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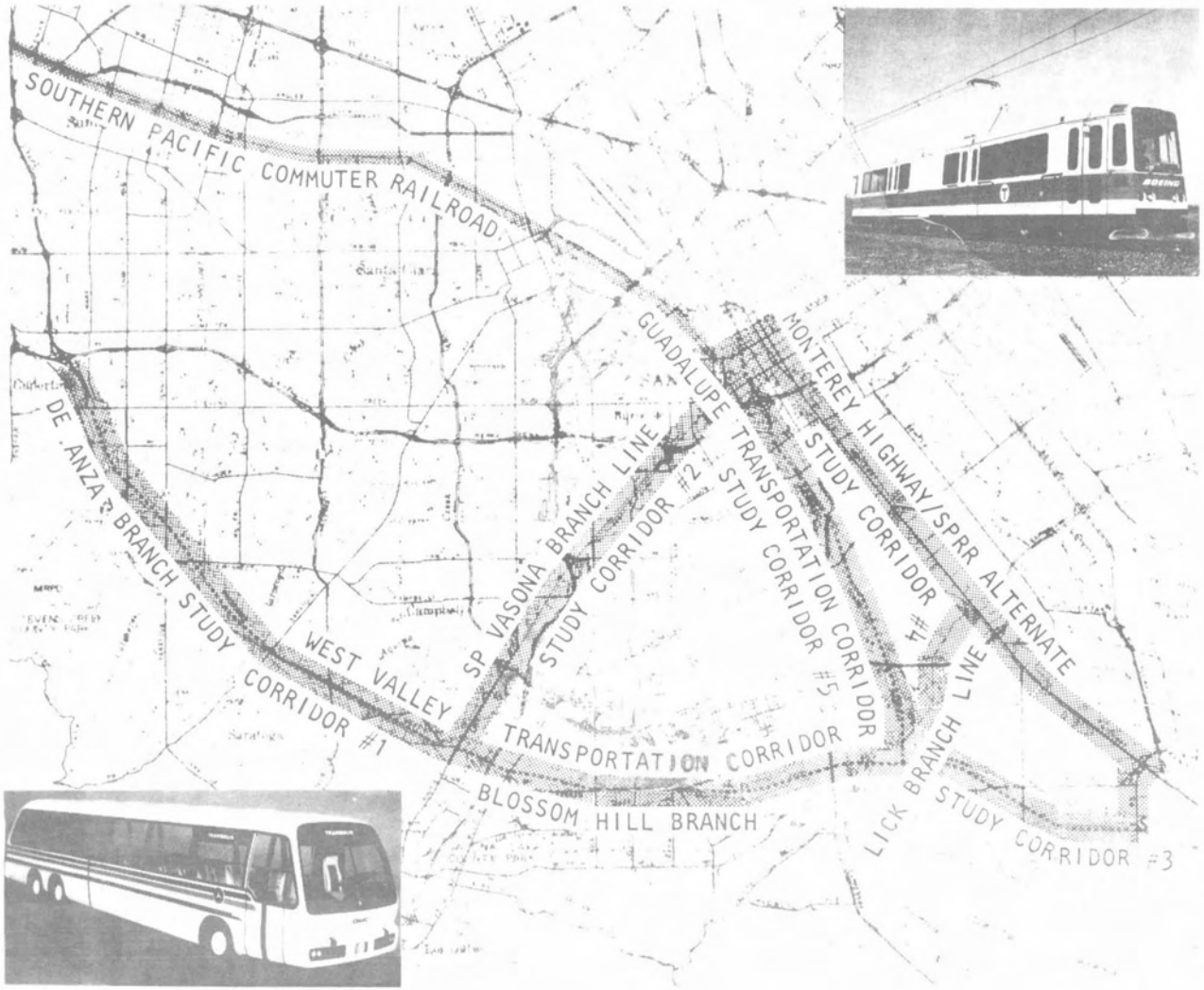
SANTA CLARA COUNTY TRANSIT DISTRICT



LIGHT RAIL FEASIBILITY AND ALTERNATIVES ANALYSIS

FINAL REPORT SUMMARY

6200

SUMMARY

This Light Rail Feasibility Study and Alternatives Analysis is concerned with potential transit services and alternative alignments in five designated corridors: the De Anza and Blossom Hill Road branches of the West Valley Transportation Corridor, the Southern Pacific (SP) railroad's Vasona Branch Line, the SP Lick Branch/Mainline Corridor and the Guadalupe Transportation Corridor. A variety of transit mode alternatives were evaluated: "Baseline Bus" or do-nothing possibilty, "Increased Local Bus Service," the "Bus Preferential Treatment (TSM) alternative, "Busway Transit" featuring roadways exclusively for buses and the "Light Rail Transit" alternative. Further, alternative design standards/service levels are possible with either busway or light rail transitways and these were also evaluated. These sub-alternatives were defined as "Base Case" (which is generally consistent with good, modern European light rail design and operating practices), and departures from this standard whose names are self-explanatory: "Meeting SP Requirements," "Higher Cost" and "Lower Cost."

Seven working papers were prepared during the course of the study for presentation to and discussion with the Santa Clara County Transit Board, the Santa Clara County Transportation Commission, staffs of various public agencies and the general public. These were: 1) Functional Design Criteria; 2) Travel Market Potential; 3) Alignment Definition; 4) Land Use, Socio-Economic and Environmental Considerations; 5) Patronage Forecasts; 6) Capital and Operating Costs; and 7) Alternatives Analysis. This Final Report draws upon these working papers and summarizes in one document all work undertaken, the methodologies used, major assumptions made, major problems encountered and key findings regarding the feasibility of implementing light rail transit or alternative modes in the designated study corridors.

INTRODUCTION AND PROJECT OVERVIEW

Chapter I of this report discusses the study's purpose and scope, the alternatives being evaluated, and the general assumptions underlying the study -- including such areas as land use/demographic data, 1990 highway network, fare levels, policy toward serving the handicapped, and so on -- and the criteria used for evaluating alternatives, grouped under the following headings:

- Transportation Service Effectiveness
- Economic Feasibility
- Environmental Sensitivity
- Compatibility with Local, Regional and National Goals
- Technological Suitability
- Community Acceptability and Political Support
- Financial Feasibility

CONCEPTUAL DEFINITION OF ALTERNATIVES

Chapter II consists of an expanded definition of the alternative transit modes and a description of how they would operate in the areas under study.

FUNCTIONAL DESIGN CRITERIA AND ALIGNMENT REVIEW

This chapter summarizes the major design criteria and system performance characteristics utilized in the study, including: vehicle characteristics, geometric standards, prototypical line crossections, station or stop layouts, and other data needed for plan and profile studies, cost estimates and environmental impact studies. Performance characteristics include operating patterns, maximum speeds, station or stop dwell times, minimum and policy headways, loading standards and similar information needed as inputs to the patronage analysis and for the preparation of operating cost estimates.

CAPITAL COSTS

Chapter IV outlines the costing methodology, capital cost items and corridor cost subtotals for use in corridor comparisons. A summary of the cost subtotals is shown in Table S-1 on the following page. The chapter also discusses cost comparisons between busway and light rail systems under different conditions and presents and reviews systemwide cost totals, as summarized here in Table S-2. Also contained in Chapter IV are charts showing minimum implementation time required for the various alternatives.

Table S-1 SUMMARY OF CORRIDOR CAPITAL COST SUBTOTALS

Corridor Description	Alternate	Base Case	Meeting SP Requirements	Higher Cost	Lower Cost
		(June 1976 dollars)		(Cost in $million)	
De Anza Corridor No. 1 Alternate "A" - 8.56 mi.	Light rail	47.5	53.7	57.5	42.8
	Busway	30.1	37.0	40.8	30.1
De Anza Corridor No. 1 Alternate "B" - 6.74 mi.	Light rail	32.3	36.4	40.5	28.6
	Busway	17.6	22.1	26.5	17.6
Vasona Corridor No. 2 - 6.12 mi.	Light rail	41.2	52.4	61.3	35.4
	Busway	37.0	48.5	72.2	34.2
Blossom Hill Corridor No. 3 - 9.30 mi.	Light rail	60.1	60.1	71.7	53.0
	Busway	40.1	40.1	52.7	38.2
S.P. Mainline/Lick Corridor - 7.55 mi.	Light rail	45.5	47.4	52.7	41.3
	Busway	32.0	34.2	39.5	32.0
Fourth Street RR/ Monterey Highway Alternate No. 4 - 7.78 mi.	Light rail	56.8	67.6	81.0	51.1
	Busway	43.4	55.5	69.8	40.1
Guadalupe Corridor No. 5 - 6.09 mi.	Light rail	38.1	39.2	44.5	34.7
	Busway	26.6	27.8	33.5	26.6

Table S-2	SUMMARY OF SYSTEMWIDE CAPITAL COST TOTALS			
	(June 1976 Dollars) (Costs in $Millions)			
Transit Alternative	Base Case	Meeting SP Requirements	Higher Cost	Lower Cost
Light Rail	267.5	294.0	348.0	210.4
Busway	174.2	202.7	276.1	166.2
Bus Preferential Treatment	39.6			
Increased Local Bus Service	66.7			
Baseline Bus System	68.3			

PATRONAGE FORECASTS AND EVALUATION

Chapter V contains a presentation and discussion of the 1975 and 1990 patronage estimates by mode and by corridor (see, as examples, Table S-3 and Figure S-1). Also included are results of sensitivity tests and presentation of transportation service effectiveness measures such as: modal split for selected major activity centers, impacts on parallel highway volumes and speeds and impacts on parking requirements. Accessibility/mobility measures are also analyzed, including: access to population and employment concentrations, service for transit dependents and access to major activity centers.

SYSTEM OPERATIONS, OPERATING COSTS AND FARE REVENUE ESTIMATES

Chapter VI describes how the various transit alternatives might be operated, given the ridership forecasts presented previously. Vehicle fleet size and vehicle-mile and vehicle-hour operating statistics are then derived from the possible operating patterns, resulting in annual operating cost estimates, as summarized in Table S-4. Also included in this chapter are the estimated costs of purchasing transit services from the SP railroad in order to permit free transfer arrangements for intra-County transit riders, the annual fare revenues for the various transit alternatives (assuming a 25-cent base fare) and the percent of operating costs estimated to be recovered from farebox revenues (see Table S-4).

ENVIRONMENTAL ASSESSMENT

Chapter VII features a discussion of the impact the alternatives are likely to have with respect to such land use areas as joint station/building opportunities, collateral development possibilities and station area land use impact. Socio-economic evaluations presented and discussed in Chapter VII involve community services, relocation requirements, economic pressure around stations, neighborhood character and equity considerations. Also discussed are natural environment considerations such as air quality, energy, noise, visual, ecosystem, water resources, soils and geology, parks and open space and historic and archaeological sites.

Table S-3
1990 SYSTEMWIDE TRANSIT PATRONAGE FORECASTS BY MODE

Alternative	Peak-Hour Trips		Daily Trips	
	By Transit	% of Total	By Transit	% of Total
Baseline Bus (516-Bus Fleet)	15,000	3.8	120,000	2.0
Low-Capital-Cost Improved Bus				
• 1000-Bus Fleet	24,000	6.0	170,000	2.8
• Bus Preferential Treatment (TSM)	20,000	5.0	140,000	2.3
Busway Transit				
• On Busway	8,700	2.2	60,000	1.0
• On Local Buses	11,300	2.8	90,000	1.5
System Total	20,000	5.0	150,000	2.5
Light Rail				
• On Light Rail	10,000	2.6	70,000	1.2
• On Local Buses	11,500	2.9	90,000	1.5
System Total	21,500	5.5	160,000	2.7

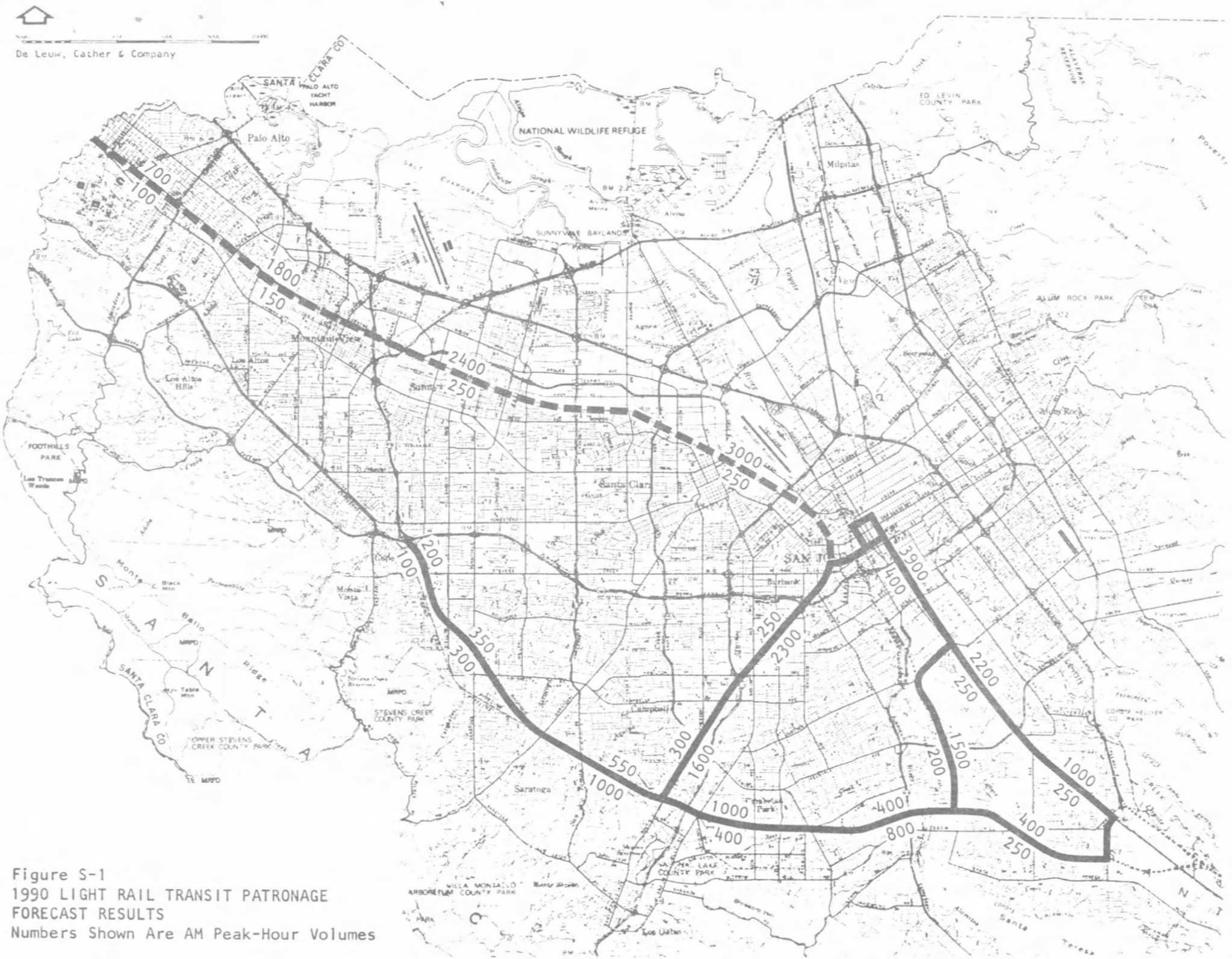


Figure S-1
1990 LIGHT RAIL TRANSIT PATRONAGE
FORECAST RESULTS
Numbers Shown Are AM Peak-Hour Volumes

Table S-4
PERCENT OF OPERATING COSTS RECOVERED FROM FAREBOX REVENUES

Transit Alternative	Annual Operating Costs*	Annual Farebox Receipts	Percent Farebox/ Operating Costs
Baseline Bus	$38.60	$5.83	15.1
Increased Local Bus	72.60	8.26	11.3
Bus Preferential Treatment			
Local Bus	38.60	5.15	13.3
Preferential Bus	11.60	1.65	14.2
Busway Transit			
Local Bus	38.60	4.86	12.6
Busway	10.30	2.43	23.6
Light Rail Transit			
Local Bus	38.60	4.86	12.6
Light Rail	8.73	2.92	33.0

*Operating costs for transitway/express bus portions include SPRR "purchase of services" costs.

The relative results for alternative transit modes and corridors are summarized graphically in Figures S-2 and S-3 on the following pages. Analysis indicated no insurmountable land use, socio-economic or natural environmental constraints which would automatically preclude any particular mode or corridor, though there are sensitive locations in each corridor which will require special precautions to avoid undesirable effects and these will vary according to the mode selected for implementation.

ECONOMIC FEASIBILITY

This chapter features both a benefit-cost analysis for each of the alternative modes and additional economic efficiency crtieria such as costs per passenger and per passenger-mile and annual subsidy requirements. Two types of benefits were evaluated, primary benefits and potential "add-on" benefits. Primary benfits were: constant transit user time savings, non-diverted auto user time savings, diverted auto user automobile and operating and maintenance (O & M) cost savings, parking cost savings, reduced highway accidents and commercial vehicle time savings. The potential "add-on" benefits were those which might be attributable to containment of urban sprawl, reduction in automobile ownership and time savings for non-work trips. Discount rates of seven percent, four percent and ten percent were used in view of the current lack of unanimity regarding the appropriate discount value for studies of this kind.

Benefit-cost ratios for the alternatives and sub-alternatives, both without and with the potential "add-on" benefits, can be seen in Table S-5. It will be noted that on the basis of primary benefits only, none of the alternatives have benefit-cost ratios greater than 1.0 at seven percent or ten percent discount rates. At a four percent rate, both the busway and light rail systems exceed 1.0. If the potential additional benefits are included, the busway and light rail benefit-cost ratios exceed 1.2, even with a seven percent discount rate.

The transit efficiency measures used as economic criteria are summarized in Tables S-6 and S-7.

With respect to transit efficiency measures, the baseline bus has the lowest capital cost per passenger ($0.21) and per passenger-mile ($0.05), while light rail is highest at $0.61 and $0.11, respectively. The situation is different, however, in regard to operating cost, where the light rail ranks best at $1.11 per passenger and $0.20 per passenger-mile (versus $1.13 and $0.25 for the baseline bus). Considering combined capital and operating cost,

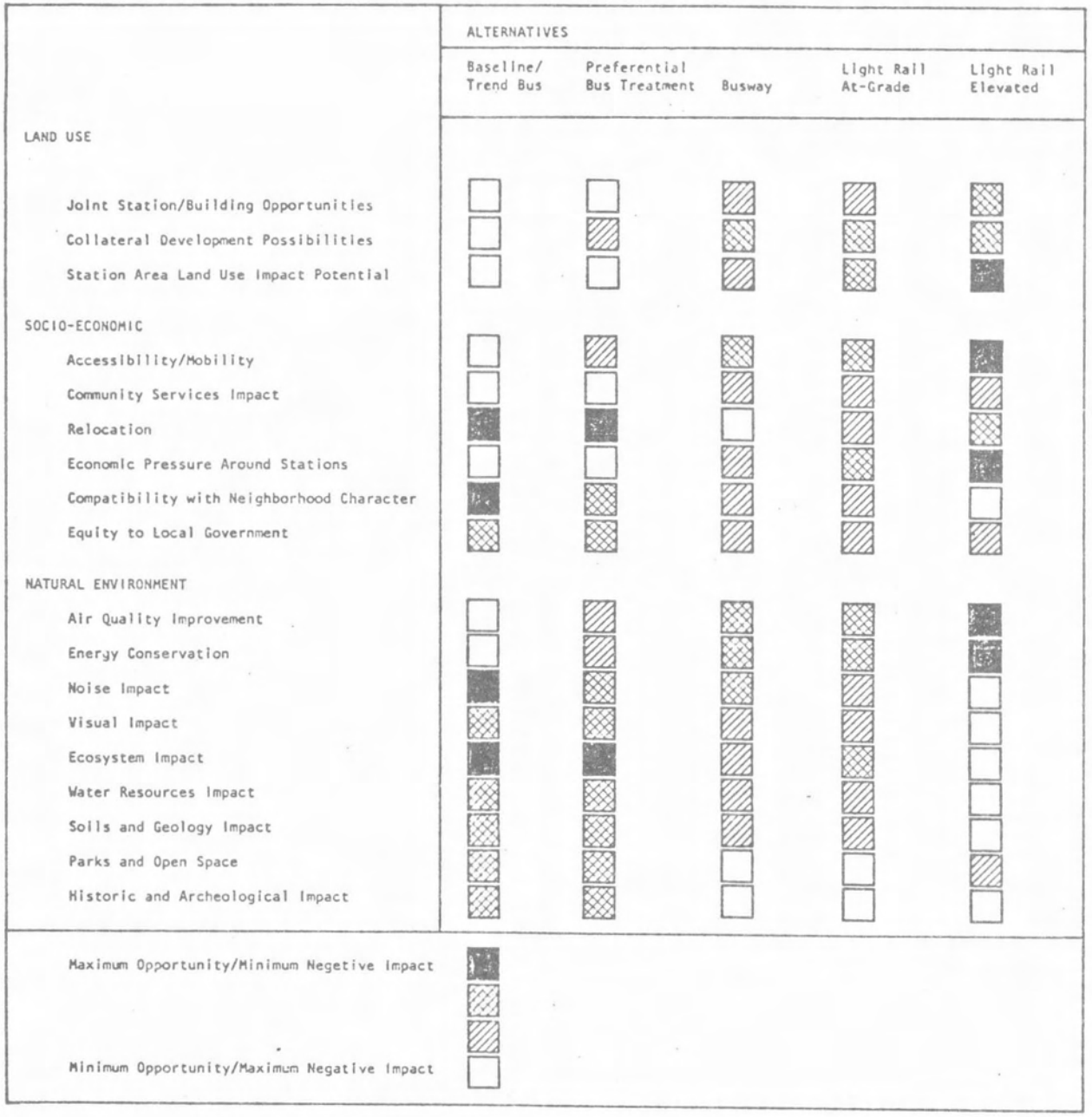


Figure S-2
COMPARISON OF ENVIRONMENTAL CONSIDERATION BY ALTERNATIVE TRANSIT MODES

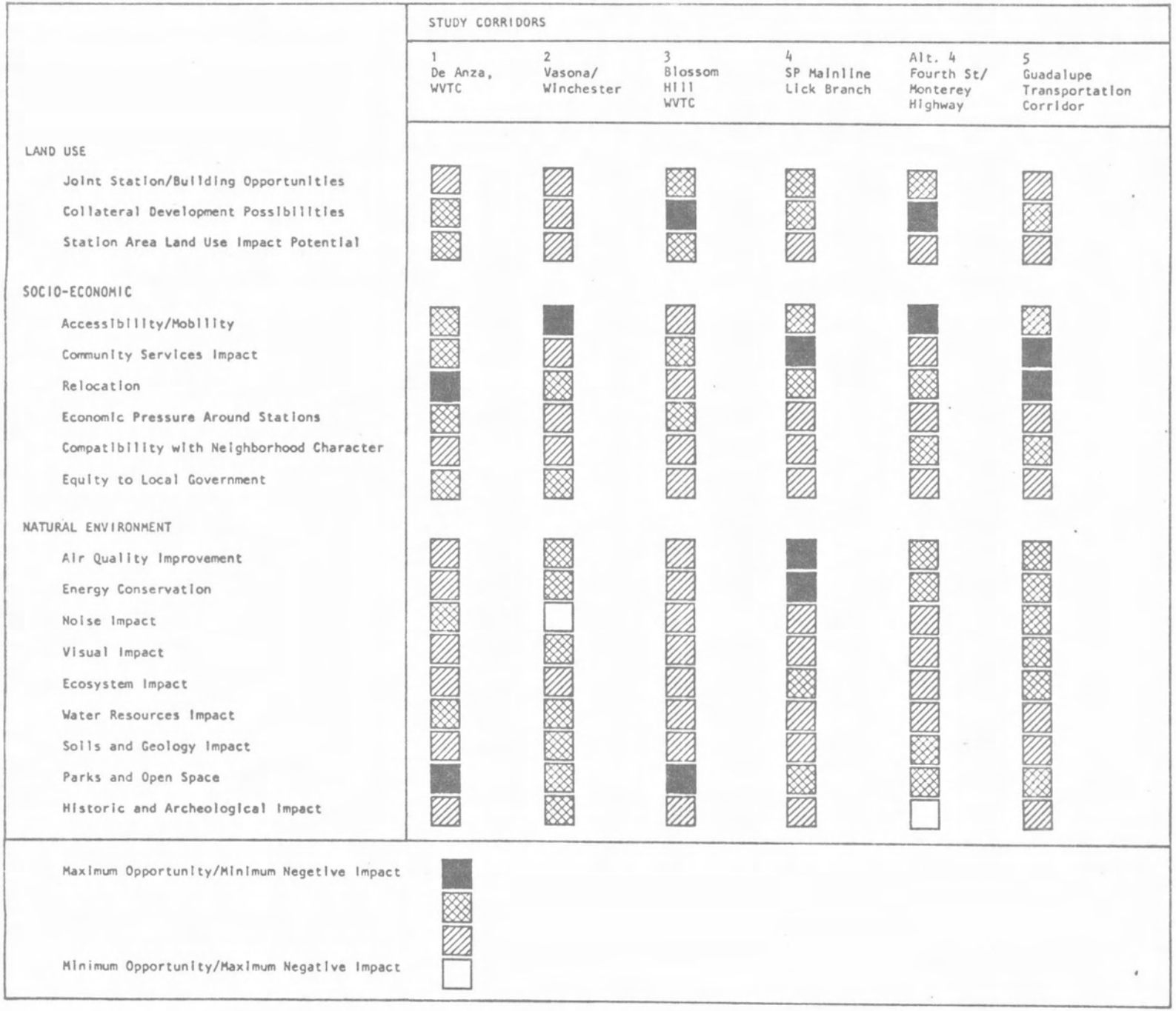


Figure S-3
COMPARISON OF ENVIRONMENTAL CONSIDERATIONS BY CORRIDOR

Table S-5
1990 BENEFIT-COST RATIOS WITHOUT AND WITH POTENTIAL ADDITIONAL BENEFITS

Benefits/Costs*	Base Case					Sub-Alternatives					
						Lower Cost		SP/PUC Requirements		Higher Cost	
	Baseline Bus	Bus Pref.	Expanded Bus	Busway	Light Rail	Busway	Light Rail	Busway	Light Rail	Busway	Light Rail
Without Potential Additional Benefits											
7% Discount Rate											
Annual Benefits	--	8.94	24.38	20.58	25.84	16.26	20.58	20.58	25.84	29.75	32.55
Annualized Costs	45.98	15.22	41.03	24.03	29.14	22.33	24.71	26.17	31.14	32.57	35.87
Benefit-Cost Ratio	--	0.59	0.59	0.86	0.87	0.73	0.83	0.77	0.83	0.91	0.91
4% Discount Rate											
Annual Benefits	--	8.94	24.38	20.58	25.84	16.26	20.58	20.58	25.84	29.75	32.55
Annualized Costs	44.49	14.31	39.62	19.84	22.67	18.33	19.58	21.28	24.02	25.88	27.43
Benefit-Cost Ratio	--	0.62	0.62	1.04	1.14	0.89	1.05	0.97	1.08	1.15	1.19
10% Discount Rate											
Annual Benefits	--	8.94	24.38	20.58	25.84	16.26	20.58	20.58	25.84	29.75	32.55
Annualized Costs	47.61	16.21	42.58	28.74	36.33	26.78	30.43	31.61	39.06	40.02	45.25
Benefit-Cost Ratio	--	0.55	0.57	0.72	0.71	0.61	0.68	0.65	0.66	0.74	0.72
With Potential Additional Benefits											
7% Discount Rate											
Annual Benefits	--	11.66	32.74	29.59	36.25	24.16	29.59	29.59	36.25	41.04	44.22
Annualized Costs	45.98	15.22	41.03	24.03	29.14	22.33	24.71	26.17	31.14	32.57	35.87
Benefit-Cost Ratio	--	0.77	0.80	1.23	1.24	1.08	1.20	1.13	1.16	1.26	1.24

* Benefits and costs are marginal; expressed in millions of 1976 dollars

Table S-6
TRANSIT ECONOMIC EFFICIENCY MEASURES -- SYSTEM COSTS

	Base Case					Sub-Alternatives					
						Lower Cost		SP/PUC Requirements		Higher Cost	
	Baseline Bus	Bus Pref.	Expanded Bus	Busway	Light Rail	Busway	Light Rail	Busway	Light Rail	Busway	Light Rail
Total System Annual Passenger Trips (millions)	34.3	40.0	48.6	42.9	45.8	41.5	42.9	42.9	45.8	47.2	48.6
Total System Annual Passenger Miles (millions)	154.4	208.8	218.8	236.0	256.0	234.5	236.0	236.0	256.0	266.0	276.0
Incremental Annual Passenger Trips (millions)	--	5.7	14.3	8.6	11.5	7.2	8.6	8.6	11.5	12.9	14.3
Incremental Annual Passenger Miles (millions)	--	54.3	64.4	81.5	101.5	80.1	81.5	81.5	101.5	111.5	121.6
Annual Cost in 1976 Dollars per 1990 Passenger-Trip and 1990 Passenger-Mile											
Total System Capital Cost/Passenger	$0.21	$0.27	$0.30	$0.49	$0.61	$0.49	$0.54	$0.54	$0.65	$0.61	$0.70
Total System Capital Cost/Passenger-Mile	0.05	0.05	0.07	0.09	0.11	0.09	0.10	0.10	0.12	0.11	0.12
Incremental Over Base Marginal Cost/Passenger	--	0.63	0.49	1.60	1.79	1.84	1.85	1.85	1.96	1.66	1.85
Marginal Cost/ Passenger Mile	--	0.07	0.11	0.17	0.20	0.16	0.19	0.19	0.22	0.19	0.22
Total System O+M Cost/ Passenger	1.13	1.34	1.56	1.22	1.11	1.23	1.18	1.22	1.11	1.13	1.06
Total System O+M Cost/ Passenger-Mile	0.25	0.26	0.35	0.22	0.20	0.22	0.22	0.22	0.20	0.20	0.19
Incremental Over Base Marginal Cost/Passenger	--	2.03	2.38	1.20	0.76	1.29	1.03	1.20	0.76	0.87	0.66
Marginal Cost/ Passenger-Mile	--	0.21	0.53	0.13	0.09	0.11	0.11	0.13	0.09	0.11	0.08
Total System Cost Total Cost/Passenger	$1.34	$1.61	$1.86	$1.71	$1.72	$1.72	$1.72	$1.76	$1.76	$1.74	$1.76
Total Cost/Passenger-Mile	0.30	0.31	0.42	0.31	0.31	0.31	0.32	0.32	0.32	0.31	0.31
Incremental Over Base Marginal Cost/Passenger	--	2.66	2.87	2.80	2.55	3.13	2.88	3.05	2.72	2.53	2.52
Marginal Cost/ Passenger-Mile	--	0.28	0.64	0.30	0.29	0.27	0.30	0.32	0.31	0.30	0.30

Table S-7
TRANSIT EFFICIENCY -- SUBSIDY REQUIREMENTS
Annual Cost in 1976 Dollars per 1990 Passenger-Trip and Passenger-Mile

	Base Case					Sub-Alternatives					
						Lower Cost		SP/PUC Requirements		Higher Cost	
	Baseline Bus	Bus Pref.	Expanded Bus	Busway	Light Rail	Busway	Light Rail	Busway	Light Rail	Busway	Light Rail
System Subsidy Requirements*											
O & M Costs (incl. SP Service)	38.60	53.60	76.00	52.30	50.70	51.20	50.85	52.30	50.70	53.20	51.40
Fare Revenues	5.83	6.80	8.26	7.29	7.78	6.92	7.29	7.29	7.78	8.06	8.26
Subsidy Required	32.77	46.80	67.74	45.01	42.92	44.28	43.56	45.01	42.92	45.14	43.14
Subsidy/Passenger	0.96	1.17	1.39	1.05	0.94	1.07	1.01	1.05	0.94	0.96	0.89
Subsidy/Passenger-Mile	0.21	0.22	0.31	0.19	0.17	0.19	0.18	0.19	0.17	0.17	0.16
Incremental Subsidy**											
O & M Costs (incl. SP Service)	--	11.60	34.00	10.30	8.70	9.20	8.85	10.30	8.70	11.20	9.40
Fare Revenues	--	0.97	2.43	1.46	1.95	1.09	1.46	1.46	1.95	2.23	2.43
Subsidy	--	10.63	31.57	8.84	6.75	8.11	7.39	8.84	6.75	8.97	6.97
Subsidy/Passenger	--	1.86	2.21	1.03	0.59	1.13	0.86	1.03	0.59	0.70	0.49
Subsidy/Passenger-Mile	--	0.20	0.49	0.11	0.07	0.10	0.09	0.11	0.07	0.08	0.06

Note: All Figures are Millions of Dollars except per Passenger and per Passenger-Mile Figures.

* Baseline bus costs and revenues included in all alternatives.

** Costs and revenues are the costs/revenues accrued as a result of alternative implementation. These figures do not include base bus figures.

the baseline bus does considerably better on a cost-per-passenger basis ($1.34 vs. $1.61 for the next best) but only very slightly better than all the others on a cost-per-passenger-mile basis. With respect to subsidy requirements, light rail -- because of its higher patronage (and hence revenue) and lower operating cost -- is lower than all other alternatives, including the next best baseline bus, on both a per-passenger basis ($0.94 vs. $0.96) and a per-passenger-mile basis ($0.17 vs. $0.21).

GOALS ACHIEVEMENT

Chapter IX reviews the applicable national, regional and local goals and discusses the relative ability of the transit alternatives under study to assist in attaining these goals. It was found that all of the alternatives, if properly designed and implemented, can help achieve a variety of the stated goals. Some will perform better in certain areas than others, while none is to be expressly preferred on all counts. It is difficult, therefore, to summarize this aspect of the analysis, but on balance, it appears that the two transitway systems (busway and light rail) are to be preferred to all other alternatives.

FINANCIAL FEASIBILITY

The analysis summarized in Chapter X indicated that the capital funds available (as estimated by the Santa Clara County Transportation Agency staff) will be inadequate to meet the full, five-corridor implementation costs of any of the alternatives except the baseline bus and bus preferential treatment (TSM). Deficits range from $10.5 million (in inflated dollars) for the expanded local bus fleet to $280.1 million for the light rail system if lines were to be constructed in all corridors studied (see Table S-8). It should be noted that the specified funding constraints are based on the assumption that 80 percent of the cost of system implementation will be met by the Federal government -- an assumption which may or may not be valid considering the limited monies currently available and the competition among regions for these Federal funds. Also because of the restrictions placed on the uses of SCA-15 monies for "fixed guideway" facilities only, it does not appear at this time that these funds could be used to match Federal funds to construct bus or busway improvements. Therefore, it appears that only $67.5 million would be available to construct bus or busway improvements, whereas $101.7 million would be available to implement a light rail transit system.

The Transit District Board recognized this funding difficulty prior to the March 1976 sales tax election, and while realizing that passage of the 1/2-cent sales tax measure would not permit the installation and continued operation of the full five-corridor system, the Board was informed that a ten to fifteen mile useful first segment could be constructed and operated within the projected funding constraints.

Table S-8
INCREMENTAL CAPITAL COST FINANCING NEEDS FOR SYSTEM EMPLEMENTATION
(In millions of inflated dollars)

	Base Case					Sub-Alternatives					
						Lower Cost		SP/PUC Requirements		Higher Cost	
	Baseline Bus	Bus Pref.	Expanded Bus	Busway	Light Rail	Busway	Light Rail	Busway	Light Rail	Busway	Light Rail
Total Capital Cost	39.9*	47.7	78.0	239.1	381.8	227.8	299.7	279.7	420.6	382.5	498.9
Capital Cost Constraint	39.9*	67.5	67.5	67.5	101.7	67.5	101.7	67.5	101.7	67.5	101.7
Possible Shortfall in Capital Costs	--	--	10.5	171.6	280.1	160.3	198.0	212.2	318.9	315.0	397.2
Additional Local Capital Required (assumes 80% Federal funding)	--	--	2.1	34.3	56.0	32.1	39.6	42.4	63.8	63.0	78.8

* According to District's current 5-year T.I.P. issued December 1975

The situation is even worse with respect to annual operating and maintenance costs (see Table S-9). It appears that only the baseline bus alternative can meet the given constraint. The light rail system, because of its higher patronage (and hence greater farebox revenue) and lower operating cost, has the least shortfall of all the alternatives.

Table S-9
INCREMENTAL OPERATING COST FIANACING NEEDS FY 1981 - 1985
(In millions of inflated dollars)

	Base Case					Sub-Alternatives					
						Lower Cost		SP/PUC Requirements		Higher Cost	
	Baseline Bus	Bus Pref.	Expanded Bus	Busway	Light Rail	Busway	Light Rail	Busway	Light Rail	Busway	Light Rail
Operating Costs	311.3	93.5	274.2	68.9	45.0	61.3	45.7	68.9	45.0	74.8	48.6
Fares	47.1	8.0	19.6	9.9	10.2	7.0	7.5	9.9	10.2	15.0	13.8
Subsidy Requirement	264.3	85.5	254.6	59.0	34.8	54.3	38.2	59.0	34.8	59.8	34.8
Subsidy Constraint	282.3	14.3	14.3	14.3	20.2	14.3	20.2	14.3	20.2	14.3	20.2
Possible Shortfall in Operating Funds FY 1981 through 1985	--	71.2	240.3	44.7	14.6	40.0	18.0	44.7	14.6	45.5	14.6

TECHNOLOGICAL SUITABILITY

The use of proven, mature bus and rail technologies resulted in the finding that the measures of safety, technical risk, flexibility and growth potential, procurement risk and service dependability were virtually equal for all alternatives.

COMMUNITY ACCEPTABILITY AND POLITICAL SUPPORT

As discussed in Chapter XII, the scheduled community meetings and reviews of this study's findings over the next three months are expected to lead to recommendation of a Final Action Plan by the Transportation Commission and approval of such a plan by the Transit District Board. These actions will provide the best indication of how the alternatives compare with respect to this evaluation area. Based on the results of public meetings to date and the voter approval of the 1/2-cent sales tax in support of transit, baseline bus and light rail appear to the Consultant to be the preferred alternatives from the local point of view. The degree of acceptance and support of these or other alternatives at the regional and national levels is uncertain at present and can only be resolved over time as these levels of government respond to local initiatives seeking plan funding and implementation.

BASIS FOR DECISION-MAKING

Chapter XIII illustrates a procedure whereby each decision-maker, using individual value judgments and sense of priorities, can carry out a trade-off analysis both among the measures within a given evaluation area and among the seven major evaluation areas, leading to some final conclusions as the end result of this study and evaluation process. The basic questions to be answered are:

- Which of the alternative modes or combinations of modes should be selected for implementation in Santa Clara County on a systems basis?

- If either the busway or light rail mode alternative should be selected, what is the most appropriate design standard/service level option for near-term implementation (i.e., in the next five to ten years)?

- Assuming that not all of the corridors are equally attractive, what are their relative priorities for implementation?

To illustrate the process, the Consultant has prepared the summary comparison of evaluation measures shown in Tables S-10, S-11 and S-12 based on their own value judgments as to what factors are most significant, the relative rankings indicated by the data developed in the course of the study, and trade-off analysis between conflicting objectives. It is hoped that each concerned decision-maker will follow a similar procedure to arrive at his own informed conclusions using the data and supporting material contained in the project's seven working papers and this final report.

It was concluded by the Consultant that:

- All of the mode alternatives have some positive features which recommend them in one or more evaluation areas.

- Light rail and baseline bus, being preferred in numerous categories, are the two most desirable alternatives.

- Only the baseline bus system satisfies the given capital and operating constraints. If light rail is to be considered further, therefore, it must be on a basis of less than full implementation in all study corridors.

- A logical basis for a starter line would be the Guadalupe/Monterey Highway/Lick Branch corridor with a design standard/service level corresponding to the base case or meeting SP requirements options.

The rationale for the selection of a possible starter line is presented toward the end of Chapter XIII. In addition to citing data supporting the choice, it is pointed out that while technical studies such as this one can help to define the issues and quantify benefits, costs and the consequences of alternative actions, in the final analysis the choice is dependent not on technical information alone, but on the unique and special way the County perceives itself and the future toward which it wishes to move.

S-10
SUMMARY OF MODE ALTERNATIVE EVALUATION MEASURES

Evaluation Measures	Baseline Bus	Expanded Local Bus	Bus Pref. Treatment	Busway	Light Rail
TRANSPORTATION SERVICE					
Patronage & Modal Split		▨			▨
Mobility/Accessibility		▨		▨	▨
Highway & Parking Impact				▨	▨
ECONOMIC FEASIBILITY					
Annual Benefits		▨			▨
Combined Capital & Oper. Costs			▨		
Benefit-Cost Ratio				▨	▨
Combined Cost/Passenger	▨				
Combined Cost/Passenger-Mile	▨		▨	▨	▨
ENVIRONMENTAL SENSITIVITY					
General Plan Compatibility	▨	▨			
Directing Urban Growth					▨
Socio-economic Impact		▨			
Natural Environment Impact	▨	▨			
FINANCIAL FEASIBILITY					
Capital Cost Constraint	▨		▨		
Operating Cost Constraint	▨				
Subsidy Required/Passenger	▨				▨
GOALS ACHIEVEMENT					
National				▨	▨
Regional				▨	▨
Local				▨	▨
TECHNOLOGICAL SUITABILITY					
Composite Performance					
COMMUNITY SUPPORT					
Public	▨				▨
Political Leaders	▨				▨

Legend: ▨ Preferred/Performs Best in Consultant's Judgment
(Lack of any box shaded indicates no clear choice.)

S-11
SUMMARY OF DESIGN STANDARD/SERVICE LEVEL EVALUATION MEASURES

Evaluation Measures	Base Case	Meeting SP/PUC Requirements	Higher Cost	Lower Cost
TRANSPORTATION SERVICE				
Patronage & Modal Split			//////	
Mobility/Accessibility			//////	
Highway & Parking Impact			//////	
ECONOMIC FEASIBILITY				
Annual Benefits			//////	
Combined Capital & Oper. Costs				//////
Benefit-Cost Ratio			//////	
Combined Cost/Passenger				
Combined Cost/Passenger-Mile				
ENVIRONMENTAL SENSITIVITY				
General Plan Compatibility			//////	
Directing Urban Growth			//////	
Socio-economic Impact				//////
Natural Environment Impact				
FINANCIAL FEASIBILITY				//////
Capital Cost Constraint				//////
Operating Cost Constraint				//////
Subsidy Required/Passenger				
GOALS ACHIEVEMENT			//////	
National			//////	
Regional			//////	
Local				
TECHNOLOGICAL SUITABILITY		//////	//////	
Composite Performance				
COMMUNITY SUPPORT	//////			
Public	//////			
Political Leaders				

Legend: ////// Preferred/Performs Best in Consultant's Judgment
(Lack of any box shaded indicates no clear choice.)

S-12
SUMMARY OF CORRIDOR EVALUATION MEASURES

Evaluation Measures	De Anza Branch WVTC	Vasona Branch	Blossom Hill WVTC	Guadalupe/ Monterey/Lick
TRANSPORTATION SERVICE				
Patronage & Modal Split				//////
Mobility/Accessibility		//////		//////
Highway & Parking Impact				//////
ECONOMIC FEASIBILITY				
Annual Benefits				
Combined Capital & Oper. Cost:				
Benefit-Cost Ratio				
Combined Cost/Passenger				
Combined Cost/Passenger-Mile				
ENVIRONMENTAL SENSITIVITY				
General Plan Compatibility				
Directing Urban Growth		//////		//////
Socio-economic Impact		//////		//////
Natural Environment Impact				
FINANCIAL FEASIBILITY				
Capital Cost Constraint				
Operating Cost Constraint				
Subsidy Required/Passenger				
GOALS ACHIEVEMENT				
National				
Regional				
Local				
TECHNOLOGICAL SUITABILITY				
Composite Performance				
COMMUNITY SUPPORT				
Public				
Political Leaders				

Legend: ////// Preferred/Performs Best in Consultant's Judgment
(Lack of any box shaded indicates no clear choice.)

STARTER LINE

Chapter XIV further discusses the capital and operating cost constraints and indicates how a possible starter line consistent with these constraints might be selected. Figure S-4 shows a possible light rail starter line alignment which was designated for illustrative purposes. Analysis of this possible starter line indicated it would satisfy the capital cost limitations if Federal funding were provided but the possible line would cost about $1.6 million more to operate (including purchase of services from the SP railroad) than is currently available under the existing five year financial plans. Assuming a 25-cent base fare, it is estimated that only about 24 percent of the total operating cost would be recovered from the farebox by the starter line.

A benefit-cost anlaysis was made for the potential starter line assuming a seven percent discount rate. It was found that the ratio would be about 0.9 if only primary benefits were considered and about 1.3 if the possible "add-on" benefits were included. Again, if suitable land use changes were instituted in conjunction with the installation of the light rail line and if other supporting actions were carried out, a considerable increase in patronage (and, consequently, a significant increase in the benefit-cost ratio) would be expected.

Transit efficiency measures were also computed for the possible starter line and compared with the baseline bus alternative. These again highlight the choice that exists between capital-cost intensive transit systems and operating-cost intensive systems. It was concluded that the rationale for selection of a light rail starter line presented at the end of the previous chapter (Basis for Decision-Making) was still valid. Obviously, however, further refinement will be required before an optimum initial line segment is designated for implementation.

NEXT STEPS

Chapter XV concludes this report with a review of the actions scheduled to be taken between now and the end of March, 1977, when the Final EIR, Summary and Action Plan are scheduled to be incorporated into the County's Transportation Improvement Program (T.I.P.) for

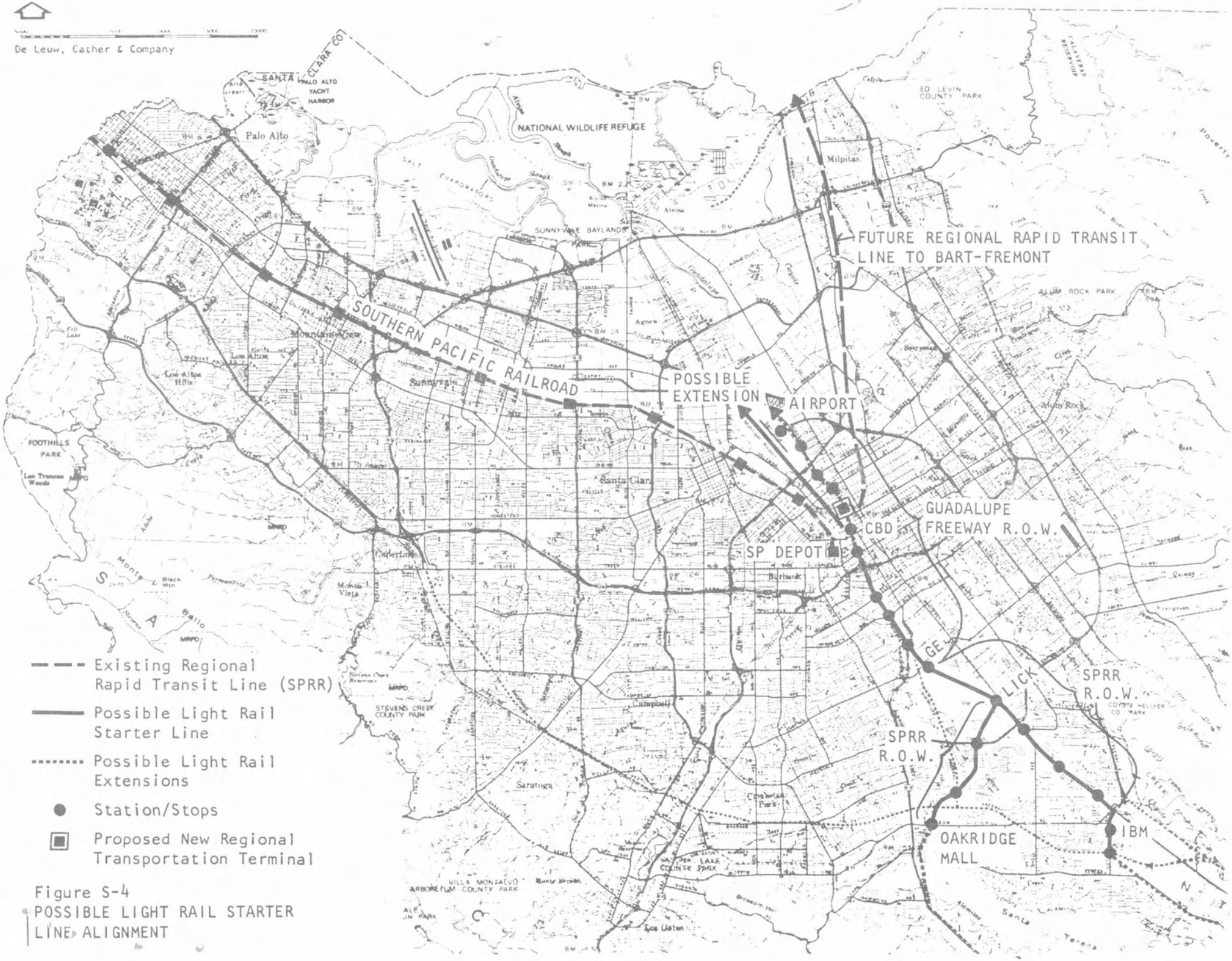


Figure S-4
POSSIBLE LIGHT RAIL STARTER LINE ALIGNMENT

transmittal to MTC for inclusion in the regional T.I.P. Chapter XV also reviews the relationship of this study to MTC's Peninsula Transit Alternatives Project (PENTAP) and to the ABAG/MTC Santa Clara Valley Corridor Study.

Finally, the desirability of seeking an early UMTA reaction to the findings of this light rail feasibility study and alternatives analysis is stressed. Much, if not all, of the information in which UMTA has based funding decisions in other cities is now available for Santa Clara County. An early reaction by UMTA could be instrumental in helping to avoid the wasting of scarce funds on pointless additional studies and/or could help focus the County's future efforts most productively.

SCHEDULE FOR CITY AND PUBLIC REVIEW OF LIGHT RAIL
FEASIBILITY AND ALTERNATIVES ANALYSIS

August 25, 1976	Joint meeting of the Board of Supervisors and the Transportation Commission to discuss the "key findings and the final report.
September-November 1976	Distribute study summaries. Cities hold public discussions and conduct public meetings. Cities complete review and formulation of recommendations relative to the study findings and conclusions.
October 1976	Distribution of a Draft EIR on Alternatives.
December 15, 1976	Submission of recommendations by each City.
January 3, 1977	Board of Supervisors Public Hearing on Draft EIR on Alternatives.
February 1, 1977	Complete preparation of a Final EIR, Summary and recommended Action Plan incorporating the Consultant's findings and the recommendations submitted by each City.
February 23, 1977	Approval by Transportation Commission of a Final EIR, Summary and Action Plan.
March 7, 1977	Approval by the Board of Supervisors of Final EIR on Alternatives and a Final Summary and Action Plan.
March 28, 1977	Incorporate the Final EIR, Summary and Action Plan in the Transportation Improvement Program for transmittal to MTC for current regional TIP.