

SAN FERNANDO VALLEY BUSWAY

FEASIBILITY REPORT

Prepared By:

Southern California Rapid Transit District

Engineering Department

January 3, 1974

INDEX.

- I. GENERAL
 - A. Purpose
 - B. Origin of Proposal
 - C. Busway Alignment
 - D. Busway Access Conditions
- II. INTERAGENCY COOPERATION
- III. GEOMETRICS
 - A. Right-of-Way
 - B. Separation of Grades
 - C. Alternative Lane Configuration
- IV. BUSWAY--STREET INTERSECTIONS AND CONTROL
- V. PARK-AND-RIDE FACILITIES
- VI. ENVIRONMENTAL IMPACT
- VII. OPERATIONAL FEATURES
- VIII. PATRONAGE ESTIMATES
- IX. COST ESTIMATES
 - A. Right-of-Way
 - B. Pavement-Barriers
 - C. Bridges and Drainage
 - D. Signals - Gates & Lighting
- X. FINANCING
- XI. FUTURE RAPID TRANSIT USE
- XII. ALTERNATIVE ROUTING ON SURFACE STREETS
- XIII. SUMMARY
- XIV. CONCLUSIONS

I. GENERAL

A. PURPOSE

The purpose of this report is to consider the feasibility of an early, interim effort to provide improved public transportation between the San Fernando Valley and destination points in Hollywood, the Wilshire area and the CBD by means of a combination of an exclusive busway along railroad right-of-way coupled with the use of contra-flow lanes on the Hollywood Freeway into Hollywood and the CBD.

Following are some of the primary points which are used to test the feasibility of this project:

1. Relatively early implementation.
2. Minimum capital investment.
3. Expedited commuter service.
4. Preservation of right-of-way for a major Rapid Transit Corridor.

B. ORIGIN OF PROPOSAL

At a meeting on October 9, 1973 with representatives from the Southern California Rapid Transit District, Southern Pacific Transportation Company, and California Department of Transportation; the Southern Pacific Transportation Company indicated they would be willing to consider the sale or lease of 50' width of their Burbank Branch Line railroad right-of-way from Chatsworth to its junction with the Hollywood Freeway for transit purposes.

Cal-Trans indicated that southbound contra-flow lanes on the Hollywood Freeway, between Magnolia in North Hollywood and Highland Avenue in Hollywood are being planned and will be in operation in approximately 1-1/2 years. They stated that a contract is being readied to eliminate the bottleneck on the Hollywood Freeway from Pilgrimage Bridge southerly to Sunset Boulevard. This project is anticipated for completion in three years. It may then be possible to operate contra-flow all the way into the Los Angeles CBD.

The San Fernando Valley Busway, as proposed by SPTC, closely approximates the San Fernando Rapid Valley Transit alignment as presented in the consultant's report dated July, 1973. Development of this alignment as a Busway could be considered as an interim step in the development of the San Fernando Valley Rapid Transit Corridor.

SPTC, by letter dated October 16, has since formally indicated its willingness to negotiate for use of a portion of their right-of-way on the Burbank Branch Line for a Busway or Rapid Transit line. The extension of the busway serving Hollywood and the CBD by the use of contra-flow lanes on the Hollywood Freeway would tend to relieve portions of the San Diego Freeway, Ventura and Hollywood Freeways, which are heavily congested during the morning and evening peak hours.

C. BUSWAY ALIGNMENT

The San Fernando Valley Busway would follow the alignment and right-of-way of the Burbank Branch Line of SPTC from the SPTC Coast Line, located northeasterly from the Chatsworth Reservoir at the intersection of Plummer Street and Canoga Avenue in Chatsworth. It would then proceed southerly, parallel to Canoga Avenue along the westside of the SPTC's track to the vicinity of Victory Boulevard, and then easterly along the southside of the SPTC track passing to the north of Pierce College and the Sepulveda Flood Control Basin; thence through Van Nuys to and along the median of Chandler Boulevard, to the intersection of the SPTC Branch Line and the Hollywood Freeway.

Busway buses would then have access to the Hollywood Freeway and travel via the proposed contra-flow lane (exclusive lanes in off-peak directions) southerly to Hollywood and then on the widened freeway to the Los Angeles Central Business District. Consideration will be given to providing a connection to the City of Burbank along or on streets adjacent to the Burbank Branch Line.

D. BUSWAY ACCESS CONDITIONS

There are no grade separations along this section of the SPTC's Burbank Branch Line. At such time as this alignment is developed for fixed guideway rapid transit, all streets which cannot be closed would have to be separated. This report will consider

the feasibility of interim development as a busway without grade separation. This would enable local buses to enter or exit the busway, thus providing direct service without transfers between the downtown CBD and out-lying San Fernando Valley districts. At some places, however, it may be desirable to have local buses serve as feeders to platforms at Park-and-Ride locations.

The northerly access to the busway lanes at Chatsworth would be on local streets and is only a short distance south of the Simi Valley Freeway. Access ramps to and from the Hollywood Freeway would be developed by Cal-Trans. In addition to surface street connections, there are several locations that should be considered for park-and-ride facilities. For example; the Chatsworth Terminal, Pierce College, Sepulveda Flood Control Basin near the San Diego Freeway, and downtown Van Nuys.

II. INTERAGENCY COOPERATION

Plans, design and construction of the San Fernando Valley Busway would require the cooperation of and agreements with the following named jurisdictions:

- 1) Southern California Rapid Transit District
- 2) Southern Pacific Transportation Company
- 3) California Department of Transportation
- 4) Los Angeles County (Flood Control District)
- 5) Los Angeles City (Traffic, Public Works, City Engineer)
- 6) Los Angeles County (Engineer & Road Department)
- 7) City of Burbank (for Burbank Busway extension)
- 8) Urban Mass Transportation Administration
- 9) U. S. Army, Corps of Engineers

It is assumed that SCR TD would be the controlling agency for the San Fernando Valley Busway from the Chatsworth Terminal to the Hollywood Freeway. It is anticipated that SCR TD would contract for necessary right-of-way negotiation and acquisition with Cal-Trans; and special engineering services, such as soils reports, surveys and construction inspection with Cal-Trans and/or with the County Engineer's Office. The approval of County Flood Control District would be necessary for the bridge crossings of their Los Angeles River and Tujunga Wash flood channels. It is assumed that the San Fernando Valley Busway project would be an UMTA funded capital grant project. For the District to be assured of a "full service" facility, it

would be necessary for SCRTD and Cal-Trans to enter into an agreement regarding the geometrics and operating conditions on the Hollywood Freeway contra-flow lanes into Hollywood and Los Angeles CBD.

III. GEOMETRICS

A. RIGHT-OF-WAY

SPTC's proposal for right-of-way width is generally 50 feet on the west side of the right-of-way from the northerly terminus to Victory Boulevard and then 50 feet on the southerly portion of the right-of-way to the Hollywood Freeway. This would require relocating the present tracks 10 feet to the east and north. The present right-of-way is 100 feet wide with the tracks in the center. There are short sections where the right-of-way may have to be confined within 40 feet such as through the old Canoga Park Station. Short sections of right-of-way may be required outside of the SPTC right-of-way such as the old Encino Station, and at park-and-ride facilities. There are 21 spur sidings along the proposed busway right-of-way that must be relocated or abandoned in order to avoid a railroad crossing on the busway.

However, to minimize the track relocation cost, this report will also consider the development of a busway, on grade, within a 40-ft. right-of-way.

B. SEPARATION OF GRADES

There are a total of 30 existing grade crossings along the section of SPTC's Burbank Branch Line under consideration.

Five of these are for local or residential streets that presumably could be closed. The remaining 25 crossings are arterial streets.

It is estimated that the average grade separation would cost \$2 million, therefore; the order-of-magnitude cost would be \$50 million to fully grade separate the San Fernando Valley Busway. This would delay the use as a busway for several years. In addition, separation structures would require a substantial amount of right-of-way outside the SPTC railroad right-of-way, as well as, constructing railroad bridges or realigning the tracks at separation structures. If separation structures are built, they should be compatible for conversion to future rapid transit. All these factors tend to diminish the cost-benefit ratio and delay the start for an interim transit solution in the San Fernando Valley corridor.

Consideration could be given for separating the 5 or 6 most heavily travelled streets. This would, of course, have a direct benefit to the street traffic but minimal benefit to the busway because of the large number of grade crossings that would remain.

So long as the project is considered as an interim step to a future system, every effort should be made to compromise ideal operating conditions to achieve an early, low cost, commuter line that can operate safely within reasonable travel times.

This report will, therefore, consider conventional intersection control devices for all the busway grade crossings.

C. ALTERNATIVE LANE CONFIGURATION

In general, it is proposed to have two 12' lanes in each direction.

There are several alternative cross sections. The method of controlling grade crossings will, to some extent, dictate not only the method of operation, but the lane configuration at intersections.

There are two basic alternatives for the busway lanes; one with adjacent opposing lanes and conventional shoulders, the second with through lanes separated by an emergency parking median. Surface street intersection requirements may vary depending on whether or not there is bus ingress and egress, and left or right turn requirements. Right-of-way width will be affected by the lane and intersection geometrics.

Following is a brief discussion on the various alternatives under consideration with references to drawings in the appendix. All alternatives propose barrier walls along the right-of-way line on each side of the busway.

1. Conventional lanes with outside shoulders (see appendix).

The single advantage is that a conventional shoulder separates the through lane and right side barrier. However, this shoulder is not wide enough to fully shield a disabled bus on a 40' right-of-way and no protection is afforded for opposing bus travel. It does allow conventional intersection design without channelization.

2. Outside lanes with a center median (see appendix).

This alternate provides adequate width for shielding a disabled bus in either the 40 or 50' right-of-way. It does

require a wider through lane due to the right side barrier. The median width will vary at intersections depending on turning and acceleration requirements.

IV. BUSWAY--STREET INTERSECTIONS AND CONTROL

There are basically two methods of traffic control for the 25 arterial intersections that are involved. The first method would be to use a typical railroad gate with flashing red lights actuated by an approaching bus platoon. The second method is to use the usual type of street intersection traffic signals on a progressive basis to give priority to the busway for a predetermined speed.

If the gate control method is used, it would, out of necessity, have to be interlocked with the railroad track circuits. This provides an inherent disadvantage because of the lead time required to close the gates in order to assure that vehicles can clear the full 100' width of right-of-way prior to a train or bus arriving at the intersection. With buses on short headways, the interruption to cross traffic may be objectionable.

The use of normal traffic signals on the busway, in addition to those already on adjacent parallel streets, is likely to cause some serious problem and will require some further detailed study. Consideration should be given to interlocking traffic signals on the busway with the local street progression in order to avoid disrupting the normal traffic flows. In addition, bus actuated loops to start the progressive signal timing could be considered in order to avoid stopping vehicular traffic during periods of low busway use,

such as during the middle of the day. Various geometric designs for surface street intersections are shown in the appendix. It may be desirable at major street intersections to acquire additional land for the busway in order to provide both left and right turns from the busway, as well as, a through lane.

V. ENVIRONMENTAL IMPACT

Although the busway would continue the transportation use of the railroad's corridor, it is expected that the addition of the busway lanes would require an environmental impact report. The overall conclusions of an environmental impact report may very well have a favorable impact because of the following general conditions:

1. A relatively small amount of private property will be required, none of which appears to be residential property.
2. There should be a definite positive impact in connection with air quality control because of the substitution of a lower pollutant transportation mode than for automobiles.
3. The noise characteristics of a bus are generally much better than that of a freight train. The proposed barrier walls on each side of the busway should assist in containing most of the noise generated by buses. However, the number of bus trips certainly will be much greater than the present freight train use; therefore, the net effect of this category will require further study.
4. The improvement of half of the SPTC right-of-way may be considered to have a beneficial effect as compared to its present unmaintained condition.

VI. OPERATIONAL FEATURES

On the basis of assumptions, made in other sections of this report, operational features discussed herein will be limited to grade crossings at all street intersections except where minor residential streets are proposed to be closed. It is further assumed that buses will be platooned either by operating instructions or by the physical character of a progressive signal system. Feeder buses entering the busway will have to adjust to the platoon formation. In the case of progressive signals, it will be up to the bus driver to adjust. But in the case of gate crossings or bus operated signal timing, the entering bus would have to enter and wait for a platoon and then accelerate to join the formation. The street intersection geometrics referred to in Section IV, provide shoulder or median areas where buses can layover to adjust to a platoon formation. It will be necessary to develop rigid operating instructions for existing buses in order to allow a safe deceleration for turning out of the busway.

The progressive signal timing would permit the most standard operating conditions and eliminates the need for bus layover on the busway. The estimated travel time on the busway from the northern terminal to the Hollywood Freeway, at an average speed of 30 MPH would be 32 minutes plus on line loading stops. The estimated travel time on the Hollywood Freeway on contra-flow lanes to Highland Avenue and then on the widened section of the Hollywood Freeway to Sunset Boulevard and on into the CBD,

a distance of 12 miles, is estimated at 18 minutes, plus on line stops for loading. The total travel time on the exclusive Busway and contra-flow lanes from Chatsworth terminal to CBD is estimated to be one hour, assuming five on route loading points. This compares with 1 hr. to 1 hr. - 15 min. for auto travel time during peak hours between these two points. Several travel time runs were made on surface streets and the Hollywood Freeway that are summarized in Section XI.

On the basis of patronage estimates in this report, it is anticipated that 100 new buses would be needed to serve the San Fernando Valley Busway. It may be desirable to consider a new maintenance yard in the vicinity of Chatsworth for the busway buses. The present maintenance and service yard in the San Fernando Valley is located at Van Nuys Boulevard and Sherman Way. This yard is presently overloaded for local buses and is some distance (12 miles) from the Chatsworth terminal which would require considerable amount of deadhead time. This new yard could also double as a service facility for local buses in the westerly portion of the San Fernando Valley.

The maximum busway capacity is dependent upon the minimum operating headway that is considered to be safe. The maximum capacity of a busway is estimated to be as high as 12,000 people/hour and 9,000 as a comfortable maximum. However, in the case of the San Fernando Valley Busway, where platooning will be required due to grade

crossings it is expected that the practical operating capacity would be approximately 3000 to 5000 people/hour.

The operational cost for the San Fernando Valley Busway will include the normal operating and labor cost of running buses in addition to surface and control equipment maintenance. Therefore, the total operating cost to the District will be slightly higher than for the San Bernardino Busway where Cal-Trans is responsible for the maintenance of the busway roadways.

VII. PATRONAGE

The SCRTD Planning Department prepared a preliminary analysis of patronage that might be expected on the San Fernando Valley Busway.

This estimate was based on the following assumptions:

- Feeder bus routes would have access to busway throughout the 16-mile length.
- 12 minute walk and wait time for surface street buses and/or park and ride buses.
- Average 30 MPH speed on Busway and 40 MPH speed on contra-flow freeway lanes.
- Three primary inbound destinations: CBD, Wilshire Area, and Hollywood Area.

Conclusions (One-Way Commuter Trips/Day) Diversions from auto mode:

- Valley to CBD, 3600 out of 11,400 trips.
- Valley to Wilshire Area, 920 out of 16,000 trips
- Valley to Hollywood, 800.
- TOTAL One-Way Diversion Trips, 5,300/day.

There are currently 4 lines approximately paralleling the San Fernando Valley Busway. From checkpoint information, it is estimated that 2,600 of the current 4,300 one-way daily trips could be made on the busway.

The extension of these estimates result in 15,800 trips per day (two-way) or 4,000,000 trips per year.

VIII. COST ESTIMATES

The following cost estimates are order-of-magnitude. Some decisions on operational and design features will be required prior to developing a preliminary project cost estimate for a capital grant request.

A. RIGHT-OF-WAY

The right-of-way cost would include that portion of the railroad right of way to be used for the busway, and any widening required at intersections. In addition, it is anticipated that 21 spur tracks will have to be terminated or relocated and certain SPTC improvements at their Canoga Park Station, Tarzana, and Van Nuys Stations must be acquired. The right-of-way costs would also include any railroad track relocation. In the case of a 40' right-of-way, track relocation would be minor. The 50' right-of-way will require relocating the through track for the 16.2 miles of the Busway.

Right-of-Way Costs

50' Width - \$12,200,000
40' Width - \$11,800,000

B. GRADE, PAVE AND BARRIERS

It is estimated that the full busway right of way would be paved with asphaltic concrete on a suitable base with barrier walls on each side of the busway.

Grade, Pave and Barrier Costs

50' Width - \$3,530,000
40' Width - \$3,000,000

C. BRIDGES AND DRAINAGE STRUCTURES

Major bridges will have to be constructed over two crossings of the Los Angeles River and one at the Tujunga Wash. In addition, major modifications may be needed at the San Diego Freeway crossing of the busway. Minor drainage structures will be required throughout the full length of the Busway.

Bridges and Drainage Structure Cost

\$2,500,000

D. TRAFFIC CONTROL AND LIGHTING

It is anticipated that intersection lighting will be required at each of the grade crossings along with traffic controls and signals.

Traffic Control and Lighting Cost

\$2,200,000

E. PARK-AND-RIDE FACILITIES

This estimate covers four (4) park-and-ride facilities; three to be located along the busway alignment at the northern terminus near Pierce College, and the Sepulveda Flood Control Basin, with an off line station in Van Nuys. The estimate is based on a 700-car parking facility with a 150-ft. long loading platform. Included in this estimate of cost are right of ways, grade, paving, lighting and other improvements.

Park-and-Ride Facilities Cost

\$11,400,000

F. NEW BUS STORAGE AND MAINTENANCE FACILITY

It is anticipated the ten (10) acres of land will be required for this facility. The cost of Division 9, currently under construction, is used as a guide in estimating the improvements costs. This facility would have the capability of servicing 250 buses.

New Bus Storage & Maintenance Facility Cost

\$5,500,000

G. 100 NEW BUSES

For the purpose of an order-of-magnitude cost, it is assumed that 100 new buses will be required for the operation of the San Fernando Valley Busway.

100 New Buses Cost

\$6,400,000

H. Order of magnitude cost for San Fernando Valley Busway right-of-way improvements and equipment: \$42,800,000 for a 40' right-of-way. The 50' right-of-way and improvements would add \$2.4 million.

IX. FINANCING

The only funds available to the District for both operating and capital expenditures are derived from fare box revenues, SB-325 funds, advertising and other minor revenues. The District's Controller-Auditor advises that all of the current funding sources are fully committed for the foreseeable future; and in addition, operating subsidies may be required.

The possibility of gas tax funds committed for transit will be a subject in the general election in June 1974. The present wording in the ballot proposal would prohibit funds from this source to be used for capital improvements of the busway discussed in this report.

Therefore, it is concluded there is no source of funds at the present time that could be used for local matching funds for an UMTA Grant to develop the San Fernando Valley Busway.

X. FUTURE RAPID TRANSIT USE

The purchase of a portion of the SPTC right-of-way for a busway will not only reserve a portion of an important future rapid transit corridor, but will also assist in establishing the price for other railroad rights-of-way that may be used for rapid transit corridors. If a portion of the Burbank Branch Line is purchased and used as a busway, every effort should be made to avoid conditions that would cause a conflict with the construction of a rapid transit line. In fact, serious consideration should be given to the reservation of the right-of-way and only using portions where city street systems are inadequate, since any busway construction now will result in problems later when grades have to be separated for rapid transit construction.

XI. ALTERNATIVE ROUTING ON SURFACE STREETS

A. GENERAL

Although the offer of the Southern Pacific Transportation Company for the utilization of the portion of the Burbank Branch Line for a busway appears to have attractive overtones, there are serious design and operational problems involved in addition to the funding problem discussed in Section IX. The feasibility study undertaken for this proposal has resulted in an alternative idea that may have more immediate merit than an exclusive busway. The idea includes an operating scheme which could be termed "The San Fernando Valley Express Coach Service".

B. ROUTE DESCRIPTION

Two general routes were considered which parallel the Burbank Branch alignment. Both routes originate at Topanga Canyon Boulevard, and Victory Boulevard. The northerly extension is not considered an important part of the routing due to the low traffic densities on existing surface streets and the lack of residential development. A northerly extension may be considered feasible at some date in the future. The first routing considered was on Victory Boulevard to Topham Street; thence along surface street adjacent to the SPTC right-of-way to White Oak Avenue; thence southerly to Burbank Boulevard and easterly to the Hollywood Freeway.

The second routing considered was all on Victory Boulevard, from Topanga Canyon Boulevard to the Hollywood Freeway. The Victory Boulevard alignment appears to be the better alternative for consideration because direct connections can be made to parking lot facilities considered in previous portions of this report.

The travel time on the two routes are within a few minutes of each other. The Victory Boulevard alignment serves more the residential area than the other surface street routes.

C. OPERATIONAL FEATURES

The operation on this alternative routing would involve no special operating techniques since it utilizes existing surface streets. Actual runs were made over the surface streets and compared to runs using all freeway. The time enroute from Topanga Canyon Boulevard, via Victory Boulevard, and the Hollywood Freeway to Temple and Hill Streets was 71 minutes. Using the Ventura and Hollywood Freeway, it was 72 minutes. We can conclude that there would be no time advantage on an exclusive busway if the intersecting streets are not separated.

D. ESTIMATED TRAVEL TIMES

The estimated travel time on semi-exclusive bus lanes with grade crossings is 30 miles an hour.

Travel times on parallel surface streets approach 30 miles an hour even in peak morning and evening periods; therefore, in considering express coach service in the San Fernando Valley, consideration should be given to the alternate of using existing surface street routes which parallel the Burbank Branch Railroad. Travel times were measured between Topanga Canyon Boulevard and the Hollywood Freeway along three separate routes:

BETWEEN TOPANGA CANYON BOULEVARD AND
HOLLYWOOD FREEWAY

VIA	<u>EASTBOUND</u> (leaving Topanga)		<u>WESTBOUND</u> (leaving Hollywood Fwy.)		
	<u>7:30 am</u>	<u>8:00 am</u>	<u>5:15 pm</u>	<u>5:45 pm</u>	<u>6:15 pm</u>
Ventura Fwy.	31 min.	29 min.	37 min.	28 min.	30 min.
Victory Blvd.	27 min.	31 min.	32 min.	30 min.	30 min.
Victory Blvd. to Topham to Burbank	28 min.	30 min.			

These tests indicate that buses on either of the surface street routes would have comparable running times with automobile traffic on Ventura Freeway, and average 27 to 30 MPH. Pick-up points for the express coach service should be limited to main collection points such as park-and-ride facilities; otherwise, the local street routes would show a much longer schedule time than the Ventura Freeway route or a semi-exclusive busway.

XII. SUMMARY

The prime goals considered in this feasibility report for a San Fernando Valley Busway are:

- No. 1. Early implementation.
- No. 2. Minimum capital investment.
- No. 3. Expedited commuter service.
- No. 4. Preservation of right-of-way for a major rapid transit corridor.

Semi-exclusive busway lanes on the Burbank Branch Railroad right-of-way will meet all of the primary goals described above, except No. 2. The construction of a grade separated exclusive busway on this right-of-way would meet the last two goals described above. The establishment of "express coach service" on Victory Boulevard from Topanga Canyon Boulevard to Hollywood Freeway would meet the first three goals, but would have no effect on No. 4.

There are serious problems that would be encountered in developing a semi-exclusive busway on the railroad right of way, such as:

- Signalized or gate controlled intersections would require prohibiting left turns from immediately adjacent, parallel streets.

- The enforcement of the prohibition of auto use of the semi-exclusive lanes would be difficult.
- Proper signal coordination between all surface streets, the busway, and the railroad would require considerable compromise.
- Two-way operation of a busway and a railroad with crossing traffic requirements will be hazardous.
- There is little or no time savings on semi-exclusive lanes at 30 MPH vs. parallel surface streets with signal timing at 30 to 35 MPH when surface streets are not operating at peak capacities.
- No local matching funds are available for busway development costs.
- Busway development on future rapid transit alignments will require buses to be routed over adjacent local streets when time comes to convert to rapid transit.

The implementation of "express coach service":

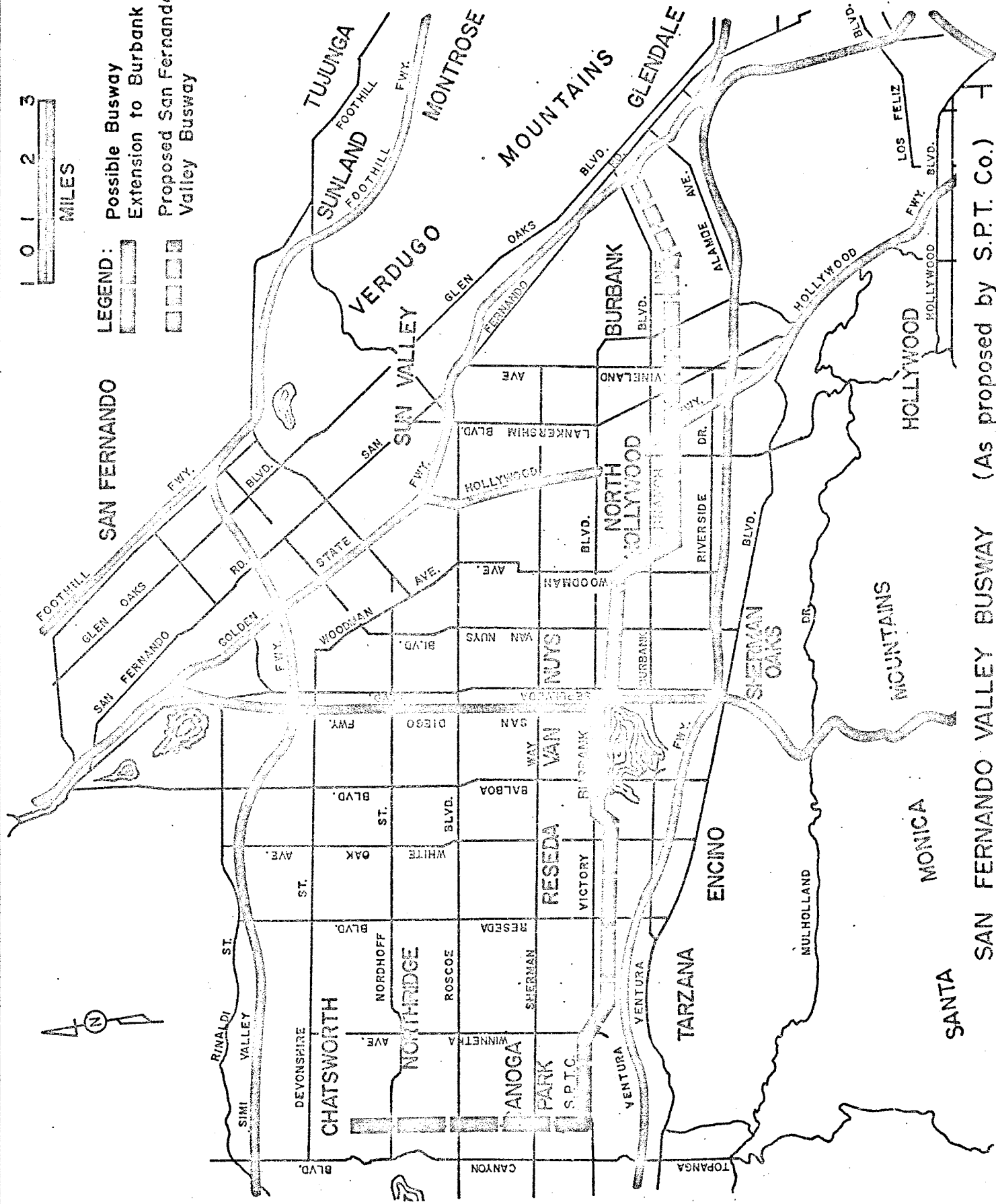
- Will not require any special funding.
- Will have comparable running times to semi-exclusive bus lanes.

- Will have the possibility of direct connection to future park-and-ride facilities.
- Can be implemented immediately.
- Will not require any unique or peculiar operating conditions.
- The development of contra-flow lanes on the Hollywood Freeway is essential to any CBD oriented bus service (and this is several years away).
- The single greatest loss to bus travel time is experienced on the Hollywood Freeway between Highland Avenue and Sunset Boulevard, where a widening project is planned to be completed in three years.
- The present contra-flow lane project is planned for southbound buses only between Magnolia Boulevard in North Hollywood and Highland Avenue. Bus schedule improvement would result with northbound contra-flow lanes.
- The development of park-and-ride facilities for any alternate would appear to increase bus patronage. These facilities can be developed on a staged basis.

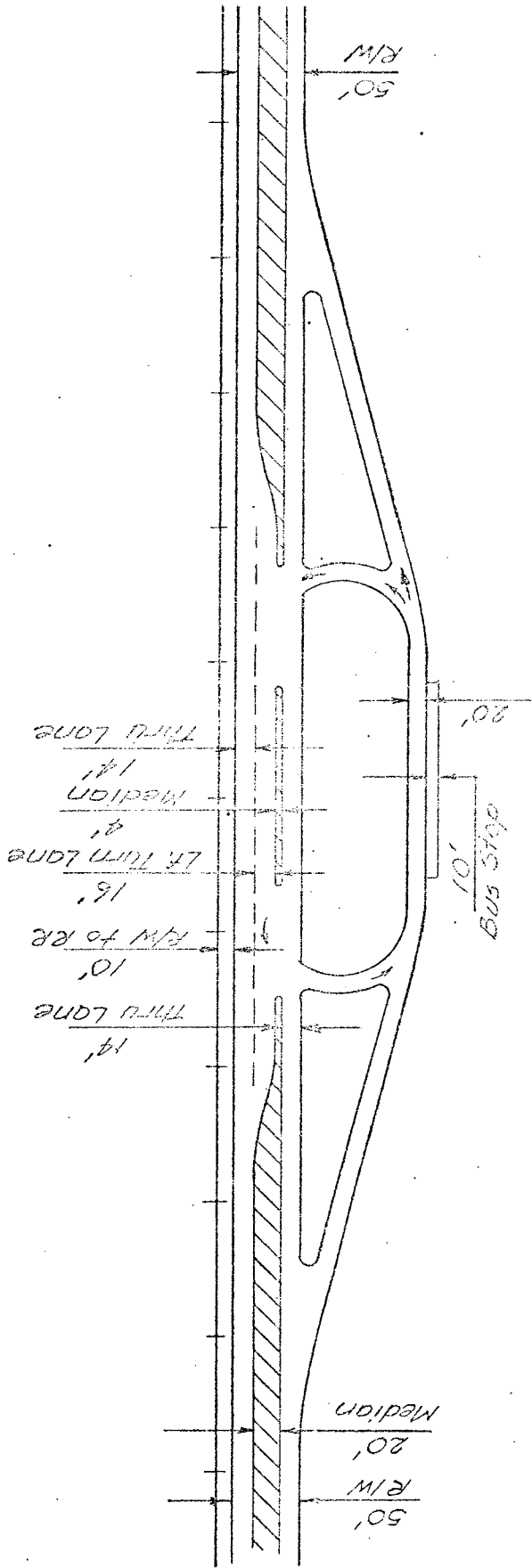
APPENDIX



LEGEND:
 Possible Busway
 Extension to Burbank
 Proposed San Fernando Valley Busway

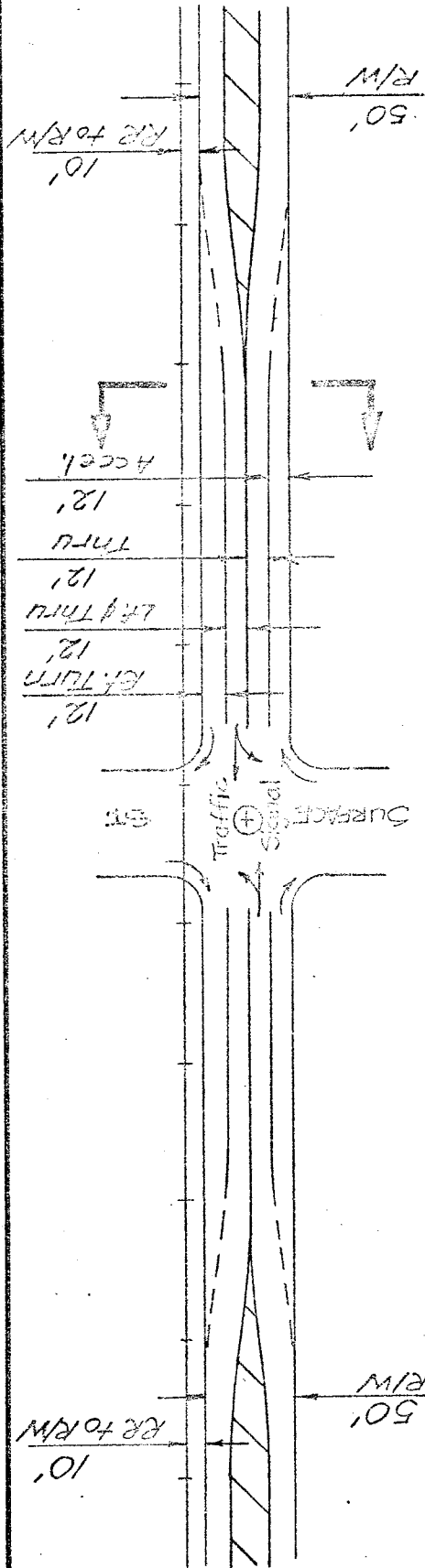


SAN FERNANDO VALLEY BUSWAY (As proposed by S.P.T. Co.)

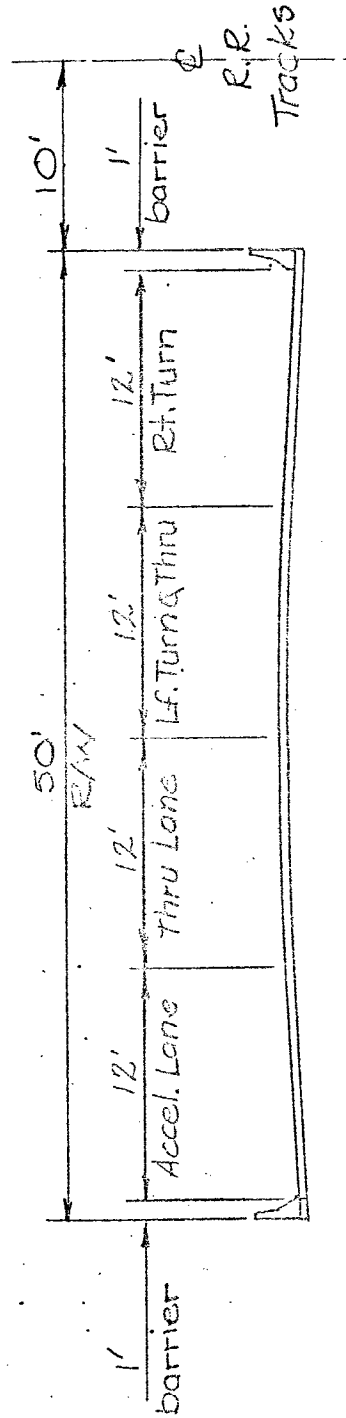


PLAN
 Scale: $\frac{3/4" = 100'$

SAN FERNANDO VALLEY BUSWAY
 ON LINE LOADING PLATFORM



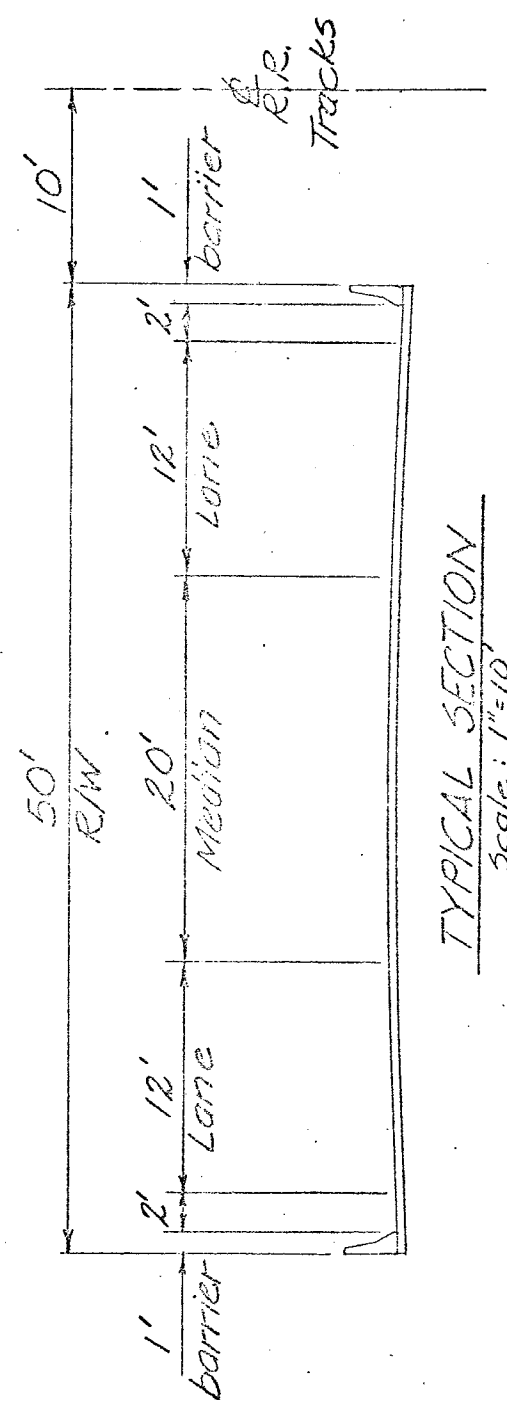
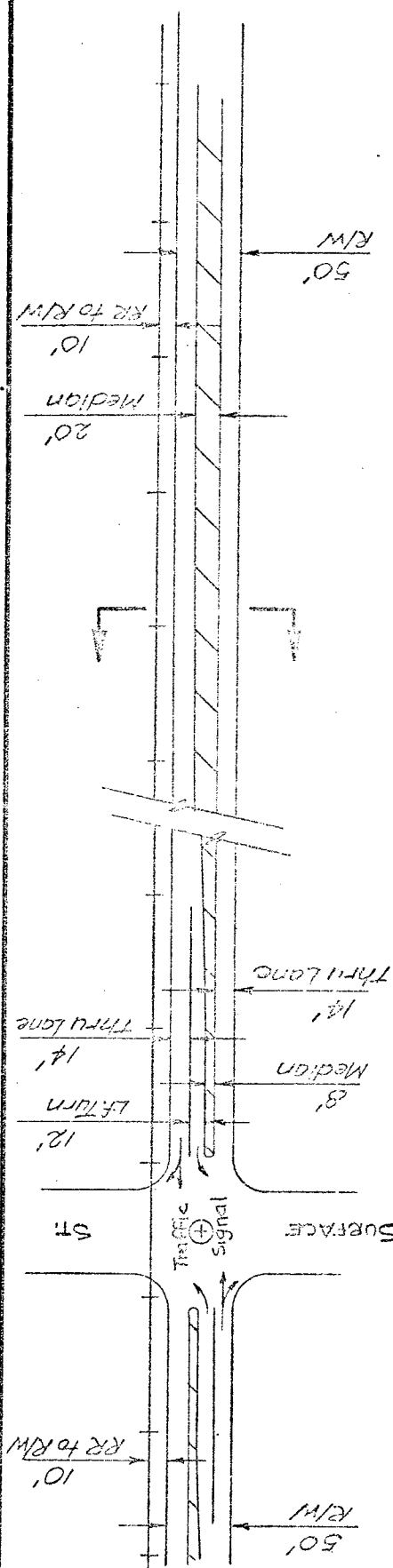
PLAN
Scale: 1"=100'



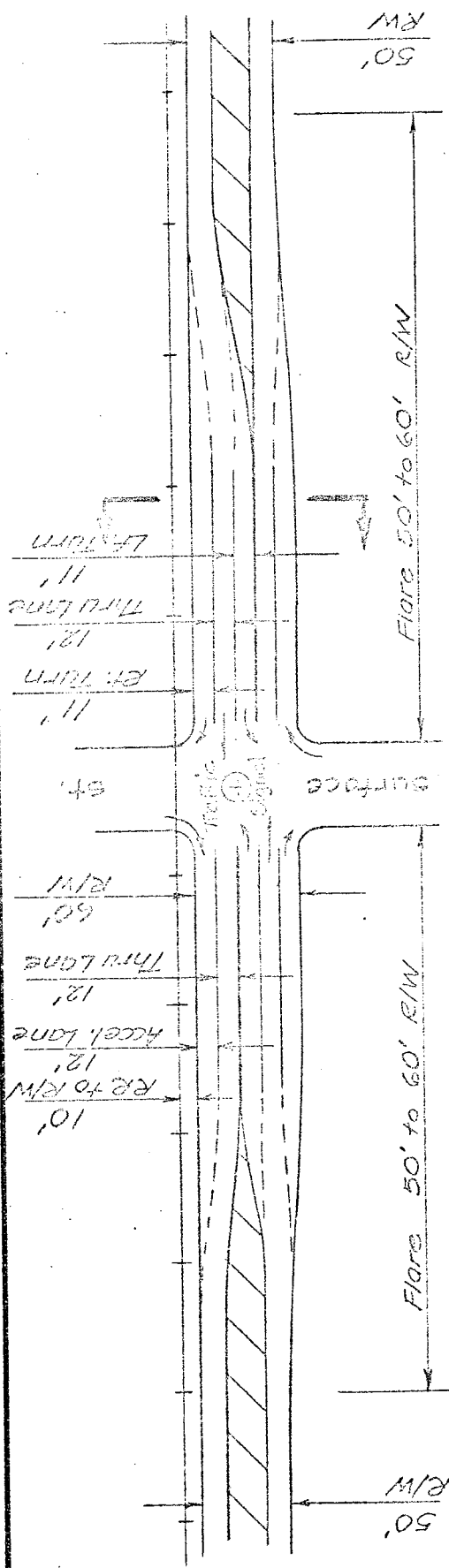
TYPICAL SECTION
Scale: 1"=10'

SAN FERNANDO VALLEY BUSWAY

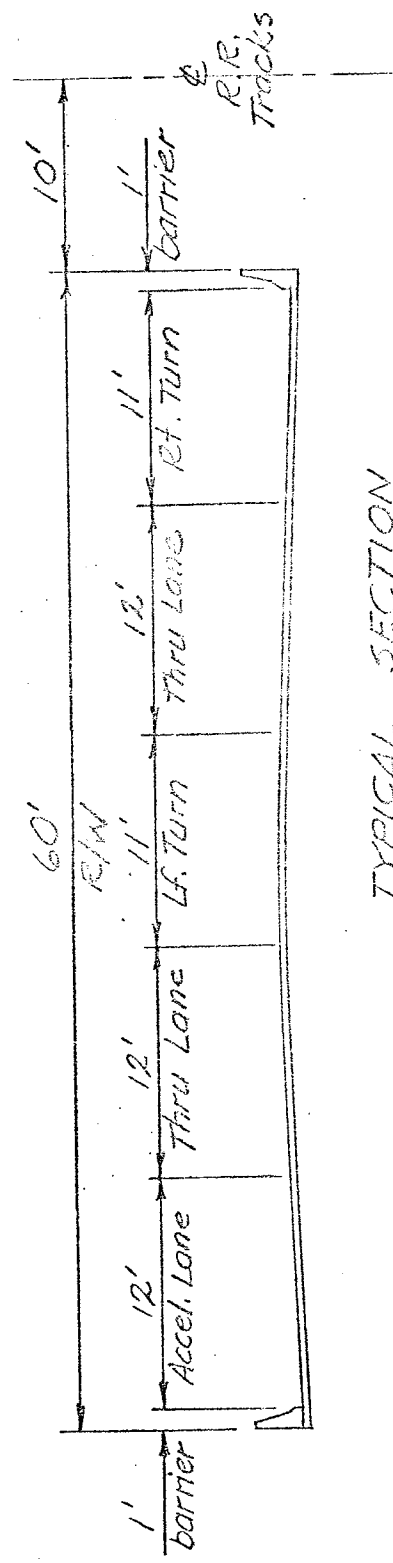
50' R/W



SAN FERNANDO VALLEY BUSWAY
50' R/W

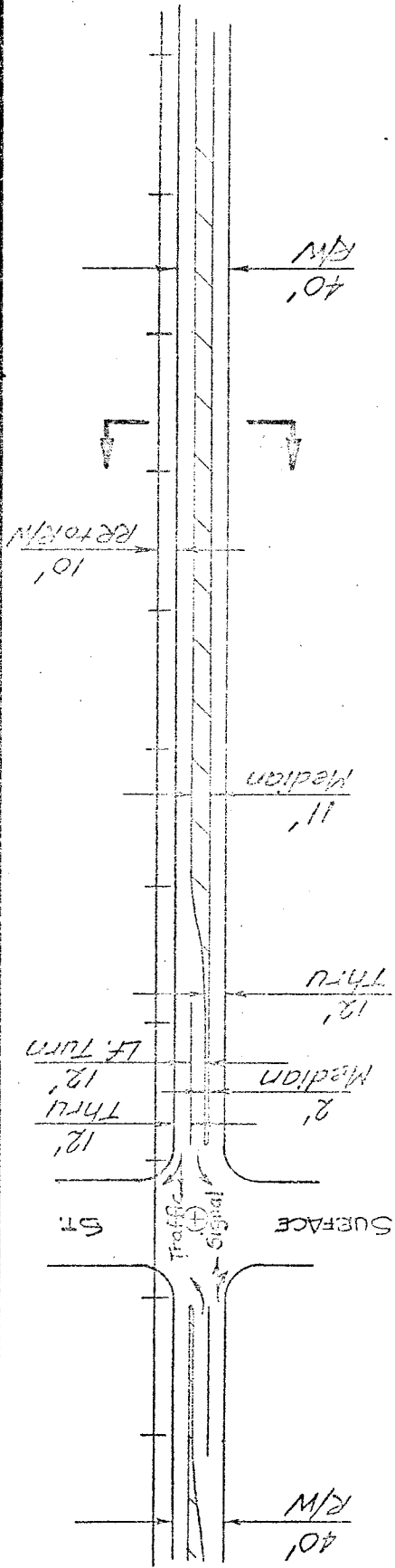


PLAN
Scale: 1"=100'

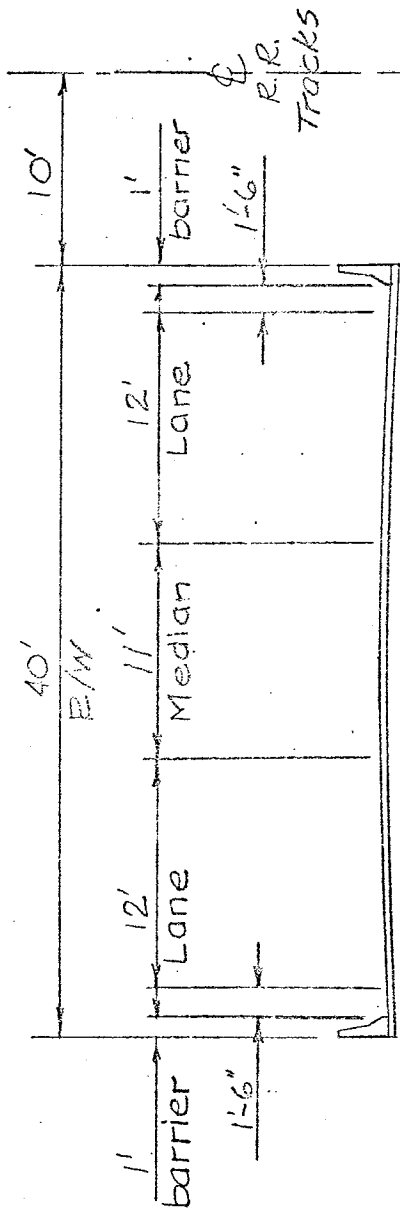


TYPICAL SECTION
Scale: 1"=10'

SAN FERNANDO VALLEY BUSWAY
FLARED INTERSECTION



PLAN
Scale 3/4" = 100'



TYPICAL SECTION
Scale 1" = 10'

SAN FERNANDO VALLEY BUSWAY

40' R/W