ALAMEDA CORRIDOR

PRE-CONCEPT ESTIMATE

SEPTEMBER 12, 1991

PRESENTATION PACKET

DMJM/M&N

ALAMEDA CORRIDOR

PRE-CONCEPT ESTIMATE

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CONTENTS

PRE-CONCEPT ESTIMATE

BASIS OF ESTIMATE

The quantity and cost estimates presented are based on:

1. 1" = 100' scale aerial mapping, dated June 26, 1990
2. All new construction, including new railway equipment for tracks, ballasts, ties, etc.
3. All new roadway construction, including pavement, curbing, drainage, and sidewalks, etc.
4. Utility locations based on a data research of existing records.
5. Average unit prices in 1991 dollars published by Caltrans and from bid tabulations of local contract lettings.
6. Graphic layouts of roadway and railway alternative solutions, plotted on 1" = 100' scale maps.
7. Preliminary geotechnical information available from historical records and some recent investigations as summarized in a report, dated February 22, 1991.
8. Conceptual level right-of-way pricing.

AT-GRADE ALTERNATIVE

COST COMPARISON

($MILLION)

	1991 PRE-CONCEPT	1989 INITIAL COST
CONSTRUCTION, RIGHT-OF-WAY, AND UTILITY RELOCATION (INCLUDING CONTINGENCY)	$891	$430
MANAGEMENT, ADMINISTRATION, ENGINEERING, CONSTRUCTION MANAGEMENT	126	72
SUBTOTAL:	$1,017	$502
FINANCE AND LEGAL	61	--
PROJECT RESERVE	108	--
SUBTOTAL:	$1,186	$502
ESCALATION	403	--
TOTAL PROJECT:	$1,589	NA

AT–GRADE ALTERNATIVE

COST COMPARISON

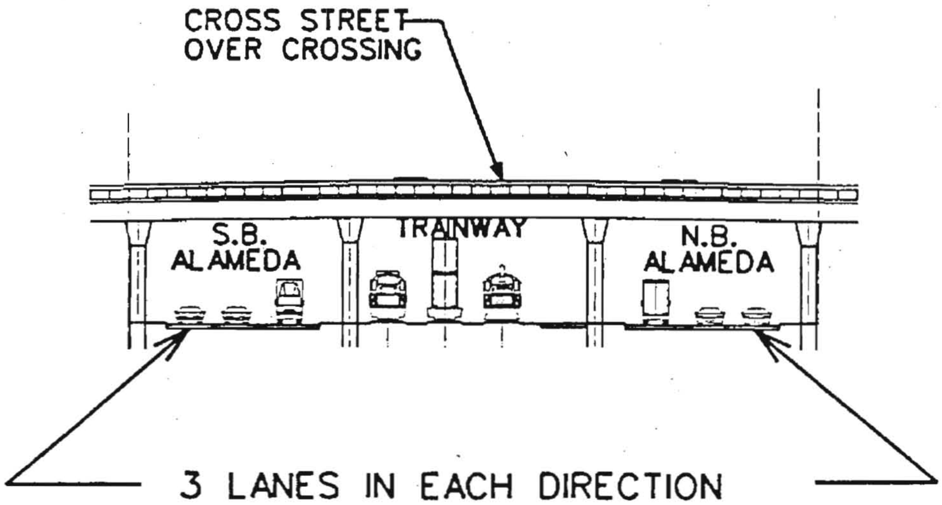
($ MILLION)

FEATURES	1991 PRE–CONCEPT	1989 INITIAL COST	FEATURES
15 Mi. ROADWAY	$81	$60	12 Mi. ROADWAY
29 GRADE SEPARATIONS (41 STRUCTURES HIGHWAY AND RAIL ESTIMATED)	$391	$250	16 GRADE SEPARATIONS (16 STRUCTURES ESTIMATED)
23 Mi. MAINLINE TRACKAGE (INCLUDES REDONDO JUNCTION GRADE SEPARATION)	$101	$120	23 Mi. MAINLINE TRACKAGE (INCLUDES REDONDO JUNCTION GRADE SEPARATION)
TOTAL CONSTRUCTION	$573	$430	TOTAL CONSTRUCTION
UTILITY RELOCATION	$58	--	UTILITY RELOCATION
RIGHT–OF–WAY*	$260 *	**	RIGHT–OF–WAY
TOTAL CONSTRUCTION, RIGHT–OF–WAY, AND UTILITY RELOCATION	$891	$430	TOTAL CONSTRUCTION AND RIGHT–OF–WAY

* EXCLUDING RAILROAD R/W ALONG ALAMEDA
ALL COSTS INCLUDE CONTINGENCY.

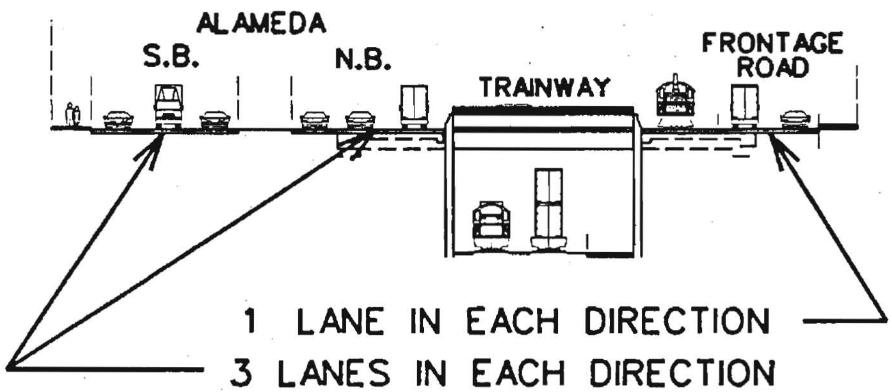
** INCLUDED IN COST OF GRADE SEPARATIONS.

PROJECT COSTS
(\$MILLION)



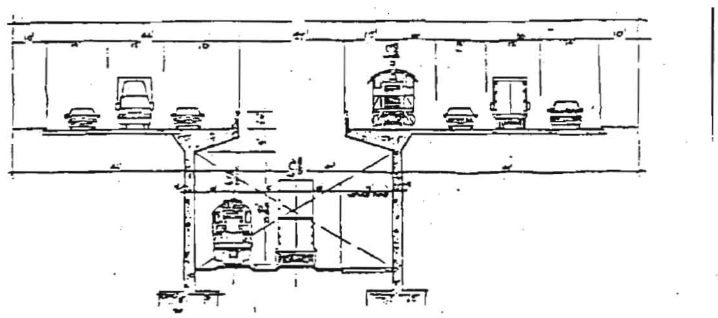
ALTERNATIVE 1 AT-GRADE TRAINWAY - 6 LANE ALAMEDA	\$1,589
ALTERNATIVE 5 SAME TRAINWAY - 4 LANE ALAMEDA	\$1,580

<u>**PROJECT COSTS**</u>
(MILLION)



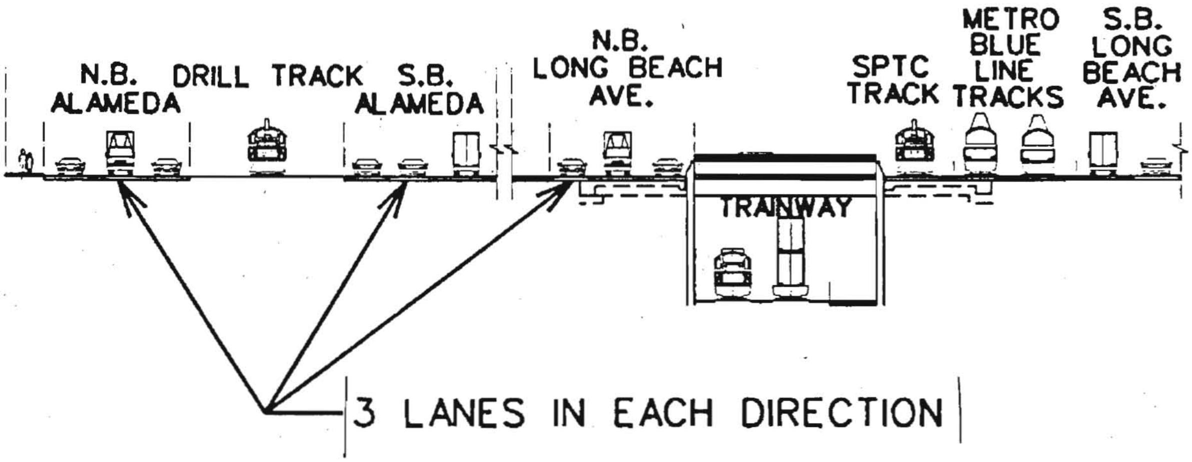
ALTERNATIVE 2.1A DEPRESSED TRAINWAY - 6 LANE ALAMEDA	$1,979

PROJECT COSTS
(\$ MILLION)



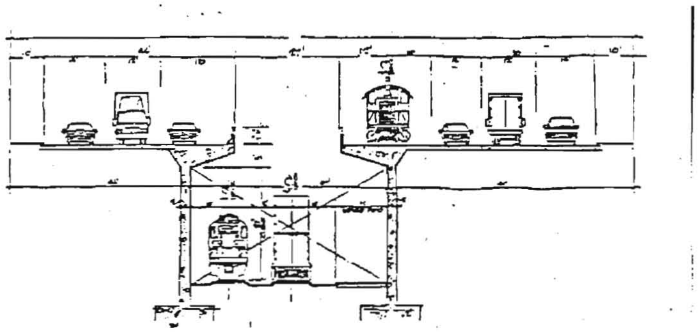
ALTERNATIVE 2.1 DEPRESSED TRAINWAY TERMINATING AT 91 FREEWAY - 6 LANE ALAMEDA	\$2,184
ALTERNATIVE 6.1 SAME TRAINWAY - 4 LANE ALAMEDA	\$1,960

<u>**PROJECT COSTS**</u>
(MILLION)



ALTERNATIVE 2.2 DEPRESSED TRAINWAY WILMINGTON DIVERSION THROUGH THE CITY OF VERNON – 6 LANE ALAMEDA	$2,041
ALTERNATIVE 6.2 SAME TRAINWAY - 4 LANE ALAMEDA	$1,963

PROJECT COSTS
($ MILLION)

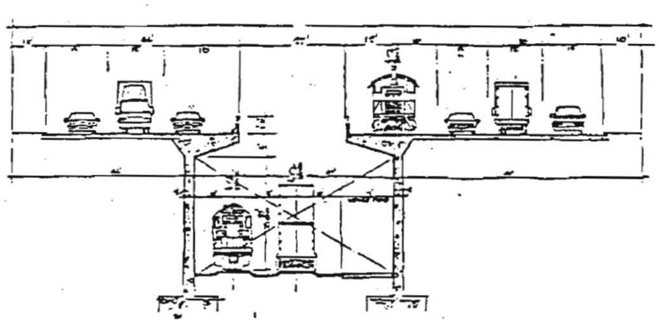


ALTERNATIVE 2.3
DEPRESSED TRAINWAY
TERMINATING AT N/O ROSECRANS –
6 LANE ALAMEDA

	$2,087

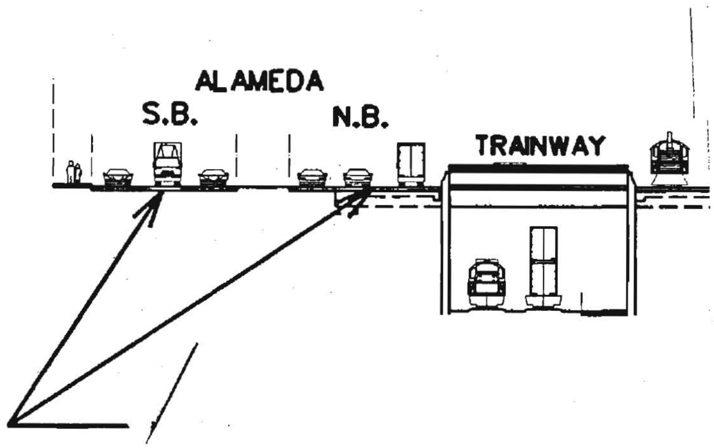
ALTERNATIVE 6.3
SAME TRAINWAY -
4 LANE ALAMEDA $1,873

PROJECT COSTS
(MILLION)



ALTERNATIVE 2.4 DEPRESSED TRAINWAY TERMINATING AT N/0 FIRESTONE – 6 LANE ALAMEDA	$1,791
ALTERNATIVE 6.4 SAME TRAINWAY - 4 LANE ALAMEDA	$1,643

PROJECT COSTS
(MILLION)



ALTERNATIVE 3.0
DEPRESSED TRAINWAY -
EAST SIDE ALAMEDA
6 LANE ALAMEDA

$2,582

DEFINITIONS

Project Cost

All inclusive costs for implementing the project projected to the midpoint of construction.

Contingency
(20% Allowance)

A percentage applied to the construction cost to allow for refining construction items as a result of further engineering. As engineering progresses, construction needs will be defined and details developed which will result in more complete quantity take-offs and construction costing and the contingency will be decreased.

Management, Administration, Engineering and Construction Management
(20% Allowance)

The cost of managing and administering the project, performing the engineering, and managing the construction. These costs include:

- Management and administrative staff
- Project control and scheduling
- Engineering for preparation of plans, specifications, and estimates
- Geotechnical investigations
- Detail survey for final design
- Construction management
- Construction inspection
- Construction survey
- Construction testing

Financing and Legal Costs
(6% Allowance)

The cost associated with obtaining the project funding and legal support during the life of the project. This item includes the following:

- Cost of obtaining project funds
- Contractual legal advice
- Special legal advice
- Legal support for EIR challenges
- General legal advice

Project Reserve
(10% Allowance)

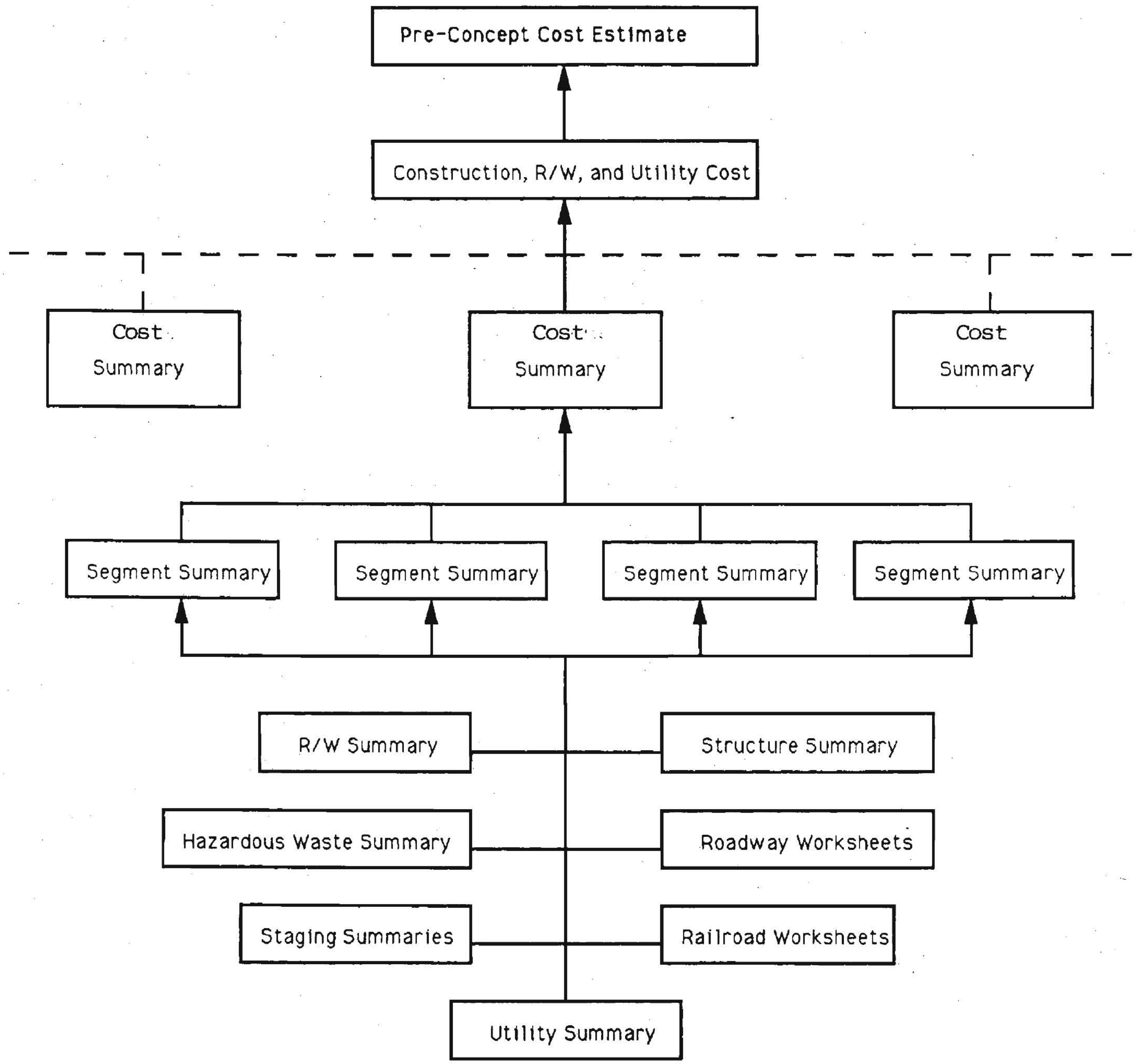
An allowance included for the cost of accommodating items required to implement the project. This item is intended to include the following:

- Permits and regulatory requirements
- Temporary construction
- Construction packaging
- Accelerating construction items
- Unknown construction requirements/cost of doing business
- Design/Construction modifications due to unknown/varying field conditions

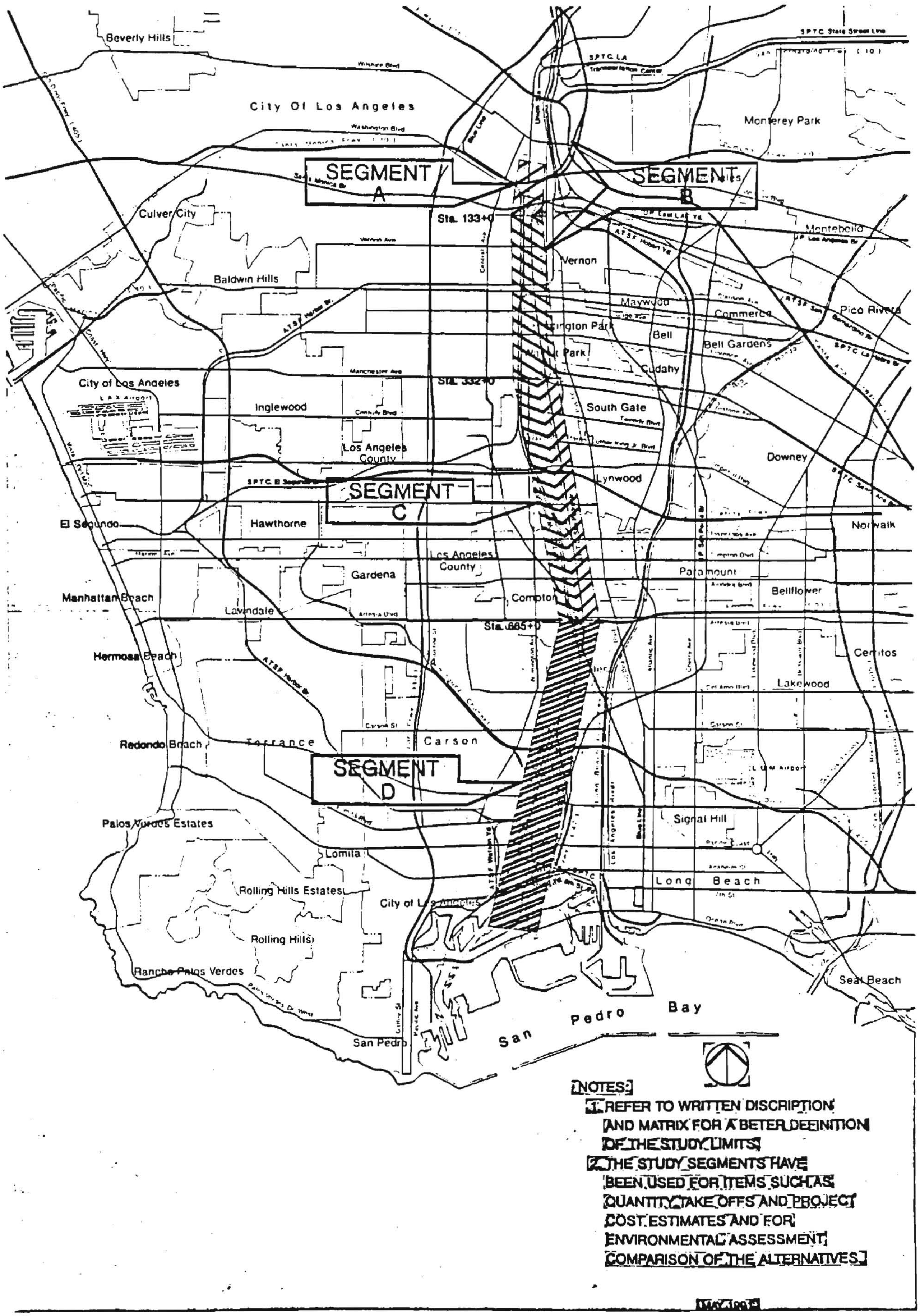
Escalation
(34% Factor)

The projection of the present day (1991) project costs to the midpoint of construction to account for inflation. The projected midpoint of construction considered was 1997 and the escalation rate used was 5 percent per year compounded annually.

ALAMEDA CORRIDOR PRE-CONCEPT ESTIMATE
Cost Estimate Model



DMJM / MN 6/06/91



CONSOLIDATED TRANSPORTATION CORRIDOR
BY STUDY SEGMENTS

Alternate 7 Structure Estimate (Worksheet)

Total Alt.7 Structure Cost | **$289,371,540**

Segment A Structures	$0
Structures-East of 25th/Washington	$64,611,000
Segment B Structures	$56,749,780
Segment C Structures	$71,446,860
Segment D Structures	$96,563,900

	Location	Structure Type	Overhead Cost	Use	Underpass Cost	Use	Cost
1	Redondo Junction (15 mph)	RR Grade Sep			$39,800,000	1	$39,800,000
2	Redondo Junction (40 mph)	RR Grade Sep			$48,300,000		
3	Washington Blvd. (Widen)	Railroad			$687,000	1	$687,000
4	Washington Blvd/ Sante Fe	Highway	$13,832,000	1	$12,034,000		$13,832,000
5	Soto St.	Railroad			$2,150,000	1	$2,150,000
6	Perrino Place	Railroad			$3,306,000	1	$3,306,000
7	Los Angeles River Bridge	Railroad			$4,836,000	1	$4,836,000
8	N/B Alameda	Highway			$7,048,600	1	$7,048,600
9	25th St.	Highway			$4,134,000	1	$4,134,000
10	Vernon Ave.	Highway	$7,554,000		$4,047,780	1	$4,047,780
11	38th/41st. St.	Highway			$4,047,780	1	$4,047,780
12	Gage Avenue	Highway	$6,808,200	1	$5,182,000		$6,808,200
13	Slauson Ave.	Highway	$8,087,340	1	$4,047,780		$8,087,340
14	Slauson Ave. (RR)**	Railroad			$197,300		
15	Randolph**	Railroad			$197,300		
16	Nadeau St.	Highway	$3,712,800		$3,944,640	1	$3,944,640
17	Florence Ave.	Highway	$7,568,450		$3,944,640	1	$3,944,640
18	Northbound Cross Over	Highway			$14,686,800	1	$14,686,800
19	Firestone	Highway	$7,000,000		$5,000,000	1	$5,000,000
20	Southern Ave.	Highway	$6,810,600	1	$6,060,600		$6,810,600
21	Alameda/Tweedy	Highway	$14,416,200	1			$14,416,200
22	Imperial/Alameda	Highway			$4,498,500	1	$4,498,500
23	Weber	Highway	$6,288,360	1	$4,975,200		$6,288,360
24	El Segundo	Highway	$5,727,360	1	$4,463,200		$5,727,360
25	Alondra	Highway	$5,192,920		$4,375,000	1	$4,375,000
26	Compton/Ramps	Highway	$12,370,380	1	$4,520,100		$12,370,380
27	Compton Creek Box Culvert	Highway/Rail	$3,732,000	1			$3,732,000
28	Greenleaf	Highway	$8,228,460	1			$8,228,460
29	Alameda UP at Laurel Pk.	Highway			$10,089,800	1	$10,089,800
30	Dominguez Channel (7A)	Railroad			$1,255,000	1	$1,255,000
31	Dominguez Channel (7B)	Railroad			$1,745,000	1	$1,745,000
32	Dominguez Channel (7C)	Railroad			$775,000	1	$775,000
33	Sepulveda	Highway	$14,575,000	1			$14,575,000
34	ACTA Railroad	Railroad	$19,642,800	1			$19,642,800
35	UPRR		$13,513,100	1			$13,513,100
36	Connector Road "A"	Highway	$1,630,700	1			$1,630,700
37	Connector Road "B"	Highway	$1,036,800	1			$1,036,800
38	Connector Road "C"	Highway	$120,000	1			$120,000
39	Henry Ford	Highway	$1,233,000	1			$1,233,000
40	TI Fwy On-Ramp	Highway	$1,093,000	1			$1,093,000
41	TI Fwy Off-Ramp	Highway	$1,081,000	1			$1,081,000
42	Marina RR Crossing	Railroad	$3,690,000	1			$3,690,000
43	Anaheim (Reconstruct)	Highway	$14,585,000	1			$14,585,000
44	Pacific Coast Highway	Highway	$10,498,700	1			$10,498,700
			Total Structures				**$289,371,540**

ALT-SEGMENT

1-B

Segment Summary

ELEMENT	ITEM	ITEM COST	ELEMENT COST [$Millions]
ROADWAY			$26.8
	Curb and Gutter	$1,079,650	
	Drainage System	$481,600	
	Electroliers	$416,000	
	Embankment	$918,750	
	Local Circulation	$3,195,150	
	Pavement	$6,550,625	
	Removals	$3,185,638	
	Sidewalk	$818,685	
	Signal Systems	$2,340,000	
	Signs, Stripes, Pavmt. Marking	$464,700	
	Traffic Management	$879,820	
	Mobilization	$2,033,062	
	Contingency (20%)	$4,472,736	
STRUCTURES			$162.0
	Str. East of 25/ Washington	$64,611,000	
	Sound Walls	$1,356,000	
	Alameda St. Structures	$56,749,780	
	Mobilization	$12,271,678	
	Contingency (20%)	$26,997,692	
TRAINWAY			$39.1
	Removals	$402,700	
	Construct Subgrade	$4,360,030	
	Construct Track	$20,258,850	
	Turnouts (Included)		
	Crossovers (Included)		
	Crossing Frogs (Included)		
	Road Crossings (Included)		
	Fence	$950,400	
	Signals	$6,213,080	
	Operation Control	$246,600	
	Security	$123,300	
	Contingency (20%)	$6,510,992	
RIGHT-OF-WAY			$145.4
	No. of Parcels	173	
	Land Value	$65,266,000	
	Improvement Value	$39,404,000	
	Demolition	$5,233,500	
	Relocation Assistance Payments(RAP)	$8,373,600	
	Contingency (5%)	$5,913,855	
	Administration (10%)	$12,419,096	
	R/W Engr. (8% of Demo and Acquisition)	$8,792,280	
UTILITY RELOCATION			$8.9
	Contingency (20%)	$1,489,049	

COST SUMMARY FOR ALTERNATE 1

AT GRADE TRAINWAY ALONG ALAMEDA STREET

ALAMEDA-ONE WAY COUPLET (3 LANES EACH DIRECTION) FROM 25TH STREET TO FIRESTONE BLVD.

ALAMEDA- 6 LANES WEST SIDE FROM FIRESTONE TO SR91

[COSTS IN $ MILLIONS]

ITEM	SEGMENT A I-10 to 25th Street	SEGMENT B 25th Street to 85th Street	SEGMENT C 85th Street to SR91	SEGMENT D SR 91 to Terminal Island	ALTERNATE TOTALS
ROADWAY	$2.6	$26.8	$33.0	$19.0	$81.5
STRUCTURES	$0.0	$162.0	$101.6	$127.5	$391.0
TRAINWAY	$0.0	$39.1	$25.5	$36.3	$100.8
RIGHT-OF-WAY	$7.2	$145.4	$62.4	$44.6	$259.7
UTILITY RELOCATION	$1.2	$8.9	$20.8	$26.7	$57.7
TOTAL CONST. & R/W COST	$11.1	$382.2	$243.2	$254.1	$890.7

COST SUMMARY FOR ALTERNATE 2.1A

TRENCH OVERHANGS REMOVED

DEPRESSED TRAINWAY - ALAMEDA 6 LANES

[ONE WAY COUPLETS - THREE LANES EACH DIRECTION EACH WAY FROM 25TH ST. TO COMPTON BLVD.]

[COST IN $ MILLIONS]

ITEM	SEGMENT A I-10 to 25th Street	SEGMENT B 25th Street to 85th Street	SEGMENT C 85th Street to SR91	SEGMENT D SR 91 to Terminal Island	ALTERNATE TOTALS
ROADWAY	$2.6	$14.3	$18.7	$19.0	$54.7
STRUCTURES	$0.0	$292.6	$298.6	$127.5	$718.6
TRAINWAY	$0.0	$40.9	$28.2	$36.3	$105.4
RIGHT-OF-WAY	$7.2	$93.3	$10.1	$44.6	$155.3
UTILITY RELOCATION	$1.2	$11.1	$8.1	$26.7	$47.2
TOTAL CONST. & R/W COST	$11.1	$452.2	$363.8	$254.1	$1,081.2

Construction, R/W, and Utility Cost

($ Millions)

Alt.	Description	Roadway	Structures	Trainway	Subtotal Construction Cost*	Utility Relocation	R/W	Construction R/W and Utility Cost
1	At-Grade Trainway- Alameda 6 Lanes [One Way Couplet- North of Firestone Blvd., 6 Lanes West Side South of Firestone Blvd.]	$81.5	$391.0	$100.8	$573.3	$57.7	$259.7	$890.7
2.1	Depressed Trainway- Alameda 6 Lanes [One Way Couplet from 25th St. to Compton Blvd., 6 Lanes West Side to SR91 Freeway]	$54.7	$834.9	$105.4	$995.0	$47.2	$147.1	$1,189.2
2.1A	Alternate 2.1-Railroad Trench Wall Overhangs Deleted	$54.7	$718.6	$105.4	$878.8	$47.2	$155.3	$1,081.2
2.2	Alternate 2.1-Vernon Diversion-Alameda 6 Lanes [Trainway Via Wilmington Branch (SPTC) North of Randolph Street]	$58.6	$762.3	$105.7	$926.7	$53.2	$130.3	$1,110.2
2.3	Alternate 2.1-Trainway at-grade at Rosecrans-Alameda 6 Lanes [Trainway transitions from depressed to at-grade north of Rosecrans]	$54.6	$768.1	$104.0	$926.8	$47.2	$167.2	$1,141.2
2.4	Alternate 2.1-Trainway at-grade at Firestone-Alameda 6 Lanes [Trainway transitions from depressed to at-grade north of Firestone]	$56.6	$581.5	$102.6	$740.7	$47.2	$200.8	$988.7
3	Depressed Trainway-Alameda 6 Lanes [6 Lanes West Side, East Side Local and Property Access on Structures from 25th St. to 92nd St.- Frontage Rd. Access from 92nd St. to SR 91]	$54.3	$1,019.4	$105.4	$1,179.0	$53.5	$173.3	$1,405.9

Construction, R/W, and Utility Cost (Continued)

($ Millions)

Description	Roadway	Structures	Trainway	Subtotal Construction Cost*	Utility Relocation	R/W	Construction R/W and Utility Cost
4 Alternate 2.1-Alameda 4 and 8 Lanes plus Exclusive Truck Lanes [Lanes adjacent to Depressed Trainway designated Exclusive Truckway between 25th St. and Compton Blvd. Truckway grade-separated from Cross Streets at Selected Major Intersections]	$54.6	$985.3	$105.4	$1,145.3	$47.2	$147.1	$1,339.6
5 At-Grade Trainway- Alameda 4 Lanes [One Way Couplet- North of Firestone Blvd., 4 Lanes West Side South of Firestone Blvd.]	$79.0	$391.0	$100.8	$570.8	$57.7	$257.1	$885.6
6.1 Alternate 2.1 Depressed Trainway- Alameda 4 Lanes [One Way Couplet from 25th St. to Compton Blvd., 4 Lanes West Side to SR91 Freeway]	$52.5	$718.6	$105.4	$876.5	$47.2	$146.2	$1,069.9
6.2 Alternate 2.2-Vernon Diversion-Alameda 4 Lanes [Trainway Via Wilmington Branch (SPTC) North of Randolph Street]	$56.3	$723.7	$105.7	$885.7	$53.2	$129.5	$1,068.4
6.3 Alternate 2.3-Trainway at-grade at Rosecrans-Alameda 4 Lanes [Trainway transitions from depressed to at-grade north of Rosecrans]	$52.4	$656.6	$104.0	$813.0	$47.2	$166.4	$1,026.6
6.4 Alternate 2.4-Trainway at-grade at Firestone-Alameda 4 Lanes [Trainway transitions from depressed to at-grade north of Firestone]	$61.0	$498.6	$102.6	$662.3	$47.2	$200.0	$909.4

* 1991 Dollars

Sep 02, 1991

Pre-Concept Cost Estimate

($ Millions)

Alt.	Description	Construction R/W and Utility Cost	Engineering Const. Management Administration [20%]*	Financing and Legal Costs [6%]	Project Reserve [10%]	Project Cost [1991-$]	Project Cost [Escalated]**
1	At-Grade Trainway- Alameda 6 Lanes [One Way Couplet- North of Firestone Blvd., 6 Lanes West Side South of Firestone Blvd.]	$890.7	$126.2	$61.0	$107.8	$1,185.7	$1,588.8
2.1	Depressed Trainway- Alameda 6 Lanes [One Way Couplet from 25th St. to Compton Blvd., 6 Lanes West Side to SR91 Freeway]	$1,189.2	$208.4	$83.9	$148.2	$1,629.7	$2,183.8
2.1A	Alternate 2.1-Railroad Trench Wall Overhangs Deleted	$1,081.2	$185.2	$76.0	$134.2	$1,476.6	$1,978.7
2.2	Alternate 2.1-Vernon Diversion [Trainway Via Wilmington Branch (SPTC) North of Randolph Street]	$1,110.2	$196.0	$78.4	$138.5	$1,523.0	$2,040.9
2.3	Alternate 2.1-Trainway at-grade at Rosecrans [Trainway surfaces transitions from depressed to at-grade north of Rosecrans]	$1,141.2	$194.8	$80.2	$141.6	$1,557.8	$2,087.4
2.4	Alternate 2.1-Trainway at-grade at Firestone-Alameda 6 Lanes [Trainway transitions from depressed to at-grade north of Firestone]	$988.7	$157.6	$68.8	$121.5	$1,336.6	$1,791.0
3	Depressed Trainway-Alameda 6 Lanes [6 Lanes West Side, East Side Local and Property Access on Structures from 25th St. to 92nd St.- Frontage Rd. Access from 92nd St. to SR 91]	$1,405.9	$246.5	$99.1	$175.2	$1,926.7	$2,581.8

Pre-Concept Cost Estimate (Continued)

($ Millions)

Alt.	Description	Construction R/W and Utility Cost	Engineering Const. Management Administration	Financing and Legal Costs [6%]	Project Reserve [10%]	Project Cost [1991-$]	Project Cost [Escalated]**
4	Alternate 2.1-Alameda 4 Lanes plus Exclusive Truck Lanes [Lanes adjacent to Depressed Trainway designated Exclusive Truckway between 25th St. and Compton Blvd. Truckway grade-separated from Cross Streets at Selected Major Intersections]	$1,339.6	$238.5	$94.7	$167.3	$1,840.0	$2,465.6
5	At-Grade Trainway- Alameda 4 Lanes [One Way Couplet- North of Firestone Blvd., 4 Lanes West Side South of Firestone Blvd.]	$885.6	$125.7	$60.7	$107.2	$1,179.2	$1,580.1
6.1	Alternate 2.1 Depressed Trainway- Alameda 4 Lanes [One Way Couplet from 25th St. to Compton Blvd., 4 Lanes West Side to SR91 Freeway]	$1,069.9	$184.7	$75.3	$133.0	$1,462.9	$1,960.3
6.2	Alternate 2.2-Vernon Diversion-Alameda 4 Lanes [Trainway Via Wilmington Branch (SPTC) North of Randolph Street]	$1,068.4	$187.8	$75.4	$133.2	$1,464.7	$1,962.7
6.3	Alternate 2.3-Trainway at-grade at Rosecrans-Alameda 4 Lanes [Trainway transitions from depressed to at-grade north of Rosecrans]	$1,026.6	$172.0	$71.9	$127.1	$1,397.7	$1,872.9
6.4	Alternate 2.4-Trainway at-grade at Firestone-Alameda 4 Lanes [Trainway transitions from depressed to at-grade north of Firestone] 4 Lanes West Side to SR91 Freeway]	$909.4	$141.9	$63.1	$111.4	$1,225.8	$1,642.6

*Engr., Const. Managmt. and Admin. Cost is 20% of Construction and Utility Relocation Costs

**Escalation (5% per year to FY 97)-34%

Sep 12, 1991

DMJM/MN

APPENDIX

SUPPLEMENTAL GRADE SEPARATION STRUCTURES

The analysis of traffic demands and local access and circulation needs indicated that four additional grade separation structures are warranted for this project. For informational purposes, the total project costs in 1991 dollars for these grade separation structures are presented below and are included in the alternative costs presented herein.

38th/41st St.	$29.1 million
Nadeau St.	$16.0 million
Weber St.	$29.0 million
Greenleaf St.	$32.8 million

HAZARDOUS WASTE REMOVAL

COST ESTIMATE

Our preliminary investigations have determined that known hazardous waste sites exist on private properties along or in close proximity to the Alameda Corridor. Certain portions of these sites must be acquired for this project. Under current regulations, these sites to be acquired must be dealt with to clean-up and dispose of or treat in place to stabilize the hazardous waste. Since the issue is related to right-of-way acquisition negotiations, the costs associated with the removal of the wastes have not been included in the alternative project cost estimates. The following estimates are offered as potential costs to the project for waste removal.

Alternative 1	$35 million
Alternative 2.1	$18 million

It is important to note that the estimates have been prepared on the basis of limited research and investigation. Once an alternative design is selected, further investigation and analysis will be required to better quantify the magnitude and costs of addressing the hazardous waste issues.

DMJM/M&N
A Joint Venture

October 2, 1991

Gill V. Hicks
ACTA General Manager
6550 Miles Avenue, Room 113
Huntington Park, CA 90255

RE: Alameda Corridor
Updated Decision Matrix Package

Dear Gill:

Enclosed for your use and distribution to the Technical Working Group are forty copies of the noted package. This information should replace the individual memorandums that were presented on September 12, 1991.

The information transmitted is identified as follows:

1. Three sheet decision matrix
2. Technical Memorandums
   a. Traffic - No. 3, 4, 5
   b. Safety/Security - No. 1 and 2
   c. Railroad - No. 1
   d. Environmental - No. 2, 3, 6, 7
   e. Economic - No. 2, 4
   f. Cost - No. 1, 3
   g. Construction - No. 1

We are looking forward to meeting with the committee on October 10, 1991 to receive their review comments on the decision matrix.

Sincerely,

DMJM/M&N

for Charles R. Rendall
Project Director

Daniel, Mann, Johnson, & Mendenhall / Moffatt & Nichol, Engineers
3250 Wilshire Boulevard, Los Angeles, California 90010 • Telephone (213) 381-3663

ALAMEDA CORRIDOR PROJECT GOALS

ALTERNATIVES

TRAFFIC GOALS — ASSIGNED WEIGHT: 17.0%

- GOALS -	- MEASUREMENT CRITERIA -	- COMMENT -	-TYPE OF GOAL -	MEASURED UNIT	ALT. 1.0	ALT. 2.1A	ALT. 2.2	ALT. 2.3	ALT. 2.4	ALT. 3	ALT. 5	ALT. 6.1	ALT. 6.2	ALT. 6.3	ALT. 6.4
1. REDUCE VEHICLE DELAYS AT GRADE CROSSINGS ON ALL PORT ACCESS RAIL LINES	REDUCTION IN VEHICLE HOURS OF DELAY		ALTERNATIVE CONCEPT GOAL	REDUCTION IN VEHICLE HOURS	14,506	14,130	14,130	14,344	14,219	14,130	14,506	14,130	14,130	14,344	14,219
				INDEX (MAX.)	1.00	0.97	0.97	0.99	0.98	0.97	1.00	0.97	0.97	0.99	0.98
2. IMPROVE NORTH/SOUTH TRAVEL SPEEDS	AVERAGE TRAVEL SPEED ALONG ALAMEDA		ALTERNATIVE CONCEPT GOAL	MILES PER HOUR	22.6	22.1	22.1	22.4	22.4	22.1	22.0	21.8	21.4	21.8	21.6
				INDEX (MAX.)	1.00	0.98	0.98	0.99	0.99	0.98	0.97	0.96	0.95	0.96	0.96
3. IMPROVE LEVEL-OF-SERVICE AT INTERSECTIONS	TIME DELAY		ALTERNATIVE CONCEPT GOAL	MINUTES OF DELAY	105	58	58	74.8	77.8	58	105	58	58	74.8	77.8
				INDEX (MIN.)	0.55	1.00	1.00	0.78	0.75	1.00	0.55	1.00	1.00	0.78	0.75
4. IMPROVE CONNECTIONS TO I-105 AND I-10 FREEWAYS	TRAVEL TIME FROM ALAMEDA TO FREEWAY		ALTERNATIVE CONCEPT GOAL	MINUTES	8.3	6.7	6.7	6.7	6.7	8.3	6.7	6.7	6.7	6.7	6.7
				INDEX (MIN.)	0.81	1.00	1.00	1.00	1.00	0.81	1.00	1.00	1.00	1.00	1.00
5. PROVIDE ALTERNATIVE ROUTE TO PARALLEL FREEWAYS (EMPHASIZE TRUCKS)	INCREASE OF VEHICLE MILES TRAVELED - PORT TRUCKS ON ALAMEDA PLUS DECREASE ON FREEWAYS		ALTERNATIVE CONCEPT GOAL	REDUCTION IN VEHICLE MILES BY PORTS TRUCKS	19,490	17,523	17,523	16,839	18,083	17,523	9,985	9,265	8,995	8,490	8,852
				INDEX (MAX.)	1.00	0.90	0.90	0.86	0.93	0.90	0.51	0.47	0.46	0.44	0.45
6. IMPROVE EMERGENCY VEHICLE ACCESS	ADDITIVE EMERGENCY VEHICLE RESPONSE TIME		ALTERNATIVE CONCEPT GOAL	ADDITIVE MINUTES	11.8	9.8	9.8	9.8	11.0	9.8	11.8	9.8	9.8	9.8	11.0
				INDEX (MIN.)	0.84	1.00	1.00	1.00	0.89	1.00	0.84	1.00	1.00	1.00	0.89
7. DIVERSION OF TRUCK TRAFFIC TO RAIL	--	THIS GOAL WILL NOT DIFFER BETWEEN NO PROJECT AND THE PROJECT OR AMONG THE ALTERNATIVES	--												
8. COORDINATE AND INTERFACE WITH PLANS AT CORRIDOR ENDS	--	THIS GOAL WILL NOT DIFFER BETWEEN NO PROJECT AND THE PROJECT OR AMONG THE ALTERNATIVES	--												
				TOTAL (INDEX)	5.20	5.85	5.85	5.62	5.54	5.66	4.88	5.40	5.38	5.16	5.03
				NORMALIZED TOTAL	0.89	1.00	1.00	0.96	0.95	0.97	0.83	0.92	0.92	0.88	0.86
				WEIGHTED NORMALIZED SCORE	15.1	17.0	17.0	16.3	16.1	16.4	14.2	15.7	15.6	15.0	14.6

SAFETY/SECURITY GOALS — ASSIGNED WEIGHT: 8.0%

- GOALS -	- MEASUREMENT CRITERIA -	- COMMENT -	-TYPE OF GOAL -	MEASURED UNIT	ALT. 1.0	ALT. 2.1A	ALT. 2.2	ALT. 2.3	ALT. 2.4	ALT. 3	ALT. 5	ALT. 6.1	ALT. 6.2	ALT. 6.3	ALT. 6.4
1. IMPROVE VEHICULAR SAFETY - RAILROAD	TRAINS x ADT		ALTERNATIVE CONCEPT GOAL	REDUCTION IN TRAINS x ADT (MILLIONS)	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7
				INDEX (MAX.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2. IMPROVE SAFETY FOR PEDESTRIANS	EXPOSURE AT GRADE CROSSINGS		ALTERNATIVE CONCEPT GOAL	REDUCTION IN TRAINS PER DAY x CROSSINGS	3,946	3,822	3,822	3,842	3,866	3,822	3,946	3,822	3,822	3,842	3,866
				INDEX (MAX.)	1.00	0.97	0.97	0.97	0.98	0.97	1.00	0.97	0.97	0.97	0.98
3. IMPROVE SAFETY FOR OPERATIONS AND PERSONNEL	--	ACCOUNTED FOR IN GOALS 1 AND 2 ABOVE	--												
4. IMPROVE SECURITY	--	NOT MEASUREABLE	--												
				TOTAL (INDEX)	2.00	1.97	1.97	1.97	1.98	1.97	2.00	1.97	1.97	1.97	1.98
				NORMALIZED TOTAL	1.00	0.98	0.98	0.99	0.99	0.98	1.00	0.98	0.98	0.99	0.99
				WEIGHTED NORMALIZED SCORE	8.0	7.9	7.9	7.9	7.9	7.9	8.0	7.9	7.9	7.9	7.9

RAILROAD GOALS — ASSIGNED WEIGHT: 20.0%

- GOALS -	- MEASUREMENT CRITERIA -	- COMMENT -	-TYPE OF GOAL -	MEASURED UNIT	ALT. 1.0	ALT. 2.1A	ALT. 2.2	ALT. 2.3	ALT. 2.4	ALT. 3	ALT. 5	ALT. 6.1	ALT. 6.2	ALT. 6.3	ALT. 6.4
1. IMPROVE RAILROAD OPERATING FLEXIBILITY AND EFFICIENCY	ROUTE EFFICIENCY CRITERIA		ALTERNATIVE CONCEPT GOAL	NUMERICAL RATING OF ROUTE EFFICIENCY	6.00	5.41	5.14	5.61	5.81	5.41	6.00	5.41	5.14	5.61	5.81
				INDEX (MAX.)	1.00	0.90	0.86	0.94	0.97	0.90	1.00	0.90	0.86	0.94	0.97
2. IMPROVE RAILROAD SPEEDS	AVG. OPERATING MILES PER HOUR		ALTERNATIVE CONCEPT GOAL	AVERAGE MILES PER HOUR	32.9	32.9	31.5	32.9	32.9	32.9	32.9	32.9	31.5	32.9	32.9
				INDEX (MAX.)	1.00	1.00	0.96	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00
3. PROVIDE FAIR AND EQUAL ACCESS FOR ALL CARRIERS		ACCOMPLISHED WITH PROJECT IMPLEMENTATION	--												
4. MAINTAIN SERVICE TO CUSTOMERS	--	THIS GOAL WILL NOT DIFFER AMONG THE ALTERNATIVES	--												
				TOTAL (INDEX)	2.00	1.90	1.81	1.94	1.97	1.90	2.00	1.90	1.81	1.94	1.97
				NORMALIZED TOTAL	1.00	0.95	0.91	0.97	0.98	0.95	1.00	0.95	0.91	0.97	0.98
				WEIGHTED NORMALIZED SCORE	20.0	19.0	18.1	19.4	19.7	19.0	20.0	19.0	18.1	19.4	19.7

ALAMEDA CORRIDOR PROJECT GOALS

ALTERNATIVES

ENVIRONMENTAL GOALS — ASSIGNED WEIGHT: 15.0%

- GOALS -	- MEASUREMENT CRITERIA -	- COMMENT -	- TYPE OF GOAL -	MEASURED UNIT	ALT. 1.0	ALT. 2.1A	ALT. 2.2	ALT. 2.3	ALT. 2.4	ALT. 3	ALT. 5	ALT. 6.1	ALT. 6.2	ALT. 6.3	ALT. 6.4
1. IMPROVE OVERALL QUALITY OF LIFE	--	INCLUDED IN OTHER GOALS; POLLUTION, AESTHETICS, NOISE AND VIBRATION, ACCESS	--												
2. MINIMIZE PROJECTED AIR POLLUTION	TONS/DAY OF CRITERIA POLLUTANTS		ALTERNATIVE CONCEPT GOAL	TONS PER DAY	407.8	405.3	405.3	405.3	405.3	405.3	417.3	416.0	416.0	416.0	416.0
				INDEX (MIN.)	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.98	0.98	0.98	0.98
3. REDUCE ENERGY CONSUMPTION	GALLONS OF DIESEL FUEL AND GASOLINE CONSUMED/DAY		ALTERNATIVE CONCEPT GOAL	GALLONS PER DAY (THOUSANDS)	1692	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1700	[illegible]	[illegible]	[illegible]	[illegible]
				INDEX (MIN.)	1.00	1.00	1.00	1.00	1.00	1.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4. DEVEL. OF A PROJECT COMPATIBLE WITH ADJACENT LAND USES	--	INCLUDED IN OTHER GOALS; POLLUTION AESTHETICS, NOISE AND VIBRATION, ACCESS, AND RIGHT-OF-WAY REQUIRED	--												
5. RESOLVE PRESENT POOR OR DETERIORATING SITUATIONS	--	INCLUDED IN OTHER GOALS; POLLUTION AESTHETICS, NOISE AND VIBRATION, ACCESS, AND RIGHT-OF-WAY REQUIRED	--												
6. AESTHETICS	SUBJECTIVE RATING	CONSIDERS ABOVE GRADE VISUAL IMPACTS	ALTERNATIVE CONCEPT GOAL	COMBINED AESTHETICS RATING	25	35	35	35	[illegible]	35	25	35	35	35	29
				INDEX (MAX.)	0.71	1.00	1.00	1.00	0.83	1.00	0.71	1.00	1.00	1.00	0.83
7. MINIMIZE EXPOSURE TO NOISE VIBRATION	Leq OR CNEL VIBRATION VELOCITY LEVEL	NUMBER OF SENSITIVE RECEPTORS * IMPACTED	ALTERNATIVE CONCEPT GOAL	NUMBER OF SENSITIVE RECEPTORS IMPACTED	[illegible]	9416	8817	[illegible]	12016	9416	[illegible]	9416	8817	[illegible]	12016
				INDEX (MIN.)	[illegible]	0.94	1.00	0.81	0.73	0.94	[illegible]	0.94	1.00	0.81	0.73
				TOTAL (INDEX)	3.29	3.94	4.00	3.81	[illegible]	3.94	[illegible]	[illegible]	3.95	3.78	3.52
				NORMALIZED TOTAL	0.82	[illegible]	1.00	[illegible]	[illegible]	[illegible]	0.81	0.97	[illegible]	0.94	[illegible]
				WEIGHTED NORMALIZED SCORE	12.4	14.8	15.0	14.3	13.4	14.8	12.2	14.6	14.8	14.1	13.2

ECONOMIC GOALS — ASSIGNED WEIGHT: 10.0%

- GOALS -	- MEASUREMENT CRITERIA -	- COMMENT -	- TYPE OF GOAL -	MEASURED UNIT	ALT. 1.0	ALT. 2.1A	ALT. 2.2	ALT. 2.3	ALT. 2.4	ALT. 3	ALT. 5	ALT. 6.1	ALT. 6.2	ALT. 6.3	ALT. 6.4
1. PROMOTE ECONOMIC DEVELOPMENT NEAR AND ALONG ALAMEDA CORRIDOR	SUBJECTIVE RATING	THIS GOAL WILL BE USED TO DIFFERENTIATE BETWEEN NO PROJECT AND THE PROJECT. GOAL 4 ADDRESSES THIS GOAL RELATIVE TO THE INDIVIDUAL ALTERNATIVES.	PROJECT GOAL												
2. MINIMIZE LAND DEVOTED TO PORT-RELATED RAIL FREIGHT OPERATIONS (THROUGHOUT BASIN)	TRAIN ROUTE MILES FROM REDONDO JUNCTION TO PORTS		ALTERNATIVE CONCEPT GOAL	TRAIN ROUTE MILES	19.1	19.1	19.6	19.1	19.1	19.1	19.1	19.1	19.6	19.1	19.1
				INDEX (MIN.)	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
3. SUSTAIN ECONOMIC GROWTH	--	CONSIDERED TO BE LOCAL LEVEL ECONOMICS INCLUDED IN THE FIRST ECONOMIC GOAL	--												
4. MAINTAIN/IMPROVE ACCESS TO EXISTING BUSINESSES	NUMBER OF IMPACTED PARCELS	CONSIDERS DIMINISHED ACCESS OPPORTUNITIES RELATIVE TO EXISTING CONDITIONS	ALTERNATIVE CONCEPT GOAL	NUMBER OF IMPACTED PARCELS	778	[illegible]	517	[illegible]	[illegible]	411	[illegible]	[illegible]	510	[illegible]	[illegible]
				INDEX (MIN.)	0.53	0.78	0.79	0.81	[illegible]	1.00	0.54	0.78	0.81	0.81	[illegible]
5. PROMOTE GROWTH OF INTERNATIONAL TRADE THROUGH THE PORTS	--	THIS GOAL WILL NOT DIFFER AMONG THE ALTERNATIVES	--												
6. MINIMIZE PROPERTY ACQUISITIONS	COSTS OF LAND AND IMPROVEMENTS ACQUIRED FOR RIGHT OF WAY		ALTERNATIVE CONCEPT GOAL	RIGHT OF WAY COSTS (MILLIONS)	[illegible]	$105.9	[illegible]	$120.4	$144.8	$124.8	$165.1	$105.3	$93.2	$119.9	$144.0
				INDEX (MIN.)	0.50	[illegible]	[illegible]	0.77	0.64	0.75	0.50	[illegible]	1.00	0.78	0.65
				TOTAL (INDEX)	2.03	2.84	2.78	2.59	2.33	2.76	2.05	2.65	2.78	2.59	2.33
				NORMALIZED TOTAL	0.73	[illegible]	[illegible]	0.93	0.84	[illegible]	0.74	0.95	1.00	0.93	0.84
				WEIGHTED NORMALIZED SCORE	7.3	9.5	9.9	9.3	8.4	9.9	7.4	9.5	10.0	9.3	8.4

COST GOALS — ASSIGNED WEIGHT: 25.0%

- GOALS -	- MEASUREMENT CRITERIA -	- COMMENT -	- TYPE OF GOAL -	MEASURED UNIT	ALT. 1.0	ALT. 2.1A	ALT. 2.2	ALT. 2.3	ALT. 2.4	ALT. 3	ALT. 5	ALT. 6.1	ALT. 6.2	ALT. 6.3	ALT. 6.4
1. MAXIMIZE COST-EFFECTIVENESS	ABSOLUTE COST OF AN ALTERNATIVE		ALTERNATIVE CONCEPT GOAL	ABSOLUTE COSTS (MILLIONS)	[illegible]	$1,978.7	* $2,040.9	[illegible]	$1,791.0	[illegible]	[illegible]	$1,960.3	[illegible]	[illegible]	[illegible]
				INDEX (MIN.)	[illegible]	0.80	0.77	0.76	[illegible]	[illegible]	1.00	0.81	0.81	0.84	[illegible]
2. MAXIMIZE COORDINATION OF CORRIDOR PROJECT WITH EXISTING PROJECTS AND FUNDING SOURCES (PIGGYBACK)	--	CONSTANT FOR ALL ALTERNATIVES	--												
3. ABILITY TO IMPLEMENT IN PHASES	NUMBER OF DISCRETE/SEPARATE CONSTRUCTION COMPONENTS		ALTERNATIVE CONCEPT GOAL	CONSTRUCTION PHASES	30	16	17	22	20	16	30	16	17	22	20
				INDEX (MAX.)	1.00	0.53	0.57	0.73	0.67	0.53	1.00	0.53	0.57	0.73	0.67
				TOTAL (INDEX)	[illegible]	1.33	1.34	1.49	[illegible]	1.16	2.00	1.34	1.37	[illegible]	[illegible]
				NORMALIZED TOTAL	1.00	0.67	0.67	0.75	0.77	0.57	1.00	0.67	[illegible]	[illegible]	0.81
				WEIGHTED NORMALIZED SCORE	[illegible]	[illegible]	[illegible]	[illegible]	19.4	14.3	25.0	16.7	17.1	[illegible]	20.4

* Project cost would be $1,949 million without SPTC Wilmington Branch or Alameda improvements north of Slauson

EXHIBIT G – 1

ALAMEDA CORRIDOR PROJECT GOALS

CONSTRUCTION GOALS — **ASSIGNED WEIGHT: 5.0%**

- GOALS -	- MEASUREMENT CRITERIA -	- COMMENT -	- TYPE OF GOAL -	MEASURED UNIT	ALT. 1.0	ALT. 2.1A	ALT. 2.2	ALT. 2.3	ALT. 2.4	ALT. 3	ALT. 5	ALT. 6.1	ALT. 6.2	ALT. 6.3	ALT. 6.4
1. MINIMIZE DISRUPTION TO HIGHWAY AND RAIL USERS	CONSTRUCTION YEARS PER CONSTRUCTION COMPONENT		ALTERNATIVE CONCEPT GOAL	CONSTRUCTION TIME (YEARS)	8.00	6.75	6.75	6.75	8.25	6.75	8.00	6.75	6.75	6.75	8.25
				INDEX (MIN.)	1.00	0.89	0.89	0.89	0.86	0.89	1.00	0.89	0.89	0.89	0.86
2. MAINTAIN ACCESS TO EXISTING BUSINESSES AND RESIDENCES	--	CONSIDERED TO BE INCLUDED IN GOAL 1	--												
3. MINIMIZE NOISE AND OTHER CONSTRUCTION IMPACTS	NUMBER OF "SENSITIVE RECEPTORS" WITHIN 200' OF CONSTRUCTION		ALTERNATIVE CONCEPT GOAL	NUMBER OF SENSITIVE RECEPTORS IMPACTED	691	138	171	358	613	138	691	138	171	358	613
				INDEX (MIN.)	0.20	1.00	0.80	0.38	0.27	1.00	0.20	1.00	0.80	0.38	0.27
				TOTAL (INDEX)	1.20	1.89	1.69	1.27	1.33	1.89	1.20	1.89	1.69	1.27	1.20
				NORMALIZED TOTAL	0.63	1.00	0.89	0.67	0.66	1.00	0.63	1.00	0.89	0.67	0.65
				WEIGHTED NORMALIZED SCORE	3.2	5.0	4.5	3.4	3.2	5.0	3.2	5.0	4.5	3.4	3.2

ALTERNATIVES

GOALS	MAXIMUM SCORE	ALT. 1.0	ALT. 2.1A	ALT. 2.2	ALT. 2.3	ALT. 2.4	ALT. 3	ALT. 5	ALT. 6.1	ALT. 6.2	ALT. 6.3	ALT. 6.4
TRAFFIC GOALS	17.0	15.1	17.0	17.0	16.3	16.1	16.4	14.2	15.7	15.6	15.0	14.6
SAFETY SECURITY GOALS	8.0	8.0	7.9	7.9	7.9	7.9	7.9	8.0	7.9	7.9	7.9	7.9
RAILROAD GOALS	20.0	20.0	19.0	18.1	19.4	19.7	19.0	20.0	19.0	18.1	19.4	19.7
ENVIRONMENTAL GOALS	15.0	12.4	14.8	15.0	14.3	13.4	14.8	12.2	14.6	14.8	14.1	13.2
ECONOMIC GOALS	10.0	7.3	9.5	9.9	9.3	8.4	9.9	7.4	9.5	10.0	9.3	8.4
COST GOALS	25.0	24.9	16.6	16.8	18.6	19.4	14.3	25.0	16.7	17.1	19.7	20.4
CONSTRUCTION GOALS	5.0	3.2	5.0	4.5	3.4	3.2	5.0	3.2	5.0	4.5	3.4	3.2
SCORE		90.9	89.8	89.2 *	89.2	88.0	87.3	89.9	88.4	88.1	88.8	87.4
NORMALIZED SCORE		1.00	0.99	0.98	0.98	0.97	0.96	0.99	0.97	0.97	0.98	0.96

* **Score would be 89.6 if project costs were $1,949 million**

EXHIBIT G – 1

10/0/91

from, ACTC "Engineering Report draft 10/16/91

At the conceptual level analysis of this goal, the benefit of any buffering was not considered (i.e., existing tall buildings in close proximity to the Corridor), nor were any vibration concerns. The goal addressing aesthetics is based on a subjective rating. The goal related to noise is the only one of this category that has any measurable difference among the alternatives.

e. Economic Goals

This category of goals was given a weight of importance equal to 10. Three out of the total six options were measured. While the goal of minimizing land devoted to Port-related rail freight does not vary, the goal of minimizing property acquisition was easily quantified, by determining the cost of acquisition of land in millions of dollars. The effect on access to business properties could also be quantified for comparison of the alternatives.

f. Cost Goals

This category of goals was given a weight of importance equal to 25. Two of the three goals are quantified. One of the three is the comparison of total project cost by alternative. The second goal compares alternatives by the ability to implement the construction by phases. The number of construction segments was developed by looking at the number of complete operational units or a portion of an operational unit costing in the range of $400 million. The operational unit, when complete, could be put into service.

g. Construction Goals

This category of goals was given a weight of importance equal to 5. Two of the three goals were measured. The sensitive receptors were used to measure the magnitude of noise during construction. The value of this goal is not significant, since there are not many sensitive receptors along the Corridor. The second goal measured the number of years that a particular location would be affected by the proposed construction.

4. CONCLUSION

Initially, and prior to beginning the work of developing the alternative designs, it seemed that the comparison of the adopted goals would result in a favorable ranking of one or a few of the alternatives. The analysis did not provide such "winners." Therefore, other factors would have to be considered for determining the alternatives selection that would proceed into the EIR process.

The four-lane options could be eliminated, because of the results of the traffic analysis performed. Also, the impacts of the four-lane alternatives would be analyzed as part of the status quo alternative.

The environmental review of the shortened, depressed trainway options would be covered by performing the environmental analysis of the full, depressed alternative.

Alternative 3 scored comparatively high. However, when the factor of vibration is considered in the upcoming review period, this alternative may lose any advantage, because of the proximity of the depressed train to the existing buildings. Since this alternative is the most costly, it was eliminated from further consideration.

Based on this conceptual stage analysis and the results of comparing the success of the alternatives in comparison to meeting the project goals, Alternatives 1, 2.1A and 2.2 should receive additional environmental review and be considered as the candidates for the Alameda Corridor project.

A Sensitivity Analysis was performed on the results of the decision matrix. The matrix was analyzed by final scores and again by ranking of the scores by category of the goals, with and without costs. The results of this analysis are shown in Exhibits "Alter-Native Scores Without Costs, " Alternatives Ranking with Costs," and "Alternatives Ranking Without Costs."

GOALS	HIGHEST SCORE/RANK	ALT. 1.0	ALT. 2.1A	ALT. 2.2	ALT. 2.3	ALT. 2.4
TRAFFIC GOALS	17.0 1	15.1 4	17.0 1	17.0 1	16.3 2	16.1 3
SAFETY SECURITY GOALS	8.0 1	8.0 1	7.9 2	7.9 2	7.9 2	7.9 2
RAILROAD GOALS	20.0 1	20.0 1	19.0 4	18.1 5	19.4 3	19.7 2
ENVIRONMENTAL GOALS	15.0 1	12.4 5	14.8 2	15.0 1	14.3 3	13.4 4
ECONOMIC GOALS	10.0 1	7.2 ~~7.3~~ 5	8.9 ~~9.5~~ 3 ~~2~~	9.4 ~~9.9~~ 2 ~~1~~	8.4 ~~9.3~~ 4 ~~3~~	9.9 ~~8.4~~ 1 ~~4~~
COST GOALS	25.0 1	24.9 1	16.6 5	16.8 4	18.6 3	19.4 2
CONSTRUCTION GOALS	5.0 1	3.2 4	5.0 1	4.5 2	3.4 3	3.2 4
SCORE (MAXIMIZE)	100.0	90.8 ~~90.9~~	87.2 ~~89.8~~	88.7 ~~89.2~~	85.3 ~~89.2~~	89.5 ~~88.0~~
TOTAL NUMBER OF GOALS RANKED NO. 1 (MAXIMIZE)	7	3	2	2 ~~3~~	0	1 ~~0~~

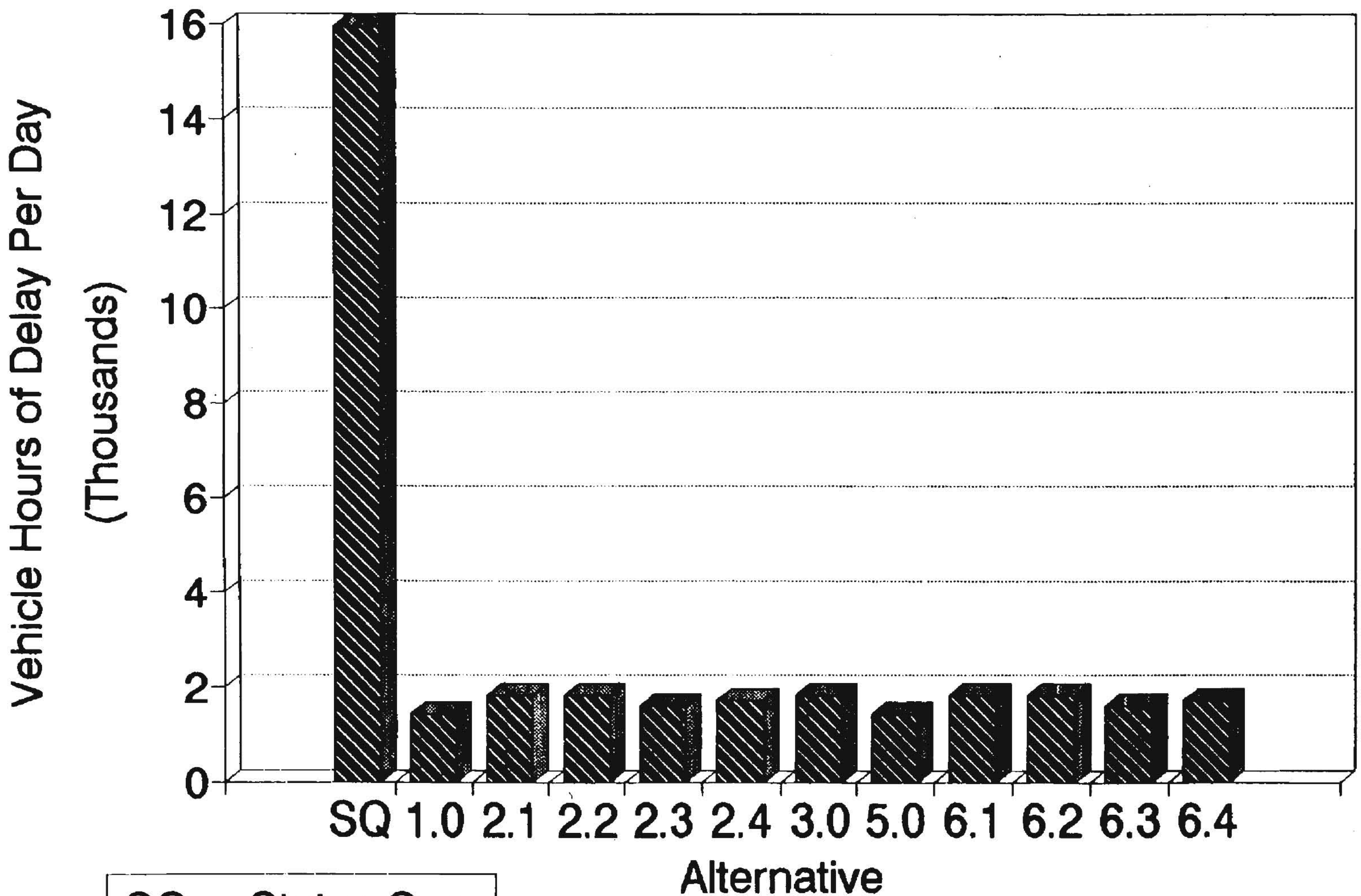
EXHIBIT G.2: ALTERNATIVE SCORES AND RANKING WITH COST

GOALS	HIGHEST SCORE/RANK	ALT. 1.0	ALT. 2.1A	ALT. 2.2	ALT. 2.3	ALT. 2.4
TRAFFIC GOALS	17.0 1	15.1 4	17.0 1	17.0 1	16.3 2	16.1 3
SAFETY SECURITY GOALS	8.0 1	8.0 1	7.6 ~~7.9~~ 2	7.6 ~~7.9~~ 2	7.6 ~~7.9~~ 2	7.6 ~~7.9~~ 2
RAILROAD GOALS	20.0 1	20.0 1	19.0 4	18.1 5	19.4 3	19.7 2
ENVIRONMENTAL GOALS	15.0 1	12.4 5	14.8 2	15.0 1	14.3 3	13.4 4
ECONOMIC GOALS	10.0 1	7.2 ~~7.3~~ 5	8.9 ~~9.5~~ 2	9.4 ~~9.9~~ 1	8.4 ~~9.3~~ 3	7.9 ~~8.4~~ 4
COST GOALS						
CONSTRUCTION GOALS	5.0 1	3.2 4	5.0 1	4.5 2	3.4 3	3.2 4
SCORE (MAXIMIZE)	75.0	65.8 ~~65.9~~	72.3 ~~73.2~~	71.6 ~~72.4~~	69.3 ~~70.5~~	67.9 ~~68.7~~
TOTAL NUMBER OF GOALS RANKED NO. 1 (MAXIMIZE)	6	2	2	2 ~~3~~	0 ~~1~~	1

EXHIBIT G.3: ALTERNATIVE SCORES AND RANKING WITHOUT COST

Vehicle Hours of Delay Per Day

At Railroad Grade Crossings - Year 2020

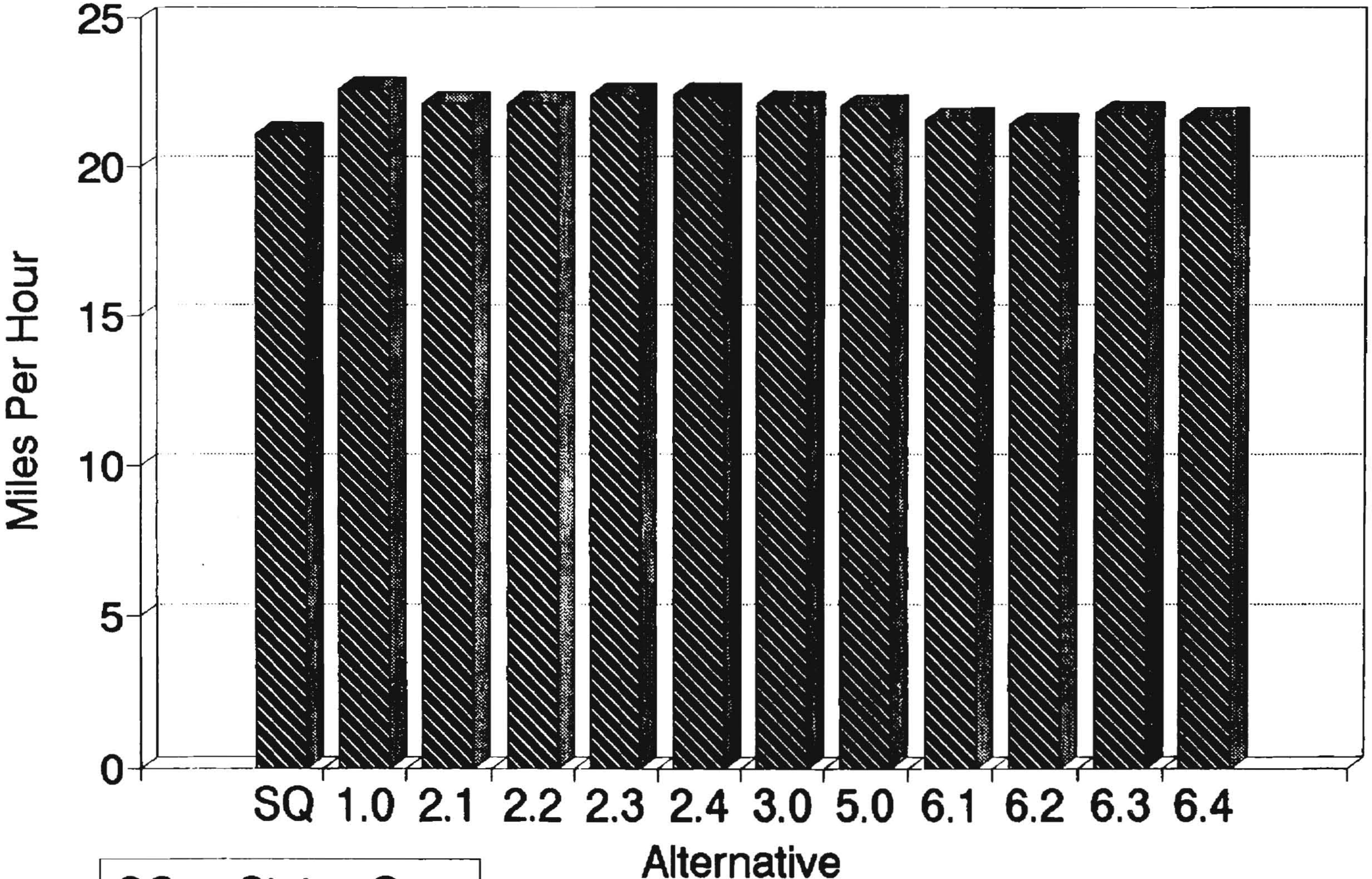


SQ = Status Quo

10/10/91

Average PM Peak Hour Travel Speeds

Alameda Street - Year 2020

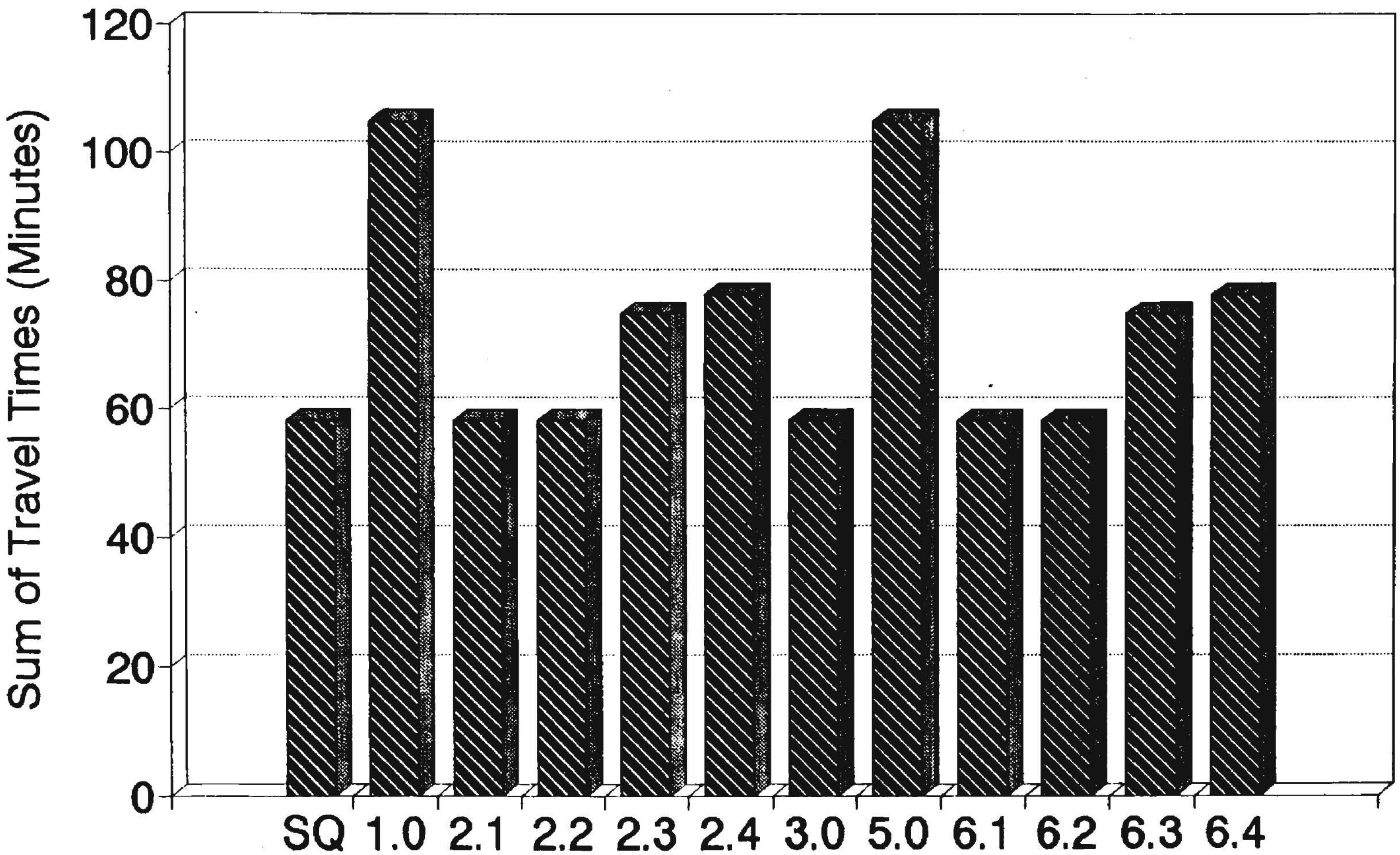


SQ = Status Quo

10/10/91

Travel Time For Turning Movements

From Alameda Street to One Block Away



SQ = Status Quo

10/10/91

PREPARED BY:
DMJM/M&N-DRM
DATE: 9/19/91
REV: 10/2/91

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Traffic Goal No. 3 - Improve Level of Service at Intersections

INTRODUCTION:

This memorandum presents a comparative evaluation of Alameda Corridor alternatives relative to their ability to reduce delays of vehicles wishing to negotiate the new Alameda intersections and reach a distant point off the corridor. This information is incorporated into a larger matrix that compares alternatives to improve Alameda Corridor for both freight rail and vehicular traffic.

The measurement criteria used to evaluate the vehicular travel time delays at an intersection is vehicular minutes of travel time delay due to requiring the drivers to take circuitous routes to reach their destinations. It is presented as the projected minutes of delay associated with each alternative.

METHODOLOGY:

The evaluation is based on estimating total vehicle travel time/delays in minutes by alternative, associated with negotiating the proposed intersection(s) to reach a distant point one block off the corridor. The vehicle must either traverse the grade separations or an at-grade bridge over the depressed trainway to reach the distant point.

The construction of roadway grade separation structures in order to eliminate the traffic conflict with an at-grade trainway will required additional travel distance and time to reach a destination point on the opposite side of the trainway. This additional distance and time can be compared to the travel time associated with negotiating the at-grade intersection of the depressed trainway alternatives. The comparison by alternative of the delay in reaching a certain point of intersection one block off of Alameda is a reasonable approach for comparing the serviceability of the alternatives or under this Goal.

Further, this approach is reasonable for comparing the alternatives, rather than comparing level of service of Alameda intersections, by analyzing the volume to capacity ratio of the intersections along Alameda. It is important to note that the Alameda intersections will be designed to provide a uniform level of service and signal timing with progression, to provide for the most efficient traffic control system practical. Also, the signals placed at the terminal point intersections of the grade separation structures will also be provided with a reasonable efficient design to maintain through traffic-operation along the east-west local streets.

An average speed of 25 mph and average 3 minute signalized intersection phasing were factors used for this analysis.

This goal is developed, where the low score is better than the higher. This differs from the procedures used for the other goals. Therefore, the lower value of time delay in minutes is the best score. The following is the results of this analysis:

ALTERNATIVE

SEGMENT	1.0/5.0	2.1/6.1	2.2/6.2	2.3/6.3	2.4/6.4	3
A	n/a	n/a	n/a	n/a	n/a	n/a
B	53	25.1	25.1	25.1	25.1	25.1
C	43	23.9	23.9	40.7	43.1	23.9
D	9	9	9	9	9	9
TOTALS	105 min	58 min	58 min	74.8 min	77.8 min	58 min
INDEX	0.55	1.0	1.0	0.77	0.74	1.0

PREPARED BY:
DMJM/M&N-MGG
DATE: 9/03/91
REV: 10/2/91

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Traffic Goal No. 4 - Improve Connections to I-105 and I-10 Freeways

INTRODUCTION:

This memorandum presents a comparative evaluation of Alameda Corridor alternatives relative to their ability to provide improved connections to the I-105 and I-10 Freeways. This information is intended to be incorporated into a larger matrix that compares alternatives to improve Alameda Corridor for both freight rail and vehicular traffic.

The measurement criteria used to evaluate the improved connections to those freeways provided by each alternative is the time traveled (in minutes) from Alameda to each freeway.

METHODOLOGY:

The conceptual designs for the Alameda Corridor alternatives provided the basis for this analysis. Each design was reviewed and the distance from the nearest intersection along Alameda to the freeway on-ramp entrance as experienced by a motorist was established. The travel speed was then used to establish the time it would take to traverse this distance. This analysis was prepared for both the westbound as well as the eastbound move and is summarized in Table ATG4-1.

GENERAL OBSERVATIONS:

The major difference occurs between the depressed railroad condition and the at-grade railroad condition at the connection to the I-105 Freeway. Under the depressed railroad condition, both eastbound and westbound connections are provided. Under the at-grade railroad condition, only the eastbound connection is provided. The westbound connection is handled with the existing connection at the I-105 Freeway/Wilmington Avenue Interchange.

AT-GRADE RAILROAD ALTERNATIVES

ALAMEDA TO I-10	DISTANCE (FEET)	SPEED (MPH)	TRAVEL TIME (MINUTES)
EAST BOUND MOVE	100	13	0.1
WEST BOUND MOVE	300	13	0.3
TOTAL TRAVEL TIME			0.4

ALAMEDA TO I-105	DISTANCE (FEET)	SPEED (MPH)	TRAVEL TIME (MINUTES)
EAST BOUND MOVE TO FWY MERGE	5,200	13	4.5
WEST BOUND MOVE TO FWY MERGE	3,900	13	3.4
TOTAL I-105 TRAVEL TIME			7.9

TOTAL TRAVEL TIME – AT-GRADE RAILROAD ALTS. 8.3

DEPRESSED RAILROAD ALTERNATIVES

ALAMEDA TO I-10	DISTANCE (FEET)	SPEED (MPH)	TRAVEL TIME (MINUTES)
EAST BOUND MOVE	100	13	0.1
WEST BOUND MOVE	300	13	0.3
TOTAL TRAVEL TIME			0.4

ALAMEDA TO I-105	DISTANCE (FEET)	SPEED (MPH)	TRAVEL TIME (MINUTES)
EAST BOUND MOVE TO FWY MERGE	3,950	13	3.5
WEST BOUND MOVE TO FWY MERGE	2,000	13	1.7
MOVE ALONG FWY	2,100	21	1.1
TOTAL I-105 TRAVEL TIME			6.3

TOTAL TRAVEL TIME – DEPRESSED RAILROAD ALTS. 6.7

TRAVEL TIME (MIN)	ALT. 1	ALT. 2.1	ALT. 2.2	ALT. 2.3	ALT. 2.4	ALT. 3	ALT. 5	ALT. 6.1	ALT. 6.2	ALT. 6.3	ALT. 6.4
ALAMEDA TO I-10 FWY	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
ALAMEDA TO I-105 FWY	7.9	6.3	6.3	6.3	6.3	6.3	7.9	6.3	6.3	6.3	6.3
TOTAL TRAVEL TIME	8.3	6.7	6.7	6.7	6.7	6.7	8.3	6.7	6.7	6.7	6.7

TABLE: ATG4-1 TRAVEL TIME IN MINUTES FROM ALAMEDA TO I-10 AND I-105 FREEWAYS

Revised 10/2/91

PREPARED BY:
DMJM/M&N-MGG
DATE: 8/29/91
REV: 10/2/81

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Traffic Goal No. 5 - Provide Alternate Route to Parallel Freeways (Emphasize Trucks)

INTRODUCTION:

This memorandum presents a comparative evaluation of Alameda Corridor alternatives relative to their ability to attract Port trucks to Alameda Street and reduce Port trucks on the I-110 and I-710 Freeways which parallel Alameda Street. This information is intended to be incorporated into a larger matrix that compares alternatives to improve Alameda Corridor for both freight rail and vehicular traffic.

The measurement criteria used to reflect the relative difference of the alternatives in their ability to effect truck travel is Port Truck Vehicle Miles of Travel (VMT - Port Trucks).

METHODOLOGY:

Projections of vehicle travel were made in the Highway Capacity and Level-of-Service Analysis (HC & LOSA) effort for this project. The traffic model used assigned the Port Truck travel independently to the network and the plots with this information were used to develop the VMT-Port Truck analysis. Six transportation models were run in the HC & LOSA effort and analyzed to determine the Port truck volumes on Alameda and the I-110 and I-710 Freeways.

The six transportation models are briefly described below:

MODEL A - Existing conditions in the Year 1990 (mainly used for model calibration efforts)

MODEL B - "Status Quo" (No Build or Null Case) conditions incorporating proposed transportation improvements defined for the transportation network outside of the improvements under consideration for the Alameda Corridor Project.

MODEL C - "Build" (Improve Alameda Corridor) Equivalent to Alternative 1 for Alameda Corridor incorporating a six-lane roadway and an at-grade railway with 25 grade separations of major cross-streets.

MODEL D - "Build" (Improve Alameda Corridor) Equivalent to Alternative 5 for Alameda Corridor incorporating a four-lane roadway and an at-grade railway with 25 grade separations of major cross-streets.

MODEL E - "Build" (Improve Alameda Corridor) Equivalent to Alternative 2.1 for Alameda Corridor incorporating a six-lane roadway and a depressed railway with 15 intersections north of the Artesia Freeway (SR-91).

MODEL G - "Build" (Improve Alameda Corridor) Truck Only Expressway alternative which incorporates a two-lane (one-lane north and one-lane south) truck only expressway from SR-91 to south of 51st Street with a four-lane roadway and a depressed railway north of SR-91 (Similar to Alternative 2.1)

Using the planning Year 2020, the traffic model network for Average Daily Traffic (ADT) Volumes were analyzed for the numbers of Port trucks on the I-110 and I-710 Freeways and Alameda Street. The Port truck volumes were analyzed by segments established for this project except that Segments A and B were combined because of difficulties associated with quantifying the freeway volumes for these segments independently. North and Southbound traffic were combined for each link[1] within a segment and averaged to represent the volume for that segment of the facility. The actual length of the roadway was defined for each segment and the average volume was multiplied by that length to establish the VMT for Port trucks. This was done for Alameda, the I-110 Freeway, and the I-710 Freeway. This computation was performed for Model Runs C through E in order to develop the relative attraction for each "Build" alternative. Each alternative then compared to Model Run B which represented the volume of Port-trucks on each facility under the "Status Quo" scenario.

The VMT-Port trucks presented represents the net increase on Alameda plus the decrease on each of the freeways (Δ Alameda *"increase"* + Δ I-110 *"decrease"* + Δ I-710 *"decrease"*). If the freeways gained Port trucks in any scenario those Port truck miles were subtracted from the VMT-Port trucks reported (Δ Alameda *"increase"* - Δ I-710 *"decrease"* - Δ I-110 *"decrease"*).

Tables ATG5-1, ATG5-2, ATG5-3, ATG5-4 present the results of this analysis.

The Alameda Corridor Alternatives 2.2, 2.3, 2.4, 3, 6.1, 6.2, 6.3, and 6.4 were not modeled in the HC & LOSA. Those alternatives are hybrids of alternatives 1, 2.1, and 5 which were modeled. The VMT-Port trucks for these alternatives have been estimated from the model data available as the similarities with the alternatives that were modeled were considered adequate for the overall evaluation. It is reasonable to assume that slight variances from

[1]Links are model representations for actual streets.

the estimated VMT-Port trucks would occur if each alternative were modeled. The general approach to developing volumes for alternatives not modeled is presented below:

- Alt. 2.2 - This alternative slightly differs from Alternative 2.1 as it includes a diversion of rail traffic to the Southern Pacific Wilmington alignment for the depressed railroad between Slauson Avenue and 25th Street. The remainder of this alternative is exactly the same as Alternative 2.1. Also, the number of traffic lanes on Alameda Street from Slauson to 25th Street is the same as Alternative 2.1. Therefore, the 2.1 volumes were used for this alternative.

- Alt. 3 - This alternative includes a depressed railroad along the east side of Alameda Street with six-lanes on Alameda from SR-91 thru 25th Street. The roadway configuration is very similar to Alt. 2.1 with respect to intersections with cross-street traffic. Therefore, the volumes from 2.1 were considered appropriate for Alt. 3.

- Alts. 2.3 & 2.4 - These alternatives are hybrids of Alts. 1 and 2.1. Therefore, where a transition occurred from Alt. 1 to Alt. 2.1, the appropriate volumes were averaged for that segment. The adjacent segment volumes were then adjusted to best reflect the type of roadway configuration and also considering a major facility (such as a freeway connection) within that segment.

- Alt. 6.1 - This alternative has the same relationship to Alt. 2.1 that Alt. 1 has to Alt. 5 (six-lane with depressed railroad to four-lane with depressed railroad vs. six-lane with at-grade railroad to four-lane with at-grade railroad). Therefore, a decrease in Port trucks on Alameda Street was projected for Alt. 6.1 using the same ratio decrease that was realized between Alt. 1 to Alt. 5 (Model C vs. Model D).

  - $$\text{Alt. 6.1} = \frac{(\text{Model E})\ (\text{Model D})}{\text{Model C}}$$

    (Alameda Street Estimates)

    However, the freeways were treated as a net decrease of Port trucks when estimating the Port trucks for Alternative 6.1:

    Alt. 6.1 = Model E - [Model D - Model C]
    (Freeway Estimates)

- Alts. 6.2, 6.3 - & 6.4 — These alternatives were treated similarly to Alt. 2.2, 2.3, and 2.4 in developing the VMT-Port trucks.

The resulting matrix of VMT-Port trucks is presented in Table ATG-5 with the estimated VMT-Port trucks shown in italics.

GENERAL OBSERVATIONS:

- Model G results in the highest volumes of Port truck miles affected with approximately 132,800, of this total 44% or approximately 58,000 VMT are caused by a reduction on the freeways.

- Model C (Alt. 1) results in the next highest volumes of Port trucks miles affected with approximately 19,500, of this total approximately 27% or approximately 5,300 are caused by a reduction on the freeways.

- Model E (Alt. 2.1) results in approximately 17,5000 VMT-Port trucks with approximately 39% or approximately 6,700 VMT of those Port trucks attributed to a reduction on the freeways.

2020 – MODEL "D" – 4 LANE ALAMEDA & @ GRADE R.R.
PORT TRUCK FREEWAY DIVERSION TO ALAMEDA CORRIDOR

TABLE: ATG5-2

2020 FUTURE TRAFFIC – PORT TRUCKS ONLY – ADT
August 21, 1991 – PORTRUCK\PT20C-A.WK3

I-110 FREEWAY

SEGMENT NO.	MODEL "B" NORTH	MODEL "B" SOUTH	MODEL "B" TOTAL	MODEL "D" NORTH	MODEL "D" SOUTH	MODEL "D" TOTAL	"D" – "B"
A & B	633	717	1350	609	722	1331	
	633	717	1350	609	722	1331	
	796	725	1521	843	769	1612	
	1035	874	1909	1111	1124	2235	
	1654	1695	3349	1773	1903	3676	
	1672	1722	3394	1790	1903	3693	
SEG SUM	6423	6450	12873	6735	7143	13878	
# OF LINKS	6	6	6	6	6	6	
AVG. VOL.	1071	1075	2146	1123	1191	2313	
SEGMENT DIST	5.7	5.7	5.7	5.7	5.7	5.7	
P.T. VEH. MILES	6104.7	6127.5	12232.2	6401.1	6788.7	13184.1	951.9
C	2158	2318	4476	2048	2382	4430	
	2134	2309	4443	2029	2357	4386	
	2229	2500	4729	2153	2508	4661	
	2301	2666	4967	2217	2613	4830	
	2414	2756	5170	2338	2701	5039	
	2660	2898	5558	2575	2832	5407	
SEG SUM	13896	15447	29343	13360	15393	28753	
# OF LINKS	6	6	6	6	6	6	
AVG. VOL.	2316	2575	4891	2227	2566	4792	
SEGMENT DIST	6.3	6.3	6.3	6.3	6.3	6.3	
P.T. VEH. MILES	14590.8	16222.5	30813.3	14030.1	16165.8	30189.6	–623.7
D	2794	3043	5837	2745	2989	5734	
	3723	3350	7073	3608	3260	6868	
	4328	3521	7849	4141	3448	7589	
	4979	4318	9297	4782	4198	8980	
	5274	4411	9685	5080	4319	9399	
	5274	4631	9905	5080	4512	9592	
SEG SUM	26372	23274	49646	25436	22746	48182	
# OF LINKS	6	6	6	6	6	6	
AVG. VOL.	4395	3879	8274	4238	3791	8030	
SEGMENT DIST	6.4	6.4	6.4	6.4	6.4	6.4	
P.T. VEH. MILES	28128	24825.6	52953.6	27129.6	24262.4	51392	–1561.6
						Subtotal	–1233.4

ALAMEDA STREET

SEGMENT NO.	MODEL "B" NORTH	MODEL "B" SOUTH	MODEL "B" TOTAL	MODEL "D" NORTH	MODEL "D" SOUTH	MODEL "D" TOTAL	"D" – "B"
A & B	48	38	86	50	245	295	
	74	64	138	73	245	318	
	20	8	28	75	225	300	
	13	12	25	198	186	384	
	60	73	133	310	191	501	
	64	66	130	445	191	636	
	31	30	61	443	244	687	
	32	30	62	648	266	914	
	38	38	76	766	266	1032	
	73	52	125				
SEG SUM	453	411	864	3008	2059	5067	
# OF LINKS	10	10	10	9	9	9	
AVG. VOL.	45	41	86	334	229	563	
SEGMENT DIST	4.8	4.8	4.8	4.8	4.8	4.8	
P.T. VEH. MILES	216	196.8	412.8	1603.2	1099.2	2702.4	2289.6
C	77	56	133				
	86	62	148				
	168	77	245				
				771	269	1040	
	168	87	255	811	398	1209	
				795	503	1298	
	618	588	1206	826	529	1355	
	639	587	1226	826	529	1355	
				867	557	1424	
	679	608	1287	652	545	1197	
				1004	701	1705	
	690	642	1332	1039	731	1770	
	729	752	1481	1052	731	1783	
	962	930	1892				
SEG SUM	4816	4389	9205	8643	5493	14136	
# OF LINKS	10	10	10	9	9	9	
AVG. VOL.	482	439	921	960	610	1571	
SEGMENT DIST	6	6	6	6	6	6	
P.T. VEH. MILES	2892	2634	5526	5760	3660	9426	3900
D	1251	1156	2407				
				1384	1270	2654	
	2524	2818	5342	2336	2450	4786	
	2895	3328	6223				
				2972	3212	6184	
	3319	3738	7057	3411	3636	7047	
	3522	4056	7578	3814	4120	7934	
	4281	4389	8670	4741	5052	9793	
	4310	4418	8728				
				4814	5081	9895	
	5058	5110	10168				
				5648	5832	11480	
SEG SUM	27160	29013	56173	29120	30653	59773	
# OF LINKS	8	8	8	8	8	8	
AVG. VOL.	3395	3627	7022	3640	3832	7472	
SEGMENT DIST	6.8	6.8	6.8	6.8	6.8	6.8	
P.T. VEH. MILES	23086	24663.6	47749.6	24752	26057.6	50809.6	3060
						Subtotal	9249.6

I-710 FREEWAY

SEGMENT NO.	MODEL "B" NORTH	MODEL "B" SOUTH	MODEL "B" TOTAL	MODEL "D" NORTH	MODEL "D" SOUTH	MODEL "D" TOTAL	"D" – "B"	PERCENT OF TOTAL PORT TRUCK MILES AFFECTED ATTRIBUTED TO FREEWAY REDUCTIONS
A & B	402	395	797	425	417	842		
	1786	2006	3792	1804	2020	3824		
	2514	2514	5028	2486	2526	5012		
	2645	2675	5320	2578	2692	5270		
	2797	2842	5639	2764	2843	5607		
SEG SUM	10144	10432	20576	10057	10498	20555		
# OF LINKS	5	5	5	5	5	5		
AVG. VOL.	2029	2086	4115	2011	2100	4111		
SEGMENT DIST	6.4	6.4	6.4	6.4	6.4	6.4		
P.T. VEH. MILES	12985.6	13350.4	26336	12870.4	13440	26310.4	–25.6	–67.9% N/A
C	3022	3062	6084	2970	3078	6048		
	3300	3338	6638	3248	3352	6600		
	4234	4252	8486	4236	4333	8569		
	4344	4324	8668	4339	4431	8770		
SEG SUM	14900	14976	29876	14793	15194	29987		
# OF LINKS	4	4	4	4	4	4		
AVG. VOL.	3725	3744	7469	3698	3799	7497		
SEGMENT DIST	5.7	5.7	5.7	5.7	5.7	5.7		
P.T. VEH. MILES	21232.5	21340.8	42573.3	21078.6	21654.3	42732.9	159.6	10.6%
D	5260	5626	10886	5297	5760	11057		
	5351	4975	10326	5438	5276	10714		
	5439	5201	10640	5452	5306	10758		
	6475	6579	13054	6517	6340	12857		
	6694	6838	13532	6743	6600	13343		
	5530	5777	11307	5764	5585	11349		
SEG SUM	34749	34996	69745	35211	34867	70078		
# OF LINKS	6	6	6	6	6	6		
AVG. VOL.	5792	5833	11624	5869	5811	11680		
SEGMENT DIST	6.5	6.5	6.5	6.5	6.5	6.5		
P.T. VEH. MILES	37648	37914.5	75556	38148.5	37771.5	75920	364	28.1%
						Subtotal	498	7.4%

TOTAL PORT TRUCK MILES AFFECTED: 9985

PORTRUCK\PT20D-A.WK3

2020 – MODEL "E" – 6 LANE ALAMEDA & DEPRESSED R.R.

PORT TRUCK FREEWAY DIVERSION TO ALAMEDA CORRIDOR

TABLE: ATG5-3

2020 FUTURE TRAFFIC – PORT TRUCKS ONLY – ADT

August 21, 1991 – PT20E-A.WK3

I-110 FREEWAY

SEGMENT NO.	MODEL "B" NORTH	MODEL "B" SOUTH	MODEL "B" TOTAL	MODEL "E" NORTH	MODEL "E" SOUTH	MODEL "E" TOTAL	"E" – "B"
A & B	633	717	1350	557	705	1262	
	633	717	1350	557	705	1262	
	798	725	1523	713	714	1427	
	1035	874	1909	931	1084	2015	
	1654	1695	3349	1727	1905	3632	
	1672	1722	3394	1753	1980	3733	
SEG. SUM	6425	6450	12875	6238	7093	13331	
# OF LINKS	6	6	6	6	6	6	
AVG. VOL.	1071	1075	2146	1040	1182	2222	
SEGMENT DIST	5.7	5.7	5.7	5.7	5.7	5.7	
PORT T. MILES	6104.7	6127.5	12232.2	5928	6737.4	12665.4	433.2
C	2158	2318	4476	1962	2180	4142	
	2134	2309	4443	1904	2181	4085	
	2229	2500	4729	1980	2333	4313	
	2301	2666	4967	2084	2488	4572	
	2414	2756	5170	2161	2577	4738	
	2660	2898	5558	2396	2717	5113	
SEG. SUM	13896	15447	29343	12487	14476	26963	
# OF LINKS	6	6	6	6	6	6	
AVG. VOL.	2316	2575	4891	2081	2413	4494	
SEGMENT DIST	6.3	6.3	6.3	6.3	6.3	6.3	
PORT T. MILES	14590.8	16222.5	30813.3	13110.3	15201.9	28312.2	–2501.1
D	2794	3043	5837	2517	2869	5386	
	3723	3350	7073	3588	3168	6756	
	4328	3521	7849	4178	3332	7510	
	4979	4318	9297	4839	4079	8918	
	5274	4411	9685	5131	4193	9324	
	5274	4631	9905	5131	4379	9510	
SEG. SUM	26372	23274	49646	25384	22020	47404	
# OF LINKS	6	6	6	6	6	6	
AVG. VOL.	4395	3879	8274	4231	3670	7901	
SEGMENT DIST	6.4	6.4	6.4	6.4	6.4	6.4	
PORT T. MILES	28128	24825.6	52953.6	27078.4	23488	50566.4	–2387.2
						Subtotal	–4455.1

ALAMEDA STREET

SEGMENT NO.	MODEL "B" NORTH	MODEL "B" SOUTH	MODEL "B" TOTAL	MODEL "E" NORTH	MODEL "E" SOUTH	MODEL "E" TOTAL	"E" – "B"
A & B	48	38	86	73	130	203	
	74	64	138	102	142	244	
	20	8	28	74	13	87	
	13	12	25	178	33	211	
	60	73	133	238	37	275	
	64	66	130	157	37	194	
	31	30	61	198	53	251	
	32	30	62	227	80	307	
	38	38	76	276	81	357	
	73	52	125				
SEG. SUM	453	411	864	1523	606	2129	
# OF LINKS	10	10	10	9	9	9	
AVG. VOL.	45	41	86	169	67	237	
SEGMENT DIST	4.8	4.8	4.8	4.8	4.8	4.8	
PORT T. MILES	216	196.8	412.8	811.2	321.6	1137.6	724.8
C	77	56	133	280	85	365	
	86	62	148	289	92	381	
				682	394	1076	
	168	77	245				
				682	459	1141	
	168	87	255	990	868	1858	
				1041	900	1941	
	618	588	1206				
	639	587	1226	1071	986	2057	
				1075	1010	2085	
	679	608	1287	1075	1023	2098	
	690	642	1332	629	1030	1659	
	729	752	1481	1320	1133	2453	
	962	930	1892				
SEG. SUM	4816	4389	9205	9134	7980	17114	
# OF LINKS	10	10	10	11	11	11	
AVG. VOL.	482	439	921	830	725	1556	
SEGMENT DIST	6	6	6	6	6	6	
PORT T. MILES	2892	2634	5526	4980	4350	9336	3810
D	1251	1156	2407				
				1409	1690	3099	
	2524	2818	5342	2776	3001	5777	
	2895	3328	6223				
				3126	3571	6697	
	3319	3738	7057	3577	4001	7578	
	3522	4056	7578	4077	4673	8750	
	4281	4389	8670	4789	5179	9968	
	4310	4418	8728				
				4854	5222	10076	
	5058	5110	10168				
				5634	5945	11579	
SEG. SUM	27160	29013	56173	30242	33282	63524	
# OF LINKS	8	8	8	8	8	8	
AVG. VOL.	3395	3627	7022	3780	4160	7941	
SEGMENT DIST	6.8	6.8	6.8	6.8	6.8	6.8	
PORT T. MILES	23086	24663.8	47749.6	25704	28288	53998.8	6249.2
						Subtotal	10784

I-710 FREEWAY

SEGMENT NO.	MODEL "B" NORTH	MODEL "B" SOUTH	MODEL "B" TOTAL	MODEL "E" NORTH	MODEL "E" SOUTH	MODEL "E" TOTAL	"E" – "B"	PERCENT OF TOTAL PORT TRUCK MILES AFFECTED ATTRIBUTED TO FREEWAY REDUCTIONS
A & B	402	395	797	351	414	765		
	1786	2006	3792	2055	1734	3789		
	2514	2514	5028	2298	2590	4888		
	2645	2675	5320	2389	2753	5142		
	2797	2842	5639	2575	2914	5489		
SEG. SUM	10144	10432	20576	9668	10405	20073		
# OF LINKS	5	5	5	5	5	5		
AVG. VOL.	2029	2086	4115	1934	2081	4015		
SEGMENT DIST	6.4	6.4	6.4	6.4	6.4	6.4		
PORT T. MILES	12985.6	13350.4	26336	12377.6	13318.4	25696	–640	22.2%
C	3022	3062	6084	2778	3140	5918		
	3300	3338	6638	3056	3412	6468		
	4234	4252	8486	4241	4315	8556		
	4344	4324	8668	4347	4389	8736		
SEG. SUM	14900	14976	29876	14422	15256	29678		
# OF LINKS	4	4	4	4	4	4		
AVG. VOL.	3725	3744	7469	3606	3814	7420		
SEGMENT DIST	5.7	5.7	5.7	5.7	5.7	5.7		
PORT T. MILES	21232.5	21340.8	42573.3	20554.2	21739.8	42294	–279.3	42.2%
D	5260	5626	10886	5346	5642	10988		
	5351	4975	10326	5442	5066	10508		
	5439	5201	10640	5500	5148	10648		
	6475	6579	13054	6184	6204	12388		
	6694	6838	13532	6424	6509	12933		
	5530	5777	11307	5324	5697	11021		
SEG. SUM	34749	34996	69745	34220	34266	68486		
# OF LINKS	6	6	6	6	6	6		
AVG. VOL.	5792	5833	11624	5703	5711	11414		
SEGMENT DIST	6.5	6.5	6.5	6.5	6.5	6.5		
PORT T. MILES	37648	37914.5	75556	37069.5	37121.5	74191	–1365	37.9%
						Subtotal	–2284.3	38.9%

TOTAL PORT TRUCK MILES AFFECTED: 17523.4

2020 – MODEL "G" – TRUCK EXPRESSWAY & DEPRESSED R.R.

TABLE: ATG5-4

PORT TRUCK FREEWAY DIVERSION TO ALAMEDA CORRIDOR

2020 FUTURE TRAFFIC – PORT TRUCKS ONLY – ADT

August 13, 1991 – PORTRUCK\PT20G-A.WK3

SEGMENT NO	I-110 FREEWAY MODEL "B" NORTH	SOUTH	TOTAL	I-110 MODEL "G" NORTH	SOUTH	TOTAL	"G" - "B"	ALAMEDA STREET MODEL "B" NORTH	SOUTH	TOTAL	ALAMEDA MODEL "G" NORTH	SOUTH	TOTAL	"G" - "B"	I-710 FREEWAY MODEL "B" NORTH	SOUTH	TOTAL	I-710 MODEL "G" NORTH	SOUTH	TOTAL	"G" - "B"	PERCENT OF TOTAL PORT TRUCK MILES AFFECTED ATTRIBUTED TO FREEWAY REDUCTIONS
A & B								48	38	86	844	818	1662		402	395	797	280	322	602		
	633	717	1350	446	449	895		74	64	138	1145	1187	2332		1786	2006	3792	1429	1579	3008		
								20	6	26	1420	1434	2854		2514	2514	5028	1649	1629	3278		
	633	717	1350	446	449	895		13	12	25	1587	1591	3178									
	798	725	1523	392	496	888		60	73	133	2476	2421	4897		2645	2675	5320	1733	1737	3470		
	1035	874	1909	709	809	1518		64	66	130	2513	2314	4827		2797	2842	5639	1892	1899	3791		
								31	30	61	2491	2397	4888									
								32	30	62	1553	2585	4138									
	1654	1695	3349	1055	1348	2403		38	38	76	2710	2565	5275									
	1672	1722	3394	1083	1350	2433		73	52	125												
SEG SUM	6425	6450	12875	4131	4901	9032		453	411	864	16739	17312	34051		10144	10432	20576	6983	7166	14149		
# OF LINKS	6	6	6	6	6	6		10	10	10	9	9	9		5	5	5	5	5	5		
AVG. VOL.	1071	1075	2146	689	817	1505		45	41	86	1860	1924	3783		2029	2086	4115	1397	1433	2830		
SEGMENT DIST	5.7	5.7	5.7	5.7	5.7	5.7		4.8	4.8	4.8	4.8	4.8	4.8		6.4	6.4	6.4	6.4	6.4	6.4		
PORT T. MILES	6104.7	6127.5	12232.2	3927.3	4656.9	8578.5	-3653.7	216	196.8	412.8	8928	9235.2	18168.4	17745.6	12985.6	13350.4	26336	8940.8	9171.2	18112	-8224	40.1%
C	2156	2318	4476	1251	1466	2717		77	56	133	2725	2577	5302		3022	3062	6084	2086	2082	4168		
	2134	2309	4443	1189	1456	2645		86	62	148	2770	2642	5412									
	2229	2500	4729	1240	1546	2786					2920	3132	6052		3300	3338	6638	2355	2353	4708		
	2301	2666	4967	1281	1610	2891		168	77	245	2921	3030	5951									
											2967	3102	6069									
								168	87	255												
								618	588	1206												
								639	587	1226												
	2414	2756	5170	1378	1685	3063					3265	3440	6705		4234	4252	8486	3527	3144	6671		
	2660	2698	5558	1560	1825	3385		679	608	1287	3301	3484	6785		4344	4324	8668	3599	3185	6784		
								690	642	1332												
								729	752	1481												
								962	930	1892												
SEG SUM	13896	15447	29343	7899	9588	17487		4816	4389	9205	20889	21407	42296		14900	14976	29876	11567	10764	22331		
# OF LINKS	6	6	6	6	6	6		10	10	10	7	7	7		4	4	4	4	4	4		
AVG. VOL.	2316	2575	4891	1317	1598	2915		482	439	921	2984	3058	6042		3725	3744	7469	2892	2691	5583		
SEGMENT DIST	6.3	6.3	6.3	6.3	6.3	6.3		6	6	6	6	6	6		5.7	5.7	5.7	5.7	5.7	5.7		
PORT T. MILES	14590.8	16222.5	30813.3	8297.1	10067.4	18364.5	-12448.8	2892	2634	5526	17904	18348	36252	30726	21232.5	21340.8	42573.3	16484.4	15338.7	31823.1	-10750.2	43.0%
D	2794	3043	5837	1694	1973	3667		1251	1156	2407					5260	5626	10886	4707	4390	9097		
	3723	3350	7073	2531	2287	4818					3698	3733	7431		5351	4975	10326	4841	4522	9363		
	4326	3521	7849	3138	2452	5590									5439	5201	10640	4900	4840	9740		
	4979	4318	9297	3820	3189	7009		2524	2818	5342	4435	4375	8810		6475	6579	13054	5859	5684	11543		
	5274	4411	9685	4122	3303	7425		2895	3328	6223					6694	6838	13532	6200	5945	12145		
	5274	4631	9905	4122	3483	7605					4767	4835	9602		5530	5777	11307	5057	5054	10111		
								3319	3738	7057	5206	5292	10498									
								3522	4056	7578	5222	5833	11055									
								4281	4389	8670	5439	6062	11501									
								4310	4418	8728	6097	6453	12550									
								5058	5110	10168	6157	6482	12639									
											6933	7196	14129									
SEG SUM	26372	23274	49646	19427	16687	36114		27160	29013	56173	47954	50261	98215		34749	34996	69745	31564	30435	61999		
# OF LINKS	6	6	6	6	6	6		8	8	8	9	9	9		6	6	6	6	6	6		
AVG. VOL.	4395	3879	8274	3238	2781	6019		3395	3627	7022	5328	5585	10913		5792	5833	11624	5261	5073	10333		
SEGMENT DIST	6.4	6.4	6.4	6.4	6.4	6.4		6.8	6.8	6.8	6.8	6.8	6.8		6.5	6.5	6.5	6.5	6.5	6.5		
PORT T. MILES	28128	24825.6	52953.6	20723.2	17798.4	38521.6	-14432	23086	24663.6	47749.6	36230.4	37978	74208.4	26458.8	37648	37914.5	75556	34196.5	32974.5	67164.5	-8391.5	46.3%
						Subtotal	-30535						Subtotal	74930.4						Subtotal	-27366	43.6%

PORTRUCK\PT20G-A.WK3

TOTAL PORT TRUCK MILES AFFECTED: 132831

PREPARED BY:
DMJM/M&N-MGG
DATE: 9/11/91
REV: ~~10/2/91~~ 10/10/91

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Safety/Security Goal No. 1 - Improve Vehicular Safety

INTRODUCTION:

This memorandum presents a comparative evaluation of Alameda Corridor alternatives relative to their ability to improve vehicular safety for rail/vehicle interface and along Alameda. This information is intended to be incorporated into a larger matrix that compares alternatives for both freight rail and vehicular traffic.

The measurement criteria used to reflect the relative difference of the alternatives in their ability to improve vehicular/railroad safety is the number of trains times the average daily traffic at each grade crossing.

METHODOLOGY:

The measurement for vehicle/railroad conflicts was established as the number of cars at an at-grade rail crossing times of the number of trains occurring at that crossing. The number of grade crossings have been identified by rail company along with the volume of average daily traffic. This information was obtained from the 1984 study prepared by SCAG and updated for this project. Exhibit ASSG1-1 contains this information for both the "Status Quo" routing of trains and the "Consolidated Corridor" routing of trains. A definition of "Status Quo" and "Consolidated Corridor" follows:

- "Status Quo" (No consolidation of port rail traffic and no improvements to the Alameda Corridor) - Under this scenario, all existing railroad routes would remain unchanged and projected increases of Port related freight rail movements would occur on existing trackage. All Alameda Corridor highway improvements would be limited to those facilities already funded or those projects programmed and approved for funding.

- "Consolidated Corridor" (Consolidate port rail traffic and improve Alameda Corridor to one of the Alameda Corridor alternatives under study) - Under this scenario, the Southern Pacific Railroad-San Pedro main line would be used as the consolidated route for all port related rail movements for all railroads serving the Ports; AT&SF, Southern Pacific, and Union Pacific. The through rail movements to and from the Ports along the Alameda Corridor would be grade separated at selected major cross streets with all other railroad grade crossings eliminated.

The projections of through-trains for each rail company is presented in Table ASSG1-1 and is consistent for both the "Status Quo" routing as well as the "Consolidated Corridor" condition.

THROUGH-TRAIN MOVEMENTS PER PEAK DAY

RAIL COMPANY	2020
AT&SF	24
Southern Pacific	41
Union Pacific	34
Total Train Movements	99

TABLE: ASSG1-1 Through-train movements by rail company.

This analysis presents a comparison of vehicle/train conflicts for the "Status Quo" vs. the "Consolidated Corridor" routing of through train movements. The "Consolidated Corridor" addresses all Alameda alternatives as equal when analyzing through-train movements. However, one of the key differences with the alternatives occurs in the handling of the rail traffic for industry service along the Alameda Corridor. Under the "Consolidated Corridor", a drill track[1] is necessary to accommodate the rail traffic for industry service. The Alameda Corridor alternatives which incorporate an at-grade railroad provide a mitigation for potential vehicular/railroad conflicts associated with the train operations on the drill track because all rail crossings by cross street traffic are eliminated through grade separations or closures . Under the Alameda Corridor depressed railroad alternatives, the drill track remains at-grade and cross street traffic which is accommodated with grade separations (bridges over the depressed main line) still results in travel across the at-grade drill track. Thus, a potential conflict of vehicles ana trains occurs. These differences in vehicle/railroad conflicts are also included in this analysis. The following table presents the daily trains projected for industry service in the Year 2020.

[1]Capacity requirements as defined in Volume 4 - Railroad Capacity and Operations Analysis identifies a two track main line for through train movements with a dedicated drill track to provide for industry service.

TYPE OF TRAIN	PLANNING YEAR 2020
Daily industry service[2] along Consolidated Corridor	10

TABLE: ASSG1-2 Daily industry service along Alameda Corridor.

The potential conflicts of vehicles and trains at grade crossings are quantified in the same fashion as the through-train conflicts:

ADT * No. of Trains = vehicle/railroad conflict index

[2]Estimated as a typical day's activity for industry service along Alameda Corridor occurring on the drill track only.

SOUTHERN PACIFIC – GRADE X–INGS, ADT'S, TR, & ADT x TRAINS PER PEAK DAY

INT. No.	SEG	RR DES	GRADE X–ING STREET NAME	2020 ADT	TR	2020 ADT x TR PER DAY
			PASADENA JUNCTION TO J – YARD (UPRR)			
1	30	3	PERRINO PL	470	10	4700
2	30	3	SANTA FE	37560	10	375600
3	30	3	WASHINGTON	30910	10	309100
			Total ADT x Trains/Day:			689,400
			WILMINGTON BRANCH			
1	29	BBH1	ALAMEDA W	37720	3	113160
2	29	BBH1	24TH ST	9980	3	29940
3	29	BBH1	LNG BCH AV E	8760	7	61320
4	29	BBH1	M.L. KING BL	1220	7	8540
5	29	BBH1	41ST ST	15150	3	45450
6	29	BBH1	VERNON AV	18940	3	56820
7	29	BBH1	48TH ST	1690	3	5070
8	29	BBH1	55TH ST	9380	3	28140
9	29	BBH1	SLAUSON AV	42450	3	127350
10	27	BBH2	60TH ST	2440	19	46360
11	27	BBH2	GAGE AVE	31000	19	589000
12	27	BBH2	FLORENCE AV	44580	19	847020
13	27	BBH2	NADEAU ST	19550	19	371450
14	27	BBH2	92ND ST	12520	19	237880
15	27	BBH2	97TH ST	9160	19	174040
16	27	BBH2	103RD ST	22900	19	435100
17	25	BBH3	108TH ST	7490	19	142310
18	25	BBH3	WILMINGTON AV	15270	19	290130
19	25	BBH3	IMPERIAL HWY	42790	19	813010
20	25	BBH3	119TH ST	3970	19	75430
21	25	BBH3	124TH ST	1380	19	26220
22	25	BBH3	EL SEGUNDO BL	32820	19	623580
23	25	BBH3	130TH ST	610	19	11590
24	25	BBH3	STOCKWELL AV	5810	19	110390
25	23	BBH3	ROSECRANS AV	39250	0	0
26	23	BBH3	ELM ST	2690	0	0
27	23	BBH3	COMPTON BL	29000	0	0
28	23	BBH3	PALM ST	4310	0	0
29	23	BBH3	LAUREL ST	2580	0	0
30	23	BBH3	MYRRH ST	1310	0	0
31	23	BBH3	INDIGO ST	900	0	0
32	23	BBH3	ALONDRA BL	27150	0	0
33	23	BBH3	GREENLEAF BL	9620	0	0
34	23	BBH3	MANVILLE ST	310	0	0
35	23	BBH3	ALAMEDA ST	14040	0	0
			Total ADT x Trains/Day:			5,269,300
			SAN PEDRO BRANCH			
1	28	BG1	25TH ST	9980	17	169660
2	28	BG1	ALAMEDA E	12210	17	207570
3	28	BG1	41ST ST	15150	17	257550
4	28	BG1	VERNON AV	22280	17	378760
5	28	BG1	51ST ST	790	17	13430
6	28	BG1	55TH ST	9380	17	159460
7	28	BG1	SLAUSON AV	42800	17	727600
8	28	BG1	RANDOLPH ST	10290	17	174930
9	26	BG1	GAGE AVE	26120	17	444040
10	26	BG1	FLORENCE AV	51040	17	867680
11	26	BG1	NADEAU AV	29370	17	499290
12	24	BG2	FIRESTONE	41230	31	1278130
13	24	BG2	SOUTHERN AV	12630	31	391530
14	24	BG2	TWEEDY BL	16370	31	507470
15	24	BG2	CENTURY BL	14510	31	449810

INT. No.	SEG	RR DESG	GRADE X–ING STREET NAME	2020 ADT	TR	2020 ADT x TR PER DAY
16	24	BG2	FERNWOOD AV	4270	31	132370
17	24	BG2	IMPERIAL HWY	14820	31	459420
18	24	BG2	LYNWOOD AV	12820	31	397420
19	24	BG2	BUTLER ST	410	31	12710
20	24	BG2	WEBER AV	3340	31	103540
21	24	BG2	EL SEGUNDO	26750	31	829250
22	24	BG2	PINE ST	10970	31	340070
23	22	BG2	ROSECRANS	30250	GS	0
24	22	BG2	ELM ST	2300	47	108100
25	22	BG2	PALMER AV	4580	47	215260
26	22	BG2	COMPTON BL	35190	47	1653930
27	22	BG2	LAUREL ST	1530	47	71910
28	22	BG2	ALONDRA AV	22100	47	1038700
29	22	BG2	GREENLEAF	15270	47	717690
30	21	BG3	DEL AMO BL	31990	GS	0
31	21	BG3	DOMINGUEZ	12680	47	595960
32	21	BG3	CARSON ST	14540	GS	0
33	19	BG3	SEPULVEDA	26850	29	778650
34	6	BG3	PCH HWY	50890	29	1475810
			Total ADT x Trains/Day:			15,457,700
			LA HABRA BRANCH			
1	32	BBJ	PASSONS BL	15020	16	240320
2	32	BBJ	SERAPIS AV	7030	16	112480
3	32	BBJ	ROSEMEAD	26420	16	422720
4	32	BBJ	PARAMOUNT	16490	16	263840
5	32	BBJ	TELEGRAPH	30100	16	481600
6	32	BBJ	GAGE AV	22900	16	366400
7	32	BBJ	GRNWD AV	2300	16	36800
8	32	BBJ	GARFIELD	29610	16	473760
9	32	BBJ	EASTERN	27390	16	438240
10	32	BBJ	ALAMO ST	3830	16	61280
11	32	BBJ	HELIO AV	4650	16	74400
12	32	BBJ	KING AV	1990	16	31840
13	32	BBJ	ATLANTIC	36810	16	588960
14	32	BBJ	PINE	4440	16	71040
15	32	BBJ	GIFFORD ST	5240	16	83840
16	32	BBJ	CARMELITA	1980	16	31680
17	32	BBJ	MAYWOOD AV	12400	16	198400
18	32	BBJ	STATE ST	21680	16	346880
19	32	BBJ	RANDOLPH ST	5930	16	94880
20	32	BBJ	ARBUTUS	2190	16	35040
21	32	BBJ	MILES AVE	26120	16	417920
22	32	BBJ	SEVILLE	7040	16	112640
23	32	BBJ	RITA AVE	1930	16	30880
24	32	BBJ	PACIFIC BLVD	20920	16	334720
25	32	BBJ	RUGBY AVE	3360	16	53760
26	32	BBJ	MALABAR	4250	16	68000
27	32	BBJ	SANTA FE	24120	16	385920
28	32	BBJ	ALBANY ST	1420	16	22720
29	32	BBJ	REGENT ST	410	16	6560
30	32	BBJ	ALAMEDA W	30300	16	484800
31	32	BBJ	WILMING AV	14650	16	234400
32	32	BBJ	HOLMES AV	11300	16	180800
			Total ADT x Trains/Day:			6,787,520
			PUENTE/SANTA ANA BRANCH			
1	34	BK	PIONEER	19700	16	315200
2	34	BK	LOS NIETOS	10230	15	153450
3	34	BK	SMITH AV	2380	15	35700
4	34	BK	FLORENCE	14600	15	219000
5	34	BK	ORR & DAY	650	15	9750

(CONTINED PAGE 2)

SOUTHERN PACIFIC – GRADE X-INGS, ADT'S, TR, & ADT x TRAINS PER PEAK DAY

INT. No.	SEG	RR DES	GRADE X-ING STREET NAME	2020 ADT	TR	2020 ADT x TR PER DAY
			PUENTE/SANTA ANA BRANCH (CONTINED)			
6	33	BK	STUDEBAKER	18660	15	279900
7	33	BK	HOXIE AV	160	15	2400
8	33	BK	REGENTV AV	3660	15	54900
9	33	BK	STEWARD/GR	12820	15	192300
10	33	BK	WOODRUFF	21380	15	320700
11	33	BK	LAKEWOOD	51910	15	778650
12	33	BK	PATTON	12210	15	183150
13	33	BK	BROOKSHR	12990	15	194850
14	33	BK	DOLAN AV	560	15	8400
15	33	BK	DOWNEY AV	14490	15	217350
16	33	BK	PARAMOUNT	37720	15	565800
17	33	BK	RIVES AV	12210	15	183150
18	33	BK	FIRESTONE	65810	15	987150
19	33	BK	GARFIELD	36810	15	552150
20	33	BK	ATLANTIC	38170	15	572550
21	33	BK	OTIS ST	18330	15	274950
22	33	BK	SAN JUAN	4580	15	68700
23	33	BK	CALIF AVE	16790	15	251850
24	33	BK	STATE ST	18330	15	274950
25	33	BK	LNG BCH BLVD	27950	15	419250
26	33	BK	SANTA FE AV	13600	15	204000
			Total ADT x Trains/Day:			7,320,200
			WEST LINE (PASADENA JCT. TO BARTOLO JUNCTION)			
1	41	B	CALIFORNIA	8380	12	100560
2	41	B	SUNSET	24480	12	293760
3	41	B	ORANGE	5550	12	66600
4	41	B	PUENTE	23070	12	276840
5	41	B	VINELAND	9190	12	110280
6	41	B	TEMPLE	27280	12	327360
7	41	B	COGSWELL	8550	12	102600
8	41	B	PECK	47130	12	565560
9	41	B	RAMONA	47330	12	567960
10	41	B	CYPRESS	5660	12	67920
11	41	B	TYLER	18630	12	223560

INT. No.	SEG	RR DESG	GRADE X-ING STREET NAME	2020 ADT	TR	2020 ADT x TR PER DAY
12	39	B	ARDEN	18630	12	223560
13	39	B	BALDWIN	35550	12	426600
14	39	B	TEMPLE CITY	30540	12	366480
15	39	B	LOWER AZUSA	16790	12	201480
16	39	B	ENCINITA	7940	12	95280
17	39	B	WALNUT GROOVE	6880	12	82560
18	39	B	SAN GABRIEL	46660	12	559920
19	39	B	DEL MAR	20270	12	243240
20	39	B	MISSION	22160	12	265920
21	39	B	RAMONA	24200	12	290400
22	39	B	VALLEY	29780	12	357360
23	39	B	BOCA	8860	12	106320
24	39	B	VINEBURN	3090	12	37080
25	39	B	SAN PABLO	12070	12	144840
			Total ADT x Trains/Day:			6,104,040
			BARTOLO JCT. TO INDUSTRY (UPRR)			
1	38	3	STIMSON	12070	31	374170
2	38	3	TURNBULL	15880	31	492280
3	38	3	7TH AVENUE	34980	31	1084380
4	38	3	WORKMAN MILL	22460	31	696260
5	38	3	MISSION MILL	2340	31	72540
6	38	3	ROSE HILLS	8800	31	272800
			Total ADT x Trains/Day:			2,992,430

TOTAL SPTC ADT x TRAINS/DAY	44,620,590

SEG = RR Mainline Segment
RR DES = Railroad Mainline Branch Number
ADT = Average Daily Traffic Volume
TR = Trains per Day
GS = Grade Separation

EXHIBIT: ATG1–1 ADT x TRAINS PER DAY "STATUS QUO 2020" – SPTC

SANTA FE (AT&SF RR) – GRADE X-INGS, ADT'S, TR, ADT x TRAINS PER DAYS PER PEAK DAY

INT No.	SEG	RR DES	GRADE X-ING STREET NAME	2020 ADT	TR	2020 ADT x TR PER DAY
			ATSF HARBOR SUBDIVISION – HOBART TO THENARD			
1	42	2H1	HARRIET ST	690	24	16560
2	42	2H1	25TH ST	840	24	20160
3	42	2H1	26TH ST	14,110	24	338640
4	42	2H1	27TH ST	1,830	24	43920
5	42	2H1	28TH ST	310	24	7440
6	42	2H1	37TH/38TH ST	19,440	24	466560
7	42	2H1	E.VERNON AV	14,970	24	359280
8	42	2H1	PACIFIC BLVD	27,360	24	656640
9	42	2H1	49TH ST	3,050	24	73200
10	42	2H1	FRUITLAND AV	8,090	24	194160
11	42	2H1	52ND ST	970	24	23280
12	42	2H1	53RD ST	1,860	24	44640
13	42	2H1	54TH ST	850	24	20400
14	42	2H1	55TH ST	5,130	24	123120
15	42	2H1	56TH ST	990	24	23760
16	42	2H1	57TH ST	1,420	24	34080
17	42	2H1	58TH ST	1,290	24	30960
18	42	2H1	SANTA FE AV	27,050	24	649200
19	42	2H1	2ND ST	2,290	24	54960
20	42	2H2	ALAMEDA E/W	32,880	24	789120
21	42	2H2	HOLMES AV	1,100	24	26400
22	43	2H2	LONG BCH W.	9,440	24	226560
23	43	2H2	COMPTON AV	17,450	24	418800
24	43	2H3	HOOPER AV	12,190	24	292560
25	43	2H3	CENTRAL AV	23,890	24	573360
26	43	2H3	MC KINLEY AV	6,020	24	144480
27	43	2H3	PALOMA AV	930	24	22320
28	43	2H3	AVALON BL	23,540	24	564960
29	43	2H3	TOWNE AV	2,710	24	65040
30	43	2H3	SAN PEDRO ST	10,480	24	251520
31	43	2H3	S. MAIN ST	19,270	24	462480
32	43	2H3	S. BROADWAY	31,420	24	754080
33	43	2H3	FIGUEROA	34,400	24	825600
34	43	2H3	HOOVER ST	18,950	24	454800
35	43	2H3	VERMONT AV	31,160	24	747840
36	43	2H3	BUDLONG AV	5,880	24	141120
37	43	2H3	NORMANDIE AV	29,560	24	709440
38	43	2H3	DENKER AV	10,360	24	248640
39	43	-2H3	SLAUSON AV	39,860	24	956640
40	43	2H3	WESTERN AV	35,460	24	851040
41	43	2H3	VAN NESS	17,620	24	422880
42	43	2H3	4TH AV	3,620	24	86880
43	43	2H3	8TH AV	25,400	24	609600
44	43	2H3	11TH AV	2,960	24	71040
45	43	2H3	67TH ST	4,970	24	119280
46	43	2H3	CRENSHAW BL	35,080	24	841920
47	43	2H3	VICTORIA AV	1,140	24	27360
48	43	2H3	BRYNHURST AV	1,050	24	25200
49	43	2H3	CENTINELA	25,070	24	601680
50	43	2H3	LA BREA ST	34,110	24	818640
51	43	2H3	IVY AV	2,360	24	56640
52	43	2H3	EUCALYP. AV	14,810	24	355440
53	43	2H3	N. CEDAR	1,250	24	30000
54	43	2H3	OAK ST	2,290	24	54960
55	43	2H3	HYDE PK BL	4,940	24	118560
56	43	2H3	LA CIEN. BL	29,080	24	697920
57	43	2H3	HINDRY AV	4,580	24	109920
58	43	2H3	MANCH. AV	49,320	24	1183680
59	43	2H3	ARBOR V.	22,760	24	546240
60	43	2H3	104TH ST	15,480	24	371520
61	43	2H3	111TH ST	2,350	24	56400
62	43	2H3	IMPERIAL HWY	76,490	24	1835760
63	43	2H3	118TH ST	6,460	24	155040
64	43	2H3	120TH ST	2,610	24	62640
65	43	2H3	DOUGLAS ST	19,050	24	457200
66	1	2H3	COMPTON AV	24,260	24	582240
67	1	2H3	INGLEWOOD	38,690	24	928560
68	1	2H3	MANHATTAN BL	2,900	24	69600
69	1	2H3	159TH ST	770	24	18480
70	1	2H3	160TH ST	770	24	18480
71	1	2H3	161ST ST	770	24	18480
72	1	2H3	162ND ST	2,290	24	54960
73	1	2H3	170TH ST	2,290	24	54960
74	1	2H3	182ND ST	18,660	24	447840
75	1	2H3	TORRANCE BL	38,120	24	914880
76	1	2H3	SONOMA ST	1,850	24	44400
77	1	2H3	CARSON ST	37,120	24	890880
78	1	2H3	WASHINGTON AV	1,170	24	28080
79	1	2H3	ARLING. AV	21,520	24	516480
80	1	2H3	CABRIL AV	11,210	24	269040
81	1	2H3	BORDER AV	1,860	24	44640
82	1	2H3	SEPULVEDA	55,690	24	1336560
83	1	2H3	WESTERN AV	38,980	24	935520
84	1	2H3	S. FIGUEROA	13,800	24	331200
85	1	2H3	AVALON BL	18,760	24	450240
86	1	2H3	BROAD ST	1,640	24	39360
87	1	2H3	LAKME ST	2,240	24	53760
88	1	2H3	WILMIN. AV	16,640	24	399360
89	2	2H3	LOMITA	26,030	24	624720
90	3	2H3	PCH	43,620	24	1046880
			Total ADT x Trains/Day:			32,543,760

ATSF SAN BERNARDINO SUBDIV. – HOBART TO DT JUNCTION

INT No.	SEG	RR DES	GRADE X-ING STREET NAME	2020 ADT	TR	2020 ADT x TR PER DAY
1	36	2	PIONEER BLVD.	19,690	24	472560
2	36	2	PASSONS BLVD	16,340	24	392160
3	36	2	SERAPIS AVE	6,040	24	144960
			Total ADT x Trains/Day:			1,009,680

TOTAL ATSF ADT x TRAINS/DAY	33,553,440

SEG = RR Mainline Segment
RR DES = Railroad Mainline Branch No.
ADT = Average Daily Traffic Volume
TR = Trains per Segment

EXHIBIT: ATG1-2 ADT x TRAINS PER DAY "STATUS QUO 2020" – ATSF RAILWAY

UNION PACIFIC – GRADE X-INGS, ADT'S, TR, & ADT x TR PER PEAK DAY

INT. No	SEG	RR DES	GRADE X-ING STREET NAME	2020 ADT	TR	2020 ADT x TR PER DAY
			UNION PACIFIC – SAN PEDRO BRANCH EAST L.A. TO THENARD			
1	14	3A	26TH ST	6600	34	224400
2	14	3A	BANDINI BLVD	36700	34	1247800
3	14	3A	CHARTER ST	2800	34	95200
4	14	3A	EXCHANGE AV	4500	34	153000
5	14	3A	FRUITLAND BL	21400	34	727600
6	14	3A	SLAUSON AV	42900	34	1458600
7	14	3A	DISTRICT BLVD	23000	34	782000
8	14	3A	RANDOLPH ST	11800	34	401200
9	14	3A	GAGE AVE	32500	34	1105000
10	14	3A	BELL AVE	4200	34	142800
11	14	3A	FLORENCE AVE	62800	34	2135200
12	14	3A	OTIS ST	15800	34	537200
13	14	3A	SANTA ANA	11500	34	391000
14	14	3A	ARDINE ST	1500	34	51000
15	14	3A	ATLANTIC AVE	38200	34	1298800
16	14	3A	FIRESTONE BL	67000	34	2278000
17	14	3A	RAYO AVE	9200	34	312800
18	14	3A	SOUTHERN AVE	1500	34	51000
19	14	3A	IMPERIAL HWY	72800	34	2475200
20	14	3A	GARFIELD AV	19700	34	669800
21	14	3A	GARDNDALE AV	9400	34	319600
22	14	3A	MAIN ST	8400	34	285600
23	14	3A	CENTURY BL	4600	34	156400
24	14	3A	ROSECRANS AVE	37900	34	1288600
25	14	3A	COMPTON BL	21300	34	724200
26	14	3A	JEFFERSON AV	3500	34	119000
27	14	3A	ALONDRA BL	23900	34	812600
28	14	3A	JACKSON ST	12400	34	421600
29	14	3A	ARTESIA BL	23900	34	812600
30	14	3A	SOUTH ST	32600	34	1108400
31	14	3A	CANDLEWOOD	21300	34	724200
32	14	3A	CARSON ST	300	34	10200
33	14	3A	WARDLOW RD	17500	34	595000
			Total ADT x Trains/Day:			23,915,600
			UNION PACIFIC MAIN TRACKS EAST L.A. TO CITY OF INDUSTRY			
1	38	3	STIMSON	11500	34	391000
2	38	3	TURNBULL	12100	34	411400
3	38	3	7TH AVENUE	33400	34	1135600
4	38	3	WORKMAN MILL	21400	34	727600
5	38	3	MISSION	700	34	23800
6	38	3	ROSE HILLS	6900	34	234600
7	37	3	DURFEE	14600	34	496400
8	37	3	MONTEBELLO	14200	34	482800
9	37	3	GREENWOOD	12800	34	435200
10	37	3	MAPLE	10300	34	350200
11	37	3	VAIL	18100	34	615400
			Total ADT x Trains/Day:			5,304,000
			TOTAL UPRR ADT x TRAINS/DAY			29,219,600

SEG = RR Mainline Segment
RR DES = Railroad Mainline Branch No.
ADT = Average Daily Traffic Volume
TR = Trains per Segment

EXHIBIT: ATG1-3 ADT x TRAINS PER DAY "STATUS QUO 2020" – UPRR

CONSOLIDATED CORRIDOR – GRADE X–INGS, ADT'S, TR, & ADT x TRAINS PER PEAK DAY

INT No.	SEG	RR DES	GRADE X–ING STREET NAME	2020 ADT	TR	2020 ADT x TR PER DAY
			ALAMEDA CORRIDOR DRILL TRACK (SEE NOTE 1)			
1	28	BG1	25TH ST (FUTURE GRADE SEPARATION)	9980	10	99800
2	28	BG1	ALAMEDA E (FUTURE GRADE SEPARATION)	12210	10	122100
3	28	BG1	41ST ST (FUTURE GRADE SEPARATION)	15150	10	151500
4	28	BG1	VERNON AV (FUTURE GRADE SEPARATION)	22280	10	222800
5	28	BG1	51ST ST (FUTURE RR CROSSING CLOSURE)	790	10	7900
6	28	BG1	55TH ST (FUTURE RR CROSSING CLOSURE)	9380	10	93800
7	28	BG1	SLAUSON AV (FUTURE GRADE SEPARATION)	42800	10	428000
8	28	BG1	RANDOLPH ST (FUTURE RR CROSSING CLOSURE)	10290	10	102900
9	26	BG1	GAGE AVE (FUTURE GRADE SEPARATION)	26120	10	261200
10	26	BG1	FLORENCE AV (FUTURE GRADE SEPARATION)	51040	10	510400
11	26	BG1	NADEAU AV (FUTURE GRADE SEPARATION)	29370	10	293700
12	24	BG2	FIRESTONE (FUTURE GRADE SEPARATION)	41230	10	412300
13	24	BG2	SOUTHERN AV (FUTURE RR CROSSING CLOSURE)	12630	10	126300
14	24	BG2	TWEEDY BL (FUTURE GRADE SEPARATION)	16370	10	163700
15	24	BG2	M.L. KING (FUTURE RR CROSSING CLOSURE)	14510	10	145100
16	24	BG2	FERNWOOD AV (FUTURE RR CROSSING CLOSURE)	4270	10	42700
17	24	BG2	IMPERIAL HWY (FUTURE GRADE SEPARATION)	14820	10	148200
18	24	BG2	LYNWOOD AV (FUTURE RR CROSSING CLOSURE)	12820	10	128200
19	24	BG2	BUTLER ST (FUTURE RR CROSSING CLOSURE)	410	10	4100
20	24	BG2	WEBER AV (FUTURE GRADE SEPARATION)	3340	10	33400
21	24	BG2	EL SEGUNDO (FUTURE GRADE SEPARATION)	26750	10	267500
22	24	BG2	PINE ST (FUTURE RR CROSSING CLOSURE)	10970	10	109700
23	22	BG2	ROSECRANS (FUTURE GRADE SEPARATION BY OTHERS)	30250	10	302500
24	22	BG2	ELM ST (FUTURE RR CROSSING CLOSURE)	2300	10	23000
25	22	BG2	PALMER AV (FUTURE RR CROSSING CLOSURE)	4580	10	45800
26	22	BG2	COMPTON BL (FUTURE GRADE SEPARATION)	35190	10	351900
27	22	BG2	LAUREL ST (FUTURE RR CROSSING CLOSURE)	1530	10	15300
28	22	BG2	ALONDRA AV (FUTURE GRADE SEPARATION)	22100	10	221000
29	22	BG2	GREENLEAF (FUTURE GRADE SEPARATION)	15270	10	152700
30	21	BG3	DEL AMO BL (FUTURE GRADE SEPARATION BY OTHERS)	31990	10	319900
31	21	BG3	DOMINGUEZ (FUTURE RR CROSSING CLOSURE)	12680	10	126800
32	21	BG3	CARSON ST (FUTURE GRADE SEPARATION BY OTHERS)	14540	10	145400
33	19	BG3	SEPULVEDA (FUTURE GRADE SEPARATION)	26850	10	268500
34	6	BG3	PCH HWY (FUTURE GRADE SEPARATION)	50890	10	508900
			TOTAL ADT x TRAINS PER DAY ALTS 2.1A, 2.2, 2.3, 2.4, 3.0, 6.1, 6.2, 6.3, 6.4			6,357,000
			TOTAL ADT x TRAINS PER DAY ALTS 1.0, 5.0 (SEE NOTE 1)			0
			ATSF SAN BERNARDINO SUBDIV. – HOBART TO DT JUNCTION			
1	36	2	PIONEER BLVD	19690	24	472560
2	36	2	PASSONS BLVD	16340	24	392160
3	36	2	SERAPIS AVE	6040	24	144960
			TOTAL ADT x TRAINS PER DAY			1,009,680

NOTE 1: AT–GRADE DRILL TRACK X–INGS IN ALTS. 2.1A, 2.2, 2.3, 2.4, 3.0, 6.1, 6.2, 6.3, 6.4 ONLY. ALTS. 1.0, 5.0 HAVE NO AT–GRADE DRILL TRACK X–INGS.

EXHIBIT: ATG1 – 4 ADT x TRAINS PER DAY "CONSOLIDATED CORRIDOR 2020"

CONSOLIDATED CORRIDOR – GRADE X-INGS, ADT'S, TR, & ADT x TRAINS PER PEAK DAY

SPTC WEST LINE – PASADENA JCT. TO INDUSTRY

INT No.	SEG	RR DES	GRADE X-ING STREET NAME	2020 ADT	TR	2020 ADT x TR PER DAY
1	41	B	CALIFORNIA	8380	41	343580
2	41	B	SUNSET	24480	41	1003680
3	41	B	ORANGE	5550	41	227550
4	41	B	PUENTE	23070	41	945870
5	41	B	VINELAND	9190	41	376790
6	41	B	TEMPLE	27280	41	1118480
7	41	B	COGSWELL	8550	41	350550
8	41	B	PECK	47130	41	1932330
9	41	B	RAMONA	47330	41	1940530
10	41	B	CYPRESS	5660	41	232060
11	41	B	TYLER	18630	41	763830
12	39	B	ARDEN	18630	41	763830
13	39	B	BALDWIN	35550	41	1457550
14	39	B	TEMPLE CITY	30540	41	1252140
15	39	B	LOWER AZUSA	16790	41	688390
16	39	B	ENCINITA	7940	41	325540
17	39	B	WALNUT GROVE	6880	41	282080
18	39	B	SAN GABRIEL	46660	41	1913060
19	39	B	DEL MAR	20270	41	831070
20	39	B	MISSION	22160	41	908560
21	39	B	RAMONA	24200	41	992200
22	39	B	VALLEY	29780	41	1220980
23	39	B	BOCA	8860	41	363260
24	39	B	VINEBURN	3090	41	126690
25	39	B	SAN PABLO	12070	41	494870
TOTAL ADT x TRAINS PER DAY						20,855,470

UNION PACIFIC MAIN TRACKS EAST L.A. TO CITY OF INDUSTRY

INT No.	SEG	RR DES	GRADE X-ING STREET NAME	2020 ADT	TR	2020 ADT x TR PER DAY
1	38	3	STIMSON	11500	34	391000
2	38	3	TURNBULL	12100	34	411400
3	38	3	7TH AVENUE	33400	34	1135600
4	38	3	WORKMAN MILL	21400	34	727600
5	38	3	MISSION	700	34	23800
6	38	3	ROSE HILLS	6900	34	234600
7	37	3	DURFEE	14600	34	496400
8	37	3	MONTEBELLO	14200	34	482800
9	37	3	GREENWOOD	12800	34	435200
10	37	3	MAPLE	10300	34	350200
11	37	3	VAIL	18100	34	615400
TOTAL ADT x TRAINS PER DAY						5,304,000

TOTAL ADT x TRAINS PER DAY ALTS 2.1A, 2.2, 2.3, 2.4, 3.0, 6.1, 6.2, 6.3, 6.4	28,178,830
TOTAL ADT x TRAINS PER DAY ALTS 1.0, 5.0 (SEE NOTE 1)	27,169,150

SEG = RR Mainline Segment
RR DESG = Railroad Mainline Branch No.
ADT = Average Daily Traffic Volume
TR = Trains per Day

EXHIBIT: ATG1 – 4 ADT x TRAINS PER DAY "CONSOLIDATED CORRIDOR 2020"

	STATUS QUO ADT x TR/DAY	CORRIDOR ADT x TR/DAY	REDUCTION IN ADT x TR/DAY CORRIDOR v. STATUS QUO
SOUTHERN PACIFIC			
PASADENA JCT TO J-YARD (UPRR)	689400	0	689400
WILMINGTON BRANCH	5269300	0	5269300
SAN PEDRO BRANCH	15477700	0	15477700
LA HABRA BRANCH	6787520	0	6787520
PUENTE/SANTA ANA BRANCH	7320200	0	7320200
WEST LINE (PASADENA TO BARTOLO JCT.)	6104040	20855470	−14751430 *INCREASE IN ADTxTR/DAY
BARTOLO TO INDUSTRY (UPRR)	2992430	0	2992430
UNION PACIFIC			
SAN PEDRO BRANCH	23915600	0	23915600
EAST L.A. TO INDUSTRY	5304000	5304000	0
ACTHISON, TOPEKA AND SANTA FE			
HARBOR SUBDIVISION	32543760	0	32543760
HOBART TO DT JUNCTION	1009680	1009680	0
CONSOLIDATED CORRIDOR			
PORTS TO DOWNTOWN CONNECTIONS			
ALTS. 1.0, 5.0	N/A	0	
ALTS. 2.1A, 2.2, 2.3, 2.4, 3.0, 6.1, 6.2, 6.3, 6.4	N/A	6357000	
TOTAL ADT x TRAINS PER DAY	107413630		
ALTS. 1.0, 5.0		27169150	80244480
ALTS. 2.1A, 2.2, 2.3, 2.4, 3.0, 6.1, 6.2, 6.3, 6.4		33526150	73887480

REDUCTION IN ADT x TRAINS PER DAY, ALTS. 1.0, 5.0 v. STATUS QUO	80,244,480
REDUCTION IN ADT x TRAINS PER DAY, ALTS. 2.1A, 2.2, 2.3, 2.4, 3.0, 6.1, 6.2, 6.3, 6.4 v. STATUS QUO	73,887,480

EXHIBIT ATG1 – 5: REDUCTION ADT x TRAINS PER DAY SUMMARY, CORRIDOR v. STATUS QUO, YEAR 2020

PREPARED BY:
DMJM/MN-WJM
DATE: 9/09/91
REV: 10/2/91

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Safety/Security Goal No. 2 - Improve Safety for Pedestrians

INTRODUCTION:

This memorandum presents a comparative evaluation of Alameda Corridor alternatives relative to their ability to provide an Improvement of Safety for Pedestrians from railroad operations. This information is intended to be incorporated into a larger matrix that compares alternatives to improve Alameda Street Corridor for both rail and vehicular traffic.
The measurement criteria used to quantify pedestrian safety is the Reduction in Trains per Day x Grade Crossings.

METHODOLOGY:

Significant railroad hazards to pedestrians result from exposure at At-Grade crossings. Even with crossings fully protected with gates and flashers (as proposed for the Corridor and recommended by the California Public Utilities Commission) pedestrians and motorists will chose to ignore the warning and walk into the path of an oncoming train.

A quantitative comparison of the alternatives can be made by tabulating the number of grade crossings and multiplying by the number of trains expected to operate over those crossings. In order to quantify the effects on rail lines beyond the Corridor this criteria was tabulated for grade crossings from the Ports to the City of Industry (SPTC, UPRR) or D.T. Junction (ATSF). This tabulation is presented in Table SS2 - 1. It should be noted that there are no At-Grade crossings of Corridor main track in any of the Alternatives, however the Depressed Alternatives include an at-grade drill track which is included in the tabulations. It is this tabulation that is carried over into the Matrix Evaluation of the Alternatives.

CONCLUSIONS:

From Table SS2 - 1 it can be seen that Alternatives 1.0 and 5.0, the At-Grade Trainway present the least pedestrian exposure to At-Grade crossing hazards. The reasoning behind this is because the pedestrians will be encouraged to use the overcrossing structures to traverse Alameda. This travel path would be encouraged in areas where continuous sound walls would be constructed along the trainway. This tabulation is carried over into the Matrix Evaluation of Alternatives.

GENERAL OBSERVATIONS:

The results of consolidating trains onto the Corridor trainway can have the effect of consolidating the "potential of pedestrian hazard" also. This in turn would automatically reduce the hazard exposure on the routes from which rail traffic was diverted. The effect of consolidating the trains and protecting the pedestrians with continuous fences and grade separations will largely eliminate pedestrian exposure to the Corridor trainway.

The Depressed Trainway should be less of an "attractive nuisance" to pedestrians attempting to cross Alameda. The Depressed Trainway will provide readily available crossings over the trainway at nearly all existing grade crossings. Also, pedestrian crossings over the Trainway can be readily installed where desirable. It will also be considerably difficult to get in and out of the Depressed Trainway. However, pedestrians may attempt to cross on utility bridges or spandrels. These facilities would be designed with property safeguards.

In that is an interesting and unusual structure, the Depressed Trainway may be more of an "attractive nuisance" to vandals and vagrants, particularly at the maintenance of way access ramps. This potential problem can be minimized by sufficient security patrols, lighting, and locked gates at the ramps.

Although it involves fewer grade crossings, the At-Grade Trainway Alternative is somewhat less amenable to the needs of pedestrians along Alameda. To utilize the over or under-pass structures, pedestrians will walk considerably out of their way east or west of Alameda St. Furthermore separate pedestrian crossings will necessitate large structures to be constructed involving stairs or long ramps along Alameda St.

Recent local experience on the Metro-Rail Blue Line is that the first year saw frequent, sometimes daily, cutting of the steel picket fence. The SCRTD followed a policy of A.S.A.P. repair of damaged fence panels. Recently vandalism of the fence has fallen to almost zero.

PEDESTRIAN EXPOSURE TO AT-GRADE CROSSING HAZARDS - CROSSINGS X TRAINS PER DAY

SEGMENT	GRADE X - INGS	TRAINS PER DAY	HAZARD EXPOSURE	REDUCTION IN HAZARD PROJECT v. STATUS QUO
<u>SOUTHERN PACIFIC</u>				
PASADENA JCT. TO J YARD				
STATUS QUO	3	10	30	
PROJECT	0	41	0	30
WILMINGTON BRANCH				
STATUS QUO	35	23	320	
PROJECT	35	0	0	320
SAN PEDRO BRANCH				
STATUS QUO	31	41	605	
PROJECT	0	41	0	605
LA HABRA BRANCH				
STATUS QUO	32	16	512	
PROJECT	32	0	0	512
PUENTE/SANTA ANA BR's				
STATUS QUO	26	15	390	
PROJECT	26	0	0	390
WEST LINE				
STATUS QUO	25	12	300	
PROJECT	25	41	1025	−725
BARTOLO JCT TO INDUSTRY				
STATUS QUO	6	31	186	
PROJECT	6	41	246	−60
<u>UNION PACIFIC</u>				
SAN PEDRO BRANCH				
STATUS QUO	32	34	1088	
PROJECT	32	0	0	1088
EAST L.A. TO INDUSTRY				
STATUS QUO	11	34	374	
PROJECT	11	34	374	0
<u>AT & SF RY.</u>				
HARBOR SUBDIVISION				
STATUS QUO	90	24	2160	
PROJECT	90	0	0	2160
HOBART TO DT JUNCTION				
STATUS QUO	3	24	72	
PROJECT	3	24	72	0
TOTAL STATUS QUO	294	99	5663	
TOTAL PROJECT (MAINLINE)	260	99	1717	<u>3946</u>
<u>CONSOLIDATED CORRIDOR</u>				REDUCTION INCLUDING DRILL TRACK
ALT. 1.0, 5.0				
MAIN TRACK	0	99	0	
DRILL TRACK	0	8	0	<u>3946</u>
ALT. 2.1, 3.0, 6.1				
MAIN TRACK	0	99	0	
DRILL TRACK	21	8	124	<u>3822</u>
ALT. 2.2, 6.2				
MAIN TRACK	0	99	0	
DRILL TRACK	21	8	124	<u>3822</u>
ALT. 2.3, 6.3				
MAIN TRACK	0	99	0	
DRILL TRACK	17	8	104	<u>3842</u>
ALT. 2.4, 6.4				
MAIN TRACK	0	99	0	
DRILL TRACK	10	8	80	<u>3866</u>

TABLE SS2 - 1 PEDESTRIAN EXPOSURE TO AT-GRADE CROSSING HAZARDS

PREPARED BY:
DMJM/M&N - WJM
DATE: 9/26/91
REV:10/2/91

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Railroad Goal No. 1 - Improve Railroad Operating Efficiency and Flexibility

INTRODUCTION:

This memorandum presents a comparative evaluation of Alameda Corridor alternatives relative to railroad efficiency. This information is intended to be incorporated into a larger matrix that compares alternatives to improve Alameda Street Corridor for both rail and vehicular traffic.

The measurement used to quantify efficiency includes a tabulation of physical characteristics affecting route efficiency as follows: length of line, quantity of special trackwork, total curvature, total rise and fall, maximum gradients, quantity of at-grade RR crossings. Flexibility is measured by the number of route between two points and is also included in this tabulation.

METHODOLOGY:

An important project goal is the improvement of the overall rail operations in the study area. The improvement in overall operating efficiency of the Corridor network over the Status Quo network has been modelled by computer simulation[1]. The quantifying by computer simulation operating efficiency accounts for such factors as train and ship arrivals, dispatching efficiency and priorities, loading and unloading times, probabilities of equipment failure and the impacts of passenger trains receiving track priority. All of the rail alternatives are very similar and satisfy the general operational rail network requirements stipulated in and verified by the computer simulations. Also, the actual procedures and practices of train operations that will be instituted by the railroads are beyond the scope of this project, and therefore cannot be included in determining the efficiency of any Alternative. In order to quantitatively compare the rail alternatives a detailed tabulation of the <u>physical</u> features of the alternatives representing Route Efficiency was prepared. This tabulation is presented by Segment (note: no railroad work in Segment A) in Tables RR1 -1 and 2.

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[1] <u>Railroad Capacity and Operation Analysis, Alameda Consolidated Transportation Corridor Project -</u> Leachman and Associates, 1991.

The short length of the corridor and the similarity of alternatives result in only minor differences when they are compared using conventional railroad quantitative parameters. The following measures of the physical characteristics of a railroad have been tabulated in order to define and compare the Route Efficiency of each alternative.

Length of Line:

Operating times tend to increase over a longer line. Construction and maintenance of way (M/W) cost will vary directly with length, i.e. more track to build and maintain.

Special Trackwork

Turnouts and at-grade crossing frogs are very expensive to install and maintain as compared to typical straight track. Also, special trackwork present a somewhat greater potential for operating inefficiencies as compared to typical track. In addition to the added construction and maintenance expense of the special trackwork required, at-grade crossings will tend to lower efficiency in that one train must wait for the other. It is assumed that Corridor traffic will be given priority in any crossing conflicts with other freight movements.

Total Curvature:

The total degree of curvature is a traditional measure of line "quality". Curves limit operating speeds and require somewhat increased maintenance. The impact of curves increases with degree or sharpness of the curve. The sharper curves also incur an increased potential for operating inefficiencies.

Total Rise and Fall

Total rise and fall is the sum of the differences between all summits and sags of a line. It is another traditional measurement of line quality. Its greatest effect is on operating and equipment cost, with minor impact on M/W cost. Note: the costs of the Depressed Trainway structure itself are compared elsewhere to costs of grade separation structures.

Maximum Gradients (Grades)

Greater gradient tends to increase operating costs, and to some degree M/W costs. lower construction cost.

Flexibility

Flexibility is defined as the number of routes available between two points. In the case of this study it is desirable to maintain and enhance, if possible, existing connections to the other rail lines in the area in order to maintain operational capacity should the Corridor incur an extended delay or maintenance operation. All alternatives maintain connections to the existing lines, and enhance overall access to the Ports. However, the Depressed Trainway Alternatives, 2.1, 2.2, 3.0, 6.1, and 6.2 which require the SPTC Santa Ana Branch to be connected to the Drill Track without access to the main track until the Artesia Fwy. are least flexible (subjective score 3). Depressed Alternatives 2.3 and 6.3, which require that the Santa Ana Branch be connected to the Drill Track but allows access to the Corridor Main tracks north of Rosecrans Ave. are somewhat more flexible and are given a subjective score of 4. All other alternatives (1.0, 2.4, 5.0 and 6.4) are equally more flexible (subjective score 5). Note, Depressed Alternatives 2.4 and 6.4 are At-Grade at Firestone Blvd. and therefore allows the Santa Ana Branch the same access to Corridor Main Tracks as the At Grade Alternatives.

Alternatives Comparison

For the purposes of comparison, each characteristic of each Alternative was measured or subjectively ranked, as appropriate. These values where then normalized for each criteria and summed for each Alternative. These sums were then normalized and compared to determine the most desirable Alternative. Refer to Tables RR1 - 1 and RR1-2.

CONCLUSIONS:

By comparing the tabulation presented in TABLE RR1 - 1, it can be seen that from a railroad perspective all alternatives are very similar. However, it can be concluded that Alternatives 1.0 and 5.0, the At-Grade Trainway is the most desirable and Alternatives 2.2 and 6.2, which involve the Depressed Wilmington Diversion are the least.

ITEM	AT-GRADE 1.0, 5.0		DEPRESSED 2.1, 3.0, 6.1		WILMINGTON DIV. 2.2, 6.2		DEPRESSED 2.3, 6.3		DEPRESSED 2.4, 6.4	
	ACTUAL	REL. RANK	ACTUAL	REL. RANK	ACTUAL	REL. RANK	ACTUAL	REL. RANK	ACTUAL	REL. RANK
LENGTH	19.14 MILES	1.00	19.14 MILES	1.00	19.55 MILES	0.98	19.14 MILES	1.00	19.14 MILES	1.00
SPECIAL TRACKWORK	58 EACH	1.00	58 EACH	1.00	58 EACH	1.00	58 EACH	1.00	58 EACH	1.00
TOTAL CURVATURE	380 DEGS	1.00	380 DEGS	1.00	507 DEGS	0.75	380 DEGS	1.00	380 DEGS	1.00
TOTAL RISE AND FALL	262 FEET	1.00	322 FEET	0.81	322 FEET	0.81	322 FEET	0.81	322 FEET	0.81
MAXIMUM GRADE	1.5 %	1.00	1.5 %	1.00	1.5 %	1.00	1.5 %	1.00	1.5 %	1.00
FLEXIBILITY RATING	5	1.00	3	0.60	3	0.60	4	0.80	5	1.00
EVALUATION		6.00		5.41		5.14		5.61		5.81
NORMALIZED EVALUATION		1.00		0.90		0.86		0.94		0.97

TABLE RR1 – 1: RAILROAD ROUTE EFFICENCY TABULATION – SUMMARY B, C, & D

ITEM	AT-GRADE 1.0, 5.0		DEPRESSED 2.1, 3.0, 6.1		WILMINGTON DIV. 2.2, 6.2		DEPRESSED 2.3, 6.3		DEPRESSED 2.4, 6.4	
	ACTUAL	REL. RANK	ACTUAL	REL. RANK	ACTUAL	REL. RANK	ACTUAL	REL. RANK	ACTUAL	REL. RANK
LENGTH	5.59 MILES	1.00	5.59 MILES	1.00	6 MILES	0.93	5.59 MILES	1.00	5.59 MILES	1.00
SPECIAL TRACKWORK	8 EACH	1.00	8 EACH	1.00	8 EACH	1.00	8 EACH	1.00	8 EACH	1.00
TOTAL CURVATURE	90 DEGS	1.00	90 DEGS	1.00	217 DEGS	0.41	90 DEGS	1.00	90 DEGS	1.00
TOTAL RISE AND FALL	110 FEET	1.00	140 FEET	0.79	140 FEET	0.79	140 FEET	0.79	170 FEET	0.65
MAXIMUM GRADE	0.6 %	1.00	1 %	0.60	1 %	0.60	1 %	0.60	1 %	0.60
FLEXIBILITY	3	1.00	1	0.33	1	0.33	2	0.67	3	1.00
EVALUATION		6.00		4.72		4.07		5.05		5.25
NORMALIZED EVALUATION		1.00		0.79		0.68		0.84		0.87

TABLE RR1 – 1: RAILROAD ROUTE EFFICIENCY TABULATION – SEGMENT B

ITEM	AT-GRADE 1.0, 5.0		DEPRESSED 2.1, 3.0, 6.1		WILMINGTON DIV. 2.2, 6.2		DEPRESSED 2.3, 6.3		DEPRESSED 2.4, 6.4	
	ACTUAL	REL. RANK	ACTUAL	REL. RANK	ACTUAL	REL. RANK	ACTUAL	REL. RANK	ACTUAL	REL. RANK
LENGTH	5.83 MILES	1.00	5.83 MILES	1.00	5.83 MILES	1.00	5.83 MILES	1.00	5.83 MILES	1.00
SPECIAL TRACKWORK	14 EACH	1.00	14 EACH	1.00	14 EACH	1.00	14 EACH	1.00	14 EACH	1.00
TOTAL CURVATURE	25 DEGS	1.00	25 DEGS	1.00	25 DEGS	1.00	25 DEGS	1.00	25 DEGS	1.00
TOTAL RISE AND FALL	55 FEET	1.00	85 FEET	0.65	85 FEET	0.65	85 FEET	0.65	55 FEET	1.00
MAXIMUM GRADE	0.4 %	1.00	1 %	0.40	1 %	0.40	1 %	0.40	0.4 %	1.00
FLEXIBILITY	1	1.00	1	1.00	1	1.00	1	1.00	1	1.00
EVALUATION		6.00		5.05		5.05		5.05		6.00
NORMALIZED EVALUATION		1.00		0.84		0.84		0.84		1.00

TABLE RR1 – 1: RAILROAD ROUTE EFFICENCY TABULATION – SEGMENT C

ITEM	AT-GRADE 1.0, 5.0		DEPRESSED 2.1, 3.0, 6.1		WILMINGTON DIV. 2.2, 6.2		DEPRESSED 2.3, 6.3		DEPRESSED 2.4, 6.4	
	ACTUAL	REL. RANK	ACTUAL	REL. RANK	ACTUAL	REL. RANK	ACTUAL	REL. RANK	ACTUAL	REL. RANK
LENGTH	7.72 MILES	1.00	7.72 MILES	1.00	7.72 MILES	1.00	7.72 MILES	1.00	7.72 MILES	1.00
SPECIAL TRACKWORK	36 EACH	1.00	36 EACH	1.00	36 EACH	1.00	36 EACH	1.00	36 EACH	1.00
TOTAL CURVATURE	265 DEGS	1.00	265 DEGS	1.00	265 DEGS	1.00	265 DEGS	1.00	265 DEGS	1.00
TOTAL RISE AND FALL	97 FEET	1.00	97 FEET	1.00	97 FEET	1.00	97 FEET	1.00	97 FEET	1.00
MAXIMUM GRADE	1.5 %	1.00	1.5 %	1.00	1.5 %	1.00	1.5 %	1.00	1.5 %	1.00
FLEXIBILITY	1	1.00	1	1.00	1	1.00	1	1.00	1	1.00
EVALUATION		6.00		6.00		6.00		6.00		6.00
NORMALIZED EVALUATION		1.00		1.00		1.00		1.00		1.00

TABLE RR1 – 1: RAILROAD ROUTE EFFICIENCY TABULATION – SEGMENT D

PREPARED BY:
MFA - GLP
DATE: August 27, 1991
REVISED: September 26, 1991

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Environmental Goal No. 2 - Minimize Projected Air Pollution

Introduction

This memorandum presents a comparative evaluation of Alameda Corridor alternatives in light of air quality and energy consumption. This information is intended to be incorporated into a larger evaluation matrix that compares alternatives to improve the Alameda Street corridor for both freight rail and vehicular traffic in terms of a number of goals that were established at the outset of the project. The criterion by which air pollution was to be evaluated was tons/day of criteria pollutants.

Methodology

Estimates of daily criteria pollutant production were developed by applying emission factors to daily estimates of vehicle miles of travel (VMT) for each of four alternatives: (1) existing (1990), (2) null (year 2020), (3) a six-lane at-grade facility for both rail and vehicles (2020), (3) a 4-lane at grade roadway facility with an at-grade railroad facility, and (5) an alternative with six vehicular travel lanes and railroad in trench. The VMT estimates that were used in this exercise were taken from previous travel modeling that had been conducted by DKS Associates. In this previous work, the modeling alternatives were referred to as A, B, C, D and E, respectively, and therefore these references are also used in this memo.

In the modeling work that was previously done, estimates were provided for daily vehicular travel by trucks and all vehicles in a study area bounded by I-110 on the west, I-710 on the east, I-10 on the north, and the Ports on the south. Using this information, daily auto travel was derived as the remainder of total vehicle miles of travel minus truck travel. Moreover, the estimates were developed for three facility types; freeway, arterials in the study area, and Alameda Street itself. The modeling work also estimated a surrogate for speed by dividing total daily miles of travel by total daily hours of travel, also by the three facility types. This information is shown in Table 1.

To the information shown in Table 1 were applied emission factors for the following pollutants: carbon monoxide, reactive organic gases, nitrogen oxides, particulates, and sulfur oxides. All but sulfur oxides are produced by both autos and trucks. Sulfur oxide production by autos is negligible. The emission factors (see Table 2) were taken from Air Quality Handbook for Preparing EIRs, South Coast Air Quality Management District, 1987. The emission factors are expressed in grams per mile. For automobiles, they vary by speed, and they are available for

1990 and for a number of intervening years up to 2002. They are not published by the SCAQMD for years beyond 2002, and therefore the 2002 factors were used for the future year of 2020 in the comparison among alternatives. This would tend to overstate the effects uniformly for all alternatives. For trucks, diesel engine emission factors were used. These are not published for any year beyond 1987, and they do not vary by speed. Diesel rail locomotive emissions were not included in the analysis because they would be equal for all alternatives. The effects associated with vehicular delays at railroad crossings were also not included. These emissions will be addressed in the project environmental document as will emissions associated with locomotive operation. The equation used to estimate emissions was as follows:

$$\text{Emissions} = \text{VMT (by vehicle \& roadway type)} \times \text{emission factor}$$

Table 3 shows the results of the analysis, for each of the modeled alternatives, by each pollutant type. Also provided in the table is a summation across all pollutants. In reality this has little meaning, but it is here used as a simple indicator of the total quantity of pollutants generated under each of the alternatives.

Table 4 presents a summary of total pollutant burden for the alternatives being considered for the corridor. Alternatives 2.2, 2.3, and 2.4 were judged to be sufficiently similar to Alternative 2.1 such that the numerical values obtained for Alternative 2.1 would apply. Alternative 6.1, 6.2, 6.3, and 6.4 are the same as Alternatives 2.1 through 2.4, except that four lanes of highway are provided instead of six. Pollutant levels for these alternatives were calculated by applying the ratio of pollutant burden for Alternative 5 divided by pollutant burden for Alternative 1 to the calculated value for Alternatives 2.1 through 2.4.

General Observations

- o All alternatives result in an increase in pollutants produced in the study area, as compared with the present due to substantial increases in travel. Improvements in internal combustion engine emissions characteristics over time are not sufficient to overcome the effects of increased travel.

- o None of the alternatives can be differentiated by level of pollutants generated. Each performs nearly the same as all others.

- o All of the project alternatives improve operating conditions within the corridor and study area to the extent that they attract trips to the study area that otherwise would not occur under the Null alternative. This results in small increases in emissions as compared to the Null Alternative, because they are directly linked to trip making.

TABLE 1 DAILY STUDY AREA VMT & DERIVED SPEEDS					
	ALTERNATIVES				
	A (Existing)	B (NULL)	C (Alt. 1)	D (Alt. 5)	E (Alt. 2.1)
Daily VMT					
Trucks					
• Freeway	1,040,937	1,962,567	1,952,415	1,972,281	1,947,683
• Arterials	496,422	734,710	723,793	759,341	726,842
• Alameda	29,364	90,660	144,333	117,092	144,158
• Total	1,566,723	2,787,937	2,820,541	2,848,714	2,818,633
Autos					
• Freeway	12,191,775	15,385,573	5,255,287	15,318,127	15,246,205
• Arterials	9,072,516	10,822,891	10,737,881	11,620,440	10,730,476
• Alameda	268,319	559,920	877,729	705,426	805,137
• Total	21,532,610	26,768,384	26,870,897	27,643,993	26,781,818
Derived Speed (VMT/VHT)					
Freeway	28	20	20	20	20
Arterials	21	13	13	14	13
Alameda	24	21	21	21	21

Source: DKS Associates, 1991.

TABLE 2
CRITERIA POLLUTANT EMISSION FACTORS
(Grams Per Mile)

Composite Factors[1] Year	Speed (mph)	Carbon Monoxide (CO)	Reactive Organic Gases (ROG)	Nitrogen Oxides (NO_x)	Particulates	Sulfur Oxides (SO_x)
1990	20	12.40	0.97	1.48	.308	Negligible
	25	9.87	0.78	1.42	.308	
	30	8.00	0.64	1.40	.308	
2002	15	9.20	0.71	1.23	.268	
	20	7.27	0.57	1.14	.268	
Heavy Duty [2] Diesel		8.37	2.93	17.20	3.3	3.2

Source: South Coast Air Quality Management District, Air Quality Handbook for Preparing EIRs, April 1987.

Footnote:
[1] EMFAC 7C composite fleet factors were taken from Appendix D. Emission factors were not published for years beyond 2002.
[2] EMFAC 7C diesel truck emission factors were taken from Appendix L. Diesel factors not published by speed.

TABLE 3
ESTIMATED EMISSIONS (TONS/DAY)

		POLLUTANT					
Alternative	Component	CO	ROG	NO_x	Part	SO_x	Total Burden
	Trucks	14.4	5.0	29.6	5.7	5.5	
	Autos						
A	• Freeway	107.3	8.6	18.8	4.1		
(Existing)	• Arterials	123.7	9.7	14.8	3.1		
	• Alameda	2.9	0.2	0.4	0.1		
	TOTAL	248.3	23.5	63.6	13.0	5.5	353.9
	Trucks	25.7	9.0	52.7	10.1	9.8	
	Autos						
B	• Freeway	123.0	9.6	19.3	4.5		
(NULL)	• Arterials	109.5	8.4	14.6	3.2		
	• Alameda	4.5	0.4	0.7	0.2		
	TOTAL	262.7	27.4	87.3	18.0	9.8	405.2
	Trucks	26.0	9.1	53.4	10.2	9.9	
	Autos						
C	• Freeway	122.0	9.6	19.1	4.5		
(Alt. 1)	• Arterials	108.7	8.4	14.5	3.2		
	• Alameda	7.0	0.6	1.1	0.3		
	TOTAL	263.7	27.7	88.1	18.2	9.9	407.6
	Trucks	26.2	9.2	53.9	10.3	10.0	
	Autos						
D	• Freeway	122.5	9.6	19.2	4.5		
(Alt. 5)	• Arterials	117.6	8.3	15.7	3.2		
	• Alameda	5.6	0.4	0.9	0.2		
	TOTAL	271.9	27.5	89.7	18.2	10.0	417.3
	Trucks	25.9	9.1	53.3	10.2	9.9	
	Autos						
E	• Freeway	121.9	9.6	19.1	4.5		
(Alt. 2.1)	• Arterials	108.6	8.4	14.5	3.2		
	• Alameda	6.4	0.5	1.0	0.2		
	TOTAL	262.8	27.6	87.9	18.1	9.8	406.3

Source: Myra L. Frank & Associates, Inc., 1991.

TABLE 4 ESTIMATED TOTAL POLLUTANT BURDEN (TONS/DAY)	
ALTERNATIVE	TOTAL BURDEN
1	407.6
2.1	406.3
2.2	406.3
2.3	406.3
2.4	406.3
3	406.3
5	417.3
6.1	416.0
6.2	416.0
6.3	416.0
6.4	416.0
Source: Myra L. Frank & Associates, Inc., 1991.	

PREPARED BY:
MFA - GLP
DATE: August 27, 1991
REVISED: September 26, 1991

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Environmental Goal No. 3 - Reduce Energy Consumption

Introduction

This memorandum presents a comparative evaluation of Alameda Corridor alternatives in light of energy consumption. This information is intended to be incorporated into a larger evaluation matrix that compares alternatives to improve the Alameda Street corridor for both freight rail and vehicular traffic in terms of a number of goals that were established at the outset of the project. The criterion by which energy consumption was to be measured was gallons/day of diesel fuel and gasoline consumed.

Methodology

Energy consumption was estimated for several modeling alternatives that were developed by DKS Associates. Vehicle miles of travel, from previously prepared estimates, were divided by fuel economy rates, resulting in estimates of truck diesel fuel and auto gasoline consumption per day. The fuel economy rates were taken from a 1984 study prepared by the Southern California Association of Governments for the Long Beach-Los Angeles Rail Transit Project, which provided fuel economy rates for the years 1984 and 2010. These rates were assumed to yield reasonable results for the Alameda corridor analysis, for the years 1990 and 2020. The results of the analysis are displayed in Table 1.

For alternatives that were not modeled, the results shown in Table 1 were factored to generate estimates for the remaining alternatives. Alternatives 2.2. through 3 were judged to be sufficiently similar to Alternative 2.1 that the estimates for Alternative 2.1 would apply. Estimates for Alternatives 6.1 through 6.4 were obtained by applying the ratio of fuel consumption for Alternative 5 divided by the results of Alternative 1 to the estimates for Alternatives 2.1 through 2.4. The results are shown in Table 2.

General Observations

- o Owing to improvements in automobile fuel economy, a 25% decrease in study area fuel consumption can be expected between the present and any of the future year alternatives. This occurs despite an estimated increase in truck travel of 34% and auto travel of 14%.

- o The variance among the alternatives, including the Null Allternative, is so slight as to not meaningfully distinguish among them. All alternatives are regarded as equal for purposes of this analysis. It is not anticipated that the detailed analysis to be conducted for the environmental document would change this finding.

TABLE 1 ENERGY CALCULATIONS					
Alternative	A (Existing)	B (NULL)	C (Alt. 1)	D (Alt. 5)	E (Alt. 2.1)
Truck VMT	1,566,723	2,787,937	2,820,541	21,848,714	2,818,633
Truck Fuel Econ. (mpg.)	5.2	5.2	5.2	5.2	5.2
Gallons Diesel	301,293	536,142	542,412	547,830	542,045
Auto VMT	21,532,610	26,768,384	26,870,897	27,643,993	26,781,818
Auto Fuel Econ. (mpg.)	13.9	24.0	24.0	24.0	24.0
Gallons Gasoline	1,549,109	1,115,349	1,119,621	1,151,833	1,115,909
TOTAL GALLONS	1,850,402	1,651,491	1,662,033	1,699,663	1,657,954

Source: Myra L. Frank & Associates, Inc., 1991.

TABLE 2 SUMMARY OF ENERGY ESTIMATES (Gallons Per Day)	
ALTERNATIVE	FUEL CONSUMPTION
1	1,662
2.1	1,658
2.2	1,658
2.3	1,658
2.4	1,658
3	1,658
5	1,700
6.1	1,696
6.2	1,696
6.3	1,696
6.4	1,696

Source: Myra L. Frank & Associates, Inc., 1991.

PREPARED BY:
MFA-GLP
DATE: August 27, 1991
REVISED: September 26, 1991

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Environmental Goal No. 6 - Aesthetics

Introduction

This memorandum presents a comparative evaluation of Alameda Corridor alternatives in light of aesthetics. This information is intended to be incorporated into a larger evaluation matrix that compares alternatives to improve the Alameda Street corridor for both freight rail and vehicular traffic in terms of a number of goals that were established at the outset of the project. A subjective rating was identified as the criterion by which aesthetics would be measured.

Methodology

The aesthetic effects of proposed corridor improvements relate to the physical presence of above-ground structures constructed as part of the project and also as a result of daily railroad operations along the corridor. Consequently, these two components were selected as focal points for the analysis.

At-Grade Railroad Exposure

Once the project is in operation, it will facilitate the daily movements of up to 90 trains, each of which could be several thousand feet in length. The presence of this level of freight traffic would result in a frequent inability to see across Alameda Street, if the trains were to be operating at grade. This could be viewed as an adverse visual effect and it is amenable to measurement. The number of miles of at-grade railroad operations permitted under each of the alternatives was used as the means by which this would be assessed.

As was noted in the Introduction, a subjective rating was established as the means by which aesthetics would be addressed for the alternatives analysis. In order to translate the number of at-grade railroad miles into a ranking mechanism, a scoring system was devised in which a raw score of between 1 and 5 was assigned to each alternative in each segment. A score of 5 was selected to represent "best" and a score of 1 was selected to represent "worst". The score assigned to each alternative was determined by taking into account both the amount of at-grade railroad exposure and the visual sensitivity of the segment in question. Some segments have very little residential or other uses which are normally considered sensitive to issues such as aesthetics. Segment A, for example, contains no residential uses adjacent or in close proximity to the corridor. Segment D has approximately 10% of its nearby land use in residential use. The same is true for the Alameda Street portion of Segment B. The Long Beach Avenue portion of Segment B has approximately one-half of its surrounding use as residential and Segment C has about 40% residential uses in proximity. These two portions would therefore be the most sensitive of all study areas. Using the length of at-grade railroad facility while at the same time considering the proportion of nearby sensitive use yielded a score for each alternative.

In order to assess the desirability of each alternative in its entirety, the scores for each segment were summed to yield a total raw score, which was then normalized to the 1 to 5 score system devised at the outset. Table 1 presents the results of this step in the analysis.

Grade Separations

In a fashion similar to that used for the railroad exposure analysis, an assessment was made of the degree to which above-ground project structures would be present under the project alternatives. The number of above-grade east-west grade separations were determined for each alternative and tabulated. Once again, taking into account the relative sensitivity of the specific segment in question, scores were assigned to each segment. And as in the above analysis, the scores were summed and normalized. Table 2 presents the results of this step in the analysis.

Combined Ratings

In order to account for both railroad exposure and above-grade structures, the scores for each were added by segment, totaled, and normalized. The results are presented in Table 3.

General Observations

- Alternatives 1 and 5 are least attractive throughout the project area, because it has the greatest amount of at-grade railroad exposure and the most above-ground grade separation structures. This alternative was rated particularly low in project segments B and C.

- Alternatives 2.4 and 6.4 did not score as high as other alternatives in Segment B and as low as Alternatives 1 and 5 in Segment C. As a result, these two alternatives scored second best overall. This alternative provides for nearly all of Segment B in a depressed configuration, and it would eliminate four above-grade structures proposed by Alternative 1, which makes it more desirable in that portion of the corridor.

- All remaining alternatives are comparable to one another, both in terms of at-grade railroad exposure and the presence of above-ground grade separations. All remaining alternatives would appear to be substantially superior to Alternatives 1 and 5.

- Alternatives 2.2 and 6.2 in Segment B do not show differences when compared with most other alternatives, because no at-grade railroad or above-grade roadway structures are proposed. Segment B under this alternative contains a high proportion of adjacent residential land use and therefore if an at-grade rail facility were to be proposed here, a substantial adverse effect could be expected.

TABLE 1
ALAMEDA CORRIDOR TRANSPORTATION PROJECT
ALTERNATIVE EVALUATION: AESTHETICS
PART ONE - AT-GRADE RAILROAD EXPOSURE
(RAW SCORES: 5=BEST; 1=WORST)

		ALTERNATIVE					
		1/5	2.1/6.1	2.2/6.2	2.3/6.3	2.4/6.4	3
Segment A	RR miles at-grade	0	0	0	0	0	0
	Score [1]	5	5	5	5	5	5
Segment B	RR miles at-grade	5.59	1.30	1.30	1.30	1.36	1.30
	Score	2[2]	5	5	5	4	5
Segment C	RR miles at-grade	6.10	0	0	0.32	6.10	0
	Score	1[3]	5	5	4	1[3]	5
Segment D	RR miles at-grade	4.66	4.66	4.66	4.66	4.66	4.66
	Score[4]	2	2	2	2	2	2
Combined Segments	RR miles at-grade	16.35	5.44	5.44	6.28	12.11	5.44
	Total of Raw Scores	10	17	17	16	12	17
	Normalized Score	2.9	5.0	5.0	4.7	3.5	5.0

Source: Myra L. Frank & Associates, Inc., July 1991.

Footnotes:

[1] Segment A has no residential or other sensitive uses adjacent to the corridor. Scores reflect visibility ratings/view blockages as perceived by the general public.

[2] All of the route in this segment is at-grade under this alternative. Sensitive uses are estimated to contribute a small proportion of adjacent properties.

[3] All of the route in this segment is at-grade under this alternative. Sensitive uses comprise 35-40% of properties adjacent to the corridor.

[4] Sensitive uses are estimated to comprise 10% of properties adjacent to the corridor.

TABLE 2
ALAMEDA CORRIDOR TRANSPORTATION PROJECT
ALTERNATIVES EVALUATION: AESTHETICS
PART TWO - GRADE SEPARATIONS
(RAW SCORES: 5=BEST; 1=WORST)

	ALTERNATIVES					
	1/5	**2.1/6.1**	**2.2/6.2**	**2.3/6.3**	**2.4/6.4**	**3**
Number Of Above Grade Structures						
Segment A	0	0	0	0	0	0
Segment B	4	0	0	0	0	0
Segment C [1]	8[2]	0	0	4[2]	8[2]	0
Segment D	3	3	3	3	3	3
Total	15	3	3	7	11	3
Raw Scores						
Segment A	5	5	5	5	5	5
Segment B	3	5	5	5	5	5
Segment C	2	5	5	4	2	5
Segment D	5	5	5	5	5	5
Total	15	20	20	19	17	20
Normalized Score	3.75	5.0	5.0	4.75	4.25	5.0

Source: Myra L. Frank & Associates, Inc., July 1991.

Footnotes:
[1] Excludes Rosecrans Avenue.
[2] Four grade separations are currently proposed as above-grade structures. The remainder could be above-grade or under passes.
[3] These scores pertain only to the portion of Segment D in which alternatives 7.1 and 7.2 propose improvements.

TABLE 3
ALAMEDA CORRIDOR TRANSPORTATION PROJECT
ALTERNATIVES EVALUATION: AESTHETICS
COMBINED AESTHETICS RATING

	ALTERNATIVES					
	1/5	2.1/6.1	2.2/6.2	2.3/6.3	2.4/6.4	3
Combined Raw Scores [1]						
Segment A	10	10	10	10	10	10
Segment B	5	10	10	10	9	10
Segment C	3	10	10	8	3	10
Segment D	7	7	7	7	7	7
Total	25	35	35	35	29	35
Normal Score	3.6	5.0	5.0	5.0	4.1	5.0

Source: Myra L. Frank & Associates, Inc.

Footnotes:
[1] Scores shown are the addition of the at-grade railroad exposure and grade separations ratings.
[2] These scores pertain only to the portion of Segment D in which alternatives 7.1 and 7.2 propose improvements.

PREPARED BY:
MFA - GLP
DATE: September 9, 1991
REVISED: September 27, 1991

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Environmental Goal No. 7 - Minimize Exposure to Noise and Vibration

Introduction

This memorandum presents a comparative evaluation of Alameda Corridor alternatives in light of operational noise and vibration. This information is intended to be incorporated into a larger evaluation matrix that compares alternatives to improve the Alameda Street corridor for both freight rail and vehicular traffic in terms of a number of goals that were established at the outset of the project. The criterion used for evaluating noise and vibration effects was the number of sensitive receptors affected by noise and vibration.

Methodology - Operational Noise and Vibration

The analysis of operational noise and vibration considered the effects on five groups of sensitive receptors; residences, schools, hospitals/medical centers, churches, and parks. In order to provide a more detailed accounting, residences have been broken down into three subgroups; single family, multi family housing with 2 to 4 units, and multi family housing with 5 or more units, including mobile home parks.

At full operation, up to 90 trains per day will traverse the corridor. In order to determine the potential effects of this level of train use and also to consider the contributing effects on vehicular travel along the corridor, Harris Miller Miller and Hanson developed a prediction model that provided estimates of impact distances under varying assumptions of vehicular traffic and train volumes, as well as consider the different structure configurations. Noise projections were made based on measured train noise and standard Federal Highway Administration (FHWA) models for traffic noise. Both Urban Mass Transportation Administration (UMTA) and FHWA criteria were considered and as a result, a criterion of 63 dBA CNEL was selected for the analysis. Using this criterion, impact distances were estimated. The initial impact distance estimates were subsequently refined to account for alternatives that separated rail traffic from vehicular traffic. The refined impact distances are as follows: (1) at-grade trains and vehicular traffic could be expected to produce a significant effect (exceed the criterion) on properties up to 1,500 feet on either side of the alignment, (2) depressed trains together with at-grade vehicular traffic could affect properties up to 1,000 feet on either side of the alignment, (3) at-grade vehicular traffic alone could affect properties up to 700 feet away, (4) at-grade trains alone could have an impact distance of 1200 feet, and (5) depressed trains alone could have an impact distance of 335 feet. The documentation in support of these estimated impact distances is attached to this technical memorandum. The impact distances predicted by the noise model were used to reflect the effects of vibration as well, recognizing that a more detailed analysis of this issue will be required during subsequent project development phases. This decision was made because it is unlikely that the depressed or at-grade rail configurations would have markedly different vibration characteristics. Low frequency vibrations are expected in either case, with associated long wave lengths.

A land use map was prepared at a scale of 1" = 400' in order to identify the impact areas in the context of individual properties. Assessor's Index Sheets were used for this purpose, supplemented with a collection of Assessor's Page Maps encompassing the corridor. When necessary, the boundaries were split at the parcel level. After these parcel splits were made, each alternative was defined according to Assessor's Book, Page, and Parcel, taking into account the noise contours that applied for each segment.

In order to account for the widest range of potential effect, transitions from at-grade to depressed railroad cross sections were assumed to be at the full at-grade band-width until full descent into the trench was reached. Likewise, transitions from depressed to at-grade were considered to be at the full at-grade band-width at the earliest point of the ascent out of the trench. Thus, the noise contour of all at-grade and grade-transition sections for trains plus vehicular traffic is 1,500', and is 1,000' only for fully depressed train sections, where trains and vehicular traffic operate adjacent to one another. This is a conservative assumption that would be refined for subsequent studies.

Once the band-widths had been determined for each alternative in each segment, a series of computer programs were developed and run in order to identify individually affected parcels. These programs were designed to identify and categorize all parcels defined within the impact contours, according to the land use types discussed above. These programs were applied to a database containing parcel-level land use information for this corridor, consisting of approximately 9,000 parcels. The programs isolated each parcel containing a sensitive use, and performed various processing operations, depending on the type of use encountered. For example, residential uses were counted by number of units, where single family was counted as one unit and all other residential parcels counted the number of units given on the database for that particular parcel. Schools, churches, and hospitals/medical centers were each counted as one unit, and parks comprised of multiple parcels per park were counted as one unit.

The sensitive-use parcels were totalled according to where they coincided with the appropriate band-width of effect for each alternative. These totals occur by segment and alternative, and are totalled for each alternative including all four segments. The results are presented in Tables 1 through 8.

General Observations

- Alternatives 1 and 5 generally affected substantially more sensitive receptors than any of the other alternatives. This large difference is accounted for by the fact that these alternatives, being at-grade, have the widest band-width. Understanding that the 1,500' band-width is 50% larger than the area of the 1,000' band-width, this means that the area between 1,000' and 1,500' is predominantly comprised of sensitive receptors. Two exceptions to this finding are hospitals/medical centers and parks, which were evenly affected throughout all the alternatives.

- The alternatives with the next largest effect, 2.4 & 6.4, are also the alternatives with the next largest amount of at-grade rail.

- All of the remaining alternatives are relatively comparable, and the majority of the effect of all of the alternatives takes place in segments B and C.

- Alternatives 1 & 5 would affect nearly twice as many school parcels as any other alternative.

- Alternatives 1 & 5 would adversely affect the greatest number of churches, followed by Alternatives 2.4 & 6.4. The remaining alternatives would have a somewhat diminished and nearly equivalent effect on churches.

- Few parks or medical centers would be affected by any alternatives.

- Taking into account all receptors, Alternatives 1 & 5 would have the greatest adverse effect. Alternatives 2.1, 6.1, 2.2, 6.2, & 3 have the least effect and are nearly equivalent to one another.

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ALAMEDA CORRIDOR TRANSPORTATION PROJECT
NOISE & VIBRATION SENSITIVE RECEPTORS

Table 1 Number of Units - Single Family Residential

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	29	29	29	29	29	29
B	2062	1091	867	1091	1350	1091
C	3366	2081	2081	2729	3366	2081
D	924	924	924	924	924	924
TOTALS	6381	4125	3901	4773	5669	4125

Table 2 Number of Units - Multi Family Residential (2 - 4 Units)

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	6	6	6	6	6	6
B	3178	1681	1374	1681	1914	1681
C	2313	1408	1408	1960	2313	1408
D	276	276	276	276	276	276
TOTALS	5773	3371	3923	3923	4529	3371x

Source: Myra L. Frank & Associates, Inc., August 1991.

ALAMEDA CORRIDOR TRANSPORTATION PROJECT
NOISE & VIBRATION SENSITIVE RECEPTORS

Table 3 Number of Units - Multi Family Residential (5 or more units, mobile homes)

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	0	0	0	0	0	0
B	1070	541	471	541	559	541
C	1064	651	651	901	1064	651
D	666	666	666	666	666	666
TOTALS	2800	1858	1788	2108	2289	1858

Table 4 Number of Parcels - Schools

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	0	0	0	0	0	0
B	20	5	16	5	5	5
C	22	12	12	13	22	12
D	0	0	0	0	0	0
TOTALS	42	17	28	18	27	17

Source: Myra L. Frank & Associates, Inc., August 1991.

ALAMEDA CORRIDOR TRANSPORTATION PROJECT
NOISE & VIBRATION SENSITIVE RECEPTORS

Table 5 Hospitals / Medical Centers

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	0	0	0	0	0	0
B	1	1	1	1	1	1
C	1	1	1	1	1	1
D	0	0	0	0	0	0
TOTALS	2	2	2	2	2	2

Table 6 Churches

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	0	0	0	0	0	0
B	28	17	8	17	17	17
C	36	20	20	29	36	20
D	3	3	3	3	3	3
TOTALS	67	40	31	49	56	40

Source: Myra L. Frank & Associates, Inc., August 1991.

ALAMEDA CORRIDOR TRANSPORTATION PROJECT
NOISE & VIBRATION SENSITIVE RECEPTORS

Table 7 Parks

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	0	0	0	0	0	0
B	3	2	2	2	2	2
C	1	1	1	1	1	1
D	0	0	0	0	0	0
TOTALS	4	3	3	3	3	3

Table 8 ALL RECEPTORS

SEGMENT	ALTERNATIVES					
	1.5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	35	35	35	35	35	35
B	6362	3338	2739	3338	3848	3338
C	6803	4174	4174	5634	6263	4174
D	1869	1869	1869	1869	1869	1869
TOTALS	15,069	9416	8817	10,876	12,015	9416

Source: Myra L. Frank & Associates, Inc., August 1991.

HARRIS MILLER MILLER & HANSON INC.
429 Marrett Road
Lexington, Mass. 02173
Tel. (617) 863-1401
Fax (617) 861-8188

TECHNICAL MEMORANDUM

TO: Gary Petersen
Myra L. Frank and Associates

FROM: Yuki Kimura
Hugh Saurenman
Harris Miller Miller & Hanson Inc.

DATE: July 5, 1991

hmmh

SUBJECT: Preliminary Noise Impact Analysis, Consolidated Transit Corridor
HMMH Job No. 291080

A noise impact analysis was performed for the proposed rail line along the Alameda Corridor using both projected traffic volumes on Alameda Street and train pass-bys for the various alternatives. The results of this analysis are outlined below.

SUMMARY OF RESULTS

Noise projections were made based on measured train noise and standard Federal Highway Administration (FHWA) models for traffic noise. Two different noise impact criteria were considered: the criteria proposed by HMMH for the Urban Mass Transportation Administration (UMTA), which have not been officially adopted by UMTA, and existing FHWA noise abatement criteria. The FHWA criteria are based on peak or noisiest hour of the day; an implicit assumption is a typical distribution of traffic between day and night. The UMTA procedure involves comparison of the existing, pre-project ambient noise level in terms of Community Noise Equivalent Level (CNEL) and then comparing it with the predicted project CNEL. We recommend the UMTA criteria as more appropriate for the Alameda Corridor project since a high percentage of the freight traffic is expected to occur during nighttime hours when most people are more sensitive to community noise.

The projections assume that freight traffic is equally distributed through the day; automobile and truck traffic volumes were taken directly from the projections made by DKS. We made projections using a range of different traffic volumes, representing different points along the corridor. The final impact screening distances are not very sensitive to traffic volume because the train noise tends to dominate the noise environment.

The worst-case impact distance was found to be approximately 1500 feet with the at-grade train configuration, and 900 feet with depressed track, for which a shielding adjustment of 12 to 15 dB was assumed. Mitigation provided by the depressed rail could be improved by enclosing the trench more, applying sound-absorptive material to the walls of the trench, or constructing side barriers above-grade. With these enhancements a 20 dB sound reduction may be possible.

Additional shielding adjustments can be assumed for rows of buildings between the source and receiver. About 3 dB is provided by the first row when the buildings occupy 40 to 65 percent of the length of the row and 5 dB when the buildings occupy 65 to 90 percent of the length of the row. The standard assumption is an additional attenuation of 1.5 dB for each successive row up to a maximum attenuation of 10 dB, which is the maximum attenuation that this mechanism provides.[1]

NOISE IMPACT CRITERIA

UMTA Criteria: These criteria were recently developed by HMMH for UMTA transit projects in urban areas.[2] They are based on comparison of the existing noise levels and future noise levels with the proposed project. Because the criteria are based on 24-hour noise exposure as expressed by CNEL or L_{dn}, they account for community annoyance caused by late night or early morning train service as well as the varying sensitivity of communities to projects under different background noise conditions. Three categories of impact are defined: i) **Severe Impact**, under which noise mitigation should be required for the affected areas; ii) **Impact**, which represents sufficient impact such that noise mitigation should be considered and included in the project if practical and cost-effective; and iii) **No Impact**, where noise from the project may be audible, but is considered to cause only a minor change in the community noise environment.

FHWA Criteria: When mass transit projects will be integrated with existing highways, noise impact and noise abatement guidelines are often determined using existing FHWA procedures. The procedures include FHWA Noise Abatement Criteria, current FHWA noise prediction models and the guidlines for considering noise abatement measures. According to these criteria, traffic noise impacts occur when the predicted traffic noise levels approach or exceed the FHWA Noise Abatement Criteria based on land use (exterior peak hour L_{eq} = 67 dBA for residential land use), or when the predicted traffic noise levels substantially exceed the existing noise levels. An increase greater than or equal to 10 or 15 decibels is considered substantial. The regulations further prescribe that noise impact should be assessed for the noisiest hour of the day in the design year.

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[1] Barry, T.M. and Reagan, J.A., *FHWA Highway Traffic Noise Prediction Model*, Report No. FHWA-RD-77-108, Federal Highway Administration, December 1978.

[2] *Guidance Manual for Transit Noise and Vibration Impact Assessment*, prepared by Harris Miller Miller & Hanson Inc. for U.S. Department of Transportation, Urban Mass Transportation Administration, June 1991.

NOISE PROJECTION MODELS

Future noise levels were predicted using mathematical models of freight train and highway traffic noise propagation along the Alameda Corridor. The scenarios evaluated were for the year 2020 (90 train movements per peak day), including at-grade trainway with grade-separated east/west traffic, and depressed trainway with at-grade traffic. The geometries for both center and east-side track alignments were considered for the two track configurations. Worst-case traffic volumes for each scenario were assumed in projecting traffic noise.

The projections of train noise are based on the measurements that we performed in October 1990. As mentioned above, we assumed that the 90 trains per day (45 in each direction) were equally distributed through the daytime and nighttime hours. Because of the 10 dB penalty included in calculation of CNEL for nighttime noise (10 pm to 7 am), computationally one nighttime train is equivalent to 10 daytime trains.

IMPACT SCREENING DISTANCES

Noise levels were computed over a range of distances separately for trains and traffic. An existing CNEL of 68 dBA was assumed for the entire corridor. The propagation characteristics for train and traffic CNEL/Peak Hour L_{eq} were then combined, and using the above guidelines, distances to the different impact levels were extracted. These are summarized below in Table 1.

It was found that differences in traffic volumes on Alameda Street had little impact on the total CNEL for the at-grade railway alternatives, since train noise will be the dominant noise source. For the depressed railway alternatives, however, shielding provided by the deep 27-foot trench is significant enough that street traffic noise is projected to be higher than noise from train movements.

The impact distances using the FHWA criteria are significantly less than the impact distances using the UMTA criteria. If the train traffic were concentrated during the daytime hours as is typical for highway traffic, the two criteria would be in close agreement. To give some idea of this effect, we estimated FHWA criteria impact distances assuming that there are twice as many trains during the peak hour. As indicated in the table, with the railroad tracks at-grade, this increases the impact distances by a factor of approximately 1.5. With the railroad tracks depressed, this results in only a small change in the impact distances.

Noise Impact Distances - Year 2020

ALTERNATIVE DESCRIPTION	Receiver Location	Distance to Significant Impact (ft) (CNEL = 63 dBA)			Distance to Severe Impact (ft) (CNEL = 69 dBA)		
		Trains + Traffic	Traffic only	Trains only	Trains + Traffic	Traffic only	Trains only
Alt. C2: At-Grade RR with one-way couplet (Alameda)	East/West[a]	1510	700	1240	680	255	560
Alt. C2: At-Grade RR east side with 6-lane Alameda west side	West[a]	1490	715	1180	640	270	505
	East[b]	1480	605	1210	630	160	530
Alt. E2: Depressed RR with one-way couplet at-grade (Alameda)	East/West[a]	890	710	335	325	260	75
Alt. E2: Depressed RR east side with 6-lane Alameda west side	West[a]	900	735	285	330	280	25
	East[c]	870	680	335	295	220	75

(a) Distance measured from center line of near traffic lane on Alameda.
(b) Distance measured from center line of frontage road.
(c) Distance measured from center line of drill track.

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ALAMEDA CORRIDOR TRANSPORTATION PROJECT
NOISE & VIBRATION SENSITIVE RECEPTORS

Table 1 Number of Units - Single Family Residential

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	29	29	29	29	29	29
B	2062	781	1070	1091	1350	1091
C	3366	2081	2081	2729	3366	2081
D	924	924	924	924	924	924
TOTALS	6381	3815	4104	4773	5669	4125

Table 2 Number of Units - Multi Family Residential (2 - 4 Units)

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	6	6	6	6	6	6
B	3178	1103	1529	1681	1914	1681
C	2313	1408	1408	1960	2313	1408
D	276	276	276	276	276	276
TOTALS	5773	2793	3219	3923	4529	3371x

Source: Myra L. Frank & Associates, Inc., August 1991.

10/1/91

ALAMEDA CORRIDOR TRANSPORTATION PROJECT
NOISE & VIBRATION SENSITIVE RECEPTORS

Table 3 Number of Units - Multi Family Residential (5 or more units, mobile homes)

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	0	0	0	0	0	0
B	1070	443	537	541	559	541
C	1064	651	651	901	1064	651
D	666	666	666	666	666	666
TOTALS	2800	1760	1854	2108	2289	1858

Table 4 Number of Parcels - Schools

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	0	0	0	0	0	0
B	20	16	16	5	5	5
C	22	12	12	13	22	12
D	0	0	0	0	0	0
TOTALS	42	28	28	18	27	17

Source: Myra L. Frank & Associates, Inc., August 1991.

10/10/91

ALAMEDA CORRIDOR TRANSPORTATION PROJECT
NOISE & VIBRATION SENSITIVE RECEPTORS

Table 5 Hospitals / Medical Centers

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	0	0	0	0	0	0
B	1	0	1	1	1	1
C	1	1	1	1	1	1
D	0	0	0	0	0	0
TOTALS	2	1	2	2	2	2

Table 6 Churches

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	0	0	0	0	0	0
B	28	3	11	17	17	17
C	36	20	20	29	36	20
D	3	3	3	3	3	3
TOTALS	67	26	34	49	56	40

Source: Myra L. Frank & Associates, Inc., August 1991.

-10/.. 91

ALAMEDA CORRIDOR TRANSPORTATION PROJECT
NOISE & VIBRATION SENSITIVE RECEPTORS

Table 7 Parks

SEGMENT	ALTERNATIVES					
	1, 5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	0	0	0	0	0	0
B	3	1	2	2	2	2
C	1	1	1	1	1	1
D	0	0	0	0	0	0
TOTALS	4	2	3	3	3	3

Table 8 ALL RECEPTORS

SEGMENT	ALTERNATIVES					
	1.5	2.1, 6.1	2.2, 6.2	2.3, 6.3	2.4, 6.4	3
A	35	35	35	35	35	35
B	6362	2347	3166	3338	3848	3338
C	6803	4174	4174	5634	6263	4174
D	1869	1869	1869	1869	1869	1869
TOTALS	15,069	8425	9244	10,876	12,015	9416

Source: Myra L. Frank & Associates, Inc., August 1991.

PREPARED BY:
DMJM/M&N-WJM
DATE: 9/09/91
REV: ~~10/2/91~~
10/10/91

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Economic Goal No. 2 - Minimize Land Devoted to Port Related Rail Freight Operations (Throughout Basin)

INTRODUCTION:

This memorandum presents a evaluation of Alameda Corridor alternatives relative to minimizing land devoted to Port related rail freight operations as compared to the "Status Quo" network. This information is intended to be incorporated into a larger matrix that compares alternatives to improve Alameda Street Corridor for both rail and vehicular traffic.

The measurement criteria used to quantify land devoted to Port related rail freight operations is Train Route Miles from the City of Industry to the Ports.

METHODOLOGY:

The Train Routes Miles for each of the lines in the "Status Quo" network and for each of the Alternatives was measured and tabulated in order to compare the "Status Quo" to the "Consolidated Corridor" and to compare the Alternatives to each other. The Train Route Miles are tabulated in Tables EG2 - 1 and EG2 - 2.

CONCLUSIONS:

Referring to Table EG2 - 1, it can be seen that the Corridor network will result in decreases of over 70 percent in Train Route Miles as compared to the "Status Quo" network.

Referring to Table EG2 - 2, it can be seen that all alternatives will have equal Train Route Miles, except Alternatives 2.2 and 6.2 (Wilmington Diversion Alternatives), which are slightly longer.

BRANCH OR SUBDIVISION	ROUTE MILES	MILES UTILIZED STATUS QUO	MILES UTILIZED CORRIDOR
"STATUS QUO"			
SPTC			
SAN PEDRO	19.5	19.5	0
WILMINGTON (MC-5 TO J-YARD)	8.3	8.3	0
LA HABRA	19.6	19.6	0
SANTA ANA/PUENTE	15.8	15.8	0
WEST LINE (PASADENA JCT. - INDUSTRY)	17.8	17.8	17.8
J-YARD TO PASADENA JCT.	3.8	3.8	3.8
UPRR			
SAN PEDRO	19.7	19.7	0
EAST L.A. TO INDUSTRY	11.3	11.3	11.3
ATSF			
HARBOR	28.5	28.5	0
REDONDO JCT TO DT JUNCTION	8.9	8.9	8.9
CONSOLIDATED CORRIDOR PORTS TO DOWNTOWN CONNECTIONS (NOTE: ALTS. 2.2 AND 6.2 – 19.6 MILES)	19.1	N/A	19.1
TOTALS		153.2	41.8

REDUCTION IN RAILROAD ROUTE MILES "CONSOLIDATED CORRIDOR" v. "STATUS QUO"		
ALL ALTERNATIVES EXCEPT 2.2 AND 6.2	111.4 MILES	73% REDUCTION
ALTERNATIVES 2.2 AND 6.2	110.9 MILES	72% REDUCTION

TABLE EG2 – 1: RAILROAD ROUTE MILES – PORTS TO CITY OF INDUSTRY/DT JUNCTION "STATUS QUO" v. "CONSOLIDATED CORRIDOR" ALTERNATIVES

COMPARISON OF TRAIN ROUTE MILES											
	ALTERNATIVES										
	1.0	2.1	2.2	2.3	2.4	3.0	5.0	6.1	6.2	6.3	6.4
TRAIN ROUTE MILES	41.8	41.8	42.3	41.8	41.8	41.8	41.8	41.8	42.3	41.8	41.8
NORMALIZED SCORE	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00

TABLE EG2 – 2: COMPARISON OF TRAIN ROUTE MILES AMONG "CONSOLIDATED CORRIDOR" ALTERNATIVES

PREPARED BY:
MFA - GLP
DATE: August 27, 1991
REVISED: October 9, 1991

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Economic Goal No. 4 - Maintain/Improve Access to Existing Businesses

Introduction

This memorandum presents a comparative evaluation of Alameda Corridor alternatives in light of business access considerations. This information is intended to be incorporated into a larger evaluation matrix that compares alternatives to improve the Alameda Street corridor for both freight rail and vehicular traffic in terms of several goals that were established at the outset of the project. A subjective rating was identified as the criterion by which this would be measured.

Methodology

The initial criterion of subjective rating was replaced by a quantitative approach, described as follows. Affected businesses were defined as commercial or industrial structures located adjacent to Alameda Street or adjacent to roadway/rail improvements that would have to be constructed for the respective alternative. Roadway/rail improvements could be overpasses, underpasses, or new frontage/access roads. It should be noted that the proposed project would generally improve access to businesses and promote increased economic activity due to its improved operating conditions. To the extent these improvements occur, they would generally affect business activity in the corridor uniformly, and thus would not distinguish among alternatives. Therefore, the analysis methodology was focused on adverse access issues that, would more readily exist in the evaluation of competing alternatives.

Residential dwellings were excluded from this analysis. Using 1" = 100' engineering drawings and comparing present access on Alameda Street with future access determined the impact of a given alternative in terms of business access. The perspective of a motorist provided the method for the analysis, focusing on the businesses' current and future accessiblity by Alameda and the cross streets, wherever applicable. Access to a business would be considered inconvenient if the motorist could not, starting from the business location, reach the north and south bound traffic on Alameda as conveniently as he could at present. Similarly, access to those businesses around the overpasses and underpasses would be considered inconvenient since the motorist would have to travel circuitous routes to get to the businesses. Before the analysis was begun, assumptions were made concerning the impact on access. The following is a list of these assumptions.

* U-turns were defined as not being an inconvenience for drivers if the travel distance (before making the U-turn) was less than 1,000 feet.

* Building footprints on the engineering drawings were generally counted as one structure unless aerial maps (1"=50') clearly delineated the outline of more than one structure.
* Rail traffic would be so heavy that crossing the tracks would only be possible at overpasses and underpasses.
* Crossing structures on the engineering drawings were assumed to be overpasses unless explicitly defined as an underpass. Overpasses have a greater impact on the surrounding area.
* Only frontage roads that ran parallel to Alameda Street were measured. Present and future frontage roads satisfying this condition were included.
* Only the front row buildings along Alameda and the cross streets were included in the analysis.

Businesses with inconvenient access resulted from the construction and/or operation of the corridor were identified using the aerial photos and engineering drawings provided by DMJM/M&N. In addition, structures that would be taken for right of way purposes were also reported. While in a strict sense this is not a post-project access consideration, it does provide an additional indication of overall effects on businesses. Lengths of at-grade or depressed rail alignments, frontage roads, and overpasses/underpasses were also recorded from each engineering drawings using a map wheel. This information , including number of overpasses and underpasses, was recorded in tabular format. Schematic drawings of each alternative have also been prepared to show frontage roads, overpasses/underpasses, and rail alignments. Special Note: A few segments among the alternatives did not have an engineering drawing. In these cases, the missing portion was noted on the schematic and further noted on the table. Further, the number of improved parcels taken should be regarded as an approximation because there could be more than one business in each building footprint. The following tables show the results of the analysis.

General Observations

* Alternative 1 would result in the greatest number of improved parcels taken, thus the largest number of businesses affected. It should be noted, however, that the number of businesses with inconvenient access under this at-grade railroad option would only be slightly higher than that under the depressed railroad Alternative 2.1. Adverse impacts due to the penetration of overpasses/underpasses into the surrounding neighborhood would be offset by easy access to north and south bound traffic on Alameda Street. With the six-lane Alameda Street on the west side of the railroad tracks (starting in Segment C), no businesses on the west side of Alameda would be affected. Some of the businesses on the east side, however, would have greater difficulty in reaching Alameda Street due to the closure of some of the cross streets.

The Wilmington Branch depressed railroad segment would have effects quite similar to those expected along Alameda Street, with the exceptions that inconvenient business access would be reduced.

* Alternative 2.4, which has a depressed railroad configuration primarily confined to Segment B, has the same number of improved parcels taken as Alternative 1/5 in Segment C.

* Inconvenient access is substantial with the depressed railroad options due to the separation of north and south bound traffic on either side of the tracks. The combination of depressed railroad and overpasses/underpasses in Alternative 2.3 results in the largest number of

inconvenient business access. Moving the depressed railroad alignment to the Wilmington Branch (Alternative 2.2) reduces the degree of inconvenient access.

* The presence of frontage roads help to reduce the impact on business access if access to these frontage roads is adequate. Frontage roads with limited access do not mitigate the problems associated with increased travel distance and inconvenient U-turns.

* Depressed rail alignments generally have a lesser impact on business access because railroad crossings can be provided by at-grade bridges. These structures do not penetrate into the surrounding community and are easier to reach from Alameda Street.

TABLE 1: ALAMEDA CORRIDOR TRANSPORTATION PROJECT SUMMARY: BUSINESS ACCESS EVALUATION

Evaluation Factor	Alternative					
	1/5	2.1/6.1	2.2/6.2	2.3/6.3	2.4/6.4	3
Improved Parcels Taken						
Segment A	12	12	12	12	12	12
Segment B	146/138	99	92/85	99	99	73
Segment C	84/56	25	25	49	56	53
Segment D	68	68	68	68	68	68
Total	310/274	204	197/190	228	235	206
Inconvenient Access						
Segment A	0	0	0	0	0	0
Segment B	136	95	67	95	90	0
Segment C	119	160	160	164	119	26
Segment D	42	40	40	42	42	40
Total	297	295	267	301	251	66
Total Structures and Businesses Affected	607/571	499	464/457	529	486	272

Date: October 9, 1991
Prepared by: Myra L. Frank & Associates, Inc.

TABLE 2: ALAMEDA TRANSPORTATION)JECT: BUSINESS ACCESS EVALUATION

ALTERNATIVE 1/5[a]

Segment	Railroad (in miles)		Frontage Road (miles)	Overpasses		Underpasses		No. of Structures with Inconvenient access	No. of improved parcels taken
	At-grade	Depressed		Number	Total miles	Number	Total miles		
Segment A	0.00	0.00	0.00	0	0.00	0	0.00	0	12
Segment B	5.59	0.00	0.36	4	1.61	7	2.42	136	146/138
Segment C	6.10	0.00	5.44	7[b]	3.87	2	0.58	119	84/56
Segment D	4.66	0.00	0.96	3	2.71	2	0.80	42	68
Total	16.35[c]	0.00	6.76	14	8.19	11	3.80	297	310/274

ALTERNATIVE 2.1/6.1[d]

Segment	Railroad (in miles)		Frontage Road (miles)	Overpasses		Underpasses		No. of Structures with Inconvenient access	No. of improved parcels taken
	At-grade	Depressed		Number	Total miles	Number	Total miles		
Segment A	0.00	0.00	0.00	0	0.00	0	0.00	0	12
Segment B	1.30	4.31	0.00	8	0.96	1	0.28	95	99
Segment C	0.00	6.09	3.25	10[b]	0.77	0	0.00	160	25
Segment D	4.14	0.83	0.96	3	2.71	2	0.79	40	68
Total	5.44[c]	11.23	4.21	21	4.44	3	1.07	295	204

Source: Myra L. Frank & Associates, Inc., October 9, 1991.

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[a] Table for Alternative 5 is the same as Alternative 1, except for number of improved parcels taken.

[b] Rosecrans Avenue fly-over and Artesia Blvd overcrossing are excluded in the total number of overpasses.

[c] This total excludes the At-Grade Trainway length of the Port Access Demonstration Project between Del Amo Blvd and Sepulveda Blvd.

[d] Table for Alternative 6.1 is the same as Alternative 2.1 except that there may be 10-12 fewer structures taken with an estimated 12-foot reduction in the right-of-way width from 6-lanes to 4-lanes.

TABLE 2 NTINUED)

ALTERNATIVE 2.2/6.2[a]									
Segment	Railroad (in miles)		Frontage Road (miles)	Overpasses		Underpasses		No. of Structures with Inconvenient access	No. of improved parcels taken
	At-grade	Depressed		Number	Total miles	Number	Total miles		
Segment A	0.00	0.00	0.00	0	0.00	0	0.00	0	12
Segment B	1.30	5.31	0.00	12	0.90	1	0.28	67	92/85
Segment C	0.00	6.09	3.25	10[b]	1.02	0	0.00	160	25
Segment D	4.14	0.83	0.96	3	2.71	2	0.79	40	68
Total	5.44[c]	12.23	4.21	25	4.63	3	1.07	267	197/190

ALTERNATIVE 2.3/6.3[d]									
Segment	Railroad (in miles)		Frontage Road (miles)	Overpasses		Underpasses		No. of Structures with Inconvenient access	No. of improved parcels taken
	At-grade	Depressed		Number	Total miles	Number	Total miles		
Segment A	0.00	0.00	0.00	0	0.00	0	0.00	0	12
Segment B	1.30	4.31	0.00	8	0.96	1	0.56	95	99
Segment C	2.21	3.90	5.26	10[b]	2.20	0	0.00	164	49
Segment D	4.66	0.00	0.96	3	2.71	2	0.80	42	68
Total	8.17[c]	8.21	6.22	21	5.87	3	1.36	301	228

Source: Myra L. Frank & Associates, Inc., October 9, 1991.

[a] Table for Alternative 6.2 is the same as Alternative 2.2 except that there may be 10-12 fewer structures taken with an estimated 12-foot reduction in the right-of-way width from 6-lanes to 4-lanes.

[b] Rosecrans Avenue fly-over and Artesia Blvd overcrossing are excluded in the total number of overpasses.

[c] This total excludes the At-Grade Trainway length of the Ports Access Demonstration Project between Del Amo Blvd and Sepulveda Blvd.

[d] Table for Alternative 6.3 is the same as Alternative 2.3 except that there may be 10-12 fewer structures taken with an estimated 12-foot reduction in the right-of-way width from 6-lanes to 4-lanes.

TABLE 2 ITINUED)

ALTERNATIVE 2.4/6.4[a]									
Segment	Railroad (in miles)		Frontage Road (miles)	Overpasses		Underpasses		No. of Structures with Inconvenient access	No. of improved parcels taken
	At-grade	Depressed		Number	Total miles	Number	Total miles		
Segment A	0.00	0.00	0.00	0	0.00	0	0.00	0	12
Segment B	1.36	4.53	0.24	7	0.84	1	0.28	90	99
Segment C	6.10	0.00	5.44	7[b]	3.86	2	0.58	119	56
Segment D	4.66	0.00	0.96	3	2.71	2	0.80	42	68
Total	12.12[c]	4.53	6.64	17	7.46	5	1.66	251	235

[a] Table for Alternative 6.4 is the same as Alternative 2.4 except that there may be 10-12 fewer structures taken with an estimated 12-foot reduction in the right-of-way width from 6-lanes to 4-lanes.

[b] Rosecrans Avenue fly-over and Artesia Blvd overcrossing are included in the total number of overpasses.

[c] This total excludes the At-Grade Trainway length the Ports Access Demonstration Project between Del Amo Blvd and Sepulveda Blvd.

TABLE 2 ITINUED)

ALTERNATIVE 3 WITH OPTIONAL FRONTAGE ROAD									
Segment	Railroad (in miles)		Frontage Road (miles)	Overpasses		Underpasses		No. of Structures with Inconvenient access	No. of improved parcels taken
	At-grade	Depressed		Number	Total miles	Number	Total miles		
Segment A	0.00	0.00	0.00	0	0.00	0	0.00	0	12
Segment B	1.30	4.36	1.11	32	0.87	1	0.28	0	73
Segment C	0.00	6.14	5.42	11[b]	0.41	0	0.00	26	53
Segment D	4.14	0.83	0.96	3	2.71	2	0.80	40	68
Total	5.44[a]	11.33	7.49	46	3.99	3	1.08	66	206

Source: Myra L. Frank & Associates, Inc., October 9, 1991.

ALTERNATIVE 3 WITHOUT OPTIONAL FRONTAGE ROAD									
Segment	Railroad (in miles)		Frontage Road (miles)	Overpasses		Underpasses		No. of Structures with Inconvenient access	No. of improved parcels taken
	At-grade	Depressed		Number	Total miles	Number	Total miles		
Segment A	0.00	0.00	0.00	0	0.00	0	0.00	0	12
Segment B	1.30	4.36	0.23	52	1.11	1	0.28	0	73
Segment C	0.00	6.14	5.42	11[a]	0.41	0	0.00	26	53
Segment D	4.14	0.83	0.96	3	2.71	2	0.80	40	68
Total	5.44[b]	11.33	6.61	66	4.23	3	1.08	178	206

Source: Myra L. Frank & Associates, Inc., October 9, 1991.

[a] Rosecrans Avenue fly-over and Artesia Blvd overcrossing are included in the total number of overpasses.

[b] This total excludes the At-Grade Trainway length of the Ports Access Demonstration Project between Del Amo Blvd and Sepulveda Blvd.

PREPARED BY:
DMJM/M&N-WJM
DATE: 10/02/91

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Cost Goal No. 1 - Maximize Cost Effectiveness.

INTRODUCTION:

This memorandum presents an evaluation of Alameda Corridor alternatives relative to their ability to maximize Cost Effectiveness of the Corridor Project Improvements. This information is intended to be incorporated into a larger matrix that compares alternatives for the Alameda Transportation Corridor.

The measurement criteria used to quantify Cost Effectiveness is Absolute Costs of the Alternative.

METHODOLOGY:

In order to compare the costs of each Alternative the total project costs in 1991 dollars were taken from the Alameda Corridor Project Cost Estimate in the Project Report and tabulated below.

Alternative	Cost (millions)
	$
1.0	1588.8
2.1A	1978.7
2.2	2040.9
2.3	2087.4
2.4	1791.0
3.0	2581.8
5.0	1580.1
6.1	1960.3
6.2	1962.7
6.3	1872.9
6.4	1642.6

CONCLUSIONS:

Referring to the table above, it can be seen that the Alternative 5.0 has the greatest Cost Effectiveness, and Alternative 3.0 the least.

PREPARED BY:
DMJM/M&N-RT/DRM
DATE: 9/11/91
REV. 10/2/91

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Cost Goal No. 3 - Ability to Implement in Phases

INTRODUCTION:

This memorandum presents a comparative evaluation of Alameda Corridor alternatives relative to the number of discrete/separate construction components, where more components is better for Alameda Street under each alternative. This information is intended to be incorporated into a larger matrix that compares alternatives to improve Alameda Street Corridor for both rail and vehicular traffic.

The measurement criteria used to identify the subjective value is the number of construction segments to build the Alameda improvements.

The construction segments were determined as follows:

The total alternative was divided into segments which would result in either:

a. A complete operational unit
(i.e. grade separation, one useable section of railroad or highway), or

b. A portion of an operational unit costing around $400 million (escalated) to construct.

Estimates were made for Alternatives 1 and 2.1A. The values for other alternatives were based on a proration of these two comparative totals.

The discrete/separate construction components are:

ALTERNATIVE 1

NO.	PROJECT	LIMITS	PROJECT TYPE
1	Henry Ford/T.I. Fwy	Schuyler Heim Br. to Dom. Channel	Construct Grate Separation
2	Anaheim St. Bridge	Anaheim St. at Dominguez Channel	Reconstruct Overhead
3	Pacific Coast Highway OH	P.C.H. at Santa Fe R.R.	Construct Overhead
4	Sepulveda Blvd. OH	Sepulveda Blvd. at Alameda St.	Construct Overhead
5	Reconstruct Alameda	Laurel Park to SR 91	Reconstruct Highway & Grade Sep.
6	Compton Creek RCB	Compton Creek at Alameda	Highway/Railway Structure
7	Southern Trainway	Badger Ave. Br. to Thenard Jct.	Railway/Structures
8	Compton Blvd.	Compton Blvd. at Alameda	Overhead
9	Alondra Blvd.	Alondra Blvd. at Alameda	Underpass
10	Wilm./MC-5 Conn. (incl. Dom. Chan. Strs.)	Thenard Jct. to Dominguez Jct.	Railway (One Track)
11	Florence Ave.	Florence Ave. at Alameda	Underpass
12	Imperial Hwy.	Imperial Hwy. at Alameda	Underpass
13	El Segundo	El Segundo at Alameda	Overhead
14	Firestone Blvd.	Firestone Blvd. at Alameda	Underpass
	Gage Ave.	Gage Ave. at Alameda	Overhead
16	Slauson Ave.	Slauson Ave. at Alameda	Overhead
17	Vernon Ave.	Vernon Ave. at Alameda	Underpass
18	Widen Alameda to 6 Lns.	SR 91 to El Segundo	Reconstruct and Widen Street & Construct Drill Track
19	Widen Alameda to 6 Lns.	El Segundo to 85th Street	Reconstruct and Widen Street & Construct Drill Track
20	Widen alameda to 6 Lns.	85th St. to Slauson incl. Alameda Crossover	Reconstruct and Widen Street & Construct Drill Track
21	Widen alameda to 6 Lns.	Slauson to I-10 incl. N. Bd. Alameda	Reconstruct and Widen Street & Construct Drill Track
22	Central Trainway	Compton creek to J Yard	Construct Trainway
23	Northern Trainway	J Yard to Hobart	Construct Trainway
24	Greenleaf	Greenleaf at Alameda	Construct Overhead
25	Weber	Weber Ave. at Alameda	Construct Overhead
26	Tweedy	Tweedy Ln. at Alameda	Construct Overhead
27	Southern	Southern at Alameda	Construct Overhead
28	Nadeau	Nadeau Ave. at Alameda	Construct Overhead
29	38th/41st St.	38th/41st at Alameda	Construct Underpass
30	25th St.	25th St. at Alameda	Construct Underpass

ALTERNATIVE 2.1A

1	Henry Ford/T.I. Fwy	Schuyler Heim Br. to Dom. Channel	Construct Grade Separation
2	Anaheim St. Bridge	Anaheim St. at Dominguez Channel	Reconstruct Overhead
3	Pacific Coast Hwy. OH	P.C.H. at Santa Fe R.R.	Construct Overhead
4	Sepulveda Blvd. OH	Sepulveda Blvd. at Alameda St.	Construct Overhead
5	Compton Creek RCB	Compton Creek at Alameda	Highway/Railway Structure
6	Southern Trainway	Badger Ave. Br. to Thenard Jct.	Railway/Structures
7	Reconstruct Alameda - 4 Lanes	Laurel Park to Rosecrans	Reconstruct Highway & Drill Track
8	Construct Depressed Railway (Dep. - Cmptn Cr. - El Segundo)	Thenard Jctn. to El Segundo	Railway, Compton & Alondra Gr. Seps. & Temporary Hwy Crossover
9	Widen Alameda - 4 lns & Drill Track	Rosecrans to 85th St.	Construct Hwy on New Alignment and Temporary Drill Track
10	Widen Alameda - 4 lns & Drill Track	85th St. to Slauson	Construct Hwy on New Alignment and Temporary Drill Track
	Widen Alameda - 4 lns & Drill Track	Slauson to I-10	Construct Hwy on New Alignment and Temporary Drill Track
12	Construct Trainway (Depressed)	Rosecrans to 85th St.	Construct Depressed Trainwa and Relocate Drill Track
13	Construct Trainway (Depressed)	85th St. to Slauson	Construct Depressed Trainwa and Relocate Drill Track
14	Construct Trainway (Depressed)	Slauson to J-Yard	Construct Depressed Trainwa and Relocate Drill Track
15	Construct Trainway	J-Yard to Hobart	Construct RR Track and Structures
16	Widen Alameda to 6 Lanes	Rosecrans to Washington Blvd.	Widen Highway

TABLE CG3-1 NUMBER OF CONSTRUCTION UNITS BY ALTERNATIVE

ALTERNATIVE	1	2.1	2.2	2.3
NO. OF UNITS	30	16	17	22
ALTERNATIVE	2.4	3	5	6.1
NO. OF UNITS	20	16	30	16
ALTERNATIVE	6.2	6.3	6.4	
NO. OF UNITS	17	22	20	

PREPARED BY:
DMJM/M&N-RT/DRM
DATE: 9/11/91
REV: 10/2/91

GOAL ANALYSIS - TECHNICAL MEMORANDUM

GOAL: Construction Goal No. 1 - Minimize Disruption to Highway and Rail Users

INTRODUCTION:

This memorandum presents a comparative evaluation of Alameda Corridor alternatives relative to the duration in years required to construct improvements on Alameda Street under each alternative. This information is intended to be incorporated into a larger matrix that compares alternatives to improve Alameda Street Corridor for both rail and vehicular traffic.

The measurement criteria used to identify construction duration is the Years of Construction of each Alternative.

METHODOLOGY:

Four representative locations along the Corridor were analyzed. They were:

- Slauson
- Firestone
- El Segundo
- Compton

The estimates for construction were developed for these four locations. Thus an average duration (divided by four) was determined. Then the total construction components developed previously was used to determine the construction duration for each alternative.

ALTERNATIVE	1	2.1	2.2	2.3
CONSTRUCTION DURATION	6	6.75	6.75	6.25
ALTERNATIVE	2.4	3	5	6.1
CONSTRUCTION DURATION	6.25	6.75	6	6.75
ALTERNATIVE	6.2	6.3	6.4	
CONSTRUCTION DURATION	6.75	6.75	6.25	

CONCLUSIONS:

It can be seen from the above table that Alternatives 1.0 and 5.0, the At-Grade Trainway have the minimum disruption to highway and rail users.