ROUTE CONCEPT REPORT SUMMARY
ROUTE 160
04-CC 0.00/1.33
04-SAC L0.00/L1.39
(Length 2.72 Mi.)

FINAL

AUG 28 1986

ROUTE_CONCEPT

Segment_A:	CC 0.00/0.70	4 Lane Freeway	C-45
	CC 0.70/SAC L1.39	4 Lane Bridge	C-45

CONCEPT_RATIONALE

Route 160 begins at Route 4 near the City of Antioch, crosses the Antioch Bridge, and proceeds northerly to its end at Rte. 51 near Sacramento. It is an interregional connector serving the industrialized areas of Contra Costa County and the San Joaquin/ Sacramento Valleys via Routes 4 and 12. Route 160 also provides recreational access to the Sacramento/San Joaquin River Delta area.

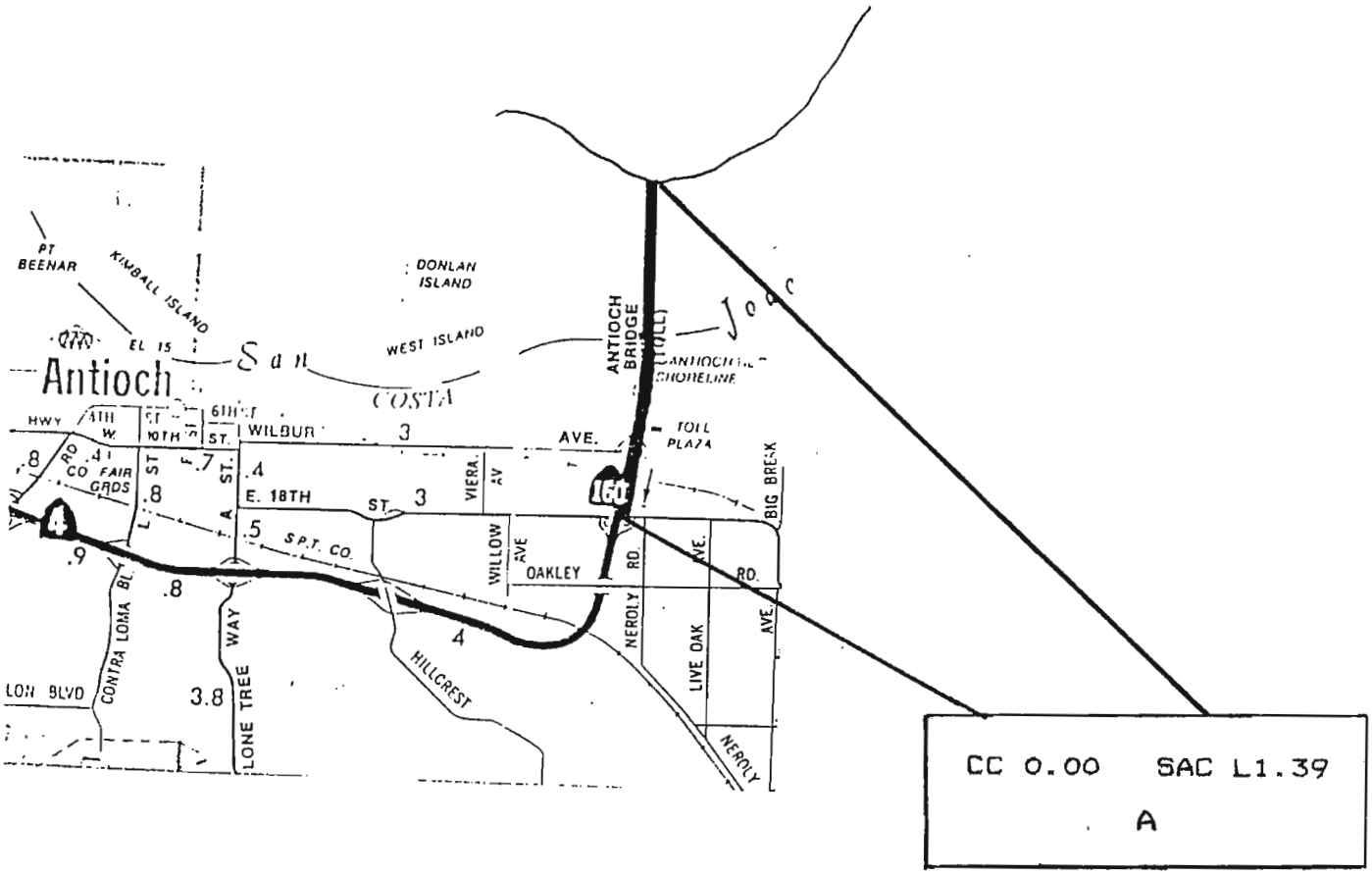
ISSUES_OF_CONCERN

CC 0.00. A possible realignment of Route 4 between the Cities of Antioch and Brentwood, now being studied, may affect the existing Route 4/160 junction.

CC 0.70/ SAC L1.39 The steep grade (4.2 percent) of the two-lane Antioch Bridge is a constraint that lowers the operating speed of the facility, especially when trucks or large recreational vehicles are present.

IMPROVEMENTS_(POST_1985_STIP)

No capacity improvements along this portion of Route 160 are planned at this time. The addition of a second, parallel span to the Antioch Bridge should be considered in the future.



LOCATION MAP

ROUTE CONCEPT REPORT

ROUTE 160

CC 00.00 to SAC L1.39

Prepared under the direction of:

7/1/86

MERLE J. JOHNSON — Date
Acting Chief,
Transportation Planning

Recommended Approval:

7-7-86

for GEORGE GRAY — Date
Deputy District Director
Planning and Programming

I approve this Route Concept Report as the guide toward which today's decisions and/or recommendations should be directed.

Approved:

8/28/86

BURCH C. BACHTOLD — Date
District Director
District 4

Approved:

D. L. WIEMAN, Chief — Date
Division of Transportation
Planning

Approved:

ALLAN HENDRIX, Chief — Date
Division of Highways
and Programming

Approved:

VINCE PAUL, Chief — Date
Division of Project
Development

STATEMENT OF PLANNING INTENT

The Route Concept Report (RCR) is a planning document which expresses the Department's judgment on what the characteristics of the state highway should be to respond to the projected travel demand over the 20-year planning period. The RCR contains the Department's goal for the development of each route in terms of level of service and broadly identifies the nature and extent of improvements needed to reach those goals. The RCR then provides the basis for the preparation of Route Development Plans (RDP) and the system analysis which indicates the level of service provided on the system at a given level of funding.

Route concept reports are prepared in the districts and represent the combined expertise of district staff. Facility dimensions (e.g., roadway widths or number of lanes on a multi-laned facility) discussed in the RCR represent an initial planning approach to scoping candidate improvements and determining estimated costs.

All information in the RCR is subject to change as conditions change and new information is obtained. Consequently, the nature and size of identified improvements may change as they move through the project development stages, with final determinations made at the time of project planning and design. If the nature and size of improvements change from that included in this report during later project development stages, this will be cause to review the RCR for this route.

ROUTE CONCEPT REPORT
ROUTE 160
04-CC 0.00/1.33
04-SAC L0.00/L1.39

ROUTE DESCRIPTION:

Route 160 in District 4 is approximately 2.72 miles long. The 1.39 mile portion in Sacramento County is included in District 4 since it is part of the new Antioch Bridge (officially the Senator John A. Nejedly Bridge). The remainder of the route, in Sacramento County, is part of District 10 of Caltrans, and is evaluated separately in a Route Concept Report prepared by that District.

The legislative description of Route 160 is as follows:

(a) From Route 4 near Antioch to Route 12 near Rio Vista.
(b) From Route 12 near Rio Vista to Route 51 via Sacramento.

That segment of Route 160 in District 4 is in the Freeway and Expressway System, the State Scenic Highway System, and the Federal Aid Primary System as a minor arterial.

PURPOSE OF ROUTE:

Route 160 is both an interregional connector serving the industrial areas of eastern Contra Costa County and a recreational route for traffic to the Sacramento/San Joaquin River Delta area.

ROUTE SEGMENT:

Segment A of Route 160 in District 4 is only a small part of the entire route. This section begins at Route 4 near Antioch, crosses the Antioch Bridge and ends approximately 1.4 miles north of the Contra Costa/Sacramento County Line.

(1) Existing Facilities

(a) Highway Facility

Pavement widths within this segment vary from 24-36 feet, with 10-foot shoulders and 40-54 foot median widths. Between Mileposts CC 0.00/0.70, Route 160 is a four-lane freeway. The remainder of the segment, across the bridge, is two lanes, with 12-foot lane widths, 5-foot shoulders, and a 6-foot median with a concrete barrier. Grades are between 0-3 percent, except on the bridge, where the grade is approximately 4.2 percent.

1985 STIP Projects:

Fiscal year 1985/86:

CC 0.8/1.3	Roadway light call boxes and TV cameras on the Antioch Bridge, Stage 2 (includes District 10-SAC-160 0.0/1.3). $771,000

Fiscal year 1988/89:

CC 0.7/0.8 SAC L1.3/L2.9	Roadway reconstruction, west and east approaches to the Antioch Bridge. $352,000.

(b) Public Transit

There is no public transit in this segment.

(c) Bicycle

Some bicycle traffic uses this segment to access the recreational areas of the delta. Bicycles must use alternate routes south of Wilbur Avenue, but are allowed on the 5-foot shoulders of the Antioch Bridge.

(d) Park and Ride

There are no park and ride lots in this segment.

(e) Rail

There is no rail service in this segment.

(2) Current Operating Conditions

The 1984 average annual daily traffic (AADT) for the freeway part of this segment is 7,200; across the bridge, 6,800. The volume/capacity ratios range from 0.15 to 0.40. The overall level of service is A-55.

(3) Accident Rate

The 36-month accident report, covering January 1983 through December 1985, shows a rate of 1.41/MVM (million vehicle miles), lower than the statewide rate of 1.73/MVM for similar facilities. There were no fatal accidents in this segment during the reporting period.

(4) Future Operating Conditions

For 1995, the AADT is projected to be 11,000 for the freeway section and 8,000 for the bridge. The respective V/C ratios are estimated at 0.25 and 0.53, with an overall LOS of B-50. By 2005, the AADT volumes should increase to 15,000 on the freeway section and 11,000 on the bridge. Corresponding V/C ratios are forecast at 0.35 and 0.73, with an overall LOS of C-45.

(5) Route Concept

The route concept for this entire segment of Route 160 is for a four-lane facility. This would require that a second, parallel span to the Antioch Bridge be built. The concept level of service is C-45.

(6) Route Improvements

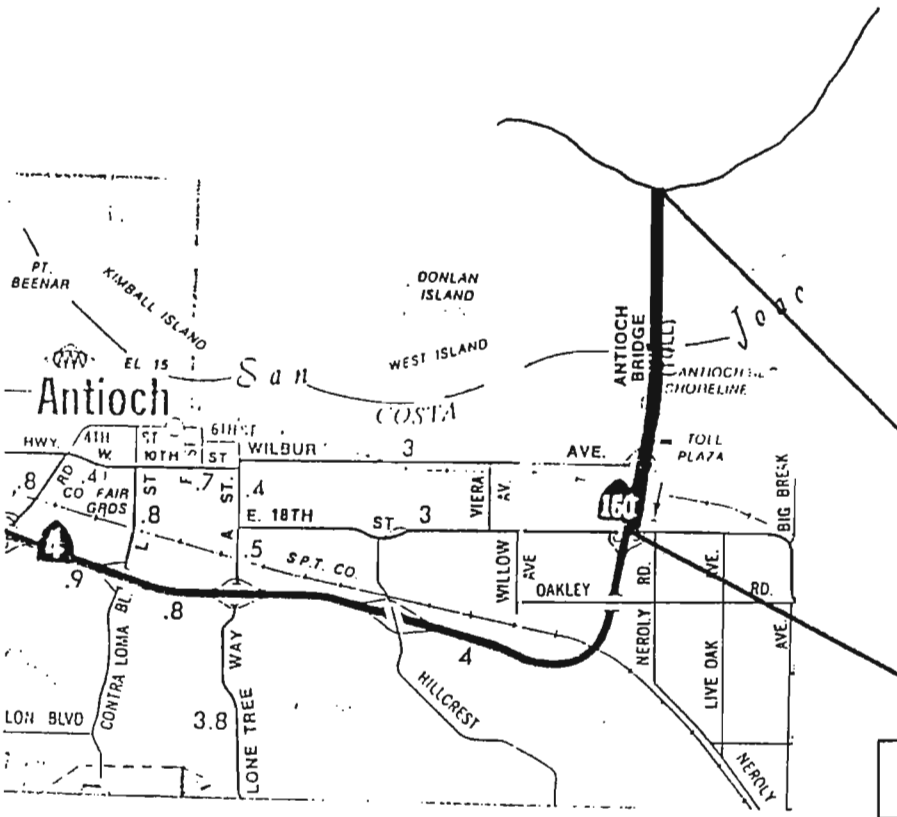
No capacity improvements along this portion of Rte. 160 are planned at this time.

(7) Concept and Local Concerns

The Antioch Bridge is the only two-lane bridge in the State of California with a concrete median barrier mandated by the legislature. This barrier, along with the narrow shoulders and steep grade, are constraints on the operating speed of the bridge, especially when trucks and recreational vehicles are present. As truck traffic, already estimated at 10 percent, is expected to increase in the future, and because the bridge is an access route to recreational areas, the projected levels of service may be below those anticipated in the current traffic forecasts.

Another future concern is the possible realigning of Rte. 4 between the Cities of Antioch and Brentwood. Should this rerouting occur, the present Route 4/160 junction would likely require modification.

District 10 foresees some problems on Route 160 in Sacramento County between the Antioch Bridge and Rio Vista. The traffic projections are similar to those for the District 4 segment. However, much of the road in District 10 is narrow and built on a levee. The route concept for the District 10 segment is for a two-lane conventional highway with alternating passing lanes. The level of service is projected at E-30 for 2005. No further improvements to this part of Rte. 160 are anticipated unless additional capacity is added to the Antioch Bridge.



SEGMENT		A
NO. LANES PROPOSED	1984 1995 2005	2-4 2-4 2-4
LEVEL OF SERVICE	1984 1995 2005	A-55 B-50 C-45
TERRAIN		F
GRADES		0-4%
ACC/MVM		1.41
FAT/MVM		0.00

EXHIBIT A

EXPLANATION TO EXHIBIT A

LEVEL OF SERVICE

The Level of Service (LOS) on a roadway is a measure of the speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort, convenience, and operating cost. A roadway designed for a certain level of service will actually operate at different levels throughout the day. The level of service on a roadway varies inversely as some function of the traffic volume. The level of service indicated in Exhibit A represents the level of service during the morning (AM) peak hour. The level of service in this report is followed by the minimum operating speed.

TERRAIN

Terrain describes the adjacent topography as to its effect on construction cost. (F-Flat, R-Rolling, M-Mountainous) Flat reflects minor grading; rolling reflects moderate grading; mountainous reflects heavy grading as economic considerations. (Note that terrain is a measure of construction cost while grade is a measure of operating cost as used in this report.)

GRADES

Grade line, a generalization of the grades along the center line of the highway. Four types of codes are used. They are:

F - Flat grade, 0-3 percent upgrades and downgrades.

R - Rolling, 3-6 percent upgrades and downgrades and sustained grades less than 1/4 mile.

M - Moderate, grades greater than 6 percent for one-half or less of the segment length and sustained grades 1/4 to 3/4 mile in length.

S- Steep, grades greater than 6 percent for more than one-half the segment length and sustained grades greater than 3/4 mile in length.

ACCIDENTS PER MVM

The number of accidents per million vehicle miles driven along the segment.

FATALITIES PER MVM

The number of fatalities per million vehicle miles driven along the segment.

RELATIONSHIP OF LEVEL OF SERVICE TO OPERATING SPEED

Level of Service	Facility Type	Minimum Operating Speed	Assigned Operating Level of Service
B	Freeways, Expressways, or Multi-Lane Divided Conventional Highways	55 MPH	B-55
B	Two-Lane Conventional Highways	50 MPH	B-50
C	Freeways or Expressways	50 MPH	C-50
C	Multi-Lane Conventional Highways	45 MPH	C-45
C	Two-Lane Conventional Highways	45 MPH	C-45
C	Two-Lane Conventional Highways	40 MPH	C-40
D	Freeways or Expressways	40 MPH	D-40
D	Conventional Highways	35 MPH	D-35
D	Conventional Highways with controlling traffic signals	15-30 MPH	D-35

The operating level of service on a roadway is a measure of the speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort, convenience, and operating cost. A roadway designed for a certain level of service will actually operate at different levels throughout the day. The level of service on a roadway varies inversely as some function of the traffic volume.

In the Route Concept Report, the level of service is followed by the minimum operating speed.

* Not all conditions are represented by this chart.

EXHIBIT B

SEGMENT		A
AADT (000)	1984	7-8
	1995	8-11
	2005	11-15
PHV (00) (ONE WAY)	1984	6-7
	1995	8-10
	2005	11-14
AV HWY SPD		50
OP SPEED		48
V/C	1984	0.40
	1995	0.53
	2005	0.73
YR CAP RCHD		N/A

EXPLANATION TO EXHIBIT B

AADT

Annual Average Daily Traffic (In Thousands) in both directions.

P.H.V.

Peak Hour Vehicles (In Hundreds). Number of vehicles in one direction during the morning (AM) Peak Hour.

AVE HWY SPEED

The Average Highway Speed is the weighted average of the design speeds within a highway section. (Design speed is a speed selected to establish specific minimum geometric design elements for a particular section of highway.) On non-engineered roads the average highway speed has been estimated.

OPERATING SPEED

A computed value based on the V/C ratio and the average highway speed. Basically, it represents the present operating speed during the present design hour volume of traffic on existing highway geometric. For segments of highway controlled by traffic signals, an "S" replaces the operating speed and generally represents speeds of 15 to 30 MPH.

V/C

Ratio of Volume to Capacity. Volume represents the number of vehicles per hour that want to travel the highway as represented by the present design hour volume. Capacity represents the maximum number of vehicles per hour the highway can carry as indicated in the Highway Capacity Manual.

D/C

Ratio of Demand to Capacity. Demand represents the projected number of vehicles per peak hour that will want to travel the highway. Capacity represents the maximum number of vehicles per hour the highway can carry.
(Projected Peak Hour Demand/Design Capacity).

TRAVEL DEMAND PROJECTIONS METHODOLOGY (ABSTRACT)

1995 & 2005 Demand Person Trips Projections
34 x 34 ABAG/MTC Region Superdistricts Matrix
Computer-Assisted Four-Step Conventional Gravity
Model. (Housing & Employment based on ABAG's "Projections 83")

December 1983

INTRODUCTION: This medeling procedure developed traffic volume expansion factors and applied them to "census" volumes ("1980 Traffic Volumes on California State Highways") of State Highway segments at ABAG/MTC superdistrict (SD) borders (screenlines).

These projected 1995 and 2005 volumes were the basis for projecting volumes on all mainline segments for the 1983/84 "Route Concept Reports."

In essence, this methodology is consistent with the elments of the conventional "four-step" procedure for travel demand forecasting as summarized in the FHWA/UMTA outline for UTPS models and as described in the NCHRP guide for urban travel estimations ("Quick Response").

SUMMARY: Criteria and methods used in each one of the four "steps":

1. Trip Generation: Based on ABAG projections per 34 MTC "superdistrict." Productions per MTC-observed person trips produced and households; attractions per employment (and housing), adjusted to observed attractions.

2. Trip Distribution: Based on zonal trips produced and attracted, distribution factors based on travel times, and calibration factors derived from MTC-observed vs. simulated 1980 trip interchanges.

3. Assignment: Based on zonal trip interchanges, "fastest path" criteria and experience of travel patterns.

4. Modal Split: Implies; it was assumed that, on the segments evaluated, modal percentages and occupacy rates would remain essentially unchanged.

ASSUMPTIONS: The following parameters would remain essentially unchanged between 1980 and 2005:

1. Trip production rates, as functions of the number of households and their superdistrict of location.

2. Trip attraction rates and adjustment factors, as functions of jobs, housing units and superdistrict of location.

3. Speeds: Change in corridor speeds may be proportional to regionwide speed changes, or may differ without significantly affecting distribution or assignment.

4. Time vs. Distribution Factor Functions, and Calibration Factors. Increased socio-economic densities vs. higher fleet efficiencies and/or real earnings would have compensatory effects on trip lengths.