ROUTE CONCEPT REPORT

ROUTE 24

24

MAY 1986

TRANSPORTATION PLANNING
DEPARTMENT OF TRANSPORTATION

DISTRICT 4

C	CC 24.264
B	CC 9.144 CC R0.0
A	ALA 6.241 ALA R1.847

LOCATION MAP
Route 24

SUMMARY

FINAL

MAY 09 1986

ROUTE CONCEPT REPORT
ROUTE 24

ALA R001.847 to CC 024.264

This report defines the development concept for Route 24 in District 4, over a 20 year planning period (1985-2005).

ROUTE CONCEPT

Segment A:	ALA R001.847-R006.241 Jct Rte 580 - Ala/CC Co. line	D-40*	8-10 lane freeway
Segment B:	CC R000.000- 009.144 Ala/CC Co. line - Jct. Rte 680	D-40*	8-10 lane freeway
Segment C:	CC 009.144- 024.264 Jct Rte 680 - Rte 4 - UNCONSTRUCTED		Remain unconstructed

*2005 traffic demand indicates a need for 10 to 14 lanes to meet a LOS of D-40. The eight/ten lane concept is based upon maximizing highway capacity within existing R/W. Improvements in public transportation and implementation of aggressive TSM measures will be needed to accomodate some of the excess demand.

CONCEPT RATIONALE

Currently, Route 24 is primarily a commuter route. The freeway serves as a major transportation corridor between Central Contra Costa County (Segment B and western portion of Segment C), and the East Bay and San Francisco. To date, the morning peak period is heaviest in the westbound direction.

AREAS OF CONCERN

In the past, this area served primarily as a bedroom community for people working in the East Bay and San Francisco. However, commercial development and subsequent employment growth have been dramatically increasing in the Central Contra Costa area. The rapid office development growth in Contra Costa County is likely to cause an increase in the reverse commute directions. Major concerns along Route 24 are congestion approaching the Caldecott Tunnel, congestion east of the Tunnel where traffic backs up onto the freeway during the evening commute hours at Orinda's Moraga Way exit, and the I-680/24 interchange. The highway facility cannot accommodate all the anticipated demand, it is therefore important to actively encourage maximum use of public transportation, staggered work hours, ridesharing, preferential treatment of alternative modes and other TSM measures. Even the implementation of these measures may not accommodate all of the excess demand.

IMPROVEMENTS

ALA R005.12-R006.241
Construction of a fourth bore at the Caldecott Tunnel with extension of these additional lanes to the Route 13/24 interchange, completion of the 13/24 interchange..

Widen to ten lanes where feasible.

ROUTE CONCEPT REPORT

ROUTE 24

ALA R01.847 to CC 24.264

Prepared under the direction of:

Cecil L. Smith 5/7/86

CECIL L. SMITH, Chief Date
Transportation Planning
District 4

Recommended Approval:

MAY 8, 86

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:

Burch Bachtold 5/9/86

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 24
ALA P.M. R001.847 - CC 024.264

1. ROUTE DESCRIPTION

Route 24 is approximately 28 miles long, and traverses Alameda and Contra Costa Counties. The freeway begins at Route 580 in the City of Oakland, Alameda County. It runs northeasterly through the Caldecott Tunnel into Contra Costa County. The Alameda/Contra Costa County line occurs mid-way through the tunnel. Route 24 continues northeasterly in Contra Costa County through Orinda, where it runs easterly through Lafayette into Walnut Creek where it meets Route 680. Although Rte 680, north of the 680/24 I/C, and legislated Rte 242 are signed as Rte 24, the legislative route for Rte 24 is an unconstructed and unadopted section of approximately 15 miles in length. It begins in Walnut Creek, and terminates at Route 4 east of the City of Pittsburg.

The legislative description of Route 24 is from:
a. Route 580 in Oakland to Route 680 in Walnut Creek.
b. Route 680 near Walnut Creek to Route 4 near Pittsburg.

Route 24 is part of the Federal-Aid Primary System (FAP) from Route 580 to Route 680. The route is functionally classified as an Urban Principal Arterial Type 1 from Route 580 to Route 680 intersections. From Route 680 to Route 4 near Pittsburg, Route 24 is an unconstructed and unadopted freeway, and therefore, has no functional classification.

Route 24 has been designated as a scenic freeway from the Contra Costa County line to the intersection of Route I-680.

2. PURPOSE OF ROUTE

Route 24 is primarily a commute route. Regionally, work trips are about 65% of the total vehicle trips. The morning peak period is heaviest in the westbound direction, largely serving commuters traveling from Contra Costa communities (Walnut Creek, Concord, Lafayette, Orinda, etc.) to employment sites in the East Bay and San Francisco. It is likely that the rapid office development in Contra Costa County will precipitate an increase in the reverse commute directions. Because of such rapid growth it will become more important to construct a fourth bore at the Caldecott Tunnel, widen the existing freeway to 10 lanes where feasible, and to actively encourage maximum use of public transportation, staggered work hours, ridesharing, and preferential treatment of alternative modes.

3. REGIONAL CHARACTERISTICS

Recent ABAG data and Metropolitan Transportation Commission's I-680/I-580 Corridor Study, Initial Findings, Summary Report, predicted significant residential and employment growth in a study area which consists of Alameda and Contra Costa cities east of the East Bay Hills.

In the past, this area served primarily as a bedroom community for people working in the East Bay and San Francisco. However, recent developments point to the trend of increasingly more people both working and living within the study area. Therefore, the amount of travel and character of travel is likely to reflect the changed employment and residential character of the area. While the traditional out-commuting to the East Bay and San Francisco will continue, the number of in-commuting, and work trips having origins and destinations within the study area, will increase.

By year 2000, the study projects a growth in population from 578,000 to 793,000 reflecting a 37% increase. The rate of residential growth will be most rapid in Pittsburg, Antioch, and Brentwood (87% increase) followed by Livermore, Pleasanton, Dublin (about 51% increase) and the San Ramon Valley (36% increase). Along the Route 24 corridor,the communities of Lafayette, Orinda, and Moraga, show virtually no residential or employment growth.

A large increase in employment is expected for Central Contra Costa County (63,000 new jobs), Livermore, Pleasanton, Dublin area with 52,000 new jobs, and the San Ramon Valley with 28,000 new jobs. Job growth is not expected to keep pace with residential growth in Pittsburg, Antioch, and Brentwood.

The MTC I-680/I-580 Corridor Study Technical Memorandum forecasts a 79% increase (143,600 new trips) in commute travel to work destinations <u>within</u> the area. The largest increase in work trips (52,600 new commuters) will originate out of the east county, where most (38,700) will have destinations within the study area (Central County - Martinez - Concord - Pleasant Hill).

The MTC I-680/I-580 Corridor study forecasted the following future travel demands:

<u>Work trips within the study area</u>
Highway 4 will experience congestion especially in the westbound direction. Major impacts will also occur on primary arterials connecting Pittsburg and Antioch to the central county. These arterials include Kirker Pass Road, Baily Road, and Route 4.

Route I-680 will also feel the effects of growth caused by developments such as Bishop Ranch. The southbound direction through the north central corridor, from Route 242 to Pleasanton will be especially impacted.

There are likely to be increases in travel demand on I-580 approaching Pleasanton and Livermore from both directions.

Work commutes into and out of the study area

New commutes are expected to travel to work in Central Contra Costa County and cause increased demand from the north, on the Benicia-Martinez Bridge. Route 4 will be impacted in both directions, but most heavily impacted in the westbound direction (AM). Route 24 is expected to have a 100% increase in demand from 1982 to 2005 in the AM, westbound direction near Caldecott Tunnel according to preliminary CALTRANS traffic data. It is also anticipated that there will be an estimated 84% increase in a reverse commute (eastbound, AM), to reflect increased office development taking place in Central Contra Costa County. Route 580 is expected to see minor increases in the westbound AM, with greater increases in eastbound travel. Commuting to and from the south on I-680 will approximately double according to the MTC study.

4. ROUTE SEGMENTS

A. Segment A

04-Ala-024, P.M. R001.847-R006.241

This segment of Route 24 begins in Oakland at the I-580 interchange. It continues through Oakland where it intersects with Route 13, and then proceeds to the Alameda/Contra Costa County line, mid-way through the Caldecott Tunnel.

This segment is more heavily used by westbound commuters (AM) traveling to employment sites in the East Bay and San Francisco area.

(1) Existing Facilities

(a) Highway Facility

This segment generally has 4 lanes in each direction and narrows to 3-two lane tunnels. Two tunnels (4 lanes), are used in the peak direction during peak hours. This segment has shoulder widths varying from 0 to 10 feet. It has a divided median varying from mass transit road beds, to separate structure, to paved and unpaved medians. Existing stubs are provided for a possible fourth tunnel bore.
The grade on this section of Route 24 is rolling with up to a 5% grade.

(b) 1984 STIP Projects

Projects included in the 1984 State Transportation Improvement Program are as follows:

- FY 87/88, Tier I, P.M. R4.0/R5.9
  This project would create a contra flow HOV lane (EB) from Broadway in Oakland to the Caldecott Tunnel.

- FY 84/85, Tier II, P.M. R5.9/R6.0
  This project would install a traffic control system in the third bore of the Caldecott Tunnel.

Ramp improvements to Route 13/24 interchange (R5.0/5.2) is listed in the Alameda County Five Year Federal-Aid Interstate and Federal-Aid Primary Programs as the No. 1 priority project in the FAP Program.. Ramp improvements would be at Route 13 (NB) to Route 24 (WB); and at Route 24 (EB) to Route 13 (SB).

(c) Public Transit

Communities within this segment of the Route 24 corridor are serviced by the A/C Transit District and BART. There are currently seven A/C Transit routes that serve the MacArthur BART station on Route 24 east of I-580 intersection.

Rockridge BART station (located at Rte 24 and College Ave.) is served by 4 A/C transit lines.

There are no A/C Transit or other local bus routes operating through the Caldecott Tunnel.

(d) Bicycle

This segment of Route 24 is closed to bicycles. However, a commute route suggested by the East Bay Bicycle Coalition closely parallels this segment of Route 24. The suggested bicycle route runs along Webster to Shafter Street, past Rockridge BART station, along Broadway and Tunnel Road, to the Caldecott Tunnel. Although there are two bicycle routes that commuters currently use to cross the Oakland Hills, the degree of difficulty and time required for such a commute would discourage many potential commuters from selecting such a commute alternative.

The City of Oakland has suggested the following alternatives:

- BART access for bicycles during commute hours on Concord line.
- Installation of bike racks on an express bus if such a service is initiated.
- Provision of a shuttle service through the Caldecott Tunnel.

(e) Rideshare and Park and Ride

RIDES for Bay Area Commuters provides carpool and vanpool services to commuters in the area. This includes services such as carpool/vanpool commuter matching, employer-based rideshare programs, and provisions for commuters to obtain vanpool vehicles.

There are no existing State-owned park and ride facilities with direct access to this segment of Route 24.

(f) Rail

This segment of Route 24 is served by the Daly City-Concord line of the Bay Area Rapid Transit District (BART). Stations along this segment of Route 24 are the Rockridge station near Claremont Boulevard, and MacArthur station near Route 24/I-580 intersection. With transfers, the BART services commuters to points north (Richmond) and south (Fremont) on the East Bay; west to San Francisco and to Daly City; and to points east to Orinda, Lafayette, Walnut Creek, and Concord.

There have been a number of current problems identified by MTC's I-680/I-580 Corridor Study-Initial Findings, Summary Report. This study identified peak hour crowding on the BART trains as a problem. Patronage during the peak hour has reached the practical maximum capacity under current operating conditions, which is typically a load factor of 1.3. Another problem facing BART is the great demand for parking at BART stations. Most BART parking lots are full before 7:00 a.m.

However, BART has plans for a $500 million system-wide capital improvement plan to expand peak period capacity by 70% in year 1989. These projects include purchase of an additional 150 new cars, new central computer system, additional subway track through downtown Oakland, and other operational improvements.

MTC's I-680/I-580 Corridor Study Technical Memorandum anticipates that BART's planned capacity expansion may be able to accommodate increased westbound traffic demand projected for the year 2000. BART's ability to handle the demand, states the MTC report, is dependent upon the trend to a spreading of the length of the peak period, and the amount of peak period non-commute travel. Report findings also anticipate that there will be BART capacity available for the year 2000 projections in the eastbound direction.

(2) Current Operating Conditions

The average annual daily traffic (AADT) count for this section of Route 24 ranges from 81,000 east of Telegraph/Claremont interchange (PM R3.06) to 115,000 near the Caldecott Tunnel (PM 5.89).

The morning peak hour traffic ranges from 1,100 east of Jct Rte 580 to 2,500 vph at the Caldecott Tunnel in the eastbound direction. Morning peak traffic in the westbound direction ranges from 3,100 to 5,400 vph at the same locations. The V/C ratio ranges from 0.43 with a level of service of "B-55" to 0.75 with a level of service of "C-50".

(3) Accident Rate (1/81 - 12/83)

During the period of January 1981 and December 1983, there were a total of 423 accidents along this route segment. 157 accidents involved injuries and 2 accidents involved fatalities.

The accident rate of this segment is 0.97/MVM in comparison to the statewide average of 0.96 for this type of facility in similar terrain. The fatality rate is 0.004/MVM as compared to the Statewide average of 0.008.

(4) Future Operating Conditions (1995 and 2005)

AADT projections for 1995 range from 92,000 east of Telegraph/Claremont interchange (14% increase from 1982 AADT) to 132,000 at the Caldecott Tunnel (15% increase from 1982). The AM projected peak hour demand ranges from 2,800 to 4,200 in the eastbound direction and between 6,500 to 9,700 in the westbound direction at the same locations. The D/C (demand/capacity) ratio ranges from 0.90 (LOS "D-40") to 1.35 (LOS "F-15"). LOS of "F-15" is projected to occur east of Junction Route 13/Landvale to the Alameda/Contra Costa County line (Caldecott Tunnel) during the AM peak, westbound direction.

The projections for 2005 AADT range from 104,000 (28% increase from 1982 AADT) east of Telegraph/Claremont interchange to 148,000 AADT (29% increase from 1982), at the Caldecott Tunnel.

The projected 2005 AM peak hour demand in the eastbound direction ranges from 3,200 vph east of Telegraph/Claremont I/C to 4,600 vph at the Caldecott Tunnel. In the westbound direction, the traffic volume demand for this segment range from 7,400 to 10,800 vph at the same locations. Year 2005 projections anticipate D/C ratios ranging from 1.03 to 1.50. The LOS "F-15" is expected for the entire segment.

From Junction Route I-580 (PM R1.85) to east of the Broadway/Patton St. interchange (PM R4.15), ten lanes would be required to accommodate the projected peak hour traffic at LOS "D-40". It would require a 14 lane freeway between east of Junction 13/Landvale to the Caldecott Tunnel to accommodate anticipated traffic at LOS "D-40".

(5) Route Concept

The route concept is an eight-ten lane freeway along this entire segment. The conceptual LOS of "D-40" is based on the assumption that improvements in public transportation and implementation of aggressive TSM techniques will provide for some of the excess demand. If these assumptions are not realized, the concept will need to be reassessed at the Route Development stage.

(6) Improvements

The Route Concept for Route 13 may also have an impact on this segment of Route 24. The Draft Route Concept Report for Route 13 proposes to construct a 6-lane conventional between Route 61 and Route 580. This would divert some of the heavy traffic currently using Route 17/880 to I-580 and Route 13.

Another part of the route concept for Route 13 is to reconstruct and complete the Route 13/24 interchange. This, coupled with the previously mentioned improvement would improve the north-south access between Route 24 and Route 17/880, Oakland Airport, I-580 and points south.

Although a fourth bore is not likely to solve all congestion problems, it is possible that the majority of the lanes through the Caldecott Tunnel will be delegated to the commute direction during the peak periods. In this case, projected 2005 traffic could conceiveably be accommodated at an LOS of D-40 with an 8-10 lane route concept. Eight-to-ten lanes including truck lanes through this section would require construction of a fourth tunnel. In addition, another bore would serve to relieve queuing on the Route 13/24 Interchange.

The area near Claremont Boulevard I/C currently serves as a location where informal carpools are frequently formed for commuters bound for San Francisco. Establishment of satellite park and ride lots near this area may be a prime location that could serve both San Francisco bound commutes, Central Contra Costa, and East Bay bound commutes.

Aggressive employer-sponsored transportation systems management programs should also be promoted.

TSM techniques that could be explored by employers are flex-time programs, ridesharing programs, shuttles to park and ride lots, promotion of at-home-work sites, and parking pricing strategies.

Finally, according to MTC's analysis in I-680/I-580 corridor study, BART's planned capacity expansion should also help to accommodate the increase in demand in the westbound direction (depending upon the amount of peak period non-commute travel and continued spreading of the peak period). BART's planned capacity expansion coupled with a HOV lane from Broadway in Oakland to Caldecott Tunnel (EB) (STIP project) should also help to offset future increases in eastbound trips. However, capacity constraints of BART's tube across the Bay may be the major factor in BART's ability to decrease headways during peak hours.

B. Segment B
(CC R000.000 - 9.144)

This segment begins in the Caldecott Tunnel at the Alameda/Contra Costa County line. The route proceeds northeasterly past Gateway Boulevard interchange through Orinda. Route 24 then continues in an easterly direction through the City of Lafayette to the I-680/24 interchange in Walnut Creek.

Communities of Lafayette, Orinda and Walnut Creek border Route 24. Lafayette-Orinda area is a low-density semi-rural residential community with a population of approximately 39,524 (1980, ABAG, Projections 83).

Most existing housing development has taken place in the valleys, north and south of Route 24. The retail-commercial core area has developed along Mt. Diablo Canyon Blvd. (south of Route 24). The constructed portion of Route 24 ends in Walnut Creek at the I-680/24 interchange.

Walnut Creek, in recent years, has experienced rapid commercial development. It currently has 1.4 million square feet of office development, and 1.7 million square feet of retail uses. Major commercial development is in the downtown core area to the east of I-680/24 interchange.

(1) Existing Facilities

a. Highway Facilities

This segment generally varies from 4 to 5 lanes in each direction, except in the Caldecott Tunnel which has three 2-lane tunnels. The terrain is rolling with grades of up to 5%. The outside shoulders vary from 0 to 8 feet from the Alameda/Contra Costa County line to Gateway Boulevard, and from 0 to 10 feet from Gateway Boulevard to intersection I-680. The median varies from 22 feet to 70 feet between the Alameda/Contra Costa County line and Gateway Boulevard, and from 22 feet to over 100 feet from Gateway Boulevard to intersection I-680. The BART frequently runs in the median of Route 24 east of Gateway Boulevard to Walnut Creek.

b. 1984 STIP Projects

Projects included in the 1984 State Transportation Improvement Program (STIP) are the following:

- FY 85/86, Tier I, P.M. R0.30/R3.70
  This project would construct a HOV access to the Caldecott Tunnel in the westbound direction from St. Stephens Drive to the east portal of the Caldecott Tunnel.

- FY 84/85, Tier II, P.M. 0.00/0.30
  This project would install a traffic control system in the third bore of the Caldecott Tunnel.

c. Public Transit

Communities within this segment of Route 24 Corridor are served by the BART Express Service, Central Contra Costa Transit Authority (CCCTA), and the Guiton Contra Costa Commute service.

BART Express Service Line D services the Walnut Creek BART station. Line D connects Dublin, Danville, Diablo, and Alamo to Walnut Creek BART station. This line runs every 30 minutes during commute hours and midday; 40-60 minutes Saturdays and Sundays; and every 60 minutes at night.

The CCCTA serves Clayton, Concord, Lafayette, Orinda, Moraga, Martinez, Pleasant Hill, and Walnut Creek. CCCTA is also currently investigating the possibility of implementing a pilot program to increase the bus service to BART stations.

The Guiton Commute Service runs buses weekdays from Central Contra Costa communities to San Francisco from 6:00 a.m. to 7:30 a.m., with return trips from 4:20 p.m. to 5:50 p.m..

d. Bicycle

The section of Route 24 between Fish Ranch Road and Camino Pablo Road is open to bicyclists to use the freeway shoulders. The remainder of Route 24 between Camino Pablo Road and Route I-680 is closed to bicycles. However, there are a number of suggested bike routes that run roughly parallel to Route 24. One suggested bike route runs to the north of Route 24 along Santa Maria Way, Altarinda Road, Orinda Woods Drive, East Altarinda Drive and El Nido Ranch Road. The route then crosses under Route 24 and runs along Mt. Diablo Boulevard, Pleasant Hill Road, Olympic Boulevard, to North Main Street in Walnut Creek.

e. Park and Ride

RIDES for Bay Area Commuters: See Segment A

There is presently a 99 space park and ride facility located at Gateway Boulevard. A July 1984 survey indicates only approximately 11% usage.

f. Rail

See Segment A.

This segment of Route 24 is serviced by the Daly City-Concord line of BART. Stations along this segment are the Orinda station near Camino Pablo Road, Lafayette station near Happy Valley Road, and the Walnut Creek station north of Route 24 near Ygnacio Valley Road.

Regional Transit Capital Projects that could affect traffic on this route include the following:

FY 85/86 and FY 86/87: Expand Pleasant Hill BART parking facility. Design/Row/Construction of 1,200 spaces.

FY 85/86 and FY 86/87: Construction of 1,200 space parking facility over existing parking Lot B at Walnut Creek BART station.

FY 86/87: Improve parking lot at the Lafayette BART Station. Improvement entails pavement striping and landscaping a gravel lot east of the station.

FY 86/87: Construction of a parking facility at Lafayette BART station. This would be a 720 stall, 3-level structure over the main lot, northeast of the station. It is proposed that a certain amount of spaces be set aside for carpooling participants.

(2) Current Operating Conditions

The present average annual daily traffic (AADT) count for this section of Route 24 ranges from 116,000 east of Acalanes Roads (P.M. CC R 4.40), to 128,000 between Pleasant Hill Road and Route I-680 interchange. (P.M. CC R 7.66 to CC 9.14).

The morning peak hour traffic ranges from 2,700 east of Fish Ranch/Claremont Blvd I/C to 4,300 vph west of I-680 I/C in the eastbound direction. Morning peak traffic in the westbound direction ranges from 5,800 to 8,000 vph in the same locations. The V/C ratio ranges from 0.64 with a level of service of "C-50" to 1.0 with a level of service of "F-15".

(3) Accident Summary (1-1-81 to 12-31-83)

During the period of January 1981 and December 1983, a total of 686 accidents occurred along the segment of Route 24. There were 260 accidents involving injuries and 6 accidents which resulted in fatalities.

The accident rate of this segment is 0.57/MVM, which is lower in comparison to the statewide average for this type of facility in similar terrain of 1.00/MVM. The fatality rate of .005/MVM for this segment is lower than the state-wide average of .010.

(4) Future Operating Conditions

AADT projections for 1995 range from 134,000 (14% increase from 1982 AADT) east of St. Stephens Street to 166,000 near the I-680 I/C (30% increase from 1982 AADT). The projected AM peak hour demand ranges from 4,300 east of Fish Ranch/Claremont Blvd I/C to 6,700 vph west of I-680 I/C in the eastbound direction and between 8,700 east of Acalanes Rd. and 10,100 vph west of I-680 I/C in the westbound direction. The D/C ratio ranges from 0.93 (Level of Service "E-30") to 1.39 (Level of Service "F-15"). LOS of "E-30" is expected to occur east of Fish Ranch/Claremont Road. The remainder of this segment from near Gateway Boulevard to the intersection of I-680 is projected to have a LOS of "F-15" during the AM, westbound direction.

The projections for 2005 AADT range from 151,000 (29% increase from 1982 AADT) near St. Stephens intersection to 173,000 (35% increase from 1982 traffic demand), near the I-680 I/C. The AM peak hour demand in the eastbound direction range from 4,800 east of Fish Ranch/Claremont Blvd I/C to 7,300 vph west of I-680 I/C. In the westbound direction, traffic volume demand is projected to range from 11,300 vph east of Fish Ranch/Claremont I/C to 9,800 vph east of Acalanes Rd I/C. Year 2005 projections anticipate peak period D/C ratios ranging from 1.05 to 1.51. The LOS "F-15" is expected for the entire segment.

It would require an eleven to fourteen lane freeway given no other mitigating measures to accommodate the projected traffic at LOS "D-40".

(5) Route Concept

The route concept is an eight-ten lane freeway along this entire segment. The conceptual LOS of D-40 is based on the assumption that improvements in public transportation and I-680; and implementation of aggressive TSM measures will provide for some of the excess demand. If these assumptions are not realized, the concept will need to be reassessed at the Route Development Plan stage.

(6) Improvements

The route concept for I-680 recommends the widening of I-680 to 8 lanes south of Route 24/680 interchange, and 10 lanes north of the interchange. In addition, a STIP project is planned to reconstruct the Route 24/680 freeway to freeway connection. These proposed improvements to this segment of I-680 should help to relieve queuing on Route 24 in the EB direction. However, the demand on WB Rte. 24 may increase due to the proposed improvements.

A Southern Pacific right of way, from Concord to Pleasanton, is also currently being studied by Contra Costa County for a public transportation facility. This right of way runs roughly parallel to I-680. A public transportation alternative may contribute to relieving traffic demand on I-680 especially near the Route 24/680 I/C, which in turn, should relieve queuing on Route 24.

The STIP project is also planned which would create a westbound HOV lane from St. Stephens Road to the east portal of Caldecott Tunnel. An HOV lane coupled with marketing of the Gateway park and ride facility may contribute to reduction in traffic demand.

The City of Orinda and Contra Costa County are studying the feasibility of constructing a two lane facility between Gateway Boulevard and Moraga Way. This would help alleviate current congested conditions caused by eastbound traffic exiting at Orinda's Moraga Way.

Finally, employer-sponsored TSM programs and BART's planned capacity exapansion are other measures that could contribute to reducing traffic demand along this corridor. An example of an employer-sponsored TSM program is a shuttle proposed by Pacific Telephone that would operate between Lafayette BART station and Bishop Ranch.

Segment C
(CC 009.144-024.264)

This segment has not been adopted nor constructed as a state highway. The legislative route generally follows Ygnacio Valley Road and Kirker Pass Rd. extending to Route 4 near the City of Pittsburg. The presence of an existing road on the approximate alignment of the legislative description of the route does not necessarily commit any future development of an unconstructed State Highway to the alignment of the existing road. Ygnacio Valley Road is one of the two major arterials in the Walnut Creek/Pleasant Hill/Concord area which provide access to I-680 and the constructed portion of Route 24. According to a DKS study for Walnut Creek Core Area Plan Studies, congestion on Ygnacio Valley Road is caused primarily by "through" commuters passing through the Core Area of Walnut Creek on their way to or from the I-680 and Route 24 freeways. Ygnacio Valley Road near Walnut Creek is usually congested during peak hours, as it is used for freeway access, BART station access and local traffic. Traffic volumes are projected by DKS to increase significantly due to through traffic and development in the Walnut Creek Core Area. Historical trends suggest a 2% annual growth rate on this segment of Ygnacio Valley Road without any major new project completions in the Core Area.

Within the Walnut Creek Area, DKS has projected 3 major types of traffic on Ygnacio Valley Road which are projected to increase in the future:

i. Traffic between new residences east of downtown Walnut Creek, especially near Clayton, and new employment opportunities in San Francisco, the East Bay, and the San Ramon Valley.

ii. Local traffic increases due to residential and employment growth along the Ygnacio Valley Corridor.

iii. Traffic between new office, retail and housing development in the Walnut Creek Core Area and residences and offices east of the Core Area.

(1) Existing Facilities

a. Roadway Facility

Ygnacio Valley Road is a major arterial. It varies from 4 lanes east of Oak Grove to 6 lanes between I-680 and Oak Grove. The majority of Kirker Pass Road is 4 lanes, and widens to 6 lanes near Concord Pavilion. The width of Ygnacio Valley Road ranges from approximately 72 feet to about 84 feet, while Kirker Pass Road is about 68 feet to 73 feet wide. Kirker Pass Road also passes through fairly steep terrain.

b. Transit

Lines 115, 101, and 110 of the Central Contra Costa County Transit Authority serves Ygnacio Valley Road. Line 115 runs along Ygnacio Valley Road between North Civic Drive and California Boulevard in Walnut Creek. It also serves the Pleasant Hill and Walnut Creek BART stations. Line 101 services most of Ygnacio Valley Road between Oak Grove Road and California Boulevard. It also serves the Pleasant Hill and Walnut Creek BART stations. The area near Ygnacio Valley Road/Kirker Pass and Clayton Road intersection is served by County Connection Line 110.

The draft of the 1984 Walnut Creek Core Area Plan has also proposed Ygnacio Valley Road in the Walnut Creek area to serve as a primary service transit corridor. The draft Plan continues to suggest that these types of transit corridors should be designed to accommodate full-sized buses. Such provisions would include bus pullouts, bus stops with benches, shelters, signs, parking restrictions, generous turnout radii, etc.

There is currently no bus service available along Kirker Pass Road.

c. Bicycles

Ygnacio Valley Road has been designated by the City of Walnut Creek as a bicycle route. The bicycle route extends between California Boulevard to the Ygnacio Canal near Walnut Creek Municipal Golf course. The Draft of 1984 Walnut Creek Core Area Plan suggests that this route should continue to be shown as an off-street facility. However, the Plan continues to suggest that the existing bikeway should be up-graded to provide more width for pedestrian and bicyclists.

The remaining portion of Ygnacio Valley Road and Kirker Pass Road are likewise suggested as bicycle routes.

d. Park and Ride

There are no park and ride facilities available along Ygnacio Valley Road or Kirker Pass Road.

RIDES for Bay Area Commuters provides alternative transportation services to this area. Services include marketing and employer services, vanpool services and client services. For instance, RIDES has worked with firms such as Woodward and Clyde, and Central Bank in Walnut Creek.

e. Rail

The Walnut Creek BART station is located near the I-680/Ygnacio Valley Road interchange.

Central Contra Costa County Transit bus lines that service this station are Lines 6, 101, 102, 105, and 115. The legislated unconstructed portion of Route 24 that would intersect with Route 4 near Pittsburg is serviced by the BART Express bus that would bring commuters to the Concord BART station.

2. Current Operating Conditions

The average annual daily traffic (AADT) for the unconstructed segment of Route 24 is estimated to range from 12,000 near Palo Verde at the Pittsburg City limits to 58,000 east of Walnut Boulevard.

3. Accident Rate

Not available.

4. Future Operating Conditions

The Walnut Creek 1984 Core Area Plan Studies Supplemental Technical Appendices Report, A-4, May 8, 1984 memo from DKS to Walnut Creek, predict significant increases along Ygnacio Valley Road due to through traffic and development in the Walnut Creek Core Area. Historical trends project an annual growth rate of 2% on Ygnacio Valley Road. The report also projects that peak volumes on Ygnacio Valley Road will increase by 27 to 164 percent by year 2000.

Residential growth in Pittsburg and Antioch will also place an increased demand on Kirker Pass and Ygnacio Valley Road. ABAG sources project an overall increase in growth by 52% from 1980 to 2000. It is anticipated that the majority of development in Pittsburg and Antioch will be residential in nature generating commuter travel to those areas in the Bay Area that are experiencing rapid office and retail development.

5. Route Concept

The route concept for this segment of Route 24 is to remain unconstructed at this time.

Although traffic volume is expected to increase within the next twenty years enough to warrant future study, it is recommended that no further study occur along this segment until a concensus is developed in support of further investigation.

The 1974, Caltrans developed four schematic versions for freeway alignments in this corridor. These alternative alignments were not accepted by the City of Walnut Creek, and further study by Caltrans was discontinued.

The Walnut Creek 1984 Core Area Plan Studies Supplemental Technical Appendices Report, A-4, May 8, 1984 memo, indicates that many conditions have changed since 1974, due to extensive

development. Constraints which did not exist ten years ago are considered important now. Due to development in the last ten years, a freeway on the existing Ygnacio Valley Road alignment would not be feasible because it would severely restrict local access in Walnut Creek. Such an alignment would also have significant impacts on residences and businesses. Many homes would be lost, while others would experience increased noise levels from traffic moving at freeway speeds. In summary, it does not recommend a freeway alignment in the Ygnacio Valley Corridor.

Walnut Creek Transportation Commission, however, is endorsing the launching of other transportation studies for the Ygnacio Valley Corridor. Some of the studies endorsed by the Commission are the following:

- Study of the traffic impacts on Ygnacio Valley Road from the proposed Keller Ranch development in Clayton.
- Conducting a regional study of the Ygnacio Valley corridor if there is a concensus from the affected jurisdictions.

The Walnut Creek City Council has previously appropriated funds for fiscal years 1984-86 to initiate the updating of the Walnut Creek Transportation Plan, the circulation element of the General Plan. In addition, the Walnut Creek City Council has placed an advisory question, Measure K, on the November ballot. Measure K asks voters whether whether the city should seek $200 million to $500 million in funding to build a freeway along Ygnacio Valley Road.

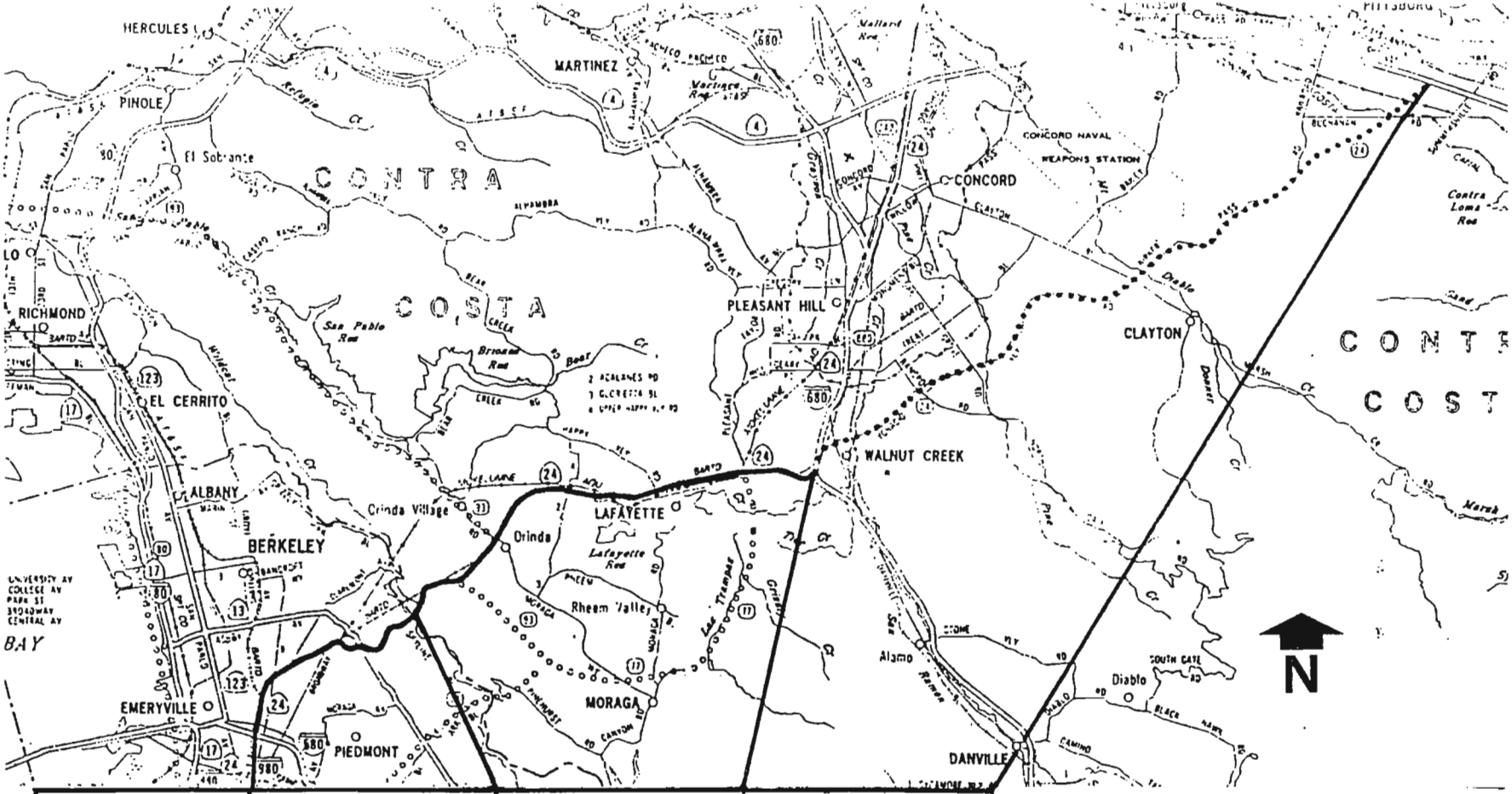
In the light of the current information and factors available, the concept for this segment is for no further study at this time of either Route location or project scoping. Since traffic volumes are expected to as much as double the existing volumes along Ygnacio Valley Road; without alternate routes, employer-based activities such as flex-time, staggered work hours, and in-house TSM techniques should be explored. Finally, local agencies might also explore zoning and parking ordinance revisions to encourage new developers to develop and implement TSM programs.

Readers Guide

The information contained in the Appendices is being provided as supplementary information that may be of interest to certain reader groups.

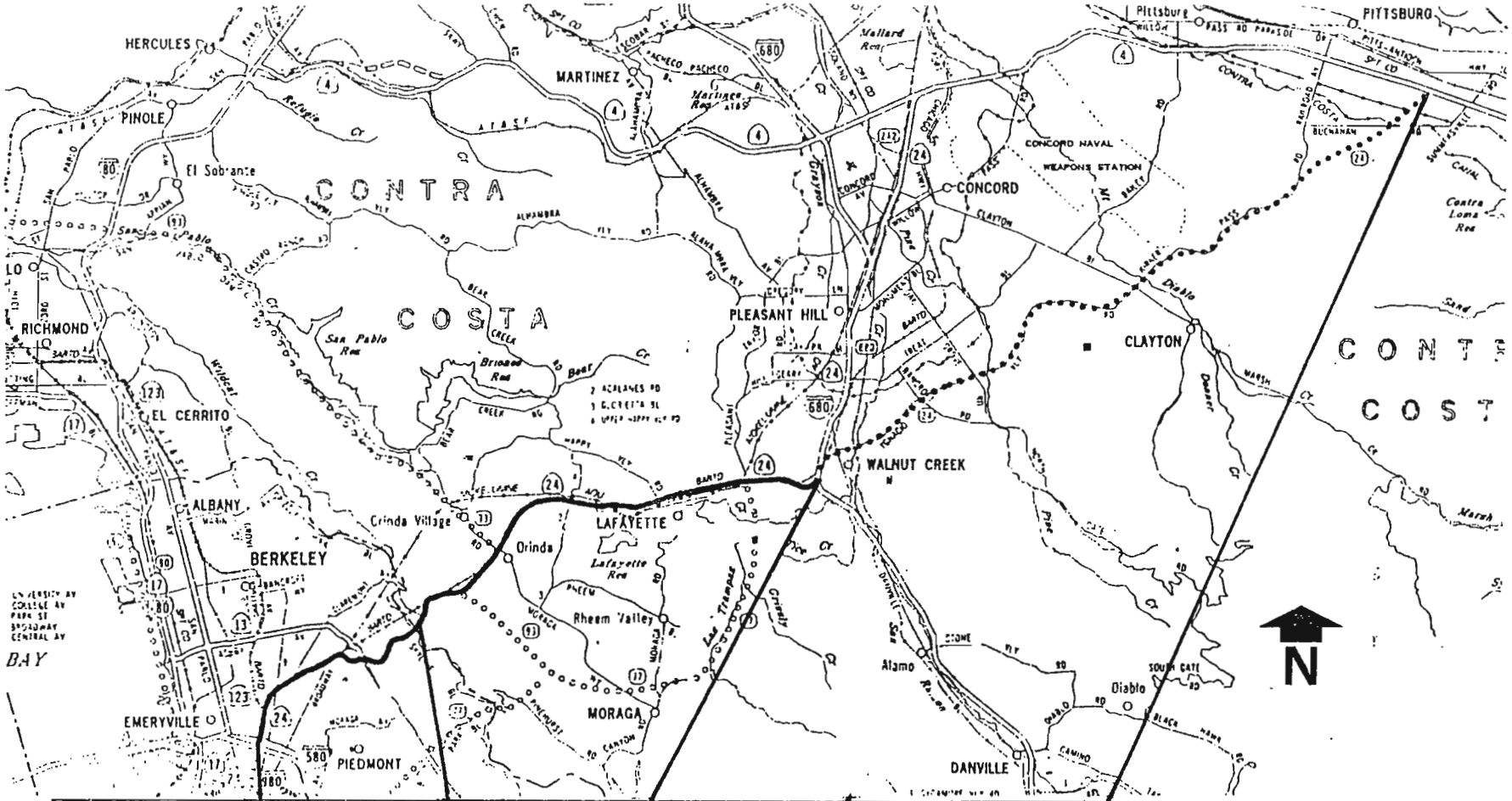
Appendices C, D, E, and F may be of special interest to LOCAL AGENCY STAFF when planning for the transportation system at the local level.

Data in appendices A, B, and C present the route from a district-wide systems perspective. It may be of special interest to STATE OFFICIALS and STAFF, REGION-WIDE-COMMISSIONERS and STAFF, and other readers with a district-wide interest.



SEGMENT		ALA R1.847 A ALA 6.241	CC R0.0 B CC 8.144	C CC 24.264
NO. OF LANES no build	PRESENT	6-8	6-10	UNCONSTRUCTED
	1995	6-8	6-10	
	2005	6-8	6-10	
LEVEL OF SERVICE no build	PRESENT	B-55,C-50	C-50,F-15	
	1995	D-40,F-15	E-30,F-15	
	2005	F-15	F-15	
TERRAIN		ROLLING	F-R	
GRADES		0-6%	0-6%	
ACTUAL	Accidents Per MVM	.97	.57	
	Fatalities Per MVM	.004	.005	

EXHIBIT A



SEGMENT		ALA R1.847 A ALA 8.241	CC R0.0 B CC 9.144	CC 24.264 C
P.H.V. ADT. (00) (.000)	1982	81–115	116–128	12–58
	1995	92–132	134–166	21–77
	2005	104–148	151–173	26–88
	1982	41	68	20
	1995	82	96	30
	2005	92	107	36
AVE HWY SPEED		70	70	UNCONSTRUCTED
OPERATING SPEED		31–53	31–44	UNCONSTRUCTED
V/C	1982	.43–.75	.64–1.0	UNCONSTRUCTED
D/C	1995	.90–1.35	.93–1.39	UNCONSTRUCTED
	2005	1.03–1.50	1.05–1.51	UNCONSTRUCTED
YEAR CAPACITY WILL BE REACHED				

EXHIBIT B

EXHIBIT C

ROUTE 24

COMPARISON OF FUTURE LOS WITH ROUTE CONCEPT

SEGMENT	NO. LANES/LOS			ROUTE CONCEPT		NEEDS	
	1982	1995	2005	Proposed Lanes	LOS	Lanes	Target Los
A-Ala R 1.847 to R 6.241	6-8/B-55 /C-50	6-8/D-40 /E-30 /F-15	6-8/F-15	8-10	F-15	10-14	D-40
B CC R 0.0 to 9.144	8-10/C-50 /D-40 /E-30 /F-15	8-10/E-30 /F-15	8-10/F-15	8-10	F-15	11-14	D-40
C CC 9.144 to 24.264	UNCONSTRUCTED			REMAIN UNCONSTRUCTED		4-6	D-40

EXHIBIT D

TRAFFIC PROJECTION

1983/4 ROUTE CONCEPT STUDY				1982							1995							2005							Truck %	
ROUTE 24				AADT	AM Ah	PK Bk	No L	V/C	LOS	LN	AADT	AM Ah	PK Bk	No L	V/C	LOS	LN	AADT	AM Ah	PK Bk	No L	V/C	LOS	LN	AADT	PK HR
Segment	Co	Mile Post	Description																							
A	Ala	R 1.85	Jct Rte 580																							
				87	11	31	4	0.43	B	4	100	30	71	4	0.99	E	5	112	34	79	4	1.10	F	5	2	2
	Ala	R 3.06	Telegraph/Claremont I/C																							
				81	12	31	4	0.43	B	4	92	28	65	4	0.90	D	4	104	32	74	4	1.03	F	5	3	2
	Ala	R 4.15	Broad/Patton I/C																							
				82	14	33	4	0.46	B	4	94	28	66	4	0.92	E	5	105	32	75	4	1.04	F	5	4	3
	Ala	R 5.12	Jct Rte 13/Landvale																							
				110	20	47	4	0.65	C	4	126	40	93	4	1.29	F	6	142	45	105	4	1.46	F	7	4	3
	Ala	R 5.47	Kay Ave I/C																							
				115	23	51	4	0.71	C	4	132	42	97	4	1.35	F	6	148	46	108	4	1.50	F	7	4	3
	Ala	R 5.89	Caldecott Tunnel																							
		R 6.20/	0.00 County Line	115	25	54	4	0.75	C	4	132	42	97	4	1.35	F	6	148	46	108	4	1.05	F	7	4	3
B	CC	R 0.04	Fish Ranch/Claremont																							
	CC	R 0.46/	0.50 Equation	118	27	58	4/5	0.64	C	4/5	136	43	100	4/6	0.93	E	4/7	153	48	113	4/6	1.05	F	4/7	4	3
	CC	1.20	Gateway Blvd I/C																							
				118	29	61	5/4	0.85	D	5/4	136	43	100	5/4	1.39	F	5/7	153	48	113	5/4	1.05	F	5/7	4	3
	CC	R 2.31	Camino Pablo I/C																							
				118	31	66	5	0.73	C	5	136	50	93	5	1.06	F	6	153	56	105	5	1.17	F	7	4	3
	CC	R 3.47	Saint Stephens I/C																							
				117	33	65	5/4	0.90	D	5/4	134	50	92	5/4	1.28	F	5/6	151	56	104	5/4	1.44	F	5/7	4	3
	CC	R 4.40.	Acalanes Rd I/C																							
				116	35	67	4	0.93	E	5	143	58	87	4	1.21	F	6	154	65	98	4	1.36	F	7	4	3
	CC	R 6.51	Oak Hill/1st I/C																							
				127	40	76	5/4	1.06	F	5	159	64	96	5/4	1.33	F	5/6	171	72	109	5/4	1.51	F	5/7	3	2
	CC	R 7.66	Pleasant Hill Rd I/C																							
				128	43	80	4/5	0.89	D	4/5	166	67	101	4/5	1.12	F	5/7	173	73	110	4/5	1.22	F	5/7	3	2
	CC	9.14	Jct Rte 680																							
				36	15	19					45	19	24					53	22	27					3	2
*C	CC	9.5	Ygnacio V. Rd/N.Main St																							
				44	16	23					59	21	31					67	24	36					3	2
	CC	9.8	Ygnacio V.Rd/Civic Dr.																							
				54	20	30					71	27	40					82	31	46					3	2
	CC	10.1	Ygnacio V. Rd./Walnut Blvd.																							
				58A	21A	35A					77	30	45					88	34	51					3	2
	CC	11.6	Ygnacio V. Rd./Bancroft Rd.																							
				42A	18A	25A					60	25	37					72	30	44					3	2
	CC	12.8	Ygnacio V. Rd./Oak Grove Rd.																							
				27A	8A	24A					40	14	34					50	18	42					3	2
	CC	14.7	Ygnacio V. Rd./Cowell Rd.																							

EXHIBIT D

TRAFFIC PROJECTION

			29A	16	24					43	24	36					51	29	43					3	2
CC	16.1	Ygnacio V. Rd./Alberta-Pine Hollow																							
			20A	11	17					30	17	26					36	21	31					3	2
CC	17.0	Ygnacio V. Rd./Clayton Rd.																							
			20A	11	17					30	17	26					36	21	31					3	2
CC	17.8	Kirker Pass Rd./Murtle Dr.																							
			16A	9	16					25	14	25					31	17	31					2	1
CC	21.6	Kirker Pass Rd./Northville Rd.																							
			13	7	13					22	11	21					28	14	27					2	1
CC	23.3	Palo Verda @ Pittsbg City Lines																							
			12	6	12					21	11	21					26	14	27					3	2
CC	24.4	Std. Oil Ave. extd/Buchanan																							
			13	8	12					23	14	22					29	18	27					3	2
CC	25.2	Std. Oil Ave./Rte. 4																							

* .: 1. Mile Posts are qpproximate; alignment follows existing Ygnacio Valley Rd. and Kirker Pass Rd. to M.P. 21-6; alignment from M.P. 21.6 to 25.2 is assumed-see diagram;

2. 1980 and 1982 volumes @ M.P. 21.6 to 25.2 are theoretical as route non-existent; This Segment covers the "Proposed-Routing Not Determined" Portion Of CC-24

References: A. 1982 ADT Walnut Blvd to Northville, and 1982 AM PK Walnut Blvd to Cowell Rd.: from WNCR, CC-Co. & Concord 1982/3 Counts.

B. 1980 ADT CC-680 to Walnut Blvd.: From 9/81-400311 Analysis.

C. 1980 2-Way PK & D.R.%, & 2010 Exp. Factors, CC-680 to Civic Dr: From 8/84-400311 Anal-Wkshts

This chart indicates the relationship between Level of Service and minimum operating speed for a given facility type.

Assigned Level of Service	Facility Type	Minimum Operating Speed
B	Freeways, expressways, or multilane conventional highways	55 MPH
B	Two-lane conventional highways	50 MPH
C	Freeways or expressways	50 MPH
C	Multilane conventional highways	45 MPH
C-45	Two-lane conventional highways	45 MPH
C	Two-lane conventional highway	40 MPH
D	Freeway or expressways	40 MPH
D	Conventional Highways	35 MPH
D	Conventional Highways with controlling traffic signals	15-30 MPH*

* This condition is shown on the tabulation of route segments under the "LOS" headings as D35.

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 raodway varies inversely as some function of the traffic volume.

EXPLANATION TO TRAFFIC VOLUME TABLES

COLUMN	DESCRIPTION
SEGMENT	Route Segment
CO	County Abbreviations
POST MILE	Post Mile in County
DESCRIPTION	Description of the route segment
AADT	Annual Average Daily Traffic (Thousands)
AM PK	Morning Peak Hour Traffic
AH	Volumes Ahead Direction (Hundreds)
BK	Volumes Back Direction (Hundreds)
NO L	Number of Lanes (Existing) One Direction
V/C	Volume/Capacity: Ratio Volume to Max. No. of Vehicles/Hr. for Peak Direction During Peak Period
D/C	Demand/Capacity: Ratio Volume of Projected Demand to Max. No. of Vehicles/Hr.
LOS	Level of Service According to Functional Classification of the Route Relative to the Terrain and Facility
LN	Number of Lanes Needed to Meet the Conceptual LOS
% TRUCK AADT	Truck % of the Average Annual Daily Traffic Count
% TRUCK PK HR	Truck % at Peak Hour

TRAVEL DEMAND PROJECTIONS METHODOLOGY (ABSTRACT)

1995 & 2005 Demand Person Trips Projects
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 modeling 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 elements 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: Implied; it was assumed that, on the segments evaluated, modal percentages and occupancy 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.

Exhibit E

ROUTE 24 ACCIDENT REPORT
(1/81 to 12/83)

Location PM	Seg.	Total	# of accidents Fat	Inj	F+I	Persons Killed	Accid. Rate* Fat	F+I	Tot	State-wide rate*o Fat	F+I	Tot
Ala R1.847-R6.241	A	423	2	157	159	3	0.004	0.36	0.97	0.008	0.36	0.96
CC R0.000-9.144	B	686	6	260	266	12	0.005	0.22	0.57	0.10	0.38	1.00
CC 9.144-24.264	C	U N C O N S T R U C T E D										

* Rates are per MVM (Million Vehicle Miles)
o State-wide averages for this type of facility in comparable terrain

EXHIBIT F

Route 24 Existing Facilities

Route Segment	County	From PM — To PM	Length (miles)	Traveled Way Width (1 direction-ft.)	# of Lanes (2 directions)	Outside Shoulder Width (ft)	Median Width (ft)
A	Ala	R 001.847 to R 006.241	4.394	24-90	6F, 8F	0-10	22-99
B	CC	R 00.00 to 009.144	9.144	24-78	6F, 8F	0-10	22-99
C	CC	009.144 to 24.264	15.12	UNCONSTRUCTED			