

STANISLAUS COUNTY REGIONAL EXPRESSWAY STUDY

Task Group 1 and 2 - Summary Final Report
**Study Context, Criteria and Assumptions
Expressway Needs, Opportunities and Constraints**

Task Group 3 - Draft Final Report
Recommended Ultimate Expressway System

Task Group 4 - Draft Report
System Design Concepts and Implementation Options

**Prepared for
Stanislaus Area Association of Governments**

**June 14, 1990
89-345**



Fehr & Peers Associates
Transportation Consultants

3685 Mt Diablo Blvd
Suite 200
Lafayette, CA 94549
415 284-3200

Stanislaus County Regional Expressway Study

Task Group 1 and 2 - Summary Final Report
Study Context, Criteria and Assumptions

Task Group 3 - Draft Final Report
Recommended Ultimate Expressway System

Task Group 4 - Draft Report
System Design Concepts and Implementation Options

**Prepared for
Stanislaus Area Association of Governments**

**Fehr & Peers Associates
The Planning Center
Economic and Planning Systems**

**June 14, 1990
89-345**



Fehr & Peers Associates
Transportation Consultants

3685 Mt Diablo Blvd
Suite 200
Lafayette, CA 94549
415 284-3200

**SAAG REGIONAL EXPRESSWAY STUDY
TASK GROUP 3 REPORT**

	<u>Page</u>
I. INTRODUCTION	1
II. NEED FOR AN EXPRESSWAY SYSTEM	3
A. Regional Development Forecasts	3
B. Expected Levels of Traffic Congestion	4
C. How Expressways Can Reduce Congestion	7
III. CANDIDATE EXPRESSWAYS	11
IV. EVALUATION OF ALTERNATIVES	12
A. Goals of Regional Expressway System	12
B. Evaluation Criteria	13
C. Evaluation of Alternatives	14
V. RECOMMENDED ULTIMATE EXPRESSWAY SYSTEM	17
A. Principal Features of the Plan	17
B. Prioritized Expressway System	21
C. System Performance	27
D. Design Concepts and Alignment Considerations	28
E. Phasing Plan	39
VI. COST ESTIMATES	40
VII. FUNDING NEEDS AND FUNDING SOURCES	42
A. Project Costs	42
B. Existing Funding Sources	42
C. Potential Funding Sources	43
D. Development Fees	43
E. Special Districts	46
F. Tax Increment	47
G. Sales Tax	48
H. State Funds	48
I. Summary	49
VIII. IMPLEMENTATION ENTITIES	51
A. Stanislaus Area Association of Governments	51
B. Joint Powers Authority	52
C. Designated County Expressway System	52
D. Summary	53

(Table of Contents, continued)

	<u>Page</u>
IX. EXPRESSWAY PERFORMANCE POLICIES	54
A. General Plan Updates	55
B. Existing General Plans.	55
C. Right-of-Way Reserve District	55
D. Development Guidelines.	56
E. Expressway Combining District	56
F. Performance Policies for Expressway Siting and Design	56
G. Performance Policies by Land Use Category	57

APPENDICES

- Appendix A - The Single-Signal Interchange for Urban Expressways**
- Appendix B - Locations and Costs for Expressway Interchange, Bridges and Overcrossing**
- Appendix C - Unit Cost Data**
- Appendix D - Route Segment Costs**

LIST OF TABLES

<u>Table</u>		<u>Follows Page</u>
1	Regional Population and Employment Projections.	3
2	Expressway Design Classes	9
3	Candidate Expressways.	11
4	Measures of Effectiveness for Evaluation of Transportation Objectives	13
5	Measures of Effectiveness for Evaluation of Environmental Constraints	14
6	Transportation Evaluation Matrix	14
7	Environmental/Land Use Evaluation Matrix.	15
8	Priority and Recommended Class and Size for Components of Ultimate Expressway System	17
9	Expressway System Performance.	27
10	Currently Proposed Improvements at Route 99 Interchanges	31
11	Effects of Expressway System on Route 99 Interchanges	31
12	Effectiveness of Kiernan Corridor Alignment Alternatives.	33
13	Effectiveness of Dakota Corridor Alignment Alternatives.	36
14	Effect of Different Expressway Alternatives on Briggsmore-Carpenter Interchange	37
15	Expressways Most Likely To Be Needed by Year 2000	39
16	Expressway Cost Summary	40
17	Cost vs. Benefit Comparison of Expressway Priority Group	40
18	Reasons for Differences Relative to Prior Cost Estimates.	41
19	Stanislaus County Regional Expressways Existing Funding and Costs by Priority Grouping.	42
20	Taxable Sales and Population Projections for Stanislaus County	47
21	Cumulative Unfunded Costs for Expressway Priority Groups	48
	Stanislaus County Regional Expressway Study Land Use Analysis - General Plan Land Use Designations	59
	Stanislaus County Regional Expressway Study Land Use Analysis - Existing Land Uses.	59

LIST OF FIGURES

<u>Figure</u>		<u>Follows Page</u>
1	Typical Expressway Cross Section.	8
2	Expressway Design Classes	9
3	Expressway Access Management.	9
4	Expressway Route Segments	11
5	Ultimate 2010 Expressway System.	17
6	Expressway Class and Number of Lanes for Ult. 2010 System.	17
7	Priority 1 Expressway System.	21
8	Priority 2 Expressway System.	25
9	Priority 3 Expressway System.	26
10	Priority 4 Expressway System.	26
11	Expressway/Arterial and Expwy/Expwy Interchange Types.	28
12	Expressway/Freeway Interchange Types	29
13	Expressway Interchanges at Rail Crossings.	29
14	2010 Expressway System Interchange Locations	29
15	Kiernan/99 Interconnect Alternative	34
16	Pelandale/99 Interconnect Alterantive	35
17	Potential Turlock/Keyes Expressway Interconnect.	38
18	South Turlock Expressway - Alt. Connections to Route 99	38

I. INTRODUCTION

Stanislaus County's population and employment are expected to double within the next twenty years. Traffic conditions, which are already approaching critical levels in some parts of the region, will become considerably worse unless roadway improvements keep pace with this growth. Recent studies have shown that significant capacity increases will be needed along State Routes 132, 108 and 99 and along other primary travel corridors. These studies suggest that one way to substantially expand the area's street and highway capacity would be to develop a regional expressway system.

Expressways provide considerable capacity and safety advantages over normal arterials, and they generally require less land and are less expensive to build than full freeways. They have higher design standards, greater access restrictions and greater freedom from cross traffic than arterials streets, but they do not meet freeway design standards. Expressways are designed to remove longer-distance "through" traffic from urban arterials, freeing them to carry shorter-distance trips.

The Stanislaus Area Association of Governments (SAAG) has selected Fehr & Peers Associates to help identify potential locations for expressways within the region. The goals of this Regional Expressway Study are as follows:

- o To establish the need for an expressway system
- o To determine the preferred location and phasing
- o To define the preferred expressway design concept
- o To assess environmental and General Plan issues associated with the expressway plan
- o To define the financing and institutional arrangements needed to implement the plan
- o To gain consensus among the various state and local agencies and jurisdictions affected by the expressway plan

The desired product of the study is information to be used in preparing an amendment to the SAAG Regional Transportation Plan (RTP). Subsequent to this study, additional studies may be conducted to: identify and protect right-of-way; establish fees or other funding mechanisms; prepare plans, specifications, designs and cost estimates; produce environmental documentation. These subsequent studies will be intended to lead directly to funding, engineering and construction of the expressway system.

The present study is composed of five task groups:

1. Establish Study Context, Assumptions and Evaluation Criteria.
2. Determine Need for an Expressway System and Key Constraints and Opportunities.
3. Identify the Preferred Ultimate Expressway System Concept.
4. Refine the System Concept and Prepare Implementation Strategy.
5. Select Expressway System and Implementation Plan.

This report summarizes the final results of Task Group 1 (Study Context, Assumptions and Evaluation Criteria), and Task Group 2 (Expressway Needs, Opportunities and Constraints). Complete information on these two tasks was presented in our December 12, 1989 report on Tasks Groups 1 and 2.

This report also reviews and refines information originally presented in our March 9 report on Task Group 3, the Preferred Ultimate Expressway System. It also presents preliminary findings and recommendations on Task Group 4. This includes system design concepts, phasing costs, funding, implementation options, and performance policies.

II. NEED FOR AN EXPRESSWAY SYSTEM

A. Regional Development Forecasts

The planning horizon for this study is twenty years, consistent with the horizon for the Regional Transportation Plan (RTP). SAAG and its member jurisdictions have projected year 2010 population and employment levels for the Stanislaus region. These projections are listed in Table 1.

The region's 1990 population is about 363,000, and its employment is about 141,000. There are presently about 39 jobs in the County for every 100 residents, which translates to less than 90 jobs in the County for every 100 employed residents. Significant numbers of the region's residents commute to work at locations outside of the area, such as the San Francisco Bay Area.

The most recent projections for 2010 suggest that the area's population will exceed 700,000 and its employment will reach about 300,000. These represent an approximate doubling of both population and employment. The region's job/housing balance will improve slightly from 39 jobs for every 100 residents to 43. As a consequence, traffic levels within the region are expected to grow considerably. Out-commuting is also predicted to grow substantially, but at a lower rate than intra-county travel.

SAAG has allocated the projected population and employment to planning zones within each City and the unincorporated areas of the County. The distribution is in accordance with current General Plans. Several cities are in the process of updating their General Plans. However, as approved by the Study Advisory committees and SAAG Policy Board, the Regional Expressway Study will be based on adopted plans, and SAAG's current 2010 land use forecasts.

Alternative land use forecasts have also been analyzed. One series of sensitivity tests evaluated the County's remote development concept. This concept holds the regional population and employment forecasts constant at about 700,000 people and about 300,000 jobs, but it shifts

Table 1
REGIONAL POPULATION AND EMPLOYMENT PROJECTIONS

<u>City (General Plan Area)</u>	<u>Population</u>		<u>Employment</u>	
	<u>1990</u>	<u>2010</u>	<u>1990</u>	<u>2010</u>
Ceres	28,600	61,700	10,100	25,600
Hughson	3,000	7,800	1,900	4,100
Modesto	191,100	379,500	83,900	173,200
Newman	4,700	13,500	1,400	5,400
Oakdale	12,800	22,000	5,800	10,200
Patterson	8,800	19,100	1,500	6,200
Riverbank	9,500	19,700	3,500	8,000
Turlock	46,000	96,300	19,200	42,700
Waterford	3,400	6,400	1,000	2,400
Other	55,400	74,700	13,200	21,800
County Total	363,300	700,700	141,500	299,600

Jobs/Resident: 0.39 in 1990
0.43 in 2010

the development pattern. It places greater emphasis on development in western portions of the county, such as the Mapes Ranch and Lakeborough areas, and it reduces the levels of new development in the existing cities and eastern County areas.

Other sensitivity tests were performed in the Modesto Area. This testing used Modesto's citywide traffic model, which contains the detailed land use information that the City is using in its current circulation planning, Capital Facilities Financing Plan, and Urban Village studies. These land uses differ somewhat from the balanced regional forecasts which were adopted as the primary basis for the expressway study.

Stanislaus County and its cities may actually develop in a pattern which differs from any of those considered in this study. Potential changes in the currently anticipated development scenarios include:

- o Major new growth areas could emerge in western parts of the county in addition to Lakeborough and Mapes Ranch.
- o A new regional airport could be sited in the western part of the county.
- o Improved transit service could affect the need for expressways.

If such circumstances do arise, the findings and recommendations of this regional expressway study should be reviewed and updated accordingly.

B. Expected Levels of Traffic Congestion

1. Regional Travel Growth

Stanislaus County's population and employment are projected to double within the next twenty years, doubling the amount of traffic generated within the County. Neighboring County's are also expecting to experience considerable growth, so that the amount of travel passing through Stanislaus County will also increase substantially. Congestion at existing traffic constraint points will worsen considerably, and new congestion points will arise.

2. Planned Non-Expressway Improvements

The Stanislaus Regional Expressway System is intended to supplement already planned improvements to the area's street and freeways systems. It will ease traffic flow through areas that would otherwise remain capacity-deficient even after all reasonably foreseeable improvements have been made to existing circulation networks.

Such "baseline" improvements include facilities that are already programmed within the short-term State and regional Transportation Improvements Programs (STIP and TIP), and those which are high-priority components of longer-range programs, including the SAAG Regional Transportation Plan (RTP) and the Caltrans Route Development Plan (RDP). Baseline improvements also include roadway projects specified in the General Plans or Capital Facilities Plans of the Stanislaus cities and the County.

Not all of these facilities would necessarily be in place by 2010. However, for purposes of this study it was assumed that these improvements would be in place before expressways would be developed in parallel corridors.

The baseline improvements are described fully in our December 1989 Task Group 1 and 2 report. They include one expressway that is a high-ranking regional priority in both Stanislaus and San Joaquin Counties, and which the consultant team was instructed to assume to be a "given" for the year 2010. That is the east/west expressway on Route 120 from Route 99 near Manteca east through southeastern San Joaquin County and northern Stanislaus County. It includes the following segments: Escalon Route 120 Bypass, Oakdale 120 Bypass, Lancaster Expressway, Valley Home Expressway. The following are also included in the baseline projects list:

- o Spot interchange improvements along Route 99 and completion of Keyes Fwy.
- o Route 108, widening from Route 219 to west Oakdale.
- o Route 132, Empire railroad grade separation and widening from Empire to Waterford.

- o Fifty-two roadway widening projects identified in the County's proposed Capital Improvements Plan, including widening many County roads to four-lanes
- o Modesto arterial widenings; consistent with the City's recently adopted Capital Improvements Program, as well as: Richland-Tioga bridge, Faith Home Road bridge, Lincoln-Lakewood bridge.
- o Ceres area, widening major arterials to up to five lanes as needed.
- o Turlock area, widening major arterials to at least four lanes and six if needed.
- o Oakdale area, an east/west local bypass for Route 108, South Yosemite improvements (four lanes), and J Street extension.
- o Riverbank area, widening arterials to four lanes as necessary.
- o Hughson area, widening arterials to four lanes as necessary.
- o Waterford area, widening arterials to four lanes as necessary.
- o Patterson area, southerly bypass of Las Palmas, Sperry four-lane arterial.
- o Newman area, widening Moyer, Merced, Orestimba, Stuhr Road, Fink Road to four lanes if necessary.
- o In San Joaquin County, the following freeway widenings: Route 120 to six lanes from I-5 to Route 99, Route 132 upgrade to four-lane expressway from Stanislaus County to I-580, Route 205 to eight lanes from Alameda County to I-5, I-5 to ten lanes from I-205 to Route 120, Route 99 to six lanes from Ripon to north of Route 120.

3. Projected Traffic Congestion - Need for an Expressway System

The planned improvements identified above will not provide sufficient capacity to off-set expected traffic growth. Under this "non-expressway" scenario, less than three-fourths of all travel in Stanislaus and San Joaquin counties will be accommodated at acceptable levels of traffic efficiency (Level of Service A, B, or C). About 26% of all travel in the two counties will occur at congestion levels which are considered unacceptable (Levels of Service D, E or F). About half of this (about 12% of all travel in the two counties), will occur under extreme congestion (Level of Service F). This 12% represents the degree by which the projected traffic

volume will exceed the planned roadway capacity. It suggests that the region's street and freeway system will be capable of carrying less than 90% of the travel demand generated in the region in year 2010.

The purpose of this study is to define an expressway system which best meets the goals of the Stanislaus region. These goals were ascertained earlier in this study through a survey of members of the Expressway Study Advisory Committee, the SAAG Technical Advisory Committee, SAAG Citizens Committees, and the SAAG Policy Board. The most important expressway evaluation criteria were found to be: (1) traffic safety, (2) air quality, (3) traffic capacity and level of service, (4) regional economic impacts, and (5) mobility. In view of these goals, the expected high levels of congestion in the year 2010 are unacceptable. They will have adverse effects on travel safety and service level, air quality, mobility and the regional economy.

To meet its goals, the Stanislaus region will need to identify roadway capacity improvements by developing new routes and/or by increasing the capacity and operating efficiency of existing and planned routes.

C. How Expressways Can Reduce Congestion

1. What An Expressway Is

Caltrans defines an "expressway" as follows:

An arterial highway with at least partial control of access, which may or may not be divided or have grade separations at intersections.¹

Within this definition, a wide range of facility types may be considered expressways. Access control may be as minimal as restricting left-turn movements at driveways and collector streets,

¹ Caltrans, Highway Design Manual, 1986.