

Chapter 2
ALTERNATE TRANSPORTATION USES OF THE SOUTHERN
PACIFIC RIGHT-OF-WAY (SAN RAMON BRANCH LINE)

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An unprecedented development surge currently underway in Contra Costa County is burdening the County's already taxed transit systems. Within this County, a continuous right-of-way, the Southern Pacific Right-of-Way (ROW), which runs 19.6 miles from Concord to San Ramon, affords a unique opportunity to provide efficient transportation answers. This study will discuss alternate transportation uses for this ROW, and determine their feasibilities.

Current Development

Four major developments are currently affecting the immediate area around the ROW: the Pleasant Hill BART development, the Walnut Creek Core Area development, the Bishop Ranch Business Park, and the Hacienda Business Park.

The Pleasant Hill BART development is a multiple development package of 4.6 million square feet, located adjacent to the Pleasant Hill BART station, about 3.5 miles from the northern terminus of the ROW. This development consists primarily of office and commercial space which would employ approximately 15,000 workers (Temko, January 9, 1984).

The Walnut Creek Core Area development, a project covering most of the downtown area of Walnut Creek, has its primary focus on the Golden Triangle Development around the Walnut Creek BART station. The Core Area development will contain more than 5 million square feet of office and commercial space, along with 1,078 dwelling and hotel units. These numbers reflect maximum build-out conditions, including proposed and anticipated projects. The employees for this area would number approximately 17,000 (Walnut Creek, 1982).

The 585-acre Bishop Ranch development site is located along the southern end of the ROW, 3.7 miles from the southern terminus. Planned capacity for this site is approximately 7 million square feet of office space, including 1.7 million each for Chevron and Pacific Telephone. This development would bring about 23,000 jobs to the San Ramon area (CCCPWD, 1983).

Hacienda Business Park in Pleasanton, the largest of the four development sites, is the most detached from the ROW. The Hacienda site is located a few miles south of the southern terminus of the presently abandoned ROW. If extended south, the ROW would be located immediately adjacent to the development. This site will contain nearly 12 million square feet of office and commercial space, and will employ

36,470 workers (Prudential, 1982, Table III).

The existing public transportation system along the ROW is fragmented, consisting of only AC Transit buses, Central Contra Costa County Transit Authority buses, and Bishop Ranch shuttles. The 91,470 new jobs to be created would increase traffic, thus warranting development of more public transit. As the ROW is strategically located to all four developments and could serve as a feeder line to the Pleasant Hill BART station, this continuous open space should be utilized as a transportation corridor. The question then remains how this ROW can be used most efficiently--a question the rest of this study will address.

Past Studies

The use of the ROW for mass transit has been considered previously in two studies, which focused on the feasibilities of particular facilities within the ROW.

In a study of alternate routes to extend BART to the Livermore-Pleasanton area (BARTD, 1974), one route was to run through the San Ramon Valley and connect with the Walnut Creek BART station. The extension was to run along the I-680 median from Walnut Creek to Danville, where it then would enter the ROW and continue south.

A second study looked at the feasibility of establishing a light rail line along the abandoned ROW (CALTRANS, 1977). The line was to run specifically from Pleasant Hill, where it linked with the city's BART station, to Crow Canyon Road, with a possible extension south to Alameda County. The emphasis of the light rail line was more towards inter-community linkages for the central county than providing a feeder line to BART. No acquisition costs for the ROW were considered, and utilization of the railroad tracks with sufficient upgrading was assumed.

However, these reports, because of the time at which they were undertaken, were unable to take into account the recent changes around the ROW, such as the massive increase in development, particularly with respect to the four developments considered in this report. Furthermore, even though the 1977 CALTRANS report de-emphasized the role of light rail as a BART feeder line within the ROW, increased emphasis must now be placed on a linkage to BART. The recent increase in the County's traffic volume makes it imperative that a continuous public transit flow, both through and out of Contra Costa County, be made available to alleviate congestion.

Methods

General information about the ROW was obtained from published reports dealing specifically with the ROW (CCCPD, 1980; CALTRANS, 1977), which were available in the Institute of Transportation Studies at UCB. Recent ROW information was obtained through interviews with members of the Contra Costa County Planning Department listed in the above studies.

Published sources commissioned by individual cities, county or private agencies provided information about a particular development and the traffic impact thereof (Walnut Creek, 1982; CCCPWD, 1983;

Prudential, 1982).

Information about current and proposed transit systems was obtained through materials written by the transit agencies, BART, AC Transit, Central Contra Costa Transit Authority, Bishop Ranch Shuttle, and CALTRANS, in either the published (at the I.T.S. Library) or publicly distributed form. BART's proposed extension to Livermore-Pleasanton through the San Ramon Valley (BARTD, 1974; MTC, 1983) and the light rail application to the ROW (CALTRANS, 1977) are examples of this. In addition to these sources, interviews with the various transit agencies provided immediate access to specific facts (cost, capacity, service area and other factors) about the transit systems.

Judgments among the transit systems and final recommendations were made by examining the feasibility of each system. This was accomplished by comparing the cost to the potential success in alleviating the transportation problem for each particular transit system.

Background on the ROW

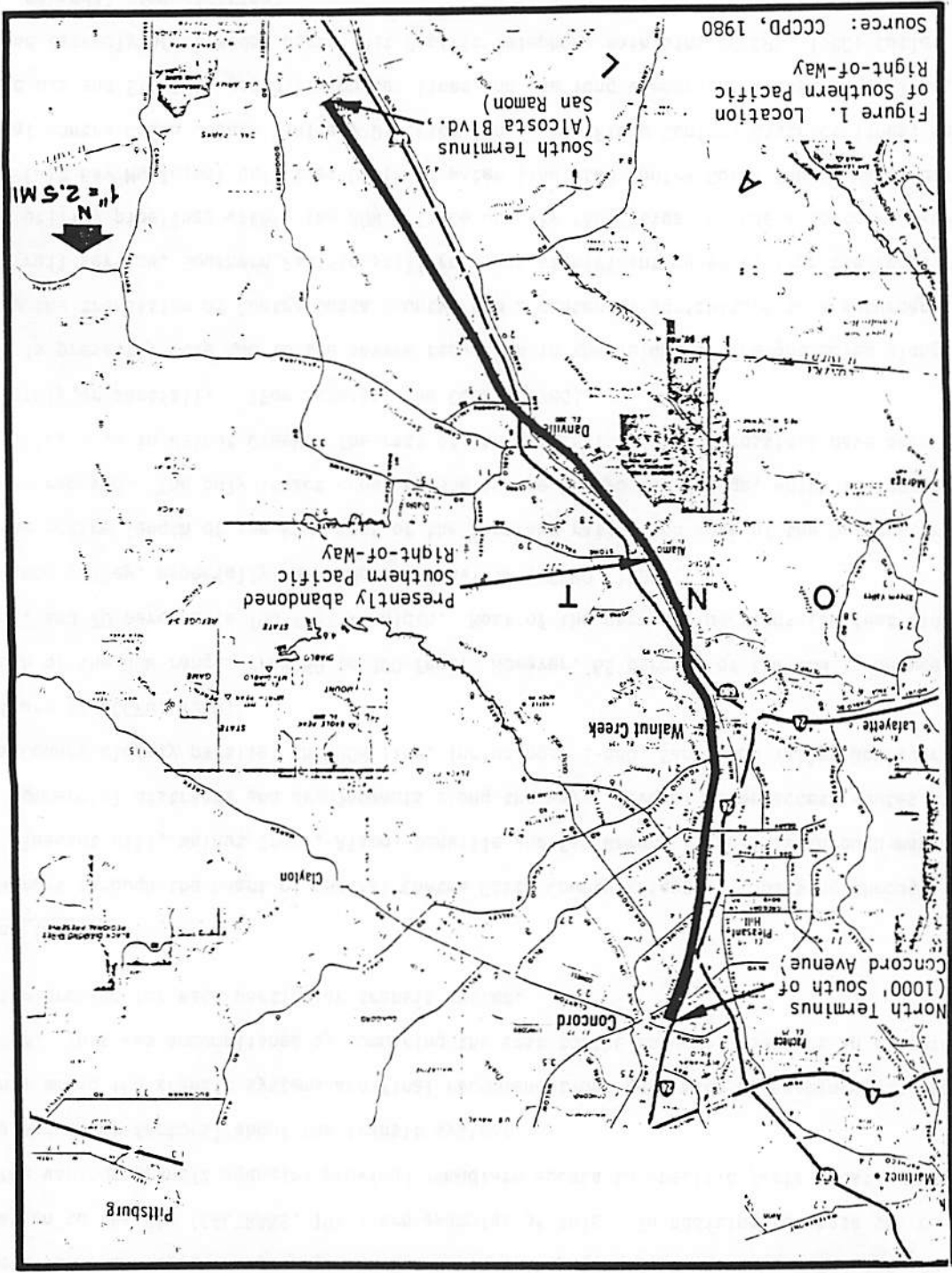
The ROW runs through the heart of central Contra Costa County (Figure 1), passing through the towns of Concord, Pleasant Hill, Walnut Creek, Alamo, Danville and San Ramon, as well as through many existing and planned commercial districts and developments along the way. Several major access routes through Contra Costa County closely parallel the ROW line, including: I-680, San Ramon Valley Boulevard, and I-24 (Figure 1; CCCPD, 1980).

The width of the ROW ranges from 50 to 300 feet. However, 85 percent of the ROW is between 50 and 100 feet wide, and 70 percent is 100 feet in width. Most of the narrower portions (50 feet wide) occur in the San Ramon Valley, especially in Alamo and Danville (CCCPD, 1980).

Along the entire length of the ROW, most of the ties and rails, and some of the bridges and crossings have been removed. The only intact crossing now is the Arroyo Way Bridge, which is located south of Ygnacio Valley Road in Walnut Creek. The rest of the original railroad crossings have been removed either completely or partially. (For details, see CCCPD, 1980).

The ROW is presently idle due to the severe reduction in the volume of freight moved along the line, brought on by the transition of Contra Costa County from a center of agriculture to a suburban community. Even without rail service, Southern Pacific still receives significant revenues from the rental and ownership of utility pipelines within the ROW. These utility facilities include a Southern Pacific pipeline, an East Bay Municipal Utilities District water line, two Contra Costa County Water District lines, several Contra Costa County Sanitary District lines, two Flood Control District lines, several short Pacific Gas and Electric gas distribution lines and one long electrical transmission line, and an underground assembly of corridor ducts that Pacific Telephone maintains (CCCPD, 1980; Cutler and Drake, 1984, personal communication).

Partial development has occurred at five locations along the wider portions of the ROW, all under short-term leases that can be terminated within thirty days. These developments consist of: a warehouse



in Concord, a lumber yard and light industrial area in Pleasant Hill, several commercial buildings in Walnut Creek, older commercial uses in Danville, and a corporation yard and mini-warehouse complex in San Ramon (CCCPD, 1980) (Cutler and Drake, 1984, personal communication).

Currently, Southern Pacific holds deeds to essentially all of the ROW, including the leased-out parcels. The sale of small portions has been discouraged by the County to maintain the integrity of the corridor for possible future transportation uses (CCCPD, 1980).

Traffic Impact of Proposed Development

The effect of the proposed developments combine to worsen considerably the traffic situation in and around Contra Costa County. Examination of daily and peak generation rates (the number of trips bound for or originating at a particular development) clearly demonstrate the cumulative effect (Table 1).

Not all trips made by the 35,493 new passengers per peak hour travelling to the four developments will be originating along or near the ROW. For these commuters it would not be advantageous to use any new ROW facility. The number of commuters for which this is the case is described by the trip distribution rates for the four developments (Table 2). Data from Tables 1 and 2 reveal that approximately half of the generated passengers per peak hour (18,013 of 35,493) would have to be accommodated by any new transit facility.

Existing Transportation in the Corridor Area

Present transportation along the SP ROW consists of BART, bus lines (County Connection, AC Transit, and Bishop Ranch Shuttle buses) and public roadways. The location of these facilities in relation to the four major developments is shown in Figure 2.

This existing system has almost reached its service capacity at peak demand hours (Table 3). BART, for instance, has no additional room for new peak hour passengers along the Concord line. Based on the maximum peak hour load factor of 1.5 set by BART (current seat allocation factored by 1.5 equals maximum capacity), the Concord line under existing service will reach 1.54 by Fiscal Year 1984/85, and 1.99 by FY 1989/90 (Table 3, BARTD, 1984, Table III-5).

The bus lines do have a little additional room for new peak hour travellers. AC Transit and County Connection currently operate under a weekday peak hour load factor of 0.65, with a factor of 1.25 corresponding to total capacity. The current level of service calls for thirty-five peak hour trips to be made throughout the ROW corridor. The Bishop Ranch Shuttle makes only two trips per peak hour, with a capacity of forty passengers per trip. The impact of these bus lines on the increased traffic situation is summarized in Table 3 (CCCTA, 1982, Table 15; Nolte, January 11, 1984, p. 8).

The main artery throughout the new development region is highway I-680. The limiting factor in its flow is a two-lane connector in Walnut Creek. These two transition lanes are central to commute travel along the ROW corridor. At present, in peak demand, these two lanes operate in an unstable traffic flow

Development	Daily Trips Generated (any direction)	Peak Hour ^a Factor	Number of Peak Hour Trips (any direction)	Passengers per Vehicle	Passengers per Peak Hour
Pleasant Hill BART	56,000(est.)	9%	5,085(est.)	1.1	5,594
Walnut Creek Core	78,935	9%	7,104(est.)	1.1	7,814
Bishop Ranch					
Business Park	101,054	9%	9,096	1.1	10,006
Hacienda					
Business Park	122,008	9%	10,981(est.)	1.1	12,079
TOTALS	358,497		32,266		35,493

a- percentage of daily trips that is originated at or destined for a development during a peak commuting hour.

Table 1. Trip Generation Rates for Developments
Sources: CALTRANS, 1977; Walnut Creek, 1982; CCCPD, 1983; Prudential, 1983.

Development	Trip Distribution ^a Rates	Passengers ^b Accommodated
Pleasant Hill BART	70%(est.)	3,916
Walnut Creek Core	70%	5,470
Bishop Ranch Business Park	50%	5,003
Hacienda Business Park	30%	3,624
TOTAL		18,013

a- percentage of trips originated along or near ROW-including BART feeder trips
b- number of passengers per peak hour that could be accommodated by a new transit system

Table 2. Trip Distribution Rates for Developments
Sources: CCCPD, 1983; Prudential, 1982; Walnut Creek, 1982.

Transit Facility	Current Peak Hour ^a Load Factor	Max. ^b PHLF	Number of Seats per Vehicle	New Passengers ^c Accommodated
BART	1.54 ^d	1.50	N/A	-
Bus Transit Lines				
CCCTA	0.65	1.25	42	781
AC Transit	0.65	1.25	42	101
Bishop Ranch Shuttle	-	1.00	40	80
Roadways				
I-680 (two lanes)	0.80	1.00	1.1	2,200
TOTAL				3,162

a- total capacity (standing and seated) of a particular transit facility-given as ratio of passengers per seat allocation during a peak hour
b- stands for "Maximum Peak Hour Load Factor"
c- number of new passengers per peak hour that can be accommodated by existing transit system
d- projected peak hour load factor is 1.99 in 1989/90

Table 3. Unused Capacity of Existing Transit Facilities
Source: CCCTA, 1982.

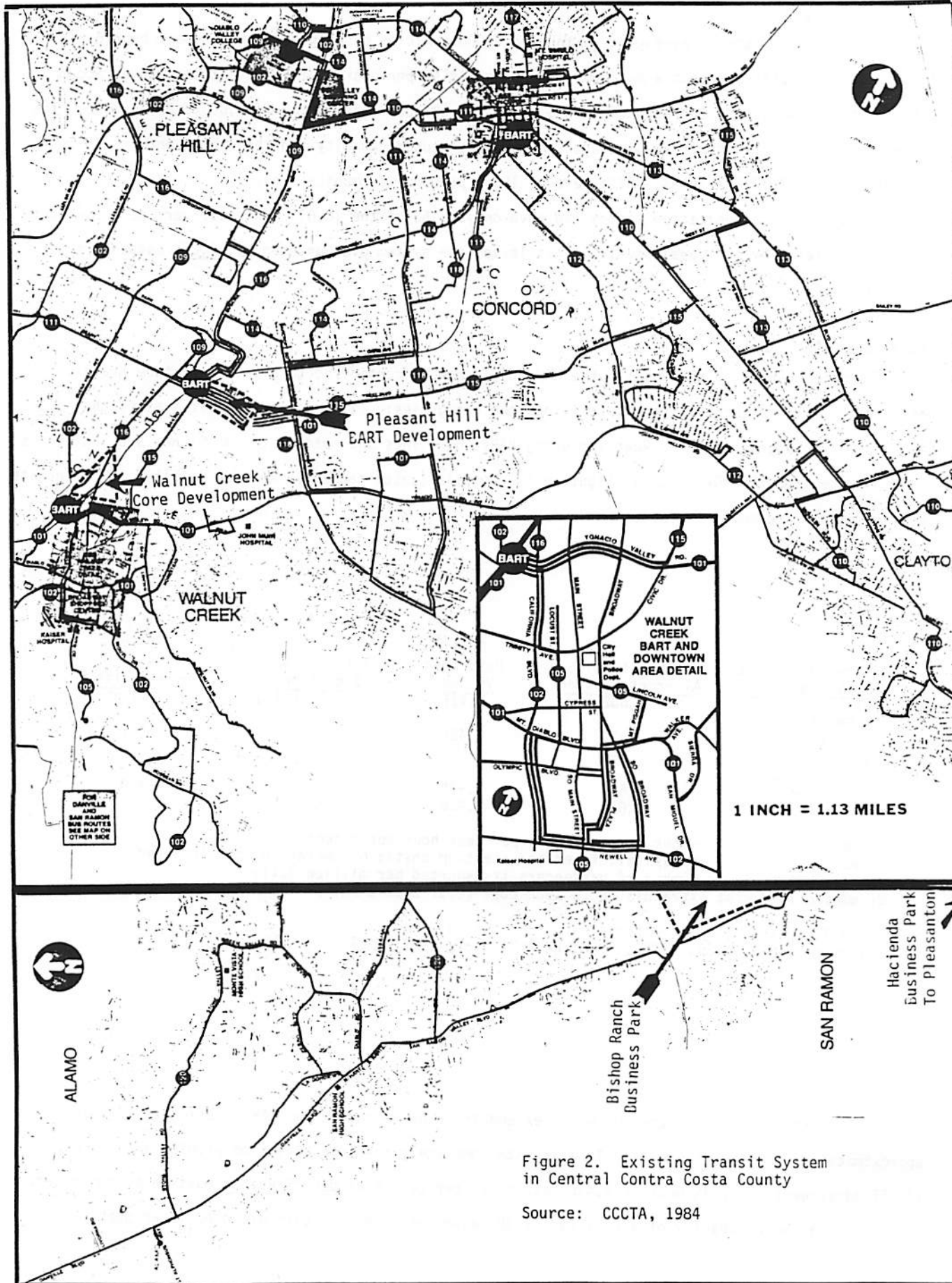


Figure 2. Existing Transit System in Central Contra Costa County

Source: CCCTA, 1984

mode, with operating speeds averaging 30 mph and 4,000 vehicles passing through per peak hour per direction. Best estimates are that a maximum of 5,000 vehicles per peak hour per direction can be accommodated by these two lanes, corresponding to a current peak hour load factor of 4,000/5,000 or 0.8. The increase in accommodation of new passengers due to the unused capacity and the subsequent impact is summarized in Table 3 (CALTRANS, 1977; Meyers, 1984, personal communication).

The existing transportation system can move only 3,162 of the 18,013 new passengers per peak hour that are generated by the developments. This leaves the system overburdened by 14,851 passengers per peak hour.

Alternate Transit Systems

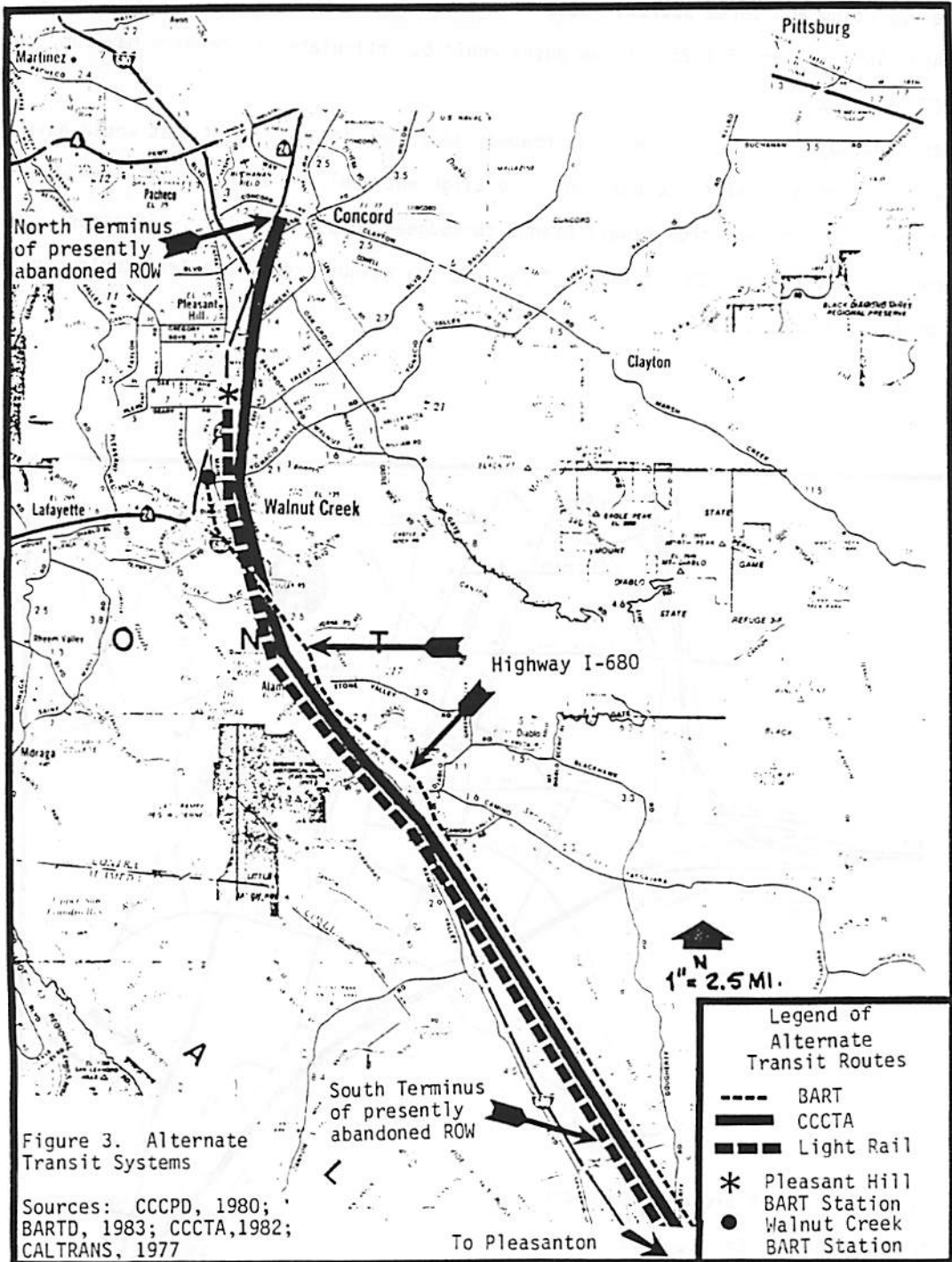
Alternate transit systems within the ROW should now be considered to alleviate future traffic deficiencies. The alternate systems fall into two categories: (1) existing transit systems that are extended and/or upgraded to the ROW, including BART, bus lines and roadways; and (2) new and indigenous transit systems to the ROW, such as light rail. Details (cost, capacity, and feasibility) for alternate transit systems are shown in Table 4.

<u>Alternate Transit Systems</u>	<u>Capacity of^a Alternate System</u>	<u>Total^a Passenger Volume</u>	<u>Total Cost^b (\$ million)</u>	<u>Feasibility^c</u>
BART	5,632	7,426	475(est.)	11.9
Bus Service				
CCCTA	630	7,426	6	105
Roadway				
South Broadway Extension	1,641	7,426	5 ^d	328
Light Rail	5,000	7,426	62 ^d	80.6

- a- values listed in number of passengers per peak hour per direction
- b- values include 1982 capital, fixed and start-up costs; no operating cost included
- c- feasibility is in number of passengers transported per million dollars
- d- quoted 1977 cost extrapolated to 1982 cost (U.S. Department of Commerce, 1985)

Table 4. Feasibility of Alternate Transit Systems
Sources: BARTD, 1983; CCCTA, 1982; Walnut Creek, 1982; CALTRANS, 1977.

A BART extension within the ROW would extend from the Walnut Creek BART station to Pleasanton, approximately 20 miles (Figure 3). To alleviate completely the transportation problem along the ROW, 14,851 passengers per peak hour or 7,426 passengers per peak hour per direction must be accommodated. Since the peak hour capacity of a BART car is 88 passengers, 84 BART cars are needed per peak hour



per direction. Only 64 new BART cars have been proposed for the extension with a carrying capacity of 5,632 passengers per peak hour per direction (BARTD, 1983).

Central Contra Costa Transit Authority (CCCTA) utilization of the ROW as a primary linkage route would run the entire length of the presently abandoned ROW, from Concord to Alcosta Boulevard in San Ramon, with a connection to the Alameda County Pleasanton bus line (Figure 3). A total fleet of fifteen buses (twelve operating and three spares) would run at ten minute headways during peak hours and would have a peak hour load factor of 1.25. These buses would be articulated to provide maximum transport capability (CCCTA, 1982).

The South Broadway Extension is the only roadway addition within the ROW that would have a significant impact on alleviating traffic congestion. The alignment would be approximately one mile in length, and would extend South Broadway from Newell Avenue to Rudgear Road from which I-680 access could be gained (Figure 4). A projected 30% of office travel to the Walnut Creek Core Area could benefit from this extension (Walnut Creek, 1982).

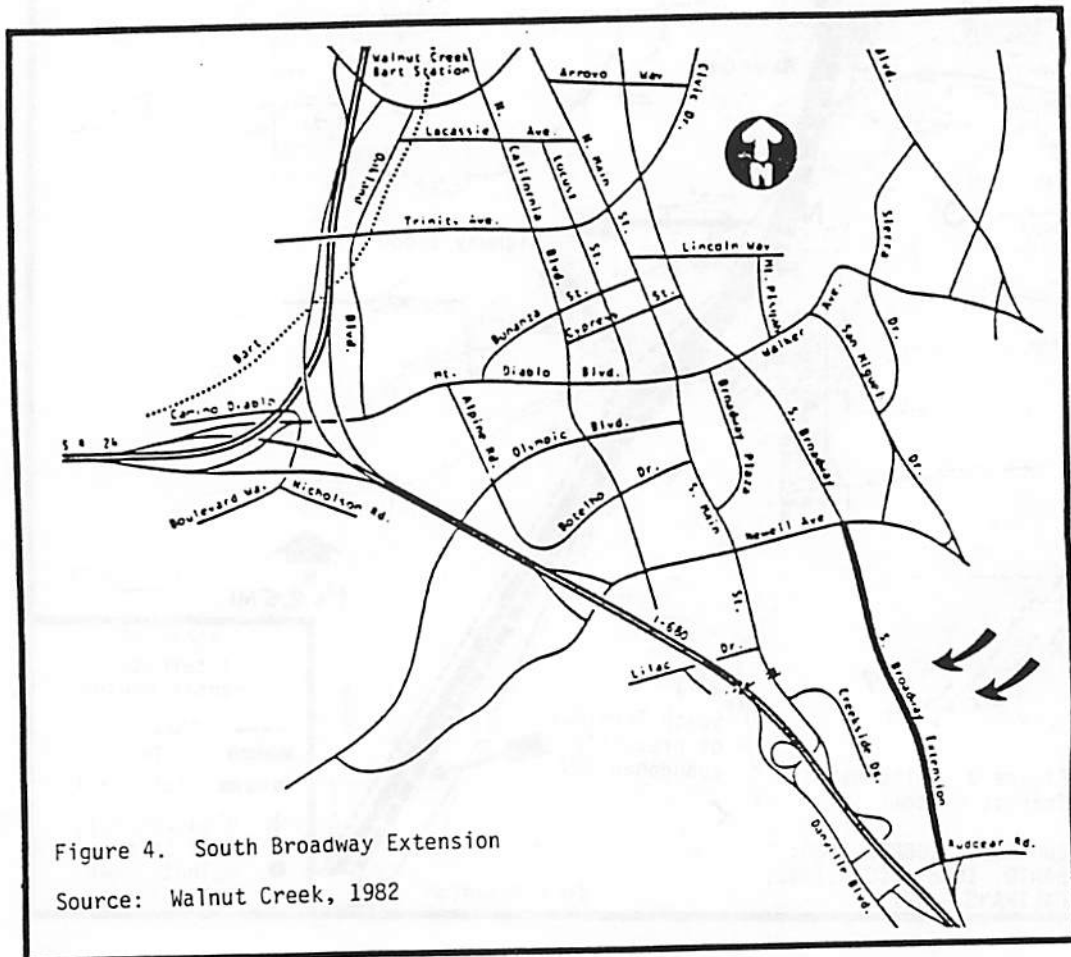


Figure 4. South Broadway Extension

Source: Walnut Creek, 1982

Light rail utilization of the ROW would provide a new type of transit system in Contra Costa County. The light rail line would interface with the Pleasant Hill BART station and would run to Dougherty Road in Dublin, with possible extensions south to Pleasanton (Figure 3). The capacity of this line would be 5,000 passengers per peak hour per direction (CALTRANS, 1977).

Discussion

A more effective transportation network must be implemented along the ROW corridor, because of the increased traffic from the four major developments in and around Contra Costa County. A projected 14,851 commuters will be overburdening the existing system in the future (Table 3). New transit systems will require money to build, but with a careful examination of all types of proposed systems, costs can be held to a minimum. However, before any new transit system is built, considerable distance must be bridged between Contra Costa County and Southern Pacific with respect to the possible acquisition of the ROW by the County. Currently, Southern Pacific's asking price for the ROW is too high, the County has too few public funds, and the traffic problems are not yet at a crisis stage, to make the acquisition of the ROW a pressing and immediate need.

The most cost-efficient of the proposed systems is the South Broadway Extension at 328 passengers per direction per peak hour per million dollars, followed by CCCTA bus service at 105, light rail at 80.6, and finally BART at 11.9 (Table 4). Although the South Broadway Extension provides the most efficient use of funds, it accommodates only 1,641 passengers, as compared to 5,000 and 5,632 for light rail and BART respectively. None of these transit systems completely eliminates the transportation problem, but BART and light rail come reasonably close (within 2,500 passengers). If either of these is implemented, the balance of the problem could be addressed by smaller mitigation measures, such as TSM (Transportation Systems Management--implemented by the developments) small roadway and intersection improvements, and ride-sharing. The nature and extent of these measures would require further study after a new transit system is in place and operating.

Recommendations

The most viable option among the proposed transit systems seems to be the light rail facility, with the possible concurrent operation of the South Broadway Extension.

The light rail system is preferred due to its relative low cost and high volume capacity. Although BART would indeed allow for a greater capacity (5,632 to 5,000 passengers), it would do so at a much higher cost than light rail (\$475 to \$62 million).

The South Broadway Extension, because of its very good feasibility rating and limited length, should also be adopted. The approval for this project, however, should be given only if it does not exclude the passage of light rail through the South Broadway section. Concurrent operation with light rail by adjoining property would be quite satisfactory.

Implementation of a CCCTA bus line along the ROW does not seem advisable, because of the low volume of passengers transported. Although the bus line is cost-efficient (105 passengers per peak hour per direction), the very small effect this system would have on the overall traffic situation makes the allocation of the entire ROW to this kind of transit facility particularly impractical and wasteful.

For these reasons, it is recommended that Contra Costa County pursue a light rail system along the Southern Pacific Right-of-Way, with an adjacent adoption of the South Broadway Extension. These two measures are not necessary to serve the existing traffic, but are an ultimate solution to the projected traffic levels due to development in and around Contra Costa County.

REFERENCES CITED

- Bay Area Rapid Transit District (BARTD), 1974. San Francisco Bay Area Rapid Transit District Livermore-Pleasanton Extension Study. San Francisco, CA, 110 pp.
- BARTD, 1983. San Francisco Bay Area Rapid Transit District Livermore-Pleasanton Extension Study. San Francisco, CA, 212 pp.
- California Department of Transportation (CALTRANS), 1977. Light Rail and Alternate Transportation Uses of the San Ramon Branch Line. CALTRANS, Sacramento, CA, 60 pp.
- Central Contra Costa Transit Authority (CCCTA), 1982. Short Range Transit Plan (1983-87). JHK & Associates, 125 pp.
- Contra Costa County Planning Department (CCCPD), 1980. Southern Pacific Railroad Right-of-Way Report (San Ramon Branch Line). CCCPD, 79 pp.
- Contra Costa County Public Works Department (CCCPWD), 1983. Traffic Impact Analysis for Pacific Telephone Office Complex and Surrounding Areas. Barton Aschman Associates, Inc., 98 pp.
- Cutler, James W., Chief of Advanced Planning, CCCPD. Personal communication, 1984.
- Drake, Robert H., Project Planner, CCCPD. Personal communication, 1984.
- Metropolitan Transportation Commission (MTC), 1983. San Francisco Bay Area New Transit Starts and Extensions. Oakland, CA, 83 pp.
- Meyers, Jerry, Mass Transport Division, CALTRANS. Personal communication, 1984.
- Nolte, Carl, January 11, 1984. Area's Biggest Problem--How to Handle Traffic. The San Francisco Chronicle, No. 309.
- Prudential Insurance Company of America, 1982. North Pleasanton Traffic Study, Volume 3. TJKM Transportation Consultants, Walnut Creek, CA, 26 pp.
- Temko, Allan, January 9, 1984. Last Chance for Planners to Save Area. The San Francisco Chronicle, p. 8.
- U.S. Department of Commerce and Bureau of Census, 1984. Statistical Abstract of the United States [1985, 105th edition. Washington, D.C., 868 pp.
- Walnut Creek, City of, 1982. City of Walnut Creek Core Area Traffic Study. DKS Associates, Oakland, CA, 50 pp.