achieving the desired development patterns. The team analyzed an additional MRT line along Hollywood Boulevard and a dense grid system between Hollywood and Wilshire using auxiliary transit. Neither were attractive propositions, relatively. Although both of these possibilities would attract a significant number of travelers, the capital costs would be high and a high CC/R ratio results. In other words, at present, it appears that the expanded surface bus feeder to the lines along Wilshire and La Brea would be a satisfactory and Lower cost means of serving the area.

Airport Southwest Corridor

In the Airport-Southwest corridor, the team recommends that the line be extended to the Del Amo area rather than stopping at Rosecrans, primarily because of a favorable CC/R ratio. The team recommends that the line be MRT rather than busway. The MRT would have a lower total cost (capital cost plus operating cost) and would be about as attractive to travelers as a busway. Also, MRT received a clearly more favorable noncostable rating.

South Central Corridor

In the South Central corridor, the team recommends that the line be extended to Long Beach rather than stopping in the Compton area. The additional riders that would be attracted would be quite large and capital costs would be relatively low, leading to a very favorable CC/R ratio. The team recommends that a line along Long Beach Avenue be constructed, rather than along the Harbor Freeway, or in the vicinity of Central or Avalon Avenues. No significant differences were found in the CC/R ratio, but the recommended alignment scored considerably higher in terms of the noncostable rating, due in part to favorable scores that resulted from its service to transit-dependent groups and its relatively minor disruption and displacement. The consultant team recommends that the MRT mode is preferable to a busway. Again, the MRT would have a lower total cost than a busway. It is also better suited to carrying the large number of travelers that are estimated to use the line.

El Segundo-Norwalk Corridor

In the El Segundo-Norwalk corridor, the team recommends a busway rather than an MRT line. Relatively lower travel volumes are expected on this line, compared with the other lines. MRT service, therefore, proved to be more costly than a busway service, and presented a more favorable noncostable rating, traceable mainly to engineering considerations.

Santa Ana Corridor

In the Santa Ana corridor, the team recommends that a line be extended from the Los Angeles County boundary to Santa Ana, but, since the Orange County Transit District is conducting a study for that region, the final decision should await the completion of that effort. The team recommends an alignment from the LA/CBD along Whittier Boulevard, south to the Long Beach Freeway or the Los Angeles River, then to the Pacific Electric Railway right-of-way, and southeast along the right-of-way toward Santa Ana. This line is preferred to going south on the South Central line to the Pacific Electric Railway and then southeast, to going along the Santa Ana Freeway all the way, to using the Santa Fe Railway line in the corridor, and to going out from the LA/CBD along either the Santa Ana Freeway or Brooklyn Avenue. The recommended alignment was favorable in terms of the CC/R ratio, and also received high scores because of its service to transit-dependent populations, its relative ease of construction, its minor amounts of disruption and displacement, and its contribution toward achieving desired regional development patterns. The team recommends that MRT is preferable to busway in this corridor. As was the case in the Airport-Southwest and the South Central analyses, the MRT is less costly when both capital and operating costs are taken into account.

San Gabriel-Pasadena Corridor

In the San Gabriel corridor, the team recommends that the busway be upgraded to an MRT line. It is expected that the patronage on the Los Angeles-El Monte busway will grow to the line's capacity during the later years of construction of the initial system and that there will be a considerable number of potential riders who cannot be accommodated. Upgrading the line to the MRT technology will provide the needed capacity at a favorable CC/R ratio. The team studied a possible extension of the line from El Monte to Pomona and found that, with the current estimates of 1990 traffic, the extension presented an unfavorable CC/R ratio. However, the potential growth of the Ontario International Airport and the surrounding communities indicates that further study of eastward extensions of the line should be undertaken.

For the Northern Extension of the Long Beach Freeway, the team recommends the busway mode because the patronage is relatively low compared with the other lines.

Station Spacing

Regarding station spacing, the team recommends that planning be started on a relatively widely spaced basis, and that additional stations be added to the recommended plan as necessary to handle the estimated number of passengers or be added or deleted as a result of community reaction to the recommendations. Little effective difference could be found in the relative patronage that would be attracted to a widely spaced system such as that recommended, compared to a more closely spaced system, given the plans for an effective feeder bus system.

Basis

The recommendations described above are a result of technical, economic, social, and environmental criteria. It is recognized that a system of lesser magnitude may be necessary for financial reasons. Such a system can be developed as a result of community reaction and policy judgments.

Special Bus Planning considerations

In conjunction with the development of the program of near-term transit improvements, the study team investigated the potential value of a greatly expanded all-bus system, described generally as "saturation" bus service and featuring a grid-like network of closely-spaced and frequently-served bus routes.

This service concept acquires added significance when considering the implications of substantially reduced automobile use resulting from either a major gasoline shortage or Environmental Protection Agency directives pursuant to the Clean Air act.

Saturation Bus Service

For the purposes of initial analysis, the saturation bus concept was represented by buses running on streets every half-mile in both north-south and east-west directions, with peak-period service at five-minute intervals. Initial analyses led to two approaches to saturation bus service: the first being literally a grid-system throughout the 2,000-square-mile service area, and the second being grid coverage in a number of selected areas. The second approach would be much less costly and only slightly less effective than the first. Major findings of this investigation revealed that:

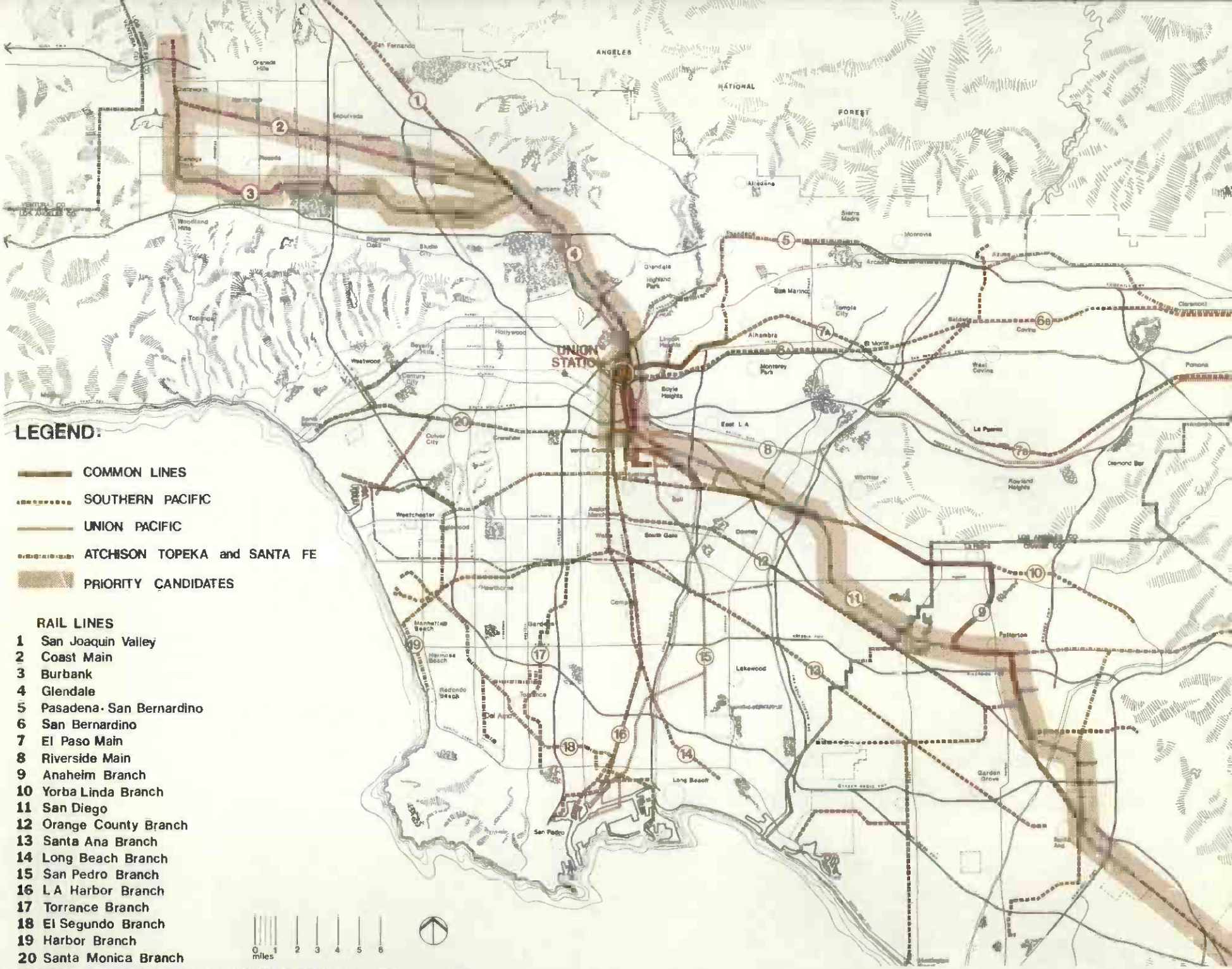
- Local financing costs would be much higher, in total and per rider served, than with the initial program of mass rapid transit.
- More riders in total could be attracted than with the initial program of MRT. However, major traffic congestion relief is much better provided by the initial rapid transit program which can penetrate highly developed areas with high-capacity service.
- Saturation bus would be most attractive to short- and medium-distance travel within and between adjacent outlying communities. In essence, it calls for providing highly subsidized, high-quality service in areas where, to date, SCRTD has determined that it cannot afford the costly losses that would be incurred.
- When the initial program of MRT is approved, the saturation concept does appear valuable as one basis upon which the existing bus system would be expanded and improved to serve travel taking place between and beyond rapid transit corridors and for trips to and from the rapid transit stations. The saturation concept will then be put to a much more economical use than as a total regional system.
- This concept may or may not fulfill the needs induced by automobile restriction. If restrictions are ubiquitous, through particular EPA policy or general gasoline shortages, the saturation approach appears to parallel the need. If restrictions are oriented toward activity centers alone, then other types of service are more effective than saturation bus.

Commuter Railroad Service

Another concept for making near-term transit improvements entails the use of existing railroad lines in the region to provide commuter rail service. Conventional rail passenger cars, designed for commuter service, would be purchased and placed in operation on the existing rail lines. Schedules would be developed largely to serve rush hour traffic, and only minor track and signalling changes would be made.

A survey of track conditions was made by the consultant team, covering all of the potentially attractive rail lines. Most lines were found to be poorly suited to high-speed passenger service. The most attractive lines are the ATSF San Diego line from the LA/CBD to Santa Ana and either the SP Main Coast Line or the Burbank Branch Line into the LA/CBD from the San Fernando Valley.

Commuter rail service was postulated on each of these lines. Capital and operating costs, probable patronage, and other factors were evaluated. While each of the services would be expected to attract commute traffic, it appears that the near-term bus improvements described earlier would serve the areas better and at lower cost. Furthermore, railroad cooperation would be difficult to obtain, since the commuter operations would interfere with the profitable freight operations. Therefore, the team recommends that near-term bus improvements be given priority at this time.



EXISTING RAIL NETWORK


VOTERS
REGISTER HERE

8.
Implementing The Plan

New Legislation

There is substantial current interest in changes in public transit legislation, at both state and federal levels of government—a fact that no doubt stems from the growing consensus of the need for greater emphasis on public rather than private transportation.

The most frequently mentioned—and the most far-reaching change that would affect transit is the opening of the Federal highway trust fund to public transit. Such legislation, which has been introduced in Washington, would provide great incentives to improve public transportation. Certainly, passage of such measures would have a major impact on the financing plan presented here.

Also at the federal level, a continuing and expanded UMTA capital grant program is necessary and should be encouraged at every opportunity. The need for additional funds is especially urgent in Los Angeles, which has a level of population and travel much larger than other cities that have received UMTA assistance.

As indicated earlier, release of the state gasoline taxes for other than highway construction would provide one way of providing additional resources for continuing the rapid transit program to complete the 250-mile system. Legislation has been introduced in both houses of the Legislature to permit the public to vote on a constitutional amendment that would enable this change.

Other legislation that will change the SCRTD Act to permit going ahead on the proposed plan is being considered in the Legislature at this writing. AB 1727 will reduce the vote requirement for the sales tax revenue bonds from a 60 percent majority to a simple majority; permit SCRTD, with voter approval, to levy a sales tax of up to ¾ of 1 percent; and permit SCRTD to use the revenues from the sales tax to carry out the proposed financial plan.

Environmental Impact Statement

Both the State and the Federal governments have taken significant steps in the last three years to assure that public (and, in some cases, private) projects give explicit consideration to their potential impact on the environment. To provide assurance that an appropriate degree of attention is given to environmental problems, an "environmental impact statement" must be prepared for submission to both levels of government.

Preparation of the environmental impact statement will require both analytical studies and hearings and meetings to get reactions from interested and responsible groups. The analytical studies must provide detailed information on effects of the project, both on people and the natural environment, and whether there are alternatives that would not result in such effects. The requirement for obtaining reactions from other groups assures that different viewpoints will be heard.

Among the factors that will be considered are the impacts on air, noise, and water pollution; the displacement of people and businesses; the use of land that is now a public park, recreation area, wildlife or waterfowl refuge or historic site; the aesthetic or visual impact; and the potential for division or disruption of a community or for affecting areas of unique interest or scenic beauty.

Community Participation Meetings

Representatives of the project team will carry out an intensive effort with community groups to explain the plan to them, to get their comments and criticisms, and finally to obtain their approval as the plan evolves. Certainly, approval of everyone cannot be obtained—what is needed is the fullest consensus that can be achieved.

To carry out this program effectively, it is fully expected that the team will have to reconsider their recommendations, and, where indicated, revise plans for the system based on community reaction. This is a planned activity, as is the eventual return of the team to the community to discuss the revisions.

The exact schedule of community meetings cannot be forecast at this time—nevertheless, it will be an essential, high priority action item in SCRTD's plans.

Finalizing the Technical Plan

This report represents a significant achievement in developing a plan for rapid transit; however, much more needs to be known about technical problems before further steps can be taken in the program. Therefore, additional technical studies must be conducted to resolve certain problems. These studies must also include the completion of the transit element of the SCAG regional transportation plan.

Among the most important issues to be resolved are the detailed locations of the rapid transit stations and lines. This will require more detailed analyses and meetings with community groups so that their needs and desires can be taken into account. Also, more detailed patronage studies will be required so that the final choices on the hardware and on the routes and stations can be made. Particular attention will be given to developing the best system that advanced technology can provide.

Referendum

The most crucial event required to go ahead with the program is the public referendum. In either June or November 1974, eligible voters within the Southern California Rapid Transit District will be faced with the question "shall we or shall we not have an advanced rapid transit system in the Los Angeles area?"

Engineering

Only after public approval of the project is it prudent to begin the final engineering and construction planning. Detailed designs for structures will be prepared so that construction firms can bid on various parts of the project. Detailed designs of the vehicles, control system, and other items of hardware will be prepared so that manufacturers can prepare bids. The engineering plans will, of course, also be used to control the construction and manufacturing activities.

Assemble Funds; Issue Bonds

After public approval of the rapid transit system, machinery will be set in motion to accumulate funds for the project. Revenues from the sales tax will begin to come in. These monies, however, will not be sufficient to pay for the entire construction of the system. As a result, bonds will be sold to provide the balance of the required funds.

Construction Program

Building rapid transit will be a giant undertaking that will affect many residents of the region. Of course, much of the money spent on construction of the system will flow directly to the Los Angeles population, since a large part of the cost will be in the form of wages.

Construction program of the initial system will span a period of about 12 years. While activities will be proceeding on a number of lines simultaneously, the system will begin service in steps. It is expected that, of the total project, the busway services on the northern extension of the Long Beach Freeway and the El Segundo-Norwalk Freeway will be the first to open. The first segment of MRT service is expected to begin on the South Central line to Compton. The next service to open will be the Wilshire line to La Brea and the San Fernando Valley line. After that, the Airport-Southwest, Santa Ana, and other segments of South Central and Wilshire will open. The upgrading of the Los Angeles-El Monte busway to MRT will be the last MRT line to open in the initial construction program.

During the construction of the initial system, plans will be developed for the continued construction in the next stages of the system in the other corridors shown earlier in the report. Thus, rapid transit construction will be a continuing program in Los Angeles.

Administrative Actions

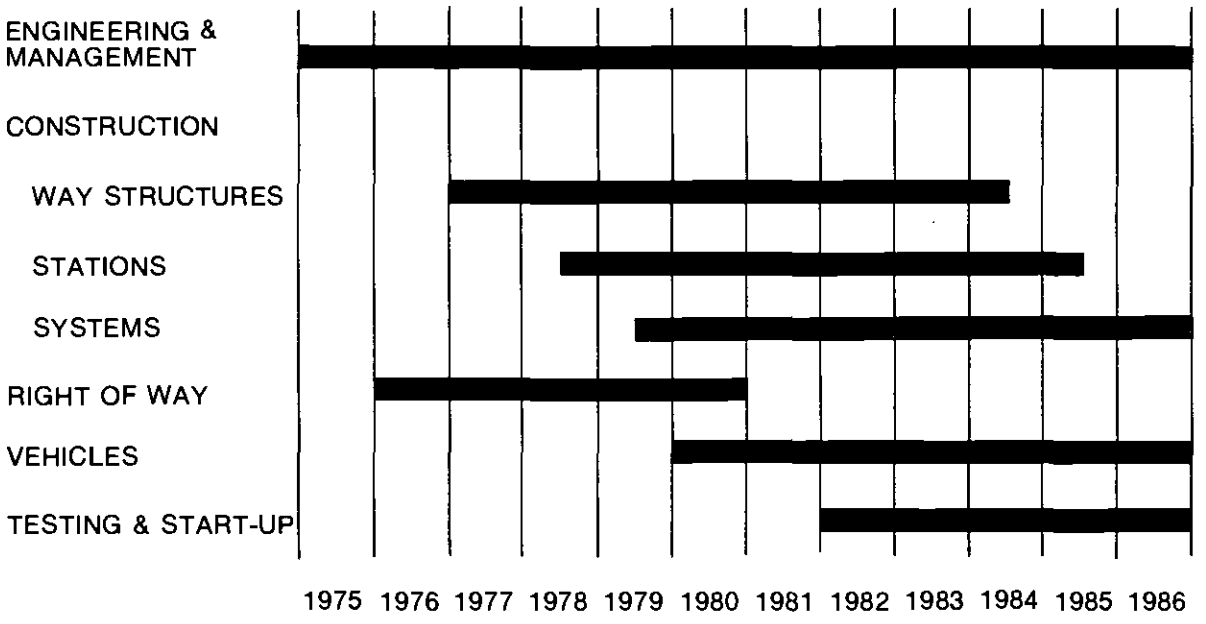
Transportation and land use are strongly affected by each other: MRT is best used to serve high-density activity centers, while buses are better used in areas of lower density. Agencies responsible for land-use zoning will have the opportunity to make desired adjustments in patterns of development to take advantage of the accessibility improvements in the vicinities of transit stations.

Additional administrative actions to reduce automobile usage can be taken to create even greater demand for rapid transit as well as benefiting the region in other ways.

Administrative actions that have been suggested include increasing parking rates substantially, rigidly controlling new parking lot and garage construction, restricting automobiles from certain areas (even to the extent of closing streets to all vehicular traffic and building malls), increasing automobile taxes (for gasoline or for auto registration), and collecting tolls during congestion hours (on freeways or on congested streets).

Actions such as these are beyond the responsibility of SCRTD. However, since they would have an impact on bringing about a balanced transportation system, SCRTD should encourage consideration of such actions by the responsible agencies and should take part in planning for them.

It is the opinion of the study team that transit systems described in this report will receive sufficient patronage to be justifiable without such actions. Therefore, they should be viewed as steps that will conserve energy and reduce congestion as well as enhance the role of rapid transit, not as steps that are required to guarantee success.



GLOSSARY

Access	Traveling to and from a rapid transit station
Activity Centers	Concentrations of activity (usually population or employment) within a limited land area
Alignment	Routing followed by rapid transit
APRT	Advanced personal rapid transit
ATSF	Atchison, Topeka, and Santa Fe Railway
BART	Bay Area Rapid Transit (San Francisco)
Busway	A guideway, usually on a freeway, for buses
Corridor	A channel or artery of concentrated traffic flow
Criteria	Factors taken into account in evaluation
EPA	Environmental Protection Agency
Evaluation	Method of comparing alternatives
Feeder and Distribution Systems	Secondary transit systems used to carry people to and from rapid transit
FHWA	Federal Highway Administration
Guideway	Reserved path for rapid transit
Kiss-and-Ride	A method of access to rapid transit stations in which the traveler is driven to the station by someone else
LA/CBD	Los Angeles central business district
LARTS	Los Angeles Regional Transportation Study
LAX	Los Angeles International Airport
Mode	Transit vehicle and associated technology
MRT	Mass Rapid Transit—high passenger capacity, high speed transit
Park-and-Ride	A method of access to rapid transit stations entailing driving to the station and leaving the car in a parking facility
PE	Pacific Electric Railway Company
PRT	Personal Rapid Transit
Right-of-Way	The land area taken up by rapid transit guideways and their associated clearances
SCAG	Southern California Association of Governments
SCRTD	Southern California Rapid Transit District
SP	Southern Pacific Railroad
Spoil	Waste earth from rapid transit construction
Surface Bus System	Bus operations on streets, arterials, or freeways other than busway operations
UMTA	Urban Mass Transportation Administration

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SCRTD Staff

General Manager: Jack R. Gilstrap
Manager of Planning and Marketing: George L. McDonald
Manager of Rapid Transit and Surface Planning: John Curtis
Chief Engineer: Richard Gallagher

Consultants

Project Control: Peat, Marwick, Mitchell & Co.
Engineering and Planning: Kaiser Engineers/Daniel, Mann, Johnson and Mendenhall
Patronage, Revenue and Bus Plans: Alan M. Voorhees & Associates
Socio-economic and Environmental: Wallace, McHarg, Roberts and Todd/Kennard and Silvers
Financing: Stone and Youngberg Municipal Financing Consultants, Inc.

City and County Technical Advisory Committees

Department of City Planning, City of Los Angeles:
- Calvin S. Hamilton*
- Thomas Stemnock
- Gene Moir

Department of Traffic, City of Los Angeles:
- S. S. Taylor*
- A. L. Hutchison
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Orange County Transit District:
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- Dan Benson

Southern California Association of Governments:
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League of California Cities, Los Angeles Region:
- Joseph N. Baker*

*Senior member representing the agency.