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An Evaluation of Transit Service to The Rockridge District

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# **An Evaluation of Transit Service to The Rockridge District**

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April 28, 1987**

## **Rockridge District Transit Service Evaluation**

### **Abstract**

This paper presents a case study of an analysis of transit service to an area of Oakland, California which is undergoing rapid gentrification. The area is mostly residential with strip development on its major street. A BART rapid transit station is located in the center of the district. A methodology is developed for analysis of transit service in this type of area and is used to evaluate service in the Rockridge district.

It was found that the Rockridge district was extremely well served by transit. Frequent service to many different locations is available, a large percentage of area residents use transit to get to work, and the demographic characteristics of transit passengers who ride transit in the area corresponds with characteristics of residents in the area. The most significant problems with transit service in the area were found to be externalities caused by transit such as BART parking lot spillover and low quality urban design in the BART station/freeway area.

The methodology used to evaluate transit service for the area developed in this paper could easily be generalized to use in other areas.

## ACKNOWLEDGEMENTS

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## **1. Introduction**

### **A. Study Background**

This study is being performed for the City of Oakland. It is one of a series of studies which will be used by the Oakland City Planning Department as background material for a specific area plan which will be prepared for the Rockridge district. The Rockridge district is presented in Figure 1-1. This study will address transit service to the Rockridge district. Other studies being performed include on and off street parking, vehicular traffic flow, urban design, business conditions and trip generation characteristics of the district.

This study presents an analysis of transit service in the Rockridge district. The analysis will address ways of improving the quality of life in the Rockridge district through improving the effectiveness of its transit services and facilities and reducing negative externalities caused by transit in the area.

### **B. Transit and Quality of Life**

Transit service in urban areas is an important factor in determining quality of life. Transit improves the quality of life by providing an area with an alternate form of transportation; however transit service may also detract from the quality of life if problems caused by provision of transit service adversely effect area residents (negative externalities).

Negative externalities from transit service and facilities include parking problems caused by overflow from park and ride lots, pedestrian-vehicle conflicts around transit stations and stops, transit vehicles blocking and slowing traffic, and noise and fumes from transit vehicles.

On the positive side transit improves transportation by providing an alternative form of transportation. This serves two important purposes. First, it provides residents with a means of travel. Residents of an area which is well served by transit may not need to own cars, or may not have to use their cars as frequently as those living in an area poorly served by transit. In other words transit increases the area's accessibility in an environmentally sensitive way.

Second, transit reduces the number of vehicles travelling through the area, which improves the area's environment and its livability. An increase in traffic volumes would cause increases in air





and noise pollution, safety problems and traffic congestion in the street network.

In summary, transit improves the quality of life in two ways, by providing an area with additional accessibility and by reducing the number of vehicle trips passing through the area. Negative externalities of transit service detract from the quality of life. This study will analyze the both the positive and negative effects of transit service on the Rockridge district.

### C. Transit Service in the Rockridge District

Two transit operators serve the Rockridge district. AC Transit provides fixed route bus service to the area (both local East Bay service and Transbay service to San Francisco). Bay Area Rapid Transit (BART), provides heavy rail rapid transit service to San Francisco, Oakland and several other East Bay communities from the Rockridge station. Transit routes which serve the Rockridge district are shown on Figure 1-1.

AC Transit bus service is organized to serve two major functions. First, to provide local East Bay service and second, to provide direct commuter service to San Francisco. The Rockridge district is served by four AC Transit fixed route bus lines which together serve both functions. The lines serving the Rockridge district are: the 51 College Avenue, the 17 Alcatraz Avenue, the "E" line series of routes and the 52 UC Campus line. Several other lines provide service on the edges of the Rockridge district. These are the 40 Telegraph Avenue line, providing service to the west part of the district and the 59/76 line which pass to the south of the district on Broadway Terrace. Each of these routes will be described more fully in Section 2.

The Rockridge BART station has a significant impact on district livability. It is located in the median of the State Route 24 freeway where it crosses over College Avenue. The freeway is located between Grove and Shafter Streets. The station has free parking available under the freeway for 780 cars. It is served by the Daly City-Concord line which provides direct service to downtown San Francisco from 6 AM until Midnight. In order to get to stations on the Richmond or Fremont lines passengers must transfer. BART facilities and service at the Rockridge station will be described more fully below. See Figure 1-2 for a schematic diagram of the BART system.

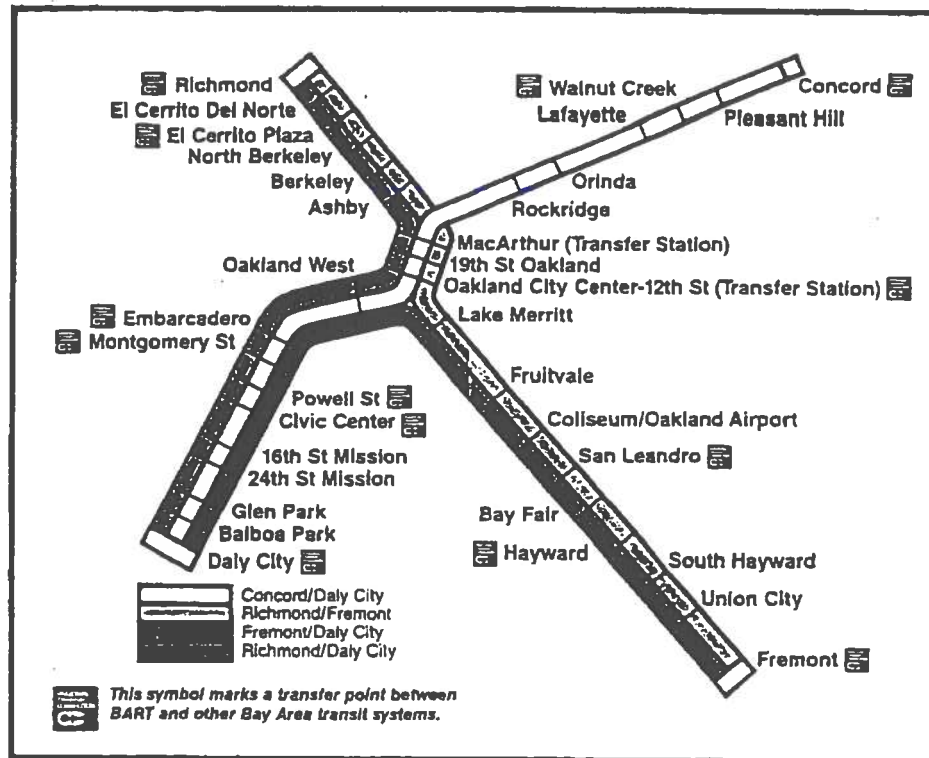


Figure 1-2 -- Bart System Map

## D. Evaluating Transit Service

In order to evaluate the effect of transit service on the quality of life in an area it is necessary to compare the needs of area residents (and travellers to the area) to the transit services provided, and to evaluate the magnitude of transit's negative impacts on area residents and businesses. In order to determine how well transit serves district residents three questions should be addressed:

- How well does the existing transit service serve transit riders?
- Are some residents of the district poorly served by transit?
- How well does transit serve people who work or shop in the district?
- What are the costs and benefits of transit services currently provided to the district and proposed for the future?

In order to answer these questions five factors will be considered in this study. These factors are:

- (1) Geographic Convenience -- How far is the transit route from a trip's origin and final destination?
- (2) Schedule Convenience -- How frequent is service on the transit route? and how well does schedule match trip patterns of residents, workers and shoppers?
- (3) Travel Time -- How long does it take to make the transit trip?
- (4) Route Costs and Benefits -- What are the financial, social, political and environmental costs and benefits of a transit route? This includes the negative externalities caused by transit.
- (5) Passenger Characteristics -- How do demographic characteristics of a transit route's passengers compare to characteristics of all people living in the area?

These factors provide a framework for comparing transit needs to services offered. For example, if everyone in an area lived very close to a bus route which went right to their final destination, then in terms of geographic convenience service would be considered excellent.

It should also be understood that the first three of these factors are among those evaluated relative to other means of transportation before people make a trip. When the alternative mode of transportation is the private automobile it is easy to understand why it is difficult to provide transit service which matches user needs and is competitive with the private automobile.

Each of the factors identified for analyzing the effectiveness of transit service will be more fully explained in the following sections.

## E. Geographic Convenience or Spatial Accessibility

Geographic convenience is determined by how far the transit route is from the start of a trip and how far it is located from the final destination of the trip. The nature of traditional cities makes transit service generally less geographically convenient in low density residential areas and more geographically convenient in downtown areas. Transit stops are often located further from homes than downtown work locations. The reverse is true for the private automobile, it is generally more convenient in low density residential areas and less convenient in downtown areas. Cars can be parked near people's homes, but are difficult to park near final destinations downtown.

The most direct measure of geographic convenience is distance to and from the transit route. The shorter the trip the more convenient the service. A second measure is mode of travel to and from the transit route. Most people who must drive or transfer from another transit route are less well served than those who can walk. Finally, the number of transit vehicles needed to make a trip can be used to measure geographic convenience. These three measures will be used to evaluate geographic convenience of transit service in Rockridge.

## F. Schedule Convenience

Schedule convenience is simply whether transit service is provided which can take you from your origin, when you want to leave, to your destination, and gets you there when you want to arrive. It would be impossible to schedule transit service to meet everyone's needs perfectly with respect to schedule convenience. Instead transit operators provide service as frequently as ridership will allow and give passengers the opportunity to choose from several times. Schedules are designed to maximize convenience to passengers by providing more service in peak hours, scheduling vehicles on regular headways (the headway is the time between arrivals of vehicles at a transit stop), and providing service throughout the day.

Several measures will be used in this study to evaluate schedule convenience. They are, first, days and hours of operation, and second, scheduled headways. In general, the more service provided to an area the better in terms of schedule convenience. Service every day is preferable to service on weekdays only; service 20 hours a day is better than service 14 hours a day and service every 15 minutes is better than service every half hour. Service will be compared to the needs of users as determined by the type of trips they are making.

## **G. Travel Time**

Travel time is simply the amount of time it takes to make the trip on transit. In order to use it as a measure of transit service effectiveness travel time using transit must be compared with travel time using other modes available to the user. Thus it becomes important to know first, what alternative modes of transportation are available to passengers and second, how long it would take them to make their trip via that mode.

It is very difficult to obtain all the data necessary to accurately make this comparison. Therefore in this study a qualitative comparison between transit and alternatives will be made. Approximate transit times will be compared to driving and carpool times for trips to various destinations.

It is important to note that travel time includes all parts of the journey. For example, transit travel time includes time spent getting to the transit route, waiting for the transit vehicle, riding to the destination stop, time spent in transferring from one transit vehicle to another, and getting from destination stop to final destination. Transit travel time is therefore directly related to geographic convenience (distance to transit route directly affects the time it takes to get to the route) and schedule convenience (the transit headway will affect the amount of time spent waiting for transit). Thus measures used in evaluating geographic and schedule convenience will be used to assist in development of transit travel times.

## **H. Route Cost/Benefit Performance**

Cost/benefit performance of a transit route is an important consideration because many ways of improving transit effectiveness involve increasing service which generally increase financial costs. Financial performance of transit is one measure used to compare the benefits of transit service improvements against their costs. Other factors are social equity (for example, providing transit service to those without cars or unable to drive is an important equity issue), political considerations and environmental effects.

In this study financial performance will be used as the chief measure of costs and benefits of transit service. Financial performance will be measured using two common transit industry statistics, farebox recovery ratio and subsidy per passenger. The farebox recovery ratio is simply the revenues generated on a transit route (fares collected) divided by the cost of providing service on the route. The subsidy per passenger is the difference between the revenues generated on a

route and the costs of operating the route, divided by the number of passengers on the route. The lower the subsidy per passenger the better.

A secondary measure of performance will be the availability of an automobile to make trips. This will give an indication of the number of people without cars who are being served and can be used to evaluate social equity benefits of transit service in the district.

It should be noted that any judgements on the financial performance of a transit route must consider the characteristics of its passengers. A low performing route which serves lower income citizens must be considered differently from one serving upper income passengers. Thus characteristics of passengers and residents of an area are important factors in evaluating transit route performance.

#### **I. Passenger Characteristics**

Comparing district transit passenger characteristics with overall district resident characteristics provides an indication of whether transit is serving all district residents or only a subset of them. In order to provide effective transit service all the district's residents should be served. The measure which will be used to evaluate this factor is a comparison between census information for residents of the Rockridge district and district transit passenger characteristics (as determined in studies of district transit service).

The analysis will consider other types of transit users as well, such as students, employees, visitors to the Rockridge district and shoppers. It will present an evaluation of the quality of transit service for each type of trip, work, shopping, medical and school.

#### **J. Study Overview**

The rest of this study will be structured to analyze transit service in the Rockridge district around the five factors described above. Section two of this report will describe existing transit service to the Rockridge district. Section three will present demographic information on Rockridge district transit passengers and for the district itself. Sections four through six will present an evaluation of transit service in the Rockridge district with respect to the five factors. Section seven will discuss negative externalities imposed on the Rockridge district by transit service. Section eight will present a summary of results and address the three questions about transit system needs and service provided. It will also present recommendations. An appendix will contain information on sources of data used in the study and raw data in cases where it was collected as part of this study.



## **2. EXISTING CONDITIONS**

### **A. Introduction**

In this section AC Transit bus services and BART services to the Rockridge district will be more fully described. The route of each AC Transit bus route through the Rockridge district and major attractions which the route serves will be described. Finally, BART services and facilities will be described.

### **B. AC Transit 51 Line**

The 51 line is the most important bus route serving the Rockridge district for three reasons. First, it serves many important attractions, second, it has frequent service and finally it is easily accessible to most Rockridge residents. The 51 line runs on College Avenue right through the heart of the Rockridge district and links it with UC Berkeley, downtown Berkeley, Oakland and Alameda. The 51 also serves four BART stations (Berkeley, Rockridge, 19th Street in Oakland and 12th Street). The 51 College Avenue line is also one of AC Transit's most heavily patronized routes.

#### **Route**

Three routes share the 51 designation, the 51, the 51A and the 51M. The 51 line serves downtown Berkeley, the University area, College Avenue in the Rockridge district, Broadway in downtown Oakland and the City of Alameda. This line operates northbound and southbound. The 51A operates southbound and follows the same route as the 51 except it also serves the Berkeley Marina, the 51M operates northbound and follows the same route as the 51A. The 51 and 51A/M routes operate on a staggered schedule to provide equal headways on the common section of the routes. The 51, 51A and 51M lines are illustrated in Figure 2-1. For purposes of the Rockridge district all three routes provide basically the same service and will be treated as one line in the following analysis.

### **C. AC Transit "E" LINE**

The "E" line is second in importance to the 51 line for Rockridge residents. Currently four routes share the "E" designation. First, the "EX" provides express service to San Francisco during

# Line 51/51A

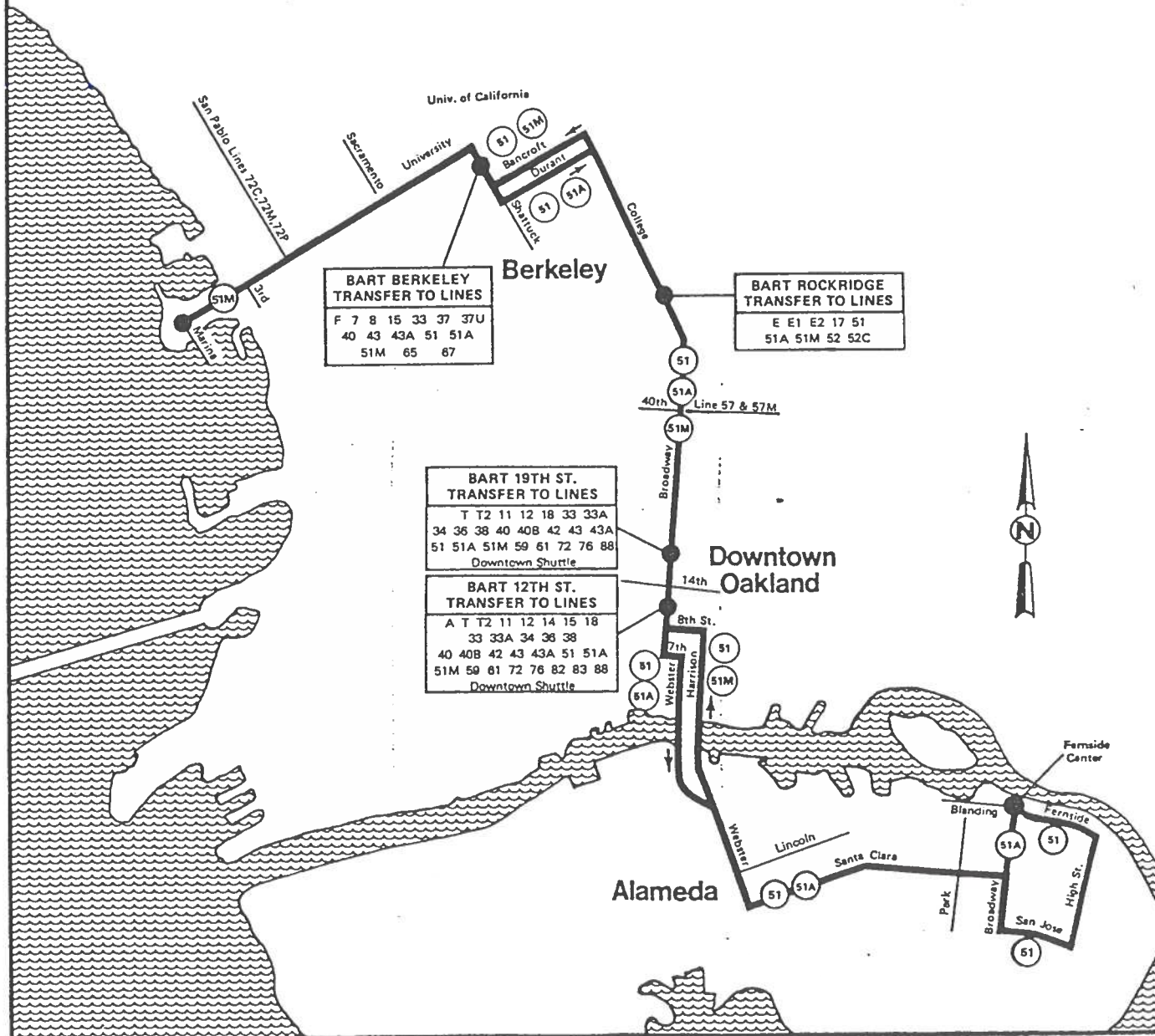


FIGURE 2-1: AL TRANSIT 51 LINE



commute hours. Second, the "E" provides local and San Francisco service during commute hours. Third, an extension of some of the "E" route trips provides service to the Parkwood Apartment complex during commute hours ("E1"). Finally, the "E2" provides local service and connections to San Francisco service during non commute hours and weekends. The existing route "E" lines are shown in Figure 2-2.

#### **Planned Route Restructuring**

A major route restructuring is planned for the "E" line. As currently proposed, the "E1" will be replaced by the "EX" which will be extended to serve the Parkwood complex; the "E2" will be discontinued and be replaced by a modified route 65 which will be rerouted to follow the current "E2" route from the Claremont Hotel to the Yerba Buena/San Pablo Avenue San Francisco transfer point; and the "E" will replace the part of the "E1" route running from Rockridge BART to San Francisco during commute hours. These service changes must be approved by AC Transit's Board of Directors, and if approved will be implemented in June 1987.

#### **D. AC Transit 17 Alcatraz Avenue Line**

The 17 line is designed to provide crosstown service between the Ashby BART station, Alta Bates Hospital in Berkeley, the Rockridge BART Station, the Rockridge Shopping Center in Oakland and Kaiser Hospital on MacArthur Boulevard in Oakland. Observations indicate that ridership on this line is quite low.

##### **Route**

The 17 line starts at the Ashby BART station and passes through the Rockridge district on College Avenue to the BART station, then jogs east through the district to Broadway, Pleasant Valley, Piedmont Ave and ends at Kaiser Hospital. The route is shown in Figure 2-3.

In 1982, the 17 line was changed from travelling east on Alcatraz Avenue turning south on College to its current route which travels east on Alcatraz then turns north on Telegraph, east on Ashby and finally south on College (this route is also shown on Figure 2-3). The change was made in order to provide a direct route from Alta Bates Hospital to the Rockridge and Ashby BART stations. According to AC Transit ridership didn't improve much after the route change. The AC Transit Planning department is considering rerouting the bus back to its original route.

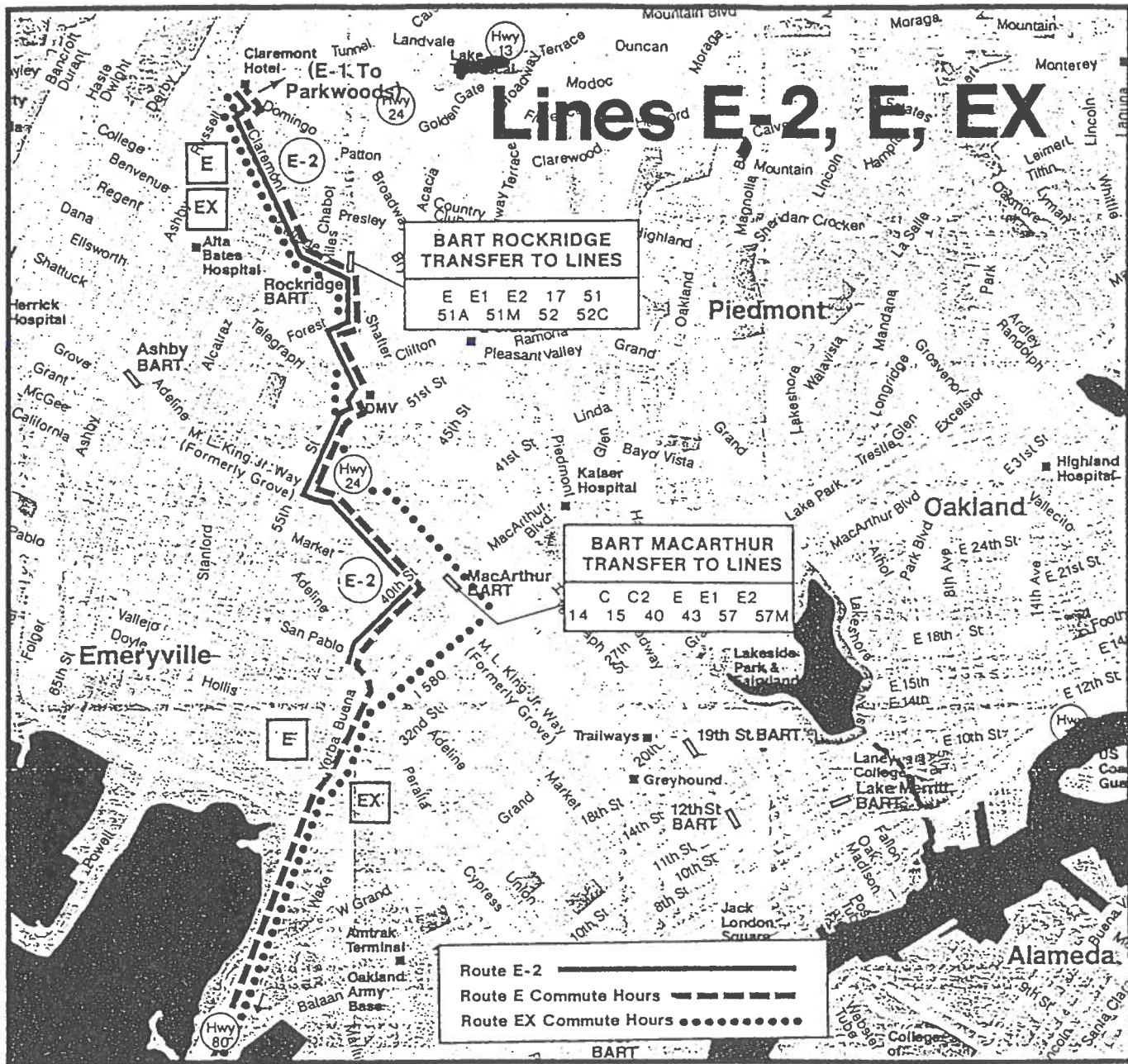


FIGURE 2-2: AC TRANSIT 'E' LINE

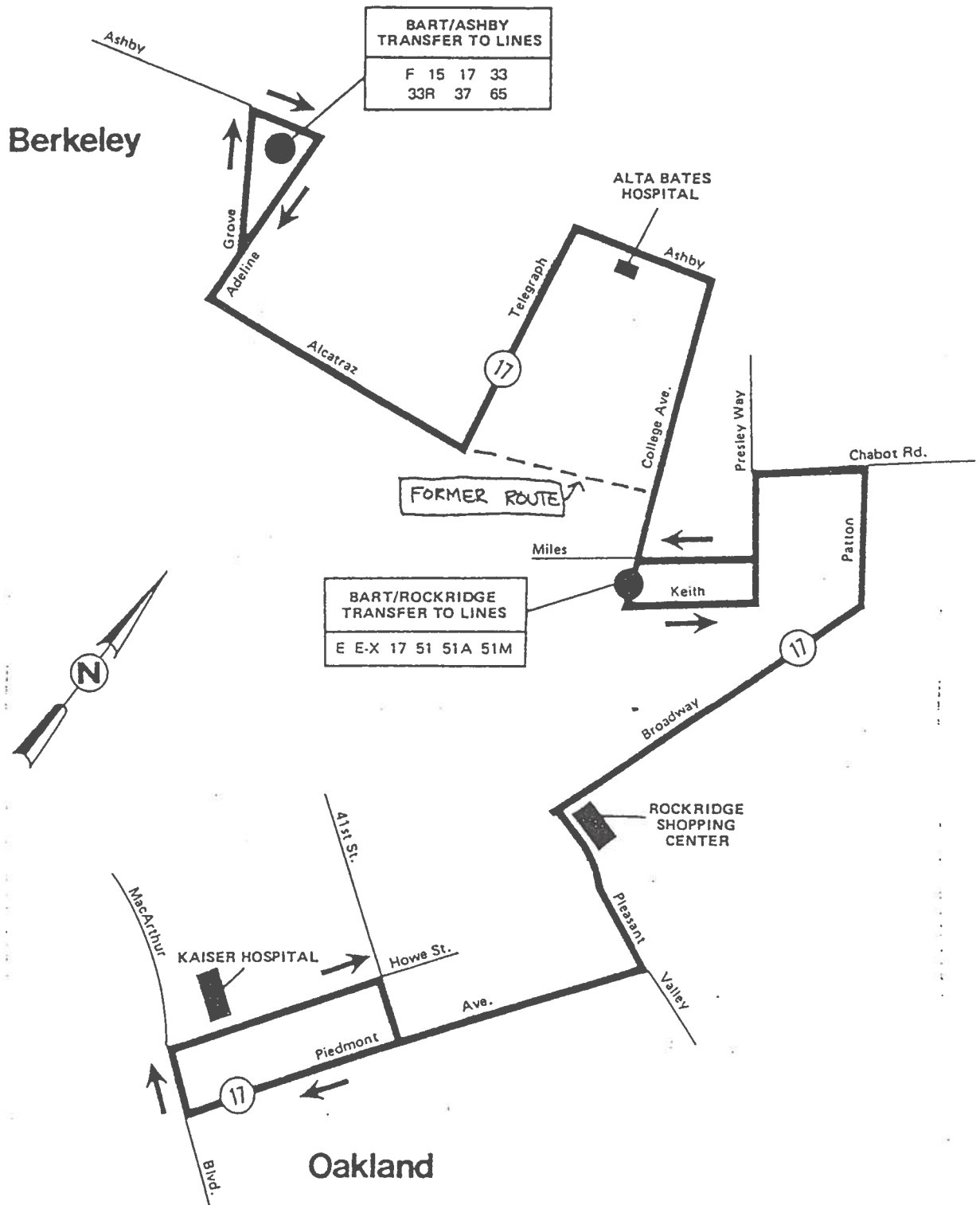


FIGURE 2-3: AC TRANSIT 17 LINE

# Line 17

### E. AC Transit 52 UC Berkeley line

The 52 line serves the Rockridge BART station, the University of California, downtown Berkeley and UC Village ( a complex of apartments for married UC students, located in the City of Albany). The 52 line starts at the Rockridge BART station, travels north on College Ave to UC Berkeley, on Hearst serving the north side of the UC campus and ends at UC Village. The route is shown in Figure 2-4.

### F. Other AC Transit Service

Three AC Transit routes (40 Telegraph Avenue, and the 59/76 line) provide limited service to the Rockridge district. These routes pass on the edges of the district and thus serve only a few district locations. They provide important additional service to the district over the four routes described above.

#### 40 Telegraph Avenue

The 40 Telegraph Avenue line is one of AC Transit's most important routes. It passes just west of the Rockridge district as shown in Figure 2-5. The 40 line connects many important East Bay attractions including downtown Berkeley, UC Berkeley, Telegraph Avenue in Berkeley and Oakland, downtown Oakland, East Oakland, and San Leandro. Service is provided 24 hours a day, seven days a week. The 40 line serves many of the same locations as the 51 line and has frequent service. Thus it provides an alternative to 51 line service for Rockridge district residents, especially those living west of College and at times when the 51 line does not operate.

#### 59/76 Line

The 59/76 line passes by the southern corner of the Rockridge district, College and Broadway. The route is shown in Figure 2-6. It connects the residential district to the east of the district with downtown Oakland via Broadway. The 59 and 76 are actually different branches of the same route, they serve separate residential areas. This route probably does not serve Rockridge district very well. Its schedule is limited and it doesn't pass very close to much of the district.



# Line 52

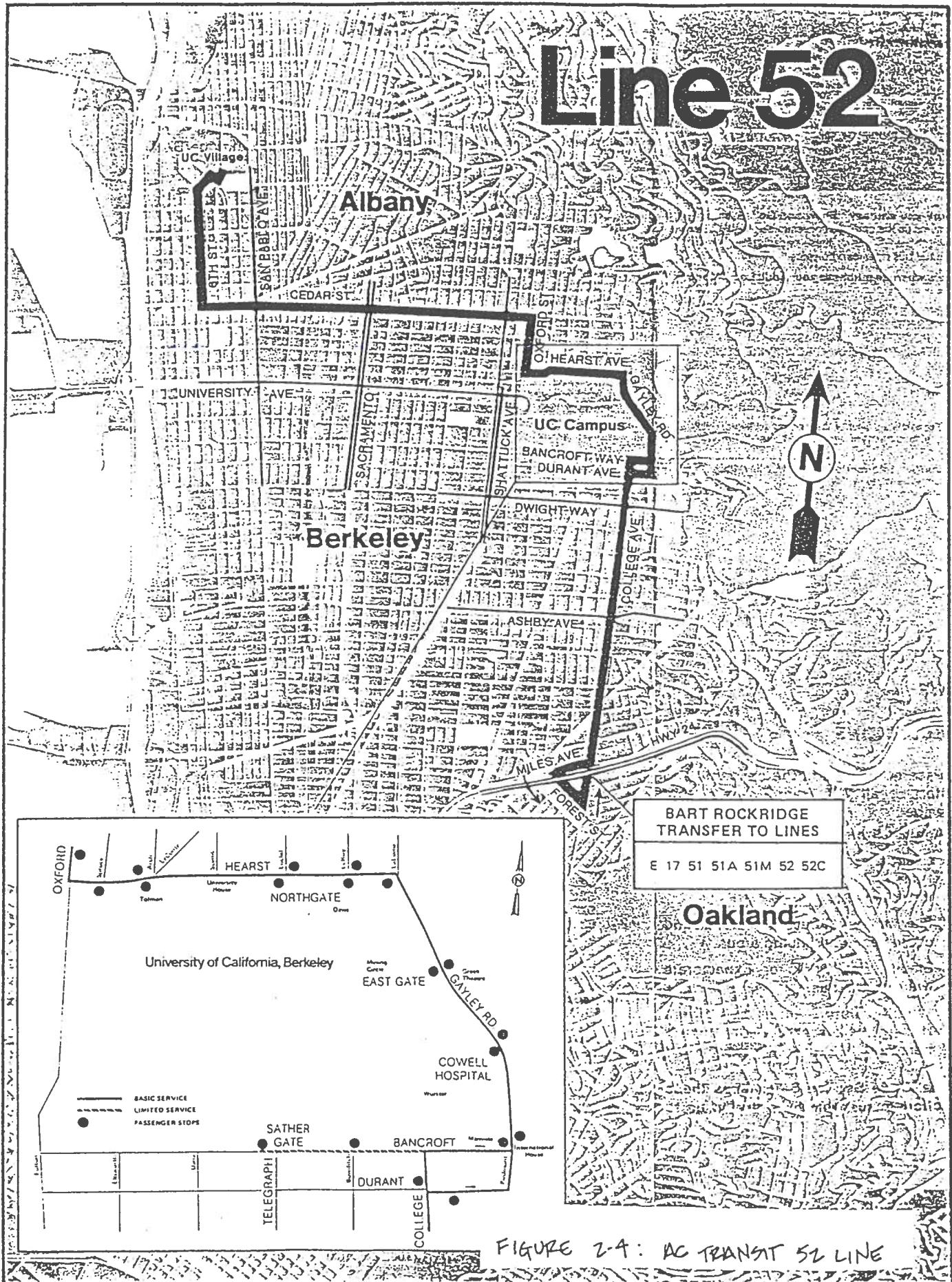


FIGURE 2-4: AC TRANSIT 52 LINE

# Lines 40 & 43

| BART EL CERRITO<br>TRANSFER TO LINES |              |
|--------------------------------------|--------------|
| G                                    | GX 10 43 51  |
| 51A                                  | 67 68 70 70A |
| 72M                                  | 72P 78 78A   |

| BART NO. BERKELEY<br>TRANSFER TO LINES |           |
|----------------------------------------|-----------|
| H                                      | 43 43A 88 |

| BART BERKELEY<br>TRANSFER TO LINES |                  |
|------------------------------------|------------------|
| F                                  | 7 8 15 33 37 37U |
| 40                                 | 43 43A 51 51A    |
| 51M                                | 65 67            |

| BART 19TH ST.<br>TRANSFER TO LINES |                        |
|------------------------------------|------------------------|
| 82 T                               | T2 11 12 18 33 33A     |
| 34                                 | 34C 36 38 40 40B 42 43 |
| 43A                                | 51 51A 59 61 72 76 88  |
| Downtown Shuttle                   |                        |

| BART 12TH ST.<br>TRANSFER TO LINES |                      |
|------------------------------------|----------------------|
| A                                  | T 12 11 12 14 15 18  |
| 33                                 | 33A 34 34C 36 38 40  |
| 40B                                | 42 43 43A 51 51A 51M |
| 59                                 | 61 72 76 82 83 88    |
| Downtown Shuttle                   |                      |

**San Leandro**

**East Oakland**

**Downtown Oakland**

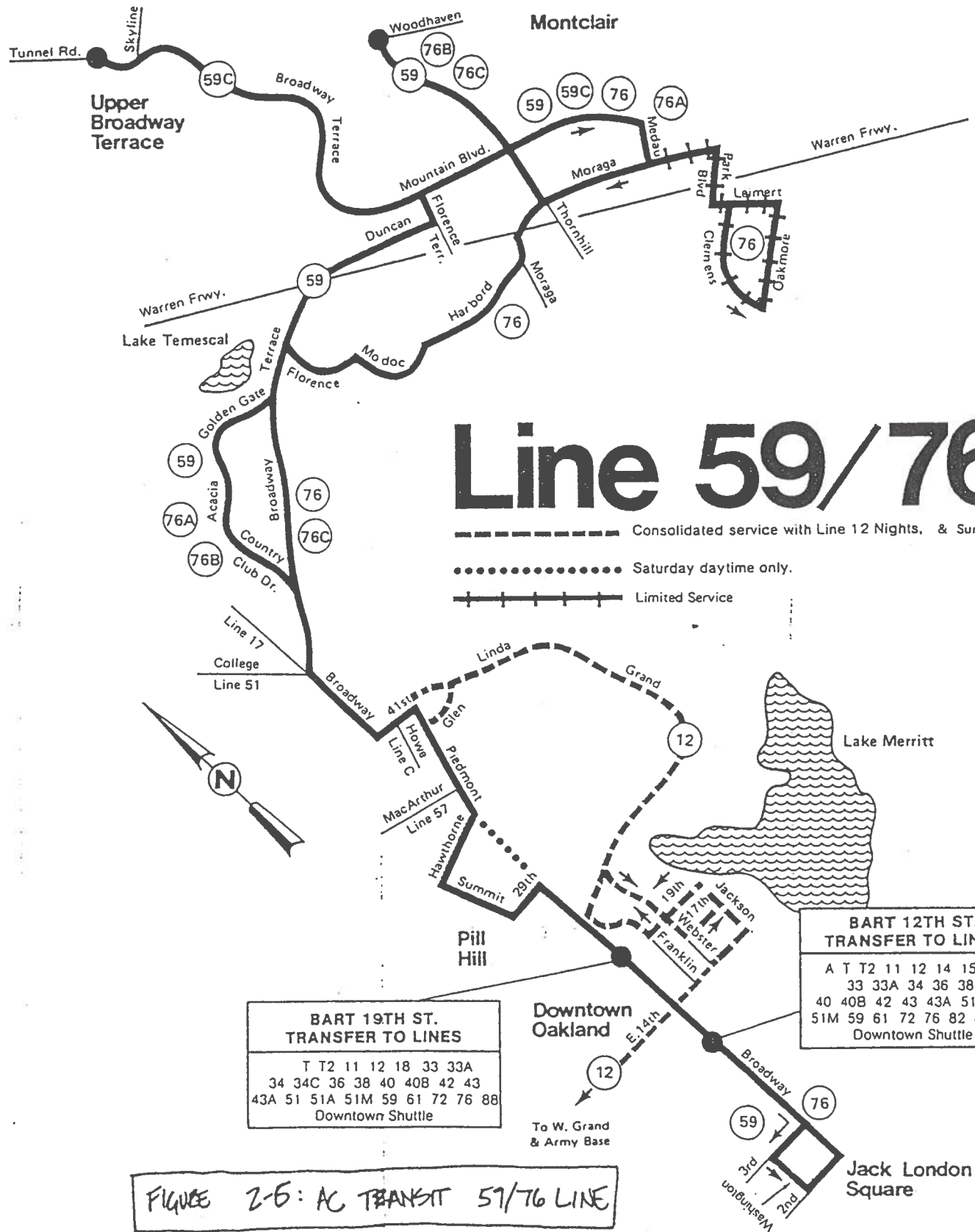
**Berkeley**

**Albany**

**El Cerrito**

FIGURE 2-5: AC TRANSIT 40 LINE

**BASIC SERVICE  
LIMITED SERVICE**





## **G. BART Facilities**

The BART station is a major land use in the Rockridge district. It is located in the middle of the district and consists of a station and a parking lot for approximately 780 cars. See Figure 2-7 for a plan of the station area. Figures 7-3 and 7-4 present views of the station. The station is located in the median of the Grove Shafter Freeway (California State Highway #24) which is an elevated freeway which passes east-west through the middle of the Rockridge district. The station is located where the freeway crosses College Avenue. Parking is provided in paved lots under the freeway on both sides of College Avenue.

All four AC Transit bus lines which serve the Rockridge district stop at the station. Figure 2-7 illustrates bus stops in the BART station area. As shown in Figure 2-7, the BART station is well served by the 51 and 52 bus routes, the 17 line and "E" routes are not as conveniently served.

## **H. BART Service**

The Rockridge BART station is served by BART's Concord line. This route provides direct service between Concord and Daly City (including service to downtown San Francisco and Oakland). Passengers must transfer for service to stations on the Fremont or Richmond lines. Figure 1-2 illustrates the BART system.

The Concord line operates from 6 AM until midnight on weekdays and Saturdays and from 9 AM until midnight on Sundays. Weekday service is provided every 15 minutes during the day, with service every 7 1/2 minutes from 7 AM to 8 AM and 5 PM to 6 PM (in the peak direction), and every 20 minutes after approximately 7 PM. On weekends service is provided every 20 minutes.



### **3. TRANSIT PASSENGER CHARACTERISTICS**

#### **A. Introduction**

In order to evaluate transit service to an area it is necessary to know if the transit service provided to the area is serving the people living there. If the people riding transit in the area have similar characteristics with respect to income, age, sex and occupation as those living in the area than the transit service is serving the area well.

In this study data from the 1980 US Census was compared to data on transit passengers in the Rockridge area from the 1985 AC Transit On-Board Survey, a 1985 BART passenger survey and the results of a Rockridge BART station passenger survey carried out for this study.

A further purpose of this analysis is to characterize each transit route serving the Rockridge district by whom the route serves and what purposes it serves. This characterization will assist in the analysis of other factors used for evaluating the quality of transit service to the district, which are presented in later sections of this report.

#### **B. Information Sources used in this Study**

##### **1980 Census Data for Rockridge District**

Data from the 1980 Census was collected for the census tracts which make up the Rockridge district. These census tracts are 4002, 4003, and 4004, all located in the City of Oakland, and county of Alameda, part of the San Francisco-Oakland Standard Metropolitan Statistical Area (SMSA).

The census data which were analyzed was household income levels, population ages, sex, and journey to work information. Raw data from the census are presented in Appendix 4 for each of the three census tracts, the Rockridge district, the City of Oakland and the SMSA. In the analysis which follows Rockridge and the City of Oakland data is compared to passenger data from AC Transit and BART.

The Rockridge district is currently undergoing a process of gentrification, therefore it was felt that if 1980 census data were inaccurate due to age of the data, it would be biased in terms of showing district residents to be less affluent than they are currently. Thus if transit is serving people with lower incomes in 1985 than 1980 the conclusion can be drawn that the change is even

worse than shown, because average incomes have been rising over the period in the district, but incomes of passengers has been falling.

#### **AC Transit 1985 On-Board Survey**

AC Transit made an on-board survey of all its routes in the Spring of 1985. This study was designed to obtain accurate data on the characteristics and travel patterns of AC Transit riders. All passengers on selected trips were asked to fill out a brief questionnaire, then the data from the completed questionnaires were entered into AC Transit's computer and analyzed. For this study, data from passengers either boarding or leaving a bus in the Rockridge district were analyzed. A complete discussion of AC Transit's 1985 On-Board Survey can be found in Appendix 1.

#### **BART 1987 Rockridge Passenger Survey**

In order to obtain information on BART Rockridge station passengers a survey was prepared and given to passengers entering the station between 7 AM and 9 AM on Thursday, April 16, 1987. The survey is described fully in Appendix 2. The survey only reflects characteristics of morning rush hour passengers originating at the Rockridge station, therefore results should be used to provide information about this market segment only. It should be noted that the Rockridge BART station serves a significant number of people in off peak hours and in off peak directions. For example, many students exit at the Rockridge station on their way to school in the morning. These markets are not included in the survey results.

#### **BART 1985 Passenger Profile**

As part of its on-going market analysis BART undertakes regular surveys of passengers. The latest survey was performed in 1985. Results of the survey are found in the publication: BART Passenger Profile Survey, 1985. The study was performed by Research and Decisions Corporation and surveyed passengers on all BART lines throughout the day and on weekends.

#### **C. Journey to Work Information**

Table 3-1 presents journey to work information for people living in the Rockridge district. Information presented in the table indicates that Rockridge district residents are less likely to drive to work (either alone or in a carpool) and slightly more likely to ride transit. Given the proximity of most district residents to the BART station and good bus service provided by AC Transit these are reasonable results. The fact that there is such a large percentage of Rockridge residents who use "other" to get to work compared to Oakland residents and SMSA residents is rather unusual. This large number of people might be bicycle or motorcycle riders.

**Table 3-1**  
**Journey to Work**

| Mode              | Rockridge | Oakland | SMSA      |
|-------------------|-----------|---------|-----------|
| Drive Alone       | 50.1%     | 55.3%   | 57.9%     |
| Carpool           | 10.2%     | 13.9%   | 15.7%     |
| Bus               | 19.3%     | 18.9%   | 13.2%     |
| BART              | 3.6%      | 2.6%    | 3.1%      |
| Walk Only         | 5.6%      | 5.1%    | 5.1%      |
| Other             | 6.9%      | 2.4%    | 2.8%      |
| Work at Home      | 4.2%      | 1.8%    | 2.0%      |
| Total             | 100.0%    | 100.0%  | 100.0%    |
| Number of workers | 5,652     | 139,117 | 1,562,352 |

Source: US Census, 1980

Note: Rockridge district defined as census tracts 4002, 4003, 4004 in the San Francisco  
Oakland SMSA.

Table 3-2 presents work locations for Rockridge residents who work in the SMSA. As shown, approximately 31 percent of Rockridge residents who work in the SMSA work in Berkeley which is ideal for bicycling, and thus may serve to explain the large percentage of people using "other" for transportation to work.

**Table 3-2**  
**Place of Employment:**  
**Rockridge Residents Who Work in the SMSA**

| Place of Employment | Rockridge | Oakland | SMSA      |
|---------------------|-----------|---------|-----------|
| San Francisco CBD   | 10%       | 7%      | 12%       |
| San Francisco Other | 8%        | 8%      | 21%       |
| Oakland CBD         | 5%        | 9%      | 2%        |
| Oakland Other       | 32%       | 45%     | 10%       |
| Berkeley            | 31%       | 9%      | 4%        |
| Other               | 13%       | 22%     | 51%       |
| Total               | 100%      | 100%    | 100%      |
| Number workers      | 5,180     | 121,404 | 1,311,357 |

Source: US Census, 1980

Note: Rockridge district defined as census tracts 4002, 4003, 4004 in the San Francisco  
Oakland SMSA.

Table 3-2 also shows that a large number of Rockridge residents work in locations which can be well served by transit. About 87% of them work in San Francisco, Berkeley and Oakland which



are all traditional urban centers. Thus the Rockridge district should be a good transit market.

#### D. Population Age and Sex

Table 3-3 presents census data on Rockridge district and City of Oakland age and sex distributions. Also presented are age and sex distributions for AC Transit routes, AC Transit as a whole and BART as a whole.

**Table 3-3**  
**Age Distributions**

| US Census<br>Ages | Rockridge | Oakland | AC Transit Passengers<br>Ages | 51   | "E"  | 17   | AC<br>Avg | BART<br>Ages | BART<br>Avg |
|-------------------|-----------|---------|-------------------------------|------|------|------|-----------|--------------|-------------|
| Under 5           | 4.4%      | 6.9%    | Under 5                       | -    | -    | -    | 1%        | na           | -           |
| 5-14              | 8.1%      | 12.9%   | 5-12                          | 3%   | 2%   | -    | 2%        | na           | -           |
| 15-19             | 5.1%      | 7.6%    | 13-17                         | 13%  | 1%   | -    | 18%       | < 18         | 3%          |
| 20-24             | 10.3%     | 9.3%    | 18-23                         | 32%  | 11%  | 7%   | 21%       | 18-24        | 17%         |
| 25-34             | 29.3%     | 20.3%   | 24-29                         | 29%  | 23%  | 8%   | 16%       | 25-34        | 21%         |
| 35-44             | 13.0%     | 11.1%   | 30-59                         | 18%  | 45%  | 67%  | 33%       | 35-54        | 33%         |
| 45-54             | 7.8%      | 8.9%    | na                            | na   | na   | na   | na        | na           | na          |
| 55-64             | 7.5%      | 9.8%    | 60-64                         | 2%   | 4%   | 9%   | 2%        | 55 +         | 12%         |
| 65 +              | 14.4%     | 13.2%   | 65 +                          | 3%   | 13%  | 9%   | 7%        | na           | na          |
| Total             | 100%      | 100%    | ----                          | 100% | 100% | 100% | 100%      | ----         | 100%        |

#### Sex Distributions

| Characteristic | Rockridge | Oakland | 51 line | "E" Line | 17 Line | AC avg | BART |
|----------------|-----------|---------|---------|----------|---------|--------|------|
| Female         | 53.3%     | 52.6%   | 66%     | 73%      | 79%     | 56%    | 53%  |
| Male           | 46.3      | 47.4%   | 34%     | 27%      | 21%     | 44%    | 47%  |
| Total          | 100%      | 100%    | 100%    | 100%     | 100%    | 100%   | 100% |

Sources: US Census, 1980; 1985 AC Transit On-Board Survey; 1985 BART Passenger Survey.  
Note: Rockridge district consists of census tracts 4002, 4003, & 4004 of SF-Oakland SMSA.

#### Sex Distributions

As shown in Table 3-3 a higher percentage of females use bus routes serving the Rockridge district than the average AC Transit line and the percentages are far higher than census figures for the district. In contrast, systemwide BART patronage percentages is almost exactly equal to census breakdowns.

One explanation for the high percentage of female bus ridership could be that jobs held by women pay less than those held by men, therefore more women may be forced to travel to work by bus while men could drive (men's jobs might pay enough to make them better able to afford parking costs and auto ownership costs). A second possible explanation is that women's jobs may be more likely to require them to remain in a single location throughout the workday, while men might be required to travel from place to place. Finally more jobs traditionally held by women may be located near Rockridge district bus lines; for example nursing jobs near the 17 line which serves two hospitals.

Regardless of the reasons for high female ridership, the high percentage of females means that service should be provided which meets their needs. For example, safety should be a high priority. Buses and bus stops in the Rockridge district must be kept safe especially at night.

#### Age Distributions

Age distributions are also presented in Table 3-3. Note that both AC Transit and BART use different age categories than the US Census which makes direct comparison difficult. Census figures for the Rockridge district indicate that the district is significantly different from Oakland as a whole. As shown below the district contains fewer children and students, more young people (ages 25-44), fewer middle aged people and slightly more old people than the City of Oakland.

| Age Discription    | Age Range  | Rockridge | Oakland |
|--------------------|------------|-----------|---------|
| Children/Students  | 24 & under | 27.9%     | 36.7%   |
| Young People       | 25-44      | 42.3%     | 31.4%   |
| Middle Aged People | 45-64      | 15.3%     | 18.7%   |
| Older People       | 65 & over  | 14.4%     | 13.2%   |
| Total              |            | 100%      | 100%    |

The combination of a low percentage of children and a high percentage of young people suggests that the district residents are more likely to fit the YUPPIE stereotype than other Oakland residents. As Table 3-3 indicates is exactly the market which BART serves, close to 70% of BART's riders are between the ages of 25 and 54, while slightly over 50% of Rockridge residents and only about 40% of Oakland residents fall into this age group.

Rockridge district AC Transit passenger age distributions are differnt from the average age distribution of AC Transit bus routes and census information for the district. Over 60% of

Rockridge district 51 line passengers are between the ages of 18 and 29 (college age) which could have been expected given the high quality service the line provides to UC Berkeley. The "E" line is fairly typical of AC Transit routes except that it serves very few young people, this seems reasonable since the route provides service to downtown San Francisco and is oriented to workers. Data from the 17 line shows that it serves an older market than the average AC route. An explanation for this may be that it provides direct service to two hospitals. Another factor may be that older people are more willing to ride the bus regardless of its low frequency of service and circuitous routing.

These age comparisons provide important information which can be used to help characterize transit service in the Rockridge district.

#### E. Income Levels

Table 3-4 presents the percentages of households in various income categories for AC Transit routes, the BART system, the Rockridge district and the City of Oakland. Again, as with age categories, AC Transit, BART and the Census Bureau use different income categories.

Table 3-4  
Income Distribution Comparison

All incomes presented are household incomes in thousands per year.

| US Census<br>Income | Rockridge | Oakland | AC Transit<br>Income | Passengers<br>51 | "E"  | 17   | AC<br>Avg | BART<br>Income | BART<br>Avg |
|---------------------|-----------|---------|----------------------|------------------|------|------|-----------|----------------|-------------|
| < 10                | 37%       | 38%     | < 10                 | 50%              | 28%  | 22%  | 32%       | < 10           | 9%          |
| 10-20*              | 28%       | 28%     | 10-20                | 17%              | 25%  | 34%  | 27%       | 10-15*         | 7%          |
| 20-25               | 11%       | 10%     | 20-30                | 16%              | 27%  | 40%  | 17%       | 15-25          | 17%         |
| 25-35               | 14%       | 12%     | 30-40                | 4%               | 10%  | 4%   | 10%       | 25-35          | 18%         |
| 35-50               | 6%        | 8%      | 40-50                | 1%               | 9%   | -    | 6%        | 35 +           | 50%         |
| 50 +                | 4%        | 4%      | 50+                  | 11%              | 3%   | -    | 8%        | na             | na          |
| Total               | 100%      | 100%    | -----                | 100%             | 100% | 100% | 100%      | -----          | 100%        |

\* US Census figures condensed from several categories, larger income level is actually just less than value shown, for example 10-20 is actually 10,000 to 19,999.

Sources: US Census, 1980; 1985 BART Passenger Survey; 1985 AC Transit On-Board Survey.  
Note: Rockridge district consists of census tracts 4002, 4003, & 4004 of SF-Oakland SMSA.

The Rockridge district is very similar to the rest of Oakland with respect to percentage of households in each income category. Thus the characterization of Rockridge residents as YUPPIES made above may be incorrect.

The characterization of Rockridge district 51 line passengers made above, that many were students, is supported by the fact that almost 50% of passengers on the 51 line have household incomes below \$10,000 per year. This is almost 20% higher than the AC Transit average and 13% higher than for the Rockridge district as a whole. The 51 line also serves a higher percentage of high income households than the average AC line or than are in the district.

The Rockridge district "E" line passengers are fairly typical of the average AC Transit passenger. More "E" line passengers are in higher income categories than for people in the district as a whole.

The 17 line Rockridge passengers appear to be from slightly higher income households, except none of them are in the highest income categories. In comparison to district residents, 17 line passengers are more likely to be middle income (\$10,000-30,000 per year households) than residents in general.

BART again is shown to serve a distinct market, that of high income household members. Almost 50% of BART passengers come from households with incomes over \$35,000 per year, while only about 10% of Rockridge households and about 12% of Oakland households fall within that category.

## F. Trip Purpose

Another important way of characterizing transit service is by what types of trips they serve. Table 3-5 presents trip purpose information on AC Transit routes and BART. As shown, almost 70% of Rockridge district passengers riding on routes 17 and the "E" line are making work trips. This compares to an average value of 42% for all AC bus routes. The 17 line also shows a higher than average percentage of medical related trips. Thus the 17 line serves mostly work and medical related trips.

**Table 3-5  
Trip Purposes**

| Purpose           | AC Transit Passengers |          |         | AC avg | BART |
|-------------------|-----------------------|----------|---------|--------|------|
|                   | 51 line               | "E" Line | 17 Line |        |      |
| Work              | 38%                   | 70%      | 70%     | 42%    | 73%  |
| Medical           | 3%                    | 4%       | 12%     | 5%     | na   |
| Social-Rec*       | 20%                   | 2%       | 9%      | 6%     | 5%   |
| School            | 30%                   | 9%       | 3%      | 28%    | 7%   |
| Shopping          | 4%                    | 7%       | 0%      | 6%     | 5%   |
| Personal Business | 6%                    | 7%       | 6%      | 13%    | 7%   |
| Other**           | 1%                    | 0%       | 0%      | 1%     | 2%   |
| Sightsee          | na                    | na       | na      | na     | 2%   |
| Total             | 100%                  | 100%     | 100%    | 100%   | 100% |

\* BART category: Visit Friend or Relative

\*\* BART category: Entertainment/Athletic Event (no "Other" category)

na = Category not used.

Sources: 1985 AC Transit On-Board Survey; 1985 BART Passenger Survey.

As shown in Table 3-5 the "E" line is fairly average except for the higher than average percentage of work related trips.

The 51 line is almost right on the AC Transit average, approximately 40% work trips, 30% school trips and the rest evenly divided among other categories, except for a higher percentage of social-recreational type of trips (20% vs the average of 6%). One explanation of this is that students might make more of this type of trip than people of other ages.

Finally BART riders are almost all making work related trips, approximately 73% are work trips; while the second highest category are school related trips which consist of only about 7% of trips.

## **G. Overall Transit Route Characterization**

In order to assist in further evaluation of transit services to the Rockridge district characterizations of income, age groups, trip purposes, sex were summarized by route. These overall route characterizations are presented below.

### **51 College Avenue Line**

- 66% female ridership
- 60% passengers are college age (18-29)
- 50% passengers from households earning less than \$10,000 per year
- larger than average percentage of high income passengers
- About 40% work trips & 30% school trips

### **"E" Line**

- 73% female ridership
- serves few children/student aged (under 24 years old) passengers
- above average district income passengers
- 70% work trips

### **17 Line**

- 79% female passengers
- serves an older than average market
- serves a middle income market (\$10-30,000 per year households)
- 70% work trips

### **BART Service (overall system)**

- average sex distribution
- low percentage of children, 73% between 25-54
- high income, almost 50% over \$35,000 per year household income
- 73% work trips

### **Rockridge district**

- average sex distribution
- lower percentage of children, higher percentage of young (25-44) than Oakland as a whole
- similar income distribution to Oakland as a whole



## **4. GEOGRAPHIC CONVENIENCE**

### **A. Introduction**

Geographic convenience is determined by how far the transit route is from the start of a trip and how far it is located from the final destination of a trip. The measures which will be used to determine geographic route convenience are the distance to/from the transit route, the mode passengers use getting to/from the transit route and the number of transfers required in a one way trip. In general, the closer a route is to origin/destination the better and the fewer transfers required the better. The convenience of each route will be evaluated based on these criteria.

This section will be divided into the following subsections. First, an analysis of transit routes serving the Rockridge district in which transit routes serving the distance are plotted on a map and walking distances are shown. Next, results from AC Transit's 1985 On-Board Survey which address questions of geographic convenience will be presented and analyzed. Finally, results of the 1987 BART Rockridge Passenger survey will be presented and analyzed.

### **B. Walking Distance to Transit Service**

Figure 4-1 presents a map of the Rockridge district showing walking distance to all transit routes serving the district. As Figure 4-1 illustrates, most of the Rockridge district is within two blocks of a bus route. In fact most residents are within two blocks of the district's most important bus line, the 51 line. The "E" line route is also close to many district residents, with the exception of those living in the south part of the district. The 17 line circulates through the district and is close to almost all areas of the district.

The BART station is located in almost the geographic center of the Rockridge district and thus serves the district as a whole quite well. Because BART provides high quality transit service people are, as a rule, willing to walk a farther to ride BART. Only the far northern and southern parts of the Rockridge district are located more than a four block walk from the BART station.

### **C. Results of AC Transit On-Board Survey**

#### **Walking Distance to Bus Route**

Results of the AC Transit 1985 On-Board Survey question on distance walked to and from the bus for passengers on lines 17, 51, and E boarding or alighting in the Rockridge district are

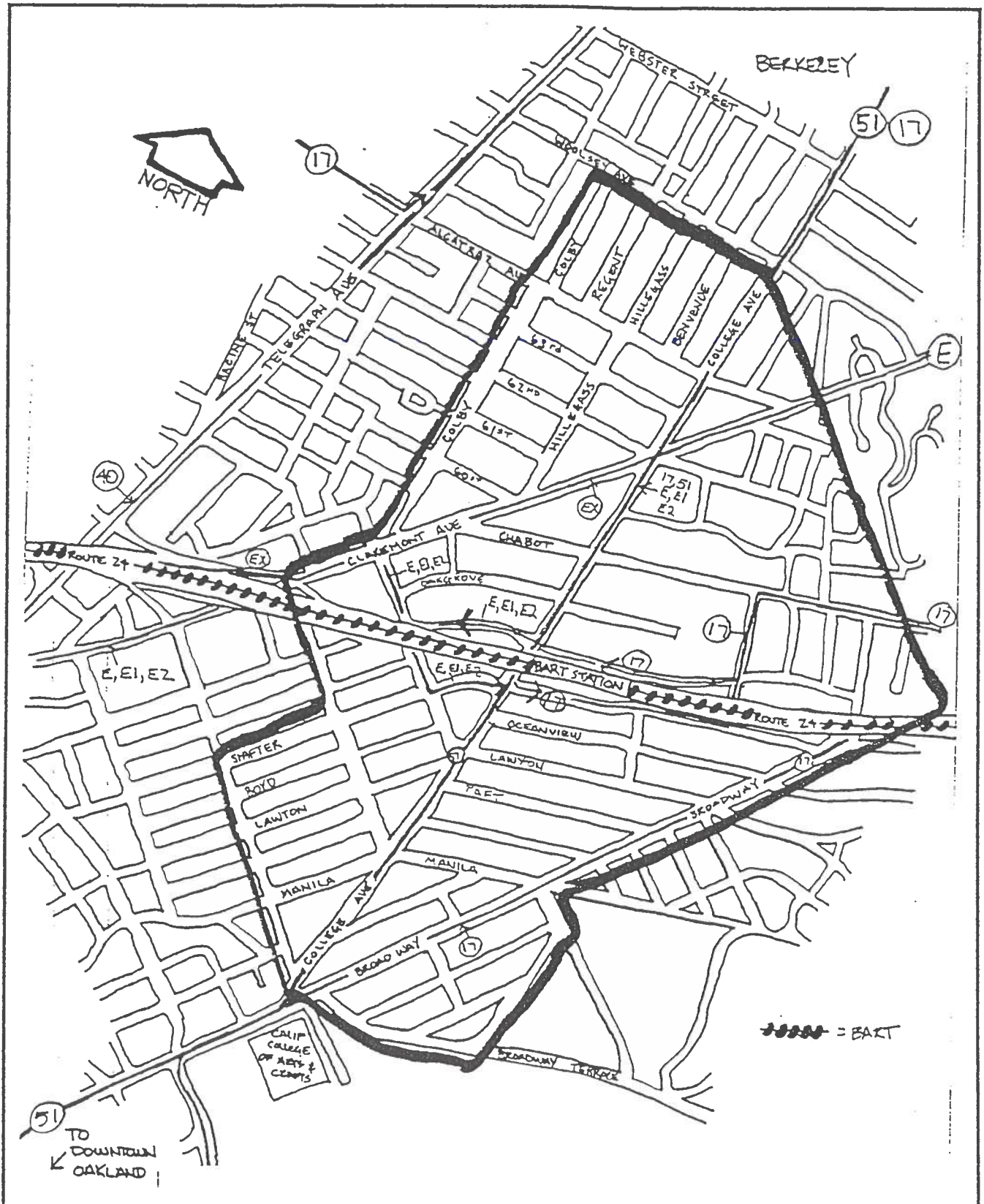


Figure 4-1: Walking Distances to Rockridge Transit

presented in Table 4-1.

**Table 4-1**  
**Walking Distance to AC Transit Routes**

|                       | Route 17 |        | Route 51 |        | Route E |        | 1985 On Board Survey average |
|-----------------------|----------|--------|----------|--------|---------|--------|------------------------------|
|                       | to bus   | fr bus | to bus   | fr bus | to bus  | fr bus |                              |
| Less than 2 blocks    | 78%      | 74%    | 31%      | 46%    | 37%     | 24%    | -na-                         |
| 2 to less than 4      | 12%      | 26%    | 47%      | 31%    | 49%     | 39%    | -na-                         |
| 4 to less than 6      | 9%       | 0%     | 13%      | 8%     | 8%      | 24%    | -na-                         |
| 6 or greater          | 0%       | 0%     | 8%       | 16%    | 5%      | 13%    | -na-                         |
| Sample size           | 354      | 481    | 1,191    | 1,555  | 290     | 221    | -na-                         |
| Average blocks walked | 0.45     | 1.31   | 2.56     | 2.79   | 2.18    | 2.89   | 2.6(to) 2.4(fr)              |

Source: AC Transit 1985 On-Board Survey.

Table 4-1 shows that over 71 percent of those who walk to the 51 bus in Rockridge walk less than 4 blocks, and 73 percent of those who alight in Rockridge walk less than 4 blocks to their destination. All line 17 riders boarding and alighting the bus in Rockridge walked less than 4 blocks to the bus or their destination. A majority of passengers on the "E" lines walk less than 4 blocks to/from the bus (86 percent of those boarding and 72 percent of those alighting in the district).

Table 4-1 also shows average number of blocks walked for all three routes and for all AC Transit routes. The average number of blocks walked to the bus is less than 1/2 for the 17 line, approximately 2.5 blocks for the 51 line, slightly over 2 blocks for the "E" lines and AC Transit's overall average is 2.6 blocks. Passengers alighting in the Rockridge district walked an average of 1.3 blocks from the 17 line, 2.8 blocks from the 51 line, and 2.9 blocks from the "E" line. The average walk from all AC Transit's routes was 2.4 blocks. This indicates that Rockridge district lines provide better than average service with respect to distance walked to bus lines.

#### Mode to/from Bus

The most common means of travel to and from bus routes by passengers boarding or alighting in the Rockridge district was walking. Table 4-2 presents mode of travel to and from each bus route serving the district. For each route two values are presented, the first in the column marked "Board" represents those who board the bus in the Rockridge district. The second marked "Alight" represents those who get off the bus in the Rockridge district.

Table 4-2 shows that fifty-two percent of the people boarding and alighting the 51 line in Rockridge walk to the bus and 95 percent of those boarding the bus in Rockridge walk to their final destination. They also show that a majority of passengers boarding and alighting the 17 line walk both to and from the bus. On the "E" line approximately 70 percent of the passengers walk to the bus and approximately 65 percent walk from the bus. On the average, 64 percent of all AC Transit riders walked to the bus, which indicates that the Rockridge district service is not significantly different from other routes.

Table 4-2  
Mode to Transit Route

|                      | Route 17  |            | Route 51  |            | Route E   |            | 1985 On Board Survey average |
|----------------------|-----------|------------|-----------|------------|-----------|------------|------------------------------|
|                      | board bus | alight bus | board bus | alight bus | board bus | alight bus |                              |
| AC Bus               | 20%       | 41%        | 23%       | 18%        | 8%        | 16%        | 22%                          |
| Walk                 | 80%       | 41%        | 52%       | 52%        | 70%       | 68%        | 64%                          |
| BART                 | -         | 4%         | 20%       | 30%        | 22%       | -          | 9%                           |
| Drive car            | -         | 14%        | 1%        | -          | 1%        | 5%         | 2%                           |
| Passenger in car     | -         | -          | 4%        | -          | -         | 1%         | 1%                           |
| Other transit system | -         | -          | -         | -          | -         | 10%        | 2%                           |
| Bike                 | -         | -          | -         | -          | -         | 1%         | 0%                           |
| Other                | -         | -          | -         | -          | -         | -          | 0%                           |
| Sample size          | 319       | 235        | 1480      | 552        | 167       | 208        | -na-                         |

Mode from Transit Route

|                      | Route 17  |            | Route 51  |            | Route E   |            | 1985 On Board Survey average |
|----------------------|-----------|------------|-----------|------------|-----------|------------|------------------------------|
|                      | board bus | alight bus | board bus | alight bus | board bus | alight bus |                              |
| AC Bus               | 10%       | 18%        | 4%        | 13%        | 18%       | 14%        | 22%                          |
| Walk                 | 90%       | 82%        | 95%       | 76%        | 67%       | 64%        | 68%                          |
| BART                 | -         | -          | 1%        | 11%        | -         | 13%        | 7%                           |
| Drive car            | -         | -          | -         | -          | 2%        | 10%        | 2%                           |
| Passenger in car     | -         | -          | 1%        | -          | -         | -          | 1%                           |
| Other transit system | -         | -          | -         | -          | 12%       | -          | 2%                           |
| Bike                 | -         | -          | -         | -          | -         | -          | 0%                           |
| Other                | -         | -          | -         | -          | 1%        | -          | 0%                           |
| Sample size          | 319       | 235        | 1480      | 548        | 154       | 221        | -na-                         |

Notes: board bus = answers for people who boarded bus in zone 137.  
alight bus = answers for people who alighted bus in zone 137.

Source: AC Transit 1985 On Board Survey; Final Report, September 1985

### Number of Buses Required for One-Way Trip

A majority of passengers who board or alight buses in the Rockridge district ride only one bus in their one-way trip as shown in Table 4-3. Eighty-one percent of those who board the 51 line in Rockridge ride only one bus on their one way trip; and 62 percent of those alighting in Rockridge ride only one bus on their one way trip. This makes sense because of the high percentage of students on this route and the excellent service which the 51 line provides to UC Berkeley.

A lower percentage of 17 line passengers required only one bus for their one way trip than 51 line passengers. Seventy percent of those boarding the bus in Rockridge use only one bus while only 45 percent of those alighting in Rockridge use only one bus in their one way trip.

Table 4-3 shows that 70 percent of "E" line passengers use only one bus to complete their one way trips (a higher percentage than either the 17 or 51 lines). Sixty percent of passengers on all AC Transit routes use only one bus in their trip. Thus for the most part Rockridge passengers are better served than average.

Table 4-3  
Number of Buses Used in One-way Trip

|                  | Route 17  |            | Route 51  |            | Route E   |            | 1985 On Board Survey average |
|------------------|-----------|------------|-----------|------------|-----------|------------|------------------------------|
|                  | board bus | alight bus | board bus | alight bus | board bus | alight bus |                              |
| One              | 70%       | 45%        | 81%       | 62%        | 73%       | 71%        | 60%                          |
| Two              | 30%       | 55%        | 19%       | 37%        | 24%       | 25%        | 36%                          |
| Three or greater | -         | -          | -         | 2%         | 2%        | 4%         | 4%                           |
| Sample size      | 319       | 235        | 1470      | 552        | 167       | 208        | -na-                         |

Notes: board bus = answers for people who boarded bus in zone 137.

alight bus = answers for people who alighted bus in zone 137.

Source: AC Transit 1985 On Board Survey; Final Report, September 1985

### Automobile Availability

Table 4-4 shows that approximately one quarter of those who board or alight the 51 bus in Rockridge have a car available for the trip. A very small number (about 8%) of 17 line passengers have a car available for their trip. Finally, a very high percentage (about 38%) of "E" line riders have cars available to make the trip. Only 23 percent of passengers on all AC Transit routes had



automobiles available for their trip. Thus route "E" passengers are significantly better off according to this measure and route 51 passengers are slightly better off than the average AC Transit passenger. Route 17 passengers are worse off than the average AC passenger.

**Table 4-4**  
**Automobile Availability**

|         | Route 17 | Route 51 | Route E | AC Average |
|---------|----------|----------|---------|------------|
| Yes     | 8%       | 28%      | 38%     | 23%        |
| No      | 92%      | 72%      | 62%     | 77%        |
| Number: | 489      | 1,937    | 338     | -na-       |

Source: AC Transit 1985 On Board Survey; Final Report, September 1985

#### **Overall Geographic Convenience of Rockridge Bus Service**

The statistics presented from the 1985 AC Transit On-Board Survey indicate that the Rockridge district is well served by transit. A large share of 51 line passengers are able to walk a short distance to the bus. A larger than average share of them have cars available for their trip, but choose to ride the bus, which indicates that the bus is relatively convenient. Most of the passengers only have to ride one bus to their destination. These facts support the hypothesis that the 51 line provides convenient service to its Rockridge district passengers.

An analysis of "E" line data supports the conclusion that it also provides convenient service to the district. A very high percentage of "E" line riders have cars available to make the trip. Most "E" line passengers walk to the bus and average walking distances are approximately the same as the system-wide average. A very high percentage of "E" line passengers require only one AC Transit bus for their trip. It is not surprising that the "E" line data supports the conclusion that it offers convenient service. The "EX" line express service provides passengers with quick, frequent service to/from downtown San Francisco, people ride this route by choice because it is convenient.

The 17 line is the district's least convenient. Passengers on the 17 line are more likely to be captive transit riders (less likely to have automobiles available for the trip) and a greater share of them require more than one bus to complete their one way trips than passengers on the 51 or "E" lines. However service on this line does not appear to be very bad on an absolute scale, most people walk to and from the bus and average walking distances are short. Thus it appears that the 17 line provides adequate service to its Rockridge district passengers.



## D. Results of BART Rockridge Station Passenger Survey

### Access Mode to BART

Table 4-5 presents a breakdown of access modes to the Rockridge BART station as determined in the survey and as given in BART's 1985 Passenger Profile Survey.

As shown in the table, results of the 1987 survey are quite different from those obtained in the 1985 survey. One reason for this is that the 1985 survey results are for the entire day, the 1987 survey results are for passengers entering the station in the morning peak only. The number of people who drive alone to the station is lower for the rest of the day since the parking lot is filled by approximately 8:30 in the morning. Table 4-5 indicates that a significant number of people walk to the station, which means that it is relatively convenient for residents to get to the station.

**Table 4-5**  
**Access Mode to BART Rockridge Station**

| Mode                | 1987 Rockridge<br>Passenger Survey | 1985 Passenger<br>Profile Survey |
|---------------------|------------------------------------|----------------------------------|
| Drive Alone         | 57%                                | 32.1%                            |
| Carpool             | 7%                                 | 1.0%                             |
| Dropped Off         | 6%                                 | 17.6%                            |
| Bus                 | 3%                                 | 11.6%                            |
| Walk                | 25%                                | 36.1%                            |
| Bike                | 2%                                 | na                               |
| All Other           | na                                 | 1.6%                             |
| Number of Responses | 467                                | 164                              |

Sources: 1987 BART Rockridge Station Passenger Survey, Nash; 1985 Survey: Research & Decisions Corporation, 1986; BART Passenger Profile Survey 1985: Table 6 on page 12.

## Walking Distance to BART

Table 4-6 presents results of the 1987 BART Rockridge passenger survey on the distance walked to BART. As shown 86% of them walk less than 6 blocks to the station. This indicates that the station serves them the district quite well.

**Table 4-6**  
**Distance Walked to BART Rockridge Station**

| Blocks      | 1987 Rockridge Passenger Survey |            |
|-------------|---------------------------------|------------|
|             | Number                          | Percentage |
| 1-2         | 27                              | 24%        |
| 3-4         | 31                              | 31%        |
| 5-6         | 31                              | 31%        |
| 7-8         | 12                              | 12%        |
| 9-10        | 4                               | 4%         |
| 11-12       | 0                               | 0%         |
| 13-14       | 0                               | 0%         |
| 15 and Over | 7                               | 6%         |
| Totals      | 112                             | 100%       |

Sources: 1987 BART Rockridge Station Passenger Survey, Nash;

### Number of Transfers Required

Table 4-7 presents the destinations of BART passengers as reported in the 1987 passenger survey. Most of the passengers (95%) are provided with direct service (they are not required to transfer) to their destination. This indicates that service from the Rockridge station is excellent with respect to geographic convenience to these riders.

Table 4-7  
BART Line Destinations for Rockridge Passengers

| BART Line     | 1987 Rockridge Passenger Survey |            |
|---------------|---------------------------------|------------|
|               | Number                          | Percentage |
| San Francisco | 305                             | 77%        |
| Oakland       | 29                              | 7%         |
| Concord       | 50                              | 11%        |
| Richmond*     | 5                               | 1%         |
| Fremont*      | 8                               | 2%         |
| Totals        | 397                             | 100%       |

Notes: (1) Lines refer to all stops on line, Oakland line is Oakland West, 12th Street, 19th Street, and Mac Arthur.

(2) \* indicates that a transfer is required for Rockridge district passengers.

Source: 1987 BART Rockridge Station Passenger Survey, Nash;

The information presented in Table 4-7 agrees with BART ridership data which indicates that 92% of passengers travelling to or from the Rockridge station are provided with direct service. (Detailed BART patronage information for the Rockridge station is provided in Appendix 3.)

### Automobile Availability

The results of the 1987 BART Rockridge Station Passenger Survey indicate that over 84% of passengers had cars available for their trip. A more interesting result is that of the number of passengers who walked to the BART station 71 (or 61%) had cars available for the trip. Thus they were not captive riders. The fact that such a large number of BART's Rockridge district passengers have cars available for their trip indicates that BART serves the passengers well.

### **BART Service to Rockridge Businesses**

Results of the 1987 BART Rockridge Station survey also indicate that BART serves people shopping in the Rockridge district. Of 265 passengers who drive alone to the BART station 78 (or 29%) plan to visit a Rockridge business on their return, an additional 13 passengers (or 5%) answered that they might stop at a business on their way home. This data supports the conclusion that Rockridge businesses are well served by BART. The passengers would not patronize Rockridge businesses if they were not convenient to the BART station. Again this is not surprising given the BART station location in the middle of the district's commercial strip.

### **BART Service to Other Users**

Finally, field observations made at the AC Transit bus stop at the BART station indicate that a significant number of passengers board buses on the 51 line at the station during the morning peak hours. Approximately 125 people were observed boarding northbound 51 line buses on Tuesday, March, date, 1987 between 7 and 9 AM. Most of those passengers were transferring from BART and many appeared to be UC Berkeley students on their way to school. The frequent bus service provided by the 51 line to the Rockridge station makes this station convenient for people transferring to the bus. It should be noted that only 3% of the Rockridge passengers surveyed used the bus to get to the station, the bus appears to serve a market which was not surveyed (ie people leaving the Station in the morning).

### **BART's Overall Geographic Convenience to Rockridge**

In summary, according to all the measures of geographic convenience used in this study, BART serves Rockridge district residents very well. This is not a surprising conclusion as the BART station is located in about the geographic center of the district, so it is relatively close to most residents and businesses.

It is close to most residents and businesses in the district and the frequent bus service on the 51 line from the station makes it convenient to locations in Berkeley and the University.

## **5. SCHEDULE CONVENIENCE AND TRAVEL TIME**

### **A. Introduction**

In this section schedule convenience of AC Transit bus services and BART services to the Rockridge district will be analyzed. Schedule convenience refers to how close the transit system's schedule matches the passenger's optimal time schedule. In other words does the transit service leave a passenger's origin when the passenger wants to leave and does it arrive at the passenger's destination when they want to arrive?

There are three aspects of schedule convenience which can be considered separately. First, does transit operate on the days and at the times which the passenger wants to travel. Second, how frequent is transit service. Third, how long does the transit trip take (travel time) in comparison to other ways of making the trip. In a perfect world, a transit vehicle would be waiting to take passengers exactly where they wanted to go when they wanted to go and do it quickly. The closer any transit service comes to this ideal the better it is in terms of schedule convenience.

Several performance measures were used to evaluate schedule convenience and travel time. These measures are the hours and days which transit service is provided, transit headways (headway is the time between vehicle arrivals) and a comparison of travel times on transit vs. that of an alternative method of transportation. Each of these measures will be described more fully below.

### **B. Hours and Days of Operation and Transit Headways**

The hours and days which a transit line operates are important measures of its convenience. Most trips are two direction, that is they consist of a trip to somewhere and a return trip, as in the trip from home to work and from work to home. If a mode of transportation is available for one of these trips and not available for the other, than in most cases it can not be used. This is especially important for transit, if a person takes the bus to work and no bus is available for the return trip the person will not take the bus because it will leave them stranded at work. Thus, it is important to offer service throughout the day and in the evening to provide service for round trips. This same considerations refer to days of operation. If transit service is offered only some of the days when the potential passenger must make a trip, than the passenger will be forced to find some other

means of making the trip when transit service is not offered and chances are will use that means on days transit is provided as well.

Transit headways are important because with more frequent service it is more likely that a transit vehicle will be leaving when the passenger wants to leave. Thus the lower the headway the better the service.

### **C. Hours of Transit Operation and Headway Evaluation**

#### **51 Line**

The 51 line provides excellent service in terms of schedule convenience. The 51 line operates from 5 AM to 2 AM daily. On weekdays the 51 operates on 5-7 minute headways in the commute hours; 10 minute headways midday (9 AM - 4 PM); 20 minute headways at night (6 PM - 6 AM). Twelve to twenty minute headways are provided on weekends. The route is served by equipment with wheelchair lifts and thus is accessible to the handicapped.

#### **"E" Line**

The "E" lines provide good service to the Rockridge district. Less service is provided on the "E" lines than on the 51 line, but service is provided from approximately 6 AM to 1:30 AM on weekdays and from 7 AM to 1:30 AM on weekends (with commute-hour service on weekdays from 6 to 8:30 in the morning and 3:30 to 6:45 in the evening). Service on the "E" line is approximately every 20 minutes during the commute hours; service on the "E2" line is every 30 minutes (non commute hour service only) and every 40 minutes on weekends. Seven "EX" trips are scheduled in the morning commute (headway approximately 12 minutes) and eleven are scheduled for the evening commute (headway approximately every 10 minutes).

Six "E1" trips are operated in the morning commute and five are operated in the evening peak. The "EX" trips are quite convenient in terms of travel time, buses can bypass the toll booths on the San Francisco Bay Bridge which saves approximately 20 minutes in the morning commute over passenger cars (non carpool vehicles).

#### **17 Alcatraz Avenue Line**

The 17 line has only limited service. It operates on weekdays only from 6 AM - 6 PM with 20 minute headways in peak periods and 30 minute headways during off peak periods. Thus the route does not provide very convenient service.



### **52 UC Berkeley line**

Service on the route to Rockridge is very limited: five trips start at the Rockridge station (7:36 AM, 8:36 AM, 9:36 AM, 3:51 PM, and 5:51 PM) and four trips end at Rockridge (3:24, 4:24, 5:24 and 6:24 PM). It should be noted that there is more service on the line from UC Berkeley to UC Village in Albany. Service on the part of this route which serves the Rockridge district is so limited that it probably serves the district only as supplemental service to the 51 College Avenue line. Service on the 51 line is so convenient with respect to schedule that operating the 52 line to Rockridge is probably not very effective.

### **Other AC Transit Service: 40 Telegraph Avenue**

The 40 line is an important service. Service on the route is provided 24 hours a day, seven days a week. Peak hour headways are between 4-12 minutes, midday headways are 7 minutes, night headways are 15-20 minutes, Saturday headways are 7-20 minutes and Sunday headways are 10-20 minutes. The 40 line provides an alternative to 51 College Avenue line service for Rockridge district residents at times when the 51 line is not operating. This service is located quite a distance from most residents of the district, but it does provide an option for late night transportation.

### **BART Service**

The Rockridge BART station is served by BART's Concord line. The Concord line operates from 6 AM until Midnight on weekdays and Saturdays and from 9 AM until Midnight on Sundays. Weekday service is provided every 15 minutes during the day, with service every 7 1/2 minutes from 7 AM to 8 AM and 5 PM to 6 PM (in the peak direction), and every 20 minutes after approximately 7 PM. On weekends service is provided every 20 minutes.

### **D. Travel Time**

The time spent getting to the transit route, waiting for the transit vehicle, riding in the vehicle to the destination stop, time spent transferring to another transit vehicle, and getting from the transit stop to the ultimate destination is referred to as the travel time. The lower the travel time the better.

Unfortunately, travel time data is extremely difficult to obtain. One problem is that in a survey people often respond with higher travel times than actual. Most of the time they will evaluate travel time as higher than actual if the time was spent unpleasantly, for example riding in a vehicle standing up. Another problem is that travel times are extremely variable from day-to-day, thus they are hard to measure with precision.

For these reasons no exact measure of travel times was used in this study. Instead, a qualitative comparison of travel times by several modes of transportation to different destinations from the Rockridge district was performed. The analysis was made by comparing components of travel time for various modes. It is presented below.

#### **Access Time**

A good measure of access time to transit is walking distance, which was discussed earlier in this study. AC Transit stops and the BART station are located within six blocks of most Rockridge district transit passengers who walk to transit. This means that most residents are within a 10-15 minute walk and many are much closer, which is fairly good for access.

#### **Wait Time**

The time spent waiting for a transit vehicle is directly related to the scheduled headway on a transit route. This was discussed in the previous section, but in general headways for bus routes serving the Rockridge district and BART are small, and therefore waiting time is low.

#### **In Vehicle Time**

In vehicle time is the time spent in the vehicle. It depends upon traffic congestion on the transit route, the number of stops made, the actual route, and special considerations such as special carpool or bus lanes.

BART provides excellent in vehicle time when compared to most modes. Its average speed including station stops is over 32 miles per hour, travel time from Rockridge to Montgomery station in the center of downtown San Francisco is 23 minutes. AC Transit service from the Rockridge district to downtown San Francisco on the "E" line is scheduled to take 25 minutes, which is also excellent. The 51 line is scheduled to take 15 minutes from Rockridge BART to downtown Oakland and 14 minutes to downtown Berkeley. Based upon field observations the travel times for these two AC Transit bus routes appear to be low, especially during peak hours when traffic congestion slows buses down.

In-vehicle times for transit services to the Rockridge district are relatively close to the amount of time it would take driving to many locations. This is especially true for travel to San Francisco during rush hours. BART service is significantly faster than driving and AC Transit vehicles have a high occupancy vehicle lane which allows them to bypass the San Francisco Oakland Bay Bridge

toll plaza. This saves buses up to twenty minutes. One important qualification must be made when comparing auto time to transit time to downtown San Francisco, that is, carpools are allowed to bypass the toll plaza as well as buses, therefore travel by carpool will be faster than bus service. In summary, in-vehicle travel times in transit vs. alternatives are comparable for many destinations from the Rockridge district.

### **Transfer Time**

Transfer time is the amount of time it takes to change transit vehicles. Most people who use transit in the Rockridge district are well served in this respect. Most AC Transit passengers travelling to or from the district only use one bus for their trip and most BART passengers do not transfer. (See the section on geographic convenience above.) If no transfer is made transfer time is zero.

BART passengers who transfer to a bus at the BART station are generally well served by the 51 bus which operates frequently enough to minimize transfer time. Thus transfer time is relatively small component of total travel time for Rockridge district transit passengers.

### **Transit to Final Destination Time**

Transit to final destination time is the time spent getting from the transit stop to the final destination. In this respect transit service to Rockridge district passengers is quite good when compared to the alternatives. Parking in downtown San Francisco, Oakland, Berkeley and at the University is limited, expensive and difficult to find. It is often located quite a distance from final destinations which means people who drive will have a long walk. In contrast, transit stops are frequently quite near final destinations. Data from the AC Transit 1985 On Board Survey indicate that most Rockridge district passengers (approximately 70%) walk less than four blocks from the bus to their final destination. Thus transit service is quite good with respect to time from transit to final destination.

### **Overall Travel Time Analysis**

The analysis of each component of travel time for Rockridge district transit passengers indicates that travel times by transit between the district and the area's major attractions are comparable to those via alternative modes such as driving or carpooling. This is due to the high frequency of service on the 51 bus and BART, direct routing of BART and AC Transit service, and proximity of transit stops to most locations in the district. Thus, transit service to the Rockridge district is very good with respect to travel times.

## **6. ROUTE COST BENEFIT PERFORMANCE**

### **A. Introduction**

Transit route cost/benefit performance is an analysis of the costs and benefits of each route. There are several factors to be analyzed in terms of costs and benefits. Financial performance of transit is one factor used to compare the benefits of transit service improvements against their costs. Other factors are social equity (for example, providing transit service to those without cars or unable to drive is an important equity issue), political considerations and environmental effects.

Cost/benefit performance of a transit route is an important consideration because many ways of improving transit effectiveness involve increasing service which generally increase financial costs. In this study financial performance will be measured using two common transit industry statistics, farebox recovery ratio and subsidy per passenger.

The characteristics of people served by the route must be considered as they may indicate social reasons for subsidizing one route more than others. Some reasons for additional subsidies are that the line serves low income persons or transit dependant persons. In order to evaluate social reasons for additional subsidy, the measures of performance used will be the availability of an automobile to make trips and demographic characteristics including income and ages of passengers. This will give an indication of the number of old people, low income people and people without cars who are being served by transit service in the district.

### **B. Financial/Operational Performance Measures**

Several performance measures are available to analyze transit route financial and operational performance. They are subsidy per passenger, farebox recovery ratio, passengers per mile and passengers per hour. Each of these measures is described below.

Subsidy per passenger is the difference between what it costs to provide the transit service (direct costs only) and what is collected in fares on the route, divided by the number of passengers on the route. The lower the subsidy per passenger the better.

The farebox recovery ratio is simply the revenues generated on a transit route (fares collected)

divided by the cost of providing service on the route. The farebox recovery ratio is another variable which measures financial performance of individual routes. A farebox recovery ratio of 1.0 would indicate that the service cost as much to provide as it generated in fares.

Passengers per mile (or hour) simply consists of the number of passengers boarding the bus divided by the miles of route service (or scheduled route service time).

It should be noted that while all variables measure different aspects of service on the route, a route which performs poorly with respect to one of these variables is likely to perform badly in terms of the others as well. Probably the most important statistics for transit agencies today are subsidy per passenger and farebox recovery ratios because of pressures to reduce transit system deficits. The analysis of Rockridge district routes will concentrate on these two variables.

### C. AC Transit Service Evaluation

Table 6-1 presents the financial and operational performance indicators for the bus routes serving the Rockridge district. It shows that the 51 line performs better than the average for AC Transit, the "E" line performs about average, while line 17 stands out as performing significantly worse than average.

Table 6-1  
AC Transit Service Performance Indicators

| Route Number | Subsidy per Passenger | Farebox Recovery Ratio | Passengers per Mile | Passengers per Hour |
|--------------|-----------------------|------------------------|---------------------|---------------------|
| Weekday      |                       |                        |                     |                     |
| 17           | \$1.68                | 0.17                   | 1.97                | 22.5                |
| 51           | \$0.34                | 0.50                   | 5.62                | 61.2                |
| C/E          | \$1.05                | 0.53                   | 1.67                | 28.6                |
| Saturday     |                       |                        |                     |                     |
| 17           | no service            |                        |                     |                     |
| 51           | \$0.33                | 0.51                   | 5.47                | 63.2                |
| E            | data not available    |                        |                     |                     |
| Sunday       |                       |                        |                     |                     |
| 17           | no service            |                        |                     |                     |
| 51           | \$0.48                | 0.41                   | 4.25                | 52.0                |
| E            | data not available    |                        |                     |                     |

Source: AC Transit Draft 5 Year Plan; FY 1987-1991; pgs: II-8--II-11.

As Table 6-1 shows the 51 line operates with a subsidy per passenger of \$0.34 and a farebox recovery ratio of 0.50. This is the second highest farebox recovery in AC Transit's local system. These results support the conclusion that the 51 line is performing well. Ridership is strong enough to support high quality transit service along this corridor.

The "E" line has a farebox recovery ratio of 0.53 and a subsidy of \$1.05 per passenger. Compared to other transbay service this is about average, it is ranked 8th of 16 in terms of farebox recovery and 7th of 16 in terms of subsidy per passenger. Since the "E" line operates local and transbay service it is unclear exactly what share each service plays in determining the performance indicators. The performance of this line is mixed. While it is good in terms of farebox recovery it requires a high subsidy per passenger. Overall it is well used, but methods for increasing efficiency should be investigated in order to reduce the subsidy per rider. This is especially important because the "E" line serves more people in high income categories than the average AC Transit line, thus the subsidy is less important in promoting social welfare goals than it is for other lines.

The 17 line performs very poorly. Its farebox recovery ratio of 0.17 and subsidy per passenger of \$1.68 rank it 37th out of 47 local routes. Service is quite limited and ridership is low. These low performance indicators suggest that changes to the 17 line should be studied. It is important that considerations other than financial performance be included in this study. The 17 line serves a traditionally transit dependant market, that of mostly middle income people, females and an older people. Thus it may warrant a higher than average subsidy for social reasons.

#### **D. BART Service Evaluation**

Using the results of BART's financial and operating statistics to evaluate and improve service is more difficult than it is with AC Transit. The reason is that BART does not have as many options available for changing service. It operates rail transit on a fixed guideway, to fixed stations. Changes to the route structure can not be made in the short term. BART is still able to make other changes, such as increase or decrease service on lines, change fares, institute pass and transfer programs and change hours of operation, but the marginal costs of BART's operation make up a lower percentage of its costs than AC Transit so these changes will have a smaller effect on financial performance than changes which can be made to AC Transit service.



Another difference is that BART does not break down financial performance measures by route, instead performance of the entire system is reported. BART's system-wide farebox recovery ratio is approximately 52%, its cost per passenger mile approximately 21 cents and average trip length is 13.9 miles (as reported in BART's Draft 1987 Five Year Plan--pages 5 & 71). Thus the average subsidy of BART trips is \$1.52 per trip.

With respect to farebox recovery BART is in the same category with AC Transit's 51 and "E" bus lines, which perform fairly well for bus lines. However, because of BART's high operating costs its subsidy per passenger trip is approximately 50% higher than the "E" line and 346% higher than the 51 bus line. This points up the problem that many fixed rail systems have, mainly that while their farebox recovery ratios are good, their high costs mean that subsidy per passenger is much higher than lower cost bus service. Given the fact that BART riders are almost all high income persons travelling to work a fare increase may be in order to reduce the subsidy. As was mentioned above, changes which BART may make to improve financial performance can not be done on a district by district basis, thus no discussion of particular changes to Rockridge district BART service is presented in this section.

## **7. EXTERNALITY ANALYSIS**

### **A. Introduction**

In order to fully evaluate the effects of transit to an area it is necessary to take into account the externalities which transit services and facilities impose on the area. Externalities are effects of some action which are imposed on persons who do not take part in a transaction. They can be positive when people who do not take part in the transaction benefit or negative when these people are hurt. For example, pollution is a negative externality; clean water is used and replaced with dirty water without regard for other people who wish to use clean water.

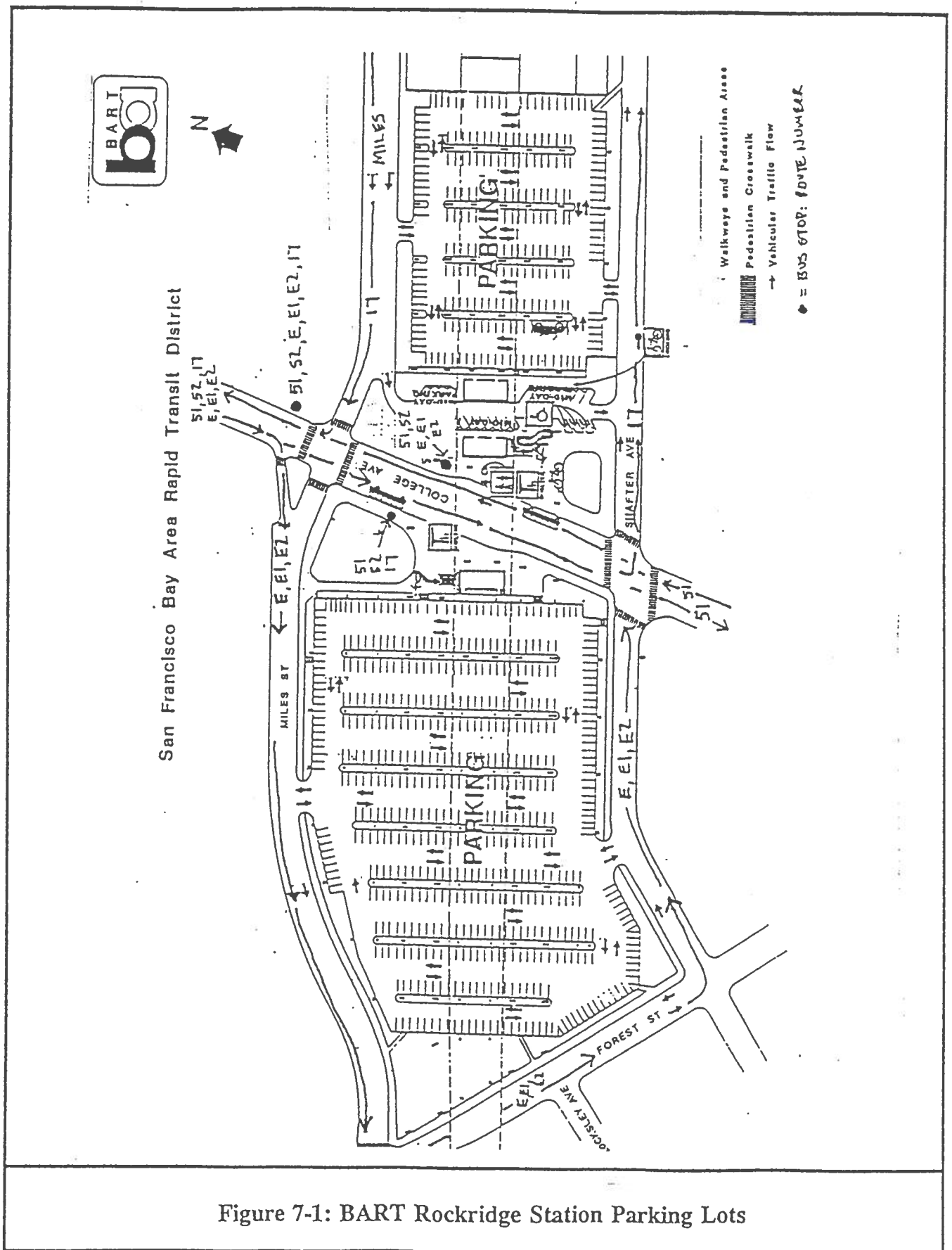
There are many types of positive and negative externalities which transit service and facilities could impose on the Rockridge district. One of the most important is the BART station. There are two different problems which the station imposes on the district. First, the BART station attracts a large number of vehicles to the district, driving through and parking on neighborhood streets when the parking lot fills up. Second, the BART station area is a major land use in the Rockridge district, but it seems to fit the area rather poorly from an urban design standpoint. On the other hand, the BART station may have improved access to the Rockridge district which caused the property values to climb leading to a positive externality to district property owners.

AC Transit's bus service imposes several types of externalities to people in the district. These include noise, air pollution from bus exhausts, and traffic congestion.

Each of these externality sources will be described below.

### **B. BART Parking**

The BART station includes parking for approximately 780 cars in two parking lots as shown in Figure 7-1. The parking lots are located under the Route 24 freeway on both sides of College Avenue. The east lot contains space for about 240 cars and the west lot contains space for about 540 cars. The east lot is more conveniently located to the station entrance and fills up by about 7:40 AM on weekdays. The west parking lot fills up by about 8:30 AM. Figure 7-2 illustrates the rate at which the parking lots fill.



# BART ROCKRIDGE PARKING LOT SURVEY

RATE AT WHICH PARKING LOTS FILL UP

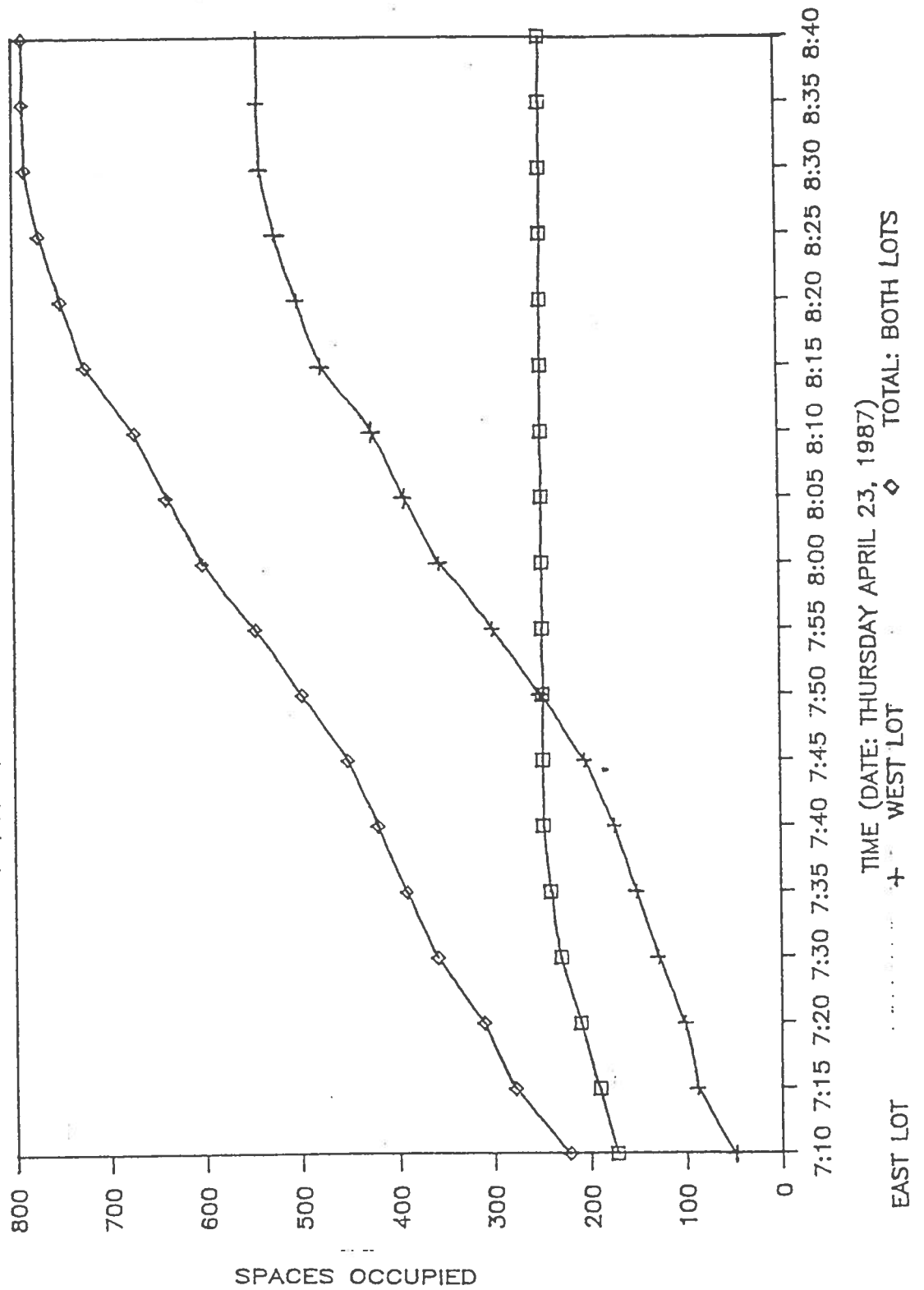


Figure 7-2: BART Rockridge Parking Lot Demand

The most significant externality problem caused by BART in the Rockridge district is parking. Drivers who arrive after the parking lots are filled park on neighborhood streets. An additional problem with parking is that access from the freeway is indirect which forces vehicles to use local streets to get to the parking lots. This increases traffic volumes on these streets which increases noise, pollution and congestion and makes the streets less safe.

### Parking on Neighborhood Streets

Results of the 1987 BART Rockridge passenger survey indicated that 24% of the passengers parking at the Rockridge station parked on the street. This figure represents a lower bound on the percentage of people who park on the street, because most of the survey was performed while parking was still available in the lot. Results of the BART 1985 Passenger Profile Study indicate that only 23% of Rockridge passengers who drive to BART on weekdays park on local streets. This is a slightly lower percentage of people parking on local streets than the 1987 survey, even though the 1987 survey is biased towards showing a lower percentage of people parking on the street. This indicates that the number of people who drive to the Rockridge station has increased since the 1985 survey, which means that parking spillover has been getting worse.

Table 7-1 presents the number of people parking on the street by time of arrival. It is based upon results of the 1987 Rockridge Station Passenger survey.

Table 7-1  
BART Passenger Parking Location By Time Period

| Time Period* | BART Lot | Local Streets | Total | Number |
|--------------|----------|---------------|-------|--------|
| 7:10-7:30 AM | 97%      | 3%            | 100%  | 33     |
| 7:30-7:40 AM | 87%      | 13%           | 100%  | 38     |
| 7:40-7:50 AM | 92%      | 8%            | 100%  | 40     |
| 7:50-8:10 AM | 84%      | 16%           | 100%  | 62     |
| 8:10-8:30 AM | 81%      | 19%           | 100%  | 52     |
| 8:30-8:55 AM | 34%      | 66%           | 100%  | 59     |

\*Time period defined when passenger entered station.

Source: 1987 BART Rockridge Passenger Survey; Nash.

Note that as the parking lots fill up more people park on the street, which is not surprising. Also note that people park on the street even when there is space in the parking lots. One possible explanation for this is that street parking near the station is easily available and it is frequently closer to the station entrance than parking in a lot (especially the west lot).

Another explanation is that these people may be planning to shop in the district when they return and therefore park in a location which is convenient to both BART and businesses. However as shown in Table 7-2 a comparison of the percentage of people parking on the street (overall, and those who park on the street between 7:10 and 8:10 when there is plenty of parking available in the lot) with all those who park, indicates that approximately the same percentage of all three groups plan to shop in the district. Thus people who park on the streets do not do so in order to be closer to businesses.

**Table 7-2**  
**BART Passengers Planning to Shop in Rockridge**

| Time Period* | Access Mode | Parking Location | Plan to shop on return** |        |
|--------------|-------------|------------------|--------------------------|--------|
|              |             |                  | Percentage               | Number |
| 7:10-8:30 AM | Drive       | Street           | 31%                      | 10     |
| 7:10-8:55 AM | Drive       | Street & lot     | 32%                      | 86     |
| 7:10-8:55 AM | Drive       | Street           | 31%                      | 23     |
| 7:10-8:55 AM | All modes   | -NA-             | 32%                      | 151    |

\*Time period defined when passenger entered station.

\*\* Question sequence from survey:

(7) Do you plan to return to the Rockridge Station on BART today?

(8) If yes, will you visit a Rockridge business on your way home?

Source: 1987 BART Rockridge Passenger Survey; Nash.

The BART survey provided space for people to comment on BART service and problems. A total of 74 surveys were returned with comments on them. A majority of those who commented on BART service commented on parking. Table 7-3 below presents the parking comments. Of those who commented on parking two people commented on the problems which spillover parking caused to neighborhood residents. Two others were aware of neighborhood concern over spillover and expressed strong opposition to implementation of any controls over on-street parking. This



was extremely interesting because the survey was not composed in such a way to make people think about spillover parking, thus the effect of spillover parking on the Rockridge district is significant enough to warrant further study.

**Table 7-3  
BART Survey Parking Comments**

| Comment                                             | Number | Percentage* |
|-----------------------------------------------------|--------|-------------|
| More parking needed.                                | 23     | 30%         |
| Vandalism in parking lot.                           | 6      | 8%          |
| Do not let non BART passengers park.                | 4      | 5%          |
| Parking lot should be cleaned.                      | 2      | 3%          |
| Worried about residential parking.                  | 2      | 3%          |
| Neighborhood residents complaining about spillover. | 2      | 3%          |

\* percentage calculated based upon 76 surveys returned with comments.

Source: 1987 BART Rockridge Passenger Survey; Nash.

### Possible Solutions to Spillover Parking Problems

There are three possible solutions to improve spillover parking problems in the neighborhood. The first is to increase the capacity of BART parking lots, which would help BART patrons as well. The second is to institute residential parking in the neighborhood, which would hurt BART patrons. Finally, the third is to institute parking controls in the Rockridge BART parking lot, this would have mixed results on BART patrons and the neighborhood.

There is plenty of room to build a second deck of parking over the west BART parking lot, however construction would be expensive and would cause negative impacts on the neighborhood during construction. Construction of additional parking at the Rockridge station is a very low priority for BART, other stations have greater need for additional parking, parking lots at some fill up by 7:00 AM. In fact, several people commented on their surveys that they used the Rockridge station because parking was unavailable at stations closer to their homes.

The second option, instituting parking restrictions around the BART station in the form of

resident parking is permitted by City of Oakland ordinance. San Francisco and Berkeley both have residential parking programs to limit commuter parking around BART stations and in neighborhoods. The Oakland ordinance requires that neighborhood residents collect signatures from a percentage of people living in the area in order to institute residential parking. If residential parking is instituted residents would be required to register their cars with the City and pay an annual fee for their stickers. The pros and cons of residential parking for the neighborhood are discussed in another chapter of this study, however BART patrons would be hurt by institution of the controls.

The third method for decreasing spillover parking is for BART to institute controls on who parks in the lots. The controls would be designed to prohibit people from parking in the lot who do not ride BART. This is a significant problem at other BART stations and controls have been developed and instituted at several of them. The controls have had mixed results. There are two problems with controls from the neighborhood's viewpoint. First, how many people actually use the BART lot and do not use BART. In other words, how many spaces will instituting controls actually free up for BART passengers? The second problem is, where will those who now park in the BART lot park if they are forced out of the lot? They probably will park on local streets, thus neighborhood parking problems will not improve.

### C. BART Station

The BART station area is poorly designed as shown in figures 7-3 and 7-4. The stretch of College Avenue between Grove and Shafter under the freeway (where the BART station is located) is austere and contains much wasted/unusable space. The space is dark and less activity takes place there than on the rest of College Avenue, it is a real dead space on the street. A further problem with the station is that many people jay-walk across College Avenue under the station from the west parking lot to the station entrance on the east side. They do this because the station entrance on the west side of College Avenue is inconveniently located, and using it requires passengers to go up stairs, then go down stairs and finally go up stairs again to get to the BART platform.

In order to improve the Rockridge station significant and costly changes would be required. These changes could improve the environment around the BART station and be part of a more ambitious program to increase parking and improve access for the station.

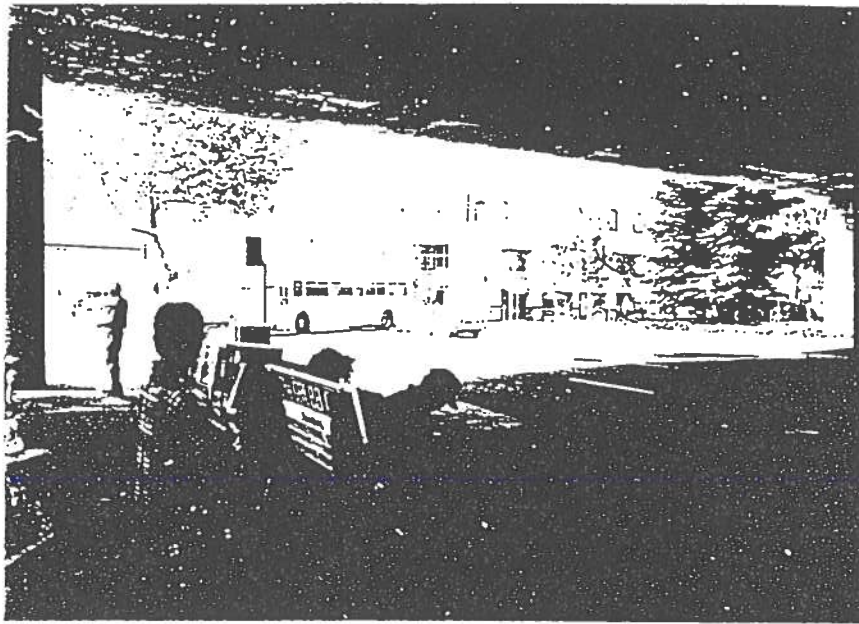


FIGURE 7-3  
ROCKLEDGE  
BART STATION:  
URBAN DESIGN



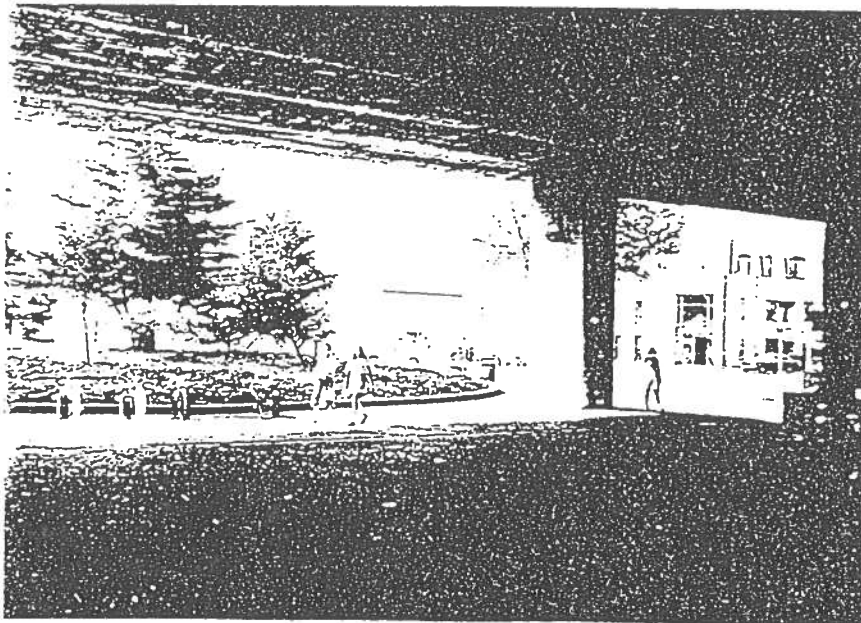
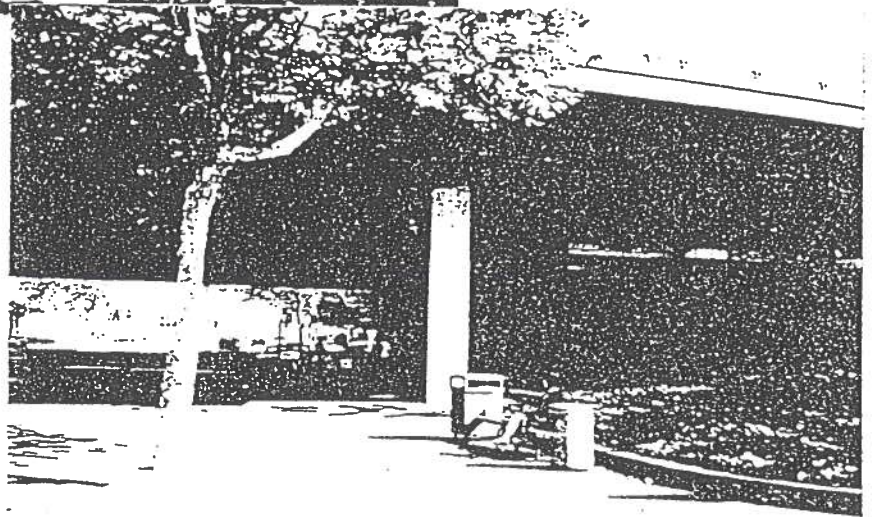
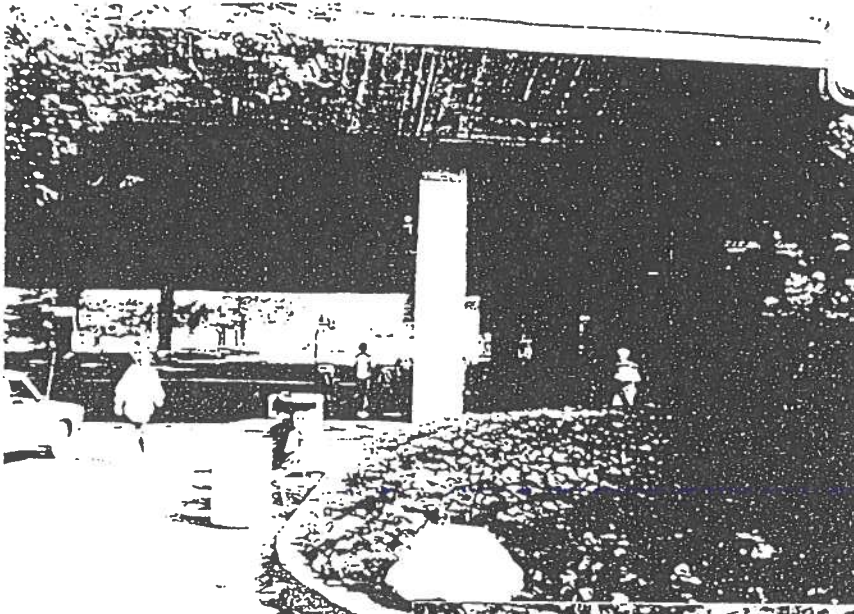


FIGURE 7-4  
ROCKRIDGE  
BART STATION:  
URBAN DESIGN

A second story could be built above the west parking lot, but on the outside this structure could contain shops and business space. As part of this project the west parking lot entrance could be redesigned to provide more direct access to the station. This area could also include space for community facilities such as the library branch and meeting rooms. Some of the property currently paved and landscaped could be converted to usable park/playground space. This would provide the neighborhood with much needed open space as well as improve and bring life to the area around the BART station, increase parking, provide a location for important community facilities and provide additional income for BART. Perhaps the project could be performed as a joint development in a similar fashion to projects BART is pursuing at other stations. It is important that the Rockridge community take an active interest in promoting and designing this type of development if they believe it would be helpful.

#### **D. AC Transit Externalities**

Externalities caused by AC Transit buses are generally of the nuisance variety. The buses are noisy, pollute the air and may cause increased traffic congestion depending upon how they are operated.

Field observations indicate that externalities caused by AC Transit vehicles operating in the Rockridge district are not significant. The area is for the most part flat, therefore buses do not generate excessive fumes or make too much noise. The buses also appear to move through the district easily thus minimizing any traffic congestion they may cause.

## 8. CONCLUSIONS AND RECOMMENDATIONS

### A. Conclusions

The Rockridge district is well served by transit. AC Transit's 51 College Avenue line provides the district with frequent service which is geographically convenient to most residents of the district. It serves most major trip destinations for Rockridge residents. The line's financial performance is relatively excellent (one of AC Transit's highest farebox recovery ratios and lowest subsidy per passenger).

The AC Transit "E" line also provides excellent service to the district. It provides frequent direct service to San Francisco in the peak hours and is relatively well patronized. In the non-peak hours it provides the district with important local service.

The AC Transit 17 line performs poorly financially, but it appears to serve an important market segment with respect to social goals. The line circulates throughout the district which means it passes near most all residents.

The AC Transit 52 line provides supplemental service to the 51 line from the Rockridge BART station to UC Berkeley. Its infrequent and duplicative service probably limits ridership.

The AC Transit 40 line provides service to the far western part of the district and to the entire district when the 51 line is not operated. However, it probably is not very important to the district. The 59/76 line is also not important to the district, it passes too far to the southeast to be close to residents of the district.

BART provides the Rockridge district with excellent service. The Rockridge station is located in the center of the district, near almost all district residents and businesses. BART service is fast and frequent from the Rockridge station. BART also causes problems for the neighborhood. The station's parking lot fills up at about 8:30 AM on weekdays, forcing drivers who arrive later to park on neighborhood streets. This causes problems for residents who wish to park in the area. Another problem is that the station area is poorly designed, access to the station itself is poor from the west parking lot and the station area contains much wasted space which could be used to provide the neighborhood with usable open space or community facilities.



## **B. Recommendations**

While the Rockridge district is well served by transit there are several changes which could be made to improve service to the district.

The most important problem with transit service to the district involves the BART station parking. In order to improve livability in the district the parking situation should be improved. Three techniques were outlined in Section 7 of this paper, and some of the pros and cons of each were discussed. It is recommended that a more detailed study be performed involving BART, the City of Oakland and Rockridge residents and businesspeople to decide how to address the problem of spillover parking from the BART lot. This study should probably be part of a study which addresses parking problems throughout the district.

It is recommended that changes be made to the BART station to improve the neighborhood and improve access to the station. These changes may be possible as part of the solution to the spillover parking problem.

AC Transit seems to be making progress on reorganizing its transit lines in the Rockridge district to better serve BART and district residents. The proposed "E" line route restructuring is a good case in point. These changes will provide the district with better service at a lower cost to AC Transit, the best of both worlds. A study should be done on the 17 line to determine how it can be changed to improve service as well. One suggestion is to make it more of a east-west crosstown line. Service on the 51 line is good, but too frequently buses are late and bunch together. In order to solve this problem it is suggested that running times be lengthened and on-street supervision be increased.

## **Appendix 1: AC Transit 1985 On-Board Survey**

In the Spring of 1985 AC Transit performed an on-board survey of passengers on all its routes. The survey was performed under the supervision of Crain and Associates, a local consulting firm. The purpose of the survey was to obtain accurate data on the characteristics and travel patterns of AC Transit passengers. A sample of the survey form and summary of system-wide results is provided at the end of this appendix.

A significant part of the survey effort was to provide AC Transit with the capability to conduct future analyses of the data and to update the data set as needed. AC Transit was supplied with copies of the data set and programs used to analyze the data.

For the purposes of this study a computer program was used which provided information on passengers who either boarded or alighted a bus in the Metropolitan Transportation Commission district of which Rockridge is a part. The data for the districts most important lines, the 51, the 17 and the "E" line was analyzed in this study.

For more information on AC Transit's 1985 On-Board Survey refer to the final report available from AC Transit's Planning and Research Department or from the Institute of Transportation Studies at UC Berkeley Library. Call number is: RTS/5009/A38/1985.

FIGURE A

QUESTIONNAIRE (English Version)

SI UD. PREFIERE PUEDE PEDIR UN CUESTIONARIO EN ESPANOL

Nº 45892



|  |  |  |
|--|--|--|
|  |  |  |
|--|--|--|

AC TRANSIT PASSENGER SURVEY

Please help AC Transit plan service for you. These questions concern the trip you are now making.

1. Where did you get on this bus? \_\_\_\_\_ Street & nearest cross street (or terminal)

2. How did you get to this bus? (Check only one)

- 1 ☐ Transferred from AC Transit Bus. What Line No.? \_\_\_\_\_
- 2 ☐ Transferred from BART train.
- 3 ☐ Transferred from other transit system. Specify: \_\_\_\_\_
- 4 ☐ Walked. How many blocks? \_\_\_\_\_
- 5 ☐ Car driver. How many miles? \_\_\_\_\_
- 6 ☐ Car passenger. How many miles? \_\_\_\_\_
- 7 ☐ Bike. How many miles? \_\_\_\_\_
- 8 ☐ Other. Specify: \_\_\_\_\_

3. How did you pay your fare on this bus? (Answer one box only.)

Transfer from:

- 1 ☐ AC Transit
- 2 ☐ BART
- 3 ☐ Other transit system: \_\_\_\_\_

Did you pay for another transfer on this bus?

1 \_\_\_ Yes 2 \_\_\_ No

Monthly Pass:

- 5 ☐ Local
- 6 ☐ Transbay
- 7 ☐ Transbay/Muni sticker
- 8 ☐ Youth
- 9 ☐ Elderly/Handicapped

4 ☐ Cash only. How much? \_\_\_\_\_

- 10 ☐ Ticket. How much? \_\_\_\_\_
- 11 ☐ None (mail carrier, police, other)

4. Where will you get off this bus? \_\_\_\_\_ Street & nearest cross street (or terminal)

5. How will you get from this bus to where you are going? (Check only one)

- 1 ☐ Transfer to AC Transit bus. What Line No.? \_\_\_\_\_
- 2 ☐ Transfer to BART train.
- 3 ☐ Transfer to other transit system. Specify: \_\_\_\_\_
- 4 ☐ Walk. How many blocks? \_\_\_\_\_
- 5 ☐ Car driver. How many miles? \_\_\_\_\_
- 6 ☐ Car passenger. How many miles? \_\_\_\_\_
- 7 ☐ Bike. How many miles? \_\_\_\_\_
- 8 ☐ Other. Specify: \_\_\_\_\_

6. How many AC Transit buses will you use for this one-way trip?

- 1 ☐ One
- 2 ☐ Two
- 3 ☐ Three or more

PLEASE COMPLETE BOTH SIDES

OFFICE USE ONLY

|    |    |   |    |   |    |     |    |   |    |   |    |       |    |        |    |
|----|----|---|----|---|----|-----|----|---|----|---|----|-------|----|--------|----|
| ON |    | z |    | D |    | OFF |    | z |    | D |    | RT ON |    | RT OFF |    |
|    | 33 |   | 36 |   | 39 |     | 43 |   | 46 |   | 49 |       | 53 |        | 56 |

FIGURE A  
(Continued)

7. Are you now going: 1 ☐ To home 2 ☐ From home 3 ☐ Neither

8. What is or was the main reason for this trip today? (Check only one)

- |                                                 |                                                  |
|-------------------------------------------------|--------------------------------------------------|
| 1 <input type="checkbox"/> Work                 | 4 <input type="checkbox"/> Medical, dental       |
| 2 <input type="checkbox"/> School or University | 5 <input type="checkbox"/> Personal business     |
| 3 <input type="checkbox"/> Shopping             | 6 <input type="checkbox"/> Social, recreation    |
|                                                 | 7 <input type="checkbox"/> Other. Specify: _____ |

9. Was a car available to you to make this trip today? 1 ☐ Yes 2 ☐ No

10. How often do you ride AC Transit buses?

- |                                            |                                                     |
|--------------------------------------------|-----------------------------------------------------|
| 1 <input type="checkbox"/> 5-7 days a week | 3 <input type="checkbox"/> 1-3 days a week          |
| 2 <input type="checkbox"/> 4 days a week   | 4 <input type="checkbox"/> Less than one day a week |

11. Sex: 1 ☐ Male 2 ☐ Female

12. Age: 1 ☐ Under 5 3 ☐ 13-17 5 ☐ 24-29 7 ☐ 60-64  
2 ☐ 5-12 4 ☐ 18-23 6 ☐ 30-59 8 ☐ 65 and over

13. Ethnic background:

- |                                     |                                            |
|-------------------------------------|--------------------------------------------|
| 1 <input type="checkbox"/> Asian    | 4 <input type="checkbox"/> American Indian |
| 2 <input type="checkbox"/> Black    | 5 <input type="checkbox"/> White           |
| 3 <input type="checkbox"/> Hispanic | 6 <input type="checkbox"/> Other: _____    |

14. Household Income:

- |                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| 1 <input type="checkbox"/> Under \$10,000    | 5 <input type="checkbox"/> \$40,001-\$50,000 |
| 2 <input type="checkbox"/> \$10,000-\$20,000 | 6 <input type="checkbox"/> Over \$50,000     |
| 3 <input type="checkbox"/> \$20,001-\$30,000 | 7 <input type="checkbox"/> Don't Know        |
| 4 <input type="checkbox"/> \$30,001-\$40,000 |                                              |

15. If you use a regional transit discount card, are you:

- |                                    |                                        |
|------------------------------------|----------------------------------------|
| 1 <input type="checkbox"/> Elderly | 2 <input type="checkbox"/> Handicapped |
|------------------------------------|----------------------------------------|

Comments: \_\_\_\_\_  
\_\_\_\_\_

\*\*\*OPTIONAL\*\*\*

AC Transit would like to find out how well we are serving our passengers. Please volunteer to participate in future surveys by giving the following information:

NAME: \_\_\_\_\_ PHONE: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_ CITY: \_\_\_\_\_ ZIP: \_\_\_\_\_

PLEASE RETURN THIS FORM TO SURVEY TAKER. THANK YOU FOR YOUR COOPERATION.  
THIS INFORMATION IS CONFIDENTIAL AND FOR STATISTICAL PURPOSES ONLY.

PLEASE COMPLETE BOTH SIDES

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## Appendix 2: BART Passenger Survey

As part of this study a survey of BART passengers arriving at the Rockridge BART station on a weekday morning peak hour was performed. The study was designed to answer several questions. First, how morning passengers get to the station and how far away they live. Second, where they park. Third, their destination and trip purpose and finally whether they planed to return to the Rockridge station and if so did they plan to visit a Rockridge business on their way home. A copy of the survey form is presented at the end of this appendix.

The survey was given on Thursday April 16, 1987, between 7:10 AM and 8:55 AM. Approximately 750 surveys were given out and 467 were returned (approximately 62% return rate). This is quite a good rate for returns on this type of survey. The method used to give out the survey was to have two people giving out the survey at the faregates. Two more people were positioned, one each, at the top of each stairway to the platform. They provided pensils and collection boxes. A third person walked up and down the platform collecting surveys from passengers before their trains came. It was found that if the people at the top of the stairs asked each person coming up the stairs if they would like a pensil the response rate was almost 100%. The survey collection boxes were left at the station for people to deposit their surveys on Thursday evening or Friday morning. They surveys were collected in the following breakdown:

|                   |     |                                    |
|-------------------|-----|------------------------------------|
| Thursday Morning: | 393 | (between 7 AM and 9 AM)            |
| Thursday Evening: | 35  | (between 9 AM and 6 PM)            |
| Friday Morning:   | 39  | (between 6 PM Thurs & Noon Friday) |
| <hr/>             |     |                                    |
| Total:            | 467 |                                    |

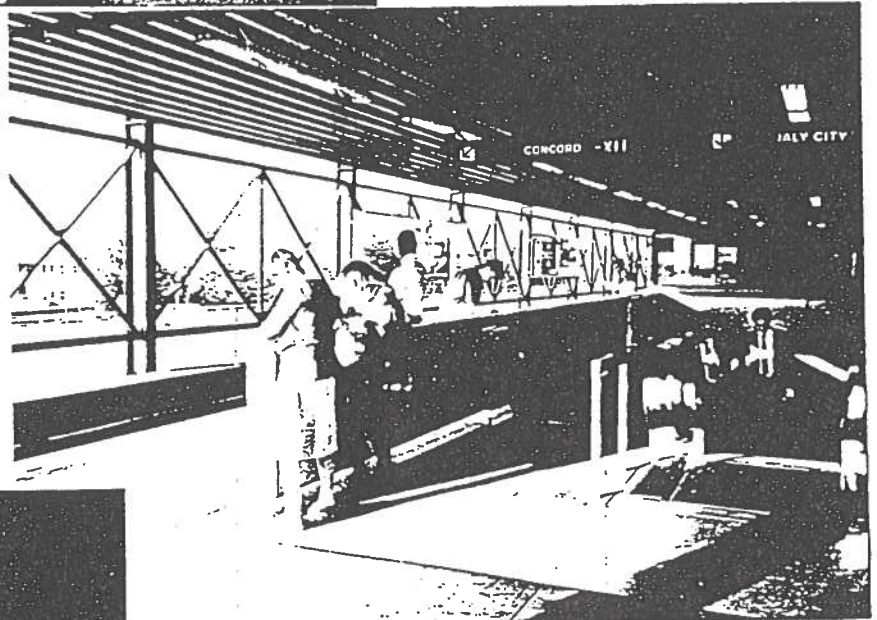
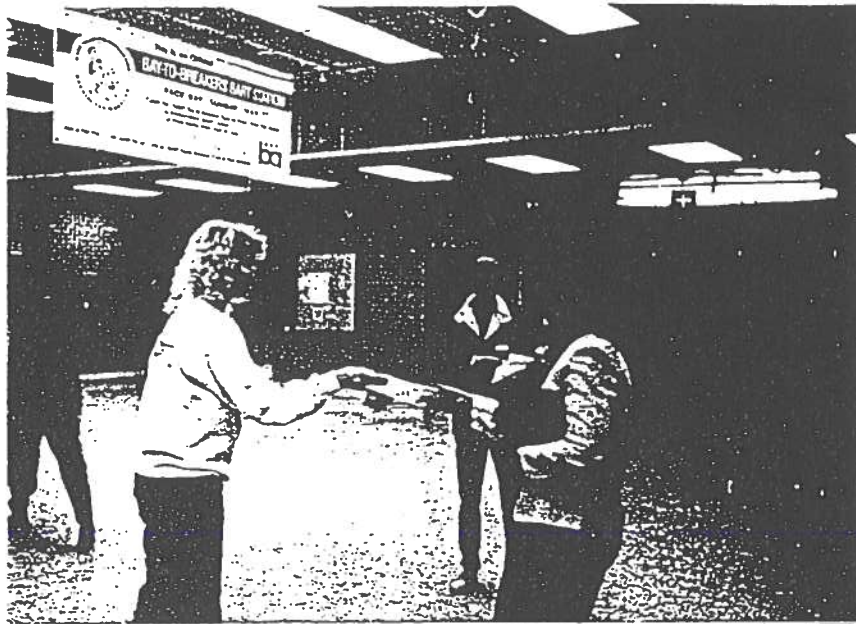
The survey provided interesting information which is presented in the report. It is referred to as the 1987 BART Rockridge Station Passenger Survey in the report. It should be emphasized that the survey is not representative of all passengers who use the Rockridge station. A large number of Rockridge station passengers use the station at off peak times and in off peak directions. In fact, patronage figures indicate that 39% of total Rockridge station passengers travel to/from the Rockridge station during off peak hours and 18% of the passengers who use the station in the AM peak hours are getting off at the station. Neither of these populations were sampled by the survey. Complete BART patronage figures for an average weekday in Spring 1986 are presented in Appendix 3.

Another source of information on BART passengers was used in this study. This was "BART Passenger Profile Study, 1985, Number Nine in a Series," which was prepared by Research and Decisions Corporation\* (January 1986). This study presents the results of a system-wide survey of BART passengers. It also presents results of certain questions for individual sample groups (for example passengers boarding at the Rockridge Station). A copy of this survey is provided at the end of this appendix. This survey is referred to as the 1985 BART Passenger survey in the report.

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\* 369 Sutter Street, Suite 203, San Francisco, CA, 94108; 989-9020.





APPENDIX 2: BART PASSENGER SURVEY

## Rockridge Station Passenger Survey

The University of California, Berkeley Department of City and Regional Planning is conducting this survey with the cooperation of the City of Oakland. Please take a minute to fill out the survey and place it in one of the boxes on the Rockridge Station platform marked SURVEY or give it to one of the survey collectors in the station area.

Please only return it at the Rockridge Station. If you have not completed the survey by the time your train comes, the boxes will be available this afternoon and tomorrow at the Rockridge Station. Thanks for your help!

### 1. How did you get to BART today?

- ☐ Walked → Number of blocks walked: \_\_\_\_\_
- ☐ Drove alone
- ☐ Shared private vehicle (carpool, vanpool)
- ☐ Was dropped off, vehicle not parked in area
- ☐ AC Transit → AC bus route used: \_\_\_\_ 51 \_\_\_\_ E \_\_\_\_ 17 \_\_\_\_ Other (#)
- ☐ Taxi
- ☐ Other (please specify): \_\_\_\_\_

### 2. If you came by car and parked in the area where is your car parked?

- ☐ BART parking lot
- ☐ Local streets in station area → How many blocks away? \_\_\_\_\_
- ☐ Other parking lot in area (please identify location) \_\_\_\_\_

### 3. Did you have a car available to make this trip? ☐ Yes ☐ No

### 4. Where do you live?

City: \_\_\_\_\_

Street address or cross streets: \_\_\_\_\_

Zip Code: \_\_\_\_\_

### 5. Which BART station will you exit from at the end of your trip?

BART Stop (exit station): \_\_\_\_\_

### 6. What is the purpose of your trip?

- ☐ Work
- ☐ School
- ☐ Shopping
- ☐ Other (Please specify: \_\_\_\_\_)

### 7. Will you return to the Rockridge station on BART today?

- ☐ Yes
- ☐ No

### 8. If yes, will you visit a Rockridge business on your way home?

- ☐ Yes
- ☐ No

Please feel free to comment on BART service, parking problems or other concerns on the reverse of this page.

Please remember to return this survey only at the Rockridge Station in the survey boxes provided. Personnel at other stations will not accept them. Thank you for your help.

This survey has been reviewed by the BART Station Operations, Real Estate and Planning, Budget and Research Departments.

RESULTS OF 1987 ROCKRIDGE BART STATION PASSENGER SURVEY: APRIL 16, 1987: 7:10 AM TO 9:00 AM

| MODE                    |     |      | DISTANCE WALKED TO BART                                |     |      | WHERE DID YOU PARK?    |     |      | DISTANCE TO CAR   |     |    |
|-------------------------|-----|------|--------------------------------------------------------|-----|------|------------------------|-----|------|-------------------|-----|----|
| WALK                    | 117 | 25%  | 1-2                                                    | 27  | 24%  | NA                     | 167 | 36%  | 1-2               | 60  | 8  |
| DRIVE                   | 265 | 57%  | 3-4                                                    | 31  | 28%  | BART LOT               | 228 | 49%  | 3-4               | 9   | 1  |
| BIKE                    | 10  | 2%   | 5-6                                                    | 31  | 28%  | STREET                 | 71  | 15%  | 5-6               | 1   |    |
| DROP OFF                | 27  | 6%   | 7-8                                                    | 12  | 11%  |                        |     |      | 7-8               | 0   |    |
| BUS                     | 14  | 3%   | 9-10                                                   | 4   | 4%   | TOTAL                  | 466 | 100% | 9-10              | 0   |    |
| CARPOOL                 | 34  | 7%   | 11-12                                                  | 0   | 0%   |                        |     |      | 11-12             | 0   |    |
|                         |     |      | 13-14                                                  | 0   | 0%   |                        |     |      | 13-14             | 0   |    |
| TOTAL                   | 467 | 100% | MILE                                                   | 7   | 6%   |                        |     |      |                   |     |    |
|                         |     |      | TOTAL                                                  | 112 | 100% | TIME PERIOD OF ARRIVAL |     |      | TOTAL             | 70  | 10 |
| BUS ROUTES              |     |      | CITY OF RESIDENCE                                      |     |      | 1                      | 43  | 9%   | NA                | 397 |    |
| 17                      | 0   |      | OAKLAND                                                | 325 | 74%  | 2                      | 62  | 13%  |                   |     |    |
| 51                      | 13  |      | BERKELEY                                               | 90  | 20%  | 3                      | 57  | 12%  | TOTAL             | 467 |    |
| *E*                     | 0   |      | CONCORD                                                | 3   | 1%   | 4                      | 96  | 21%  | EXIT BART STATION |     |    |
| TOTAL                   | 13  |      | PLEAS HIL                                              | 3   | 1%   | 5                      | 86  | 18%  | EMBARCADE         | 108 |    |
| Car Available for trip? |     |      | LAFAYETTE                                              | 3   | 1%   | 6                      | 93  | 20%  | MONTGOMER         | 98  |    |
| YES                     | 393 | 84%  | DANVILLE                                               | 4   | 1%   | 7                      | 30  | 6%   | POWELL            | 36  |    |
| NO                      | 63  | 13%  | MORAGA                                                 | 2   | 0%   | TOTAL                  | 467 | 100% | CIVIC CEN         | 57  |    |
| NA                      | 11  | 2%   | ORINDA                                                 | 4   | 1%   |                        |     |      | 12                | 12  |    |
| TOTAL                   | 467 | 100% | ANTIOCH                                                | 1   | 0%   |                        |     |      | EVENING           | 63  |    |
|                         |     |      | PITTSBURG                                              | 1   | 0%   |                        |     |      | 19                | 17  |    |
|                         |     |      | WALNUT C                                               | 4   | 1%   |                        |     |      | 16,24&GLE         | 6   |    |
|                         |     |      | TOTAL                                                  | 440 | 1%   |                        |     |      |                   |     |    |
| TRIP PURPOSE            |     |      | ZIP CODE OF RESIDENCE                                  |     |      |                        |     |      | LAKE H            |     |    |
| WORK                    | 442 | 95%  | 94611                                                  | 96  | 27%  |                        |     |      | COLOS             |     |    |
| SHOP                    | 2   | 0%   | 94618                                                  | 151 | 42%  |                        |     |      | HAYWARD           |     |    |
| SCHOOL                  | 12  | 3%   | 94704                                                  | 31  | 9%   |                        |     |      | FRUIT             |     |    |
| MEDICAL                 | 2   | 0%   | 94705                                                  | 46  | 13%  |                        |     |      | S LEAND           |     |    |
| PERS BUS                | 2   | 0%   | NA                                                     | 33  | 9%   |                        |     |      | 8                 |     |    |
| NA & FUN                | 4   | 1%   | TOTAL                                                  | 357 | 100% |                        |     |      | CONCORD           |     |    |
| COURT                   | 2   | 0%   |                                                        |     |      |                        |     |      | WALNUT C          |     |    |
| TOTAL                   | 466 | 100% |                                                        |     |      |                        |     |      | P HILL            |     |    |
|                         |     |      |                                                        |     |      |                        |     |      | LAF               |     |    |
|                         |     |      |                                                        |     |      |                        |     |      | ORINDA            |     |    |
|                         |     |      |                                                        |     |      |                        |     |      | 50                |     |    |
|                         |     |      |                                                        |     |      |                        |     |      | BERK              |     |    |
|                         |     |      |                                                        |     |      |                        |     |      | EC NORTE          |     |    |
|                         |     |      |                                                        |     |      |                        |     |      | NA                |     |    |
|                         |     |      |                                                        |     |      |                        |     |      | 1                 |     |    |
|                         |     |      |                                                        |     |      |                        |     |      | TOTAL             |     |    |
|                         |     |      |                                                        |     |      |                        |     |      | 461               |     |    |
| RETURN ON BART TODAY?   |     |      | DO YOU PLAN TO VISIT A ROCKRIDGE BUSINESS ON WAY HOME? |     |      |                        |     |      |                   |     |    |
| YES                     | 449 | 97%  | YES                                                    | 151 | 32%  |                        |     |      |                   |     |    |
| NO                      | 15  | 3%   | NO                                                     | 267 | 57%  |                        |     |      |                   |     |    |
| NA                      | 0   | 0%   | NA                                                     | 15  | 3%   |                        |     |      |                   |     |    |
| MAYBE                   | 1   | 0%   | MAYBE                                                  | 33  | 7%   |                        |     |      |                   |     |    |
| TOTAL                   | 465 | 1    | TOTAL                                                  | 466 | 1    |                        |     |      |                   |     |    |

**B**  
(5-10)

## 1985 BART PASSENGER SURVEY

Please help us plan better service by answering a few questions about your trip on BART today. Your answers will be used for survey purposes only and will be kept strictly private.

**COMPLETE AS MUCH OF THIS QUESTIONNAIRE AS YOU CAN DURING YOUR RAIL TRIP ON BART AND DEPOSIT THIS FORM IN THE BOX MARKED "SURVEY" WHEN YOU LEAVE THE STATION. CHECK THE APPROPRIATE BOX TO ANSWER QUESTIONS, OR FILL IN THE APPROPRIATE BLANKS.**



**BAY AREA RAPID TRANSIT DISTRICT**  
800 Madison Street  
Oakland, California 94607  
Telephone 464-6154

### STARTING POINT

1. Which BART station did you just enter?

(11-12)

Entry Station \_\_\_\_\_

2. How did you travel to the BART station?

(13-14)

Please check only one.

- 1 ☐ Drove alone and parked  
2 ☐ Drove or rode with one other person and parked  
3 ☐ Drove or rode with two or more people and parked  
4 ☐ Dropped off by car  
5 ☐ Local bus: route # \_\_\_\_\_  
6 ☐ BART express bus: route # \_\_\_\_\_  
7 ☐ Street or cable car: route # \_\_\_\_\_  
8 ☐ Taxi  
9 ☐ Motorcycle or moped  
10 ☐ Bicycle  
11 ☐ Walked

(15-18)

(19-22)

(23-26)

3. Please indicate your starting point for this trip (before traveling to BART) by street address or nearest cross-street.

Address or Cross-Street \_\_\_\_\_

City \_\_\_\_\_ Zip Code (if known) \_\_\_\_\_

4. Is this starting point . . .

(27)

- 1 ☐ your home?  
2 ☐ your workplace?  
3 ☐ other?

### DESTINATION

5. Which BART station will you exit from after you get off the train?

(28-29)

Exit Station \_\_\_\_\_

6. Where will you go first after leaving the BART station?

Address or Cross-Street \_\_\_\_\_

City \_\_\_\_\_ Zip Code (if known) \_\_\_\_\_

7. How will you get there?

(30-31)

Please check only one.

- 1 ☐ Drive alone  
2 ☐ Drive or ride with one other person  
3 ☐ Drive or ride with two or more people  
4 ☐ To be picked-up by car  
5 ☐ Local bus: route # \_\_\_\_\_  
6 ☐ BART express bus: route # \_\_\_\_\_  
7 ☐ Street or cable car: route # \_\_\_\_\_  
8 ☐ Taxi  
9 ☐ Motorcycle or moped  
10 ☐ Bicycle  
11 ☐ Walk

(32-35)

(36-39)

(40-43)

### BART TRAVEL

8. Please indicate the major purpose for your using BART today. I will be going to or from:  
Please check only one.

(44)

- 1 ☐ Work or related business  
2 ☐ School or college  
3 ☐ Shopping place/area  
4 ☐ A visit with friends or relatives  
5 ☐ Personal business or medical/dental office, etc.  
6 ☐ Athletic event, entertainment, dining out, etc.  
7 ☐ Sightseeing or riding BART

9. Which days did you use BART last week?  
Please check as appropriate.

(45-52)

- ☐ Sunday ☐ Thursday  
☐ Monday ☐ Friday  
☐ Tuesday ☐ Saturday  
☐ Wednesday ☐ None

10. How many Saturdays did you use BART in May 1985?

(53)

Number of Saturdays \_\_\_\_\_

How many Sundays did you use BART in May 1985?

(54)

Number of Sundays \_\_\_\_\_

11. Will your use of BART today be . . .  
Please check only one.

(55)

- 1 ☐ only one way?  
2 ☐ round trip (both directions)?  
3 ☐ three or more one-way trips?

12. a. Are you traveling alone or with someone else on BART today?

(56)

- 1 ☐ Traveling alone  
2 ☐ With one other person  
3 ☐ With two or more people

- b. If traveling with others, how many are children age 12 or younger?

(59)

Number of Children \_\_\_\_\_

13. Do you need more information about any of the following?

(58-63)

Please check as appropriate.

- ☐ BART train schedules  
☐ How to use BART ticket machines  
☐ How to get around inside BART stations  
☐ How to use BART to get to theaters and other entertainment located near BART stations  
☐ Local buses to BART  
☐ Maps of neighborhoods near BART stations

14. Have you ever used a BART schedule?

(64)

- 1 ☐ Yes 2 ☐ No

OVER



**PLEASE COMPLETE BOTH SIDES OF THIS FORM**

15. How long have you been riding BART?

(65-66)  
(67-68)

Number of Years                      Months

- (69) 1 ☐ Since BART opened in 1972  
2 ☐ This is the first time I've ridden BART

16. How satisfied are you with BART's current service?

(70)

- 1 ☐ Very satisfied  
2 ☐ Somewhat satisfied  
3 ☐ Neither satisfied or dissatisfied  
4 ☐ Somewhat dissatisfied  
5 ☐ Very dissatisfied

17. Why don't you ride BART more often?

(71-79)

Please check all that apply.

- ☐ More convenient to drive  
☐ More convenient to take the bus  
☐ BART doesn't run often enough  
☐ BART is too slow  
☐ Parking is difficult at BART  
☐ Stations are not conveniently located  
☐ Don't travel that much  
☐ BART doesn't go where I want to go  
☐ Not applicable: I ride BART often  
☐ Other \_\_\_\_\_

Please Specify

**ALTERNATE USE & PASSES**

18. How many cars, trucks, or vans are there in your household?

(80)

- 1 ☐ One                                      4 ☐ Four  
2 ☐ Two                                      5 ☐ More  
3 ☐ Three                                    9 ☐ None

19. Was a car, truck, or van available to you for today's trip?

(11)

- 1 ☐ Yes    2 ☐ No

20. Did you use a MUNI Fast Pass to ride BART today?

(12)

- 1 ☐ Yes    2 ☐ No

21. Do you currently use a BART discount ticket because you are . . .

(13)

- 1 ☐ handicapped?  
2 ☐ age 65 or older  
3 ☐ age 12 or younger?  
4 ☐ other?

**VITAL STATISTICS**

And finally, we would like to know something about you. This information will be used to compare BART riders with the general population.

22. What is your sex?

(23)

- 1 ☐ Male                                      2 ☐ Female

23. What is your age?

(24)

- 1 ☐ 12 or younger                      6 ☐ 35-44  
2 ☐ 13-15                                      7 ☐ 45-54  
3 ☐ 16-17                                      8 ☐ 55-64  
4 ☐ 18-24                                      9 ☐ 65 or older  
5 ☐ 25-34

24. How much school have you completed?  
Please check only one.

(25)

- 1 ☐ Less than 12 years  
2 ☐ Graduated from high school  
3 ☐ Some college/junior college  
4 ☐ Four-year college graduate  
5 ☐ More than four years of college

25. Which category describes you best?

(26-27)

- 1 ☐ Black  
2 ☐ Chinese  
3 ☐ Filipino  
4 ☐ Japanese  
5 ☐ Other Asian  
6 ☐ Mexican-American  
7 ☐ Other Spanish/Hispanic  
8 ☐ American Indian/Eskimo  
9 ☐ White  
10 ☐ Other \_\_\_\_\_

Please Specify

26. How many related people are there living in your household?

(28)

Number of People

27. What is the total income of all related people living in your household, including yourself?

(29-30)

- 1 ☐ Under \$10,000  
2 ☐ \$10,000-\$14,999  
3 ☐ \$15,000-\$19,999  
4 ☐ \$20,000-\$24,999  
5 ☐ \$25,000-\$29,999  
6 ☐ \$30,000-\$34,999  
7 ☐ \$35,000-\$39,999  
8 ☐ \$40,000-\$49,999  
9 ☐ \$50,000-\$59,999  
10 ☐ \$60,000 or more

Please give us your comments about this survey or BART.

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THANK YOU FOR YOUR HELP. PLEASE DEPOSIT IN THE SURVEY BOX AS YOU EXIT.

### **Appendix 3: Rockridge BART Station Patronage**

Patronage information for the Rockridge station on an average weekday was provided for this report by the BART Planning and Research Department. It is summarized by line on the next page.

The San Francisco line consists of all stations from Embarcadero to Daly City. The Oakland line consists of Oakland West, 12th Street, 19th Street, and MacArthur stations. The Richmond line consists of all stations from Ashby to Richmond. The Fremont line consists of all stations from Lake Merritt to Fremont and the Concord line consists of all stations from Orinda to Concord.

The ridership figures are broken down by time period. The AM time period is from the start of service (approximately 6 AM) to 10 AM. Midday is from 10 AM to 4 PM. The PM time period is from 4 PM to 7 PM and the evening period is from 7 PM to close of services (approximately midnight). The top third of the figures presented on the next page consist of ridership from Rockridge station. The middle third is ridership to the Rockridge station and the bottom half is total ridership.



BART Spring 1986 patronage figures

Passengers Boarding at Rockridge

| Time Period    | SF Line | Oakland | Richmond | Fremont | Concord | Totals | Percent in Time Per |
|----------------|---------|---------|----------|---------|---------|--------|---------------------|
| AM Peak (6-10) | 1142    | 83      | 14       | 41      | 183     | 1462   | 52%                 |
| Midday         | 501     | 48      | 21       | 53      | 101     | 723    | 26%                 |
| PM Peak (4-7)  | 151     | 24      | 20       | 39      | 129     | 364    | 13%                 |
| Evening        | 115     | 14      | 16       | 21      | 73      | 239    | 9%                  |
| Totals         | 1908    | 168     | 71       | 155     | 487     | 2788   | 100%                |
| % on line      | 68%     | 6%      | 3%       | 6%      | 17%     | 100%   |                     |

Passengers Alighting at Rockridge

| Time Period    | SF Line | Oakland | Richmond | Fremont | Concord | Totals | Percent in Time Per |
|----------------|---------|---------|----------|---------|---------|--------|---------------------|
| AM Peak (6-10) | 89      | 31      | 16       | 35      | 145     | 316    | 10%                 |
| Midday         | 419     | 48      | 25       | 36      | 123     | 652    | 21%                 |
| PM Peak (4-7)  | 1158    | 86      | 24       | 36      | 164     | 1467   | 47%                 |
| Evening        | 602     | 26      | 11       | 21      | 45      | 705    | 22%                 |
| Totals         | 2268    | 191     | 76       | 128     | 475     | 3140   | 100%                |
| % on line      | 72%     | 6%      | 2%       | 4%      | 15%     | 100%   |                     |
| diff am-pm     | 19%     | 14%     | 8%       | -17%    | -2%     | 13%    |                     |

All Passengers using Rockridge Station

| Time Period    | SF Line | Oakland | Richmond | Fremont | Concord | Totals | Percent in Time Per |
|----------------|---------|---------|----------|---------|---------|--------|---------------------|
| AM Peak (6-10) | 1231    | 114     | 30       | 76      | 328     | 1778   | 30%                 |
| Midday         | 920     | 96      | 46       | 83      | 224     | 1375   | 23%                 |
| PM Peak (4-7)  | 1309    | 110     | 44       | 75      | 293     | 1831   | 31%                 |
| Evening        | 717     | 40      | 26       | 42      | 113     | 944    | 16%                 |
| Totals         | 4176    | 360     | 147      | 282     | 963     | 5928   | 100%                |
| % on line      | 70%     | 6%      | 2%       | 5%      | 16%     | 100%   |                     |

Source: BART

Notes: (1) BART patronage data is 10 day average (weekdays) from Spring 1986.

(2) Time periods are based upon exit times.

## Appendix 4: Census Tract Information

In this report the Rockridge district was defined to contain census tracts: 4002, 4003 and 4004 of the San Francisco-Oakland Standard Metropolitan Statistical Area (SMSA). Information on journey to work, incomes and demographic distributions were analyzed in the report. The raw data and calculated percentages for each census tract, the Rockridge district as a whole, the City of Oakland, and the SMSA are presented on the following three pages. The top half of each page presents actual figures, the bottom half percentages.

# RR INCOME

|    | A           | B          | C          | D          | E         | F        | G        |
|----|-------------|------------|------------|------------|-----------|----------|----------|
| 1  | DESCRIPTION | TRACT 4002 | TRACT 4003 | TRACT 4004 | ROCKRIDGE | OAKLAND  | SMSA     |
| 2  |             |            |            |            |           |          |          |
| 3  | INCOME      |            |            |            |           |          |          |
| 4  | HOUSEHOLDS  | 924        | 2495       | 1792       | 5211      | 142417   | 1282689  |
| 5  | LT \$5,000  | 133        | 433        | 341        | 907       | 28268    | 142878   |
| 6  | 5000-7499   | 37         | 291        | 146        | 474       | 12976    | 81562    |
| 7  | 7500-9999   | 103        | 237        | 215        | 555       | 12918    | 83125    |
| 8  | 10-14,999   | 177        | 403        | 278        | 858       | 21460    | 171818   |
| 9  | 15-19,999   | 79         | 299        | 244        | 622       | 18021    | 161041   |
| 10 | 20-24,999   | 90         | 279        | 181        | 550       | 14402    | 154445   |
| 11 | 25-34,999   | 161        | 336        | 230        | 727       | 17697    | 227439   |
| 12 | 35-49,999   | 75         | 155        | 105        | 335       | 10720    | 161041   |
| 13 | OVER 50,000 | 69         | 62         | 52         | 183       | 5955     | 99004    |
| 14 | MEDIAN      | \$16,034   | \$13,506   | \$13,609   |           | \$13,780 | \$20,017 |
| 15 | MEAN        | \$20,961   | \$16,746   | \$16,651   |           | \$17,970 | \$24,036 |
| 16 |             |            |            |            |           |          |          |
| 17 |             |            |            |            |           |          |          |
| 18 | DESCRIPTION | TRACT 4002 | TRACT 4003 | TRACT 4004 | ROCKRIDGE | OAKLAND  | SMSA     |
| 19 |             |            |            |            |           |          |          |
| 20 | INCOME      |            |            |            |           |          |          |
| 21 | HOUSEHOLDS  | 924        | 2495       | 1792       | 5211      | 142417   | 1282689  |
| 22 | LT \$5,000  | 14.39%     | 17.35%     | 19.03%     | 17.41%    | 19.85%   | 11.14%   |
| 23 | 5000-7499   | 4.00%      | 11.66%     | 8.15%      | 9.10%     | 9.11%    | 6.36%    |
| 24 | 7500-9999   | 11.15%     | 9.50%      | 12.00%     | 10.65%    | 9.07%    | 6.48%    |
| 25 | 10-14,999   | 19.16%     | 16.15%     | 15.51%     | 16.47%    | 15.07%   | 13.40%   |
| 26 | 15-19,999   | 8.55%      | 11.98%     | 13.62%     | 11.94%    | 12.65%   | 12.55%   |
| 27 | 20-24,999   | 9.74%      | 11.18%     | 10.10%     | 10.55%    | 10.11%   | 12.04%   |
| 28 | 25-34,999   | 17.42%     | 13.47%     | 12.83%     | 13.95%    | 12.43%   | 17.73%   |
| 29 | 35-49,999   | 8.12%      | 6.21%      | 5.86%      | 6.43%     | 7.53%    | 12.55%   |
| 30 | OVER 50,000 | 7.47%      | 2.48%      | 2.90%      | 3.51%     | 4.18%    | 7.72%    |
| 31 |             | 100%       | 100%       | 100%       | 100%      | 100%     | 100%     |

# RR JOURNEY TO WORK

|    | A               | B          | C          | D          | E         | F        | G         |
|----|-----------------|------------|------------|------------|-----------|----------|-----------|
| 1  | DESCRIPTION     | TRACT 4002 | TRACT 4003 | TRACT 4004 | ROCKRIDGE | OAKLAND  | SMSA      |
| 2  |                 |            |            |            |           |          |           |
| 3  | JOURNEY TO WORK |            |            |            |           |          |           |
| 4  | WORKERS         | 969        | 2635       | 2048       | 5652      | 139117   | 1562352   |
| 5  | DRIVE ALONE     | 496        | 1452       | 884        | 2832      | 76968    | 905101    |
| 6  | CARPPOOL        | 106        | 201        | 270        | 577       | 19381    | 245841    |
| 7  | BUS             | 154        | 508        | 431        | 1093      | 26379    | 206646    |
| 8  | BART            | 42         | 94         | 70         | 206       | 3555     | 48331     |
| 9  | WALK ONLY       | 36         | 141        | 139        | 316       | 7023     | 80046     |
| 10 | OTHER           | 73         | 139        | 175        | 387       | 3276     | 44262     |
| 11 | WORK @HOME      | 62         | 100        | 73         | 235       | 2428     | 30662     |
| 12 |                 |            |            |            | AVGERAGES |          |           |
| 13 | PERS PER VEH    | 1.12       | 1.07       | 1.16       | 1.12      | 1.13     | 1.14      |
| 14 | MEAN T TIME     | 23.1       | 22.3       | 23.1       | 22.8      | 24.8     | 25.3      |
| 15 |                 |            |            |            | TOTALS    |          |           |
| 16 | WORK IN SMSA    | 931        | 2416       | 1833       | 5180      | 121404   | 1311357   |
| 17 | SF CBD          | 128        | 139        | 242        | 10 509    | 7 8486   | 12 161441 |
| 18 | SF              | 53         | 211        | 153        | 8 417     | 8 10177  | 21 273161 |
| 19 | OAK CBD         | 74         | 105        | 93         | 5 272     | 9 11100  | 2 29011   |
| 20 | OAK             | 309        | 824        | 515        | 32 1648   | 45 54274 | 10 131011 |
| 21 | BERK            | 258        | 770        | 566        | (31) 1594 | 9 10576  | 4 57256   |
| 22 |                 |            |            |            | 87 (13)   | (22)     | (51)      |
| 23 |                 |            |            |            |           |          |           |
| 24 |                 |            |            |            |           |          |           |
| 25 |                 |            |            |            |           |          |           |
| 26 |                 |            |            |            |           |          |           |
| 27 |                 |            |            |            |           |          |           |
| 28 |                 |            |            |            |           |          |           |
| 29 |                 |            |            |            |           |          |           |
| 30 | DESCRIPTION     | TRACT 4002 | TRACT 4003 | TRACT 4004 | ROCKRIDGE | OAKLAND  | SMSA      |
| 31 |                 |            |            |            |           |          |           |
| 32 | JOURNEY TO WORK |            |            |            |           |          |           |
| 33 | WORKERS         | 969        | 2635       | 2048       | 5652      | 139117   | 1562352   |
| 34 | DRIVE ALONE     | 51.19%     | 55.10%     | 43.16%     | 50.11%    | 55.33%   | 57.93%    |
| 35 | CARPPOOL        | 10.94%     | 7.63%      | 13.18%     | 10.21%    | 13.93%   | 15.74%    |
| 36 | BUS             | 15.89%     | 19.28%     | 21.04%     | 19.34%    | 18.96%   | 13.23%    |
| 37 | BART            | 4.33%      | 3.57%      | 3.42%      | 3.64%     | 2.56%    | 3.09%     |
| 38 | WALK ONLY       | 3.72%      | 5.35%      | 6.79%      | 5.59%     | 5.05%    | 5.12%     |
| 39 | OTHER           | 7.53%      | 5.28%      | 8.54%      | 6.85%     | 2.35%    | 2.83%     |
| 40 | WORK @HOME      | 6.40%      | 3.80%      | 3.56%      | 4.16%     | 1.75%    | 1.96%     |
| 41 |                 | 100%       | 100%       | 100%       | 100%      | 100%     | 100%      |

# RR POPULATION

|    | A           | B          | C          | D          | E         | F       | G       |
|----|-------------|------------|------------|------------|-----------|---------|---------|
| 1  |             |            |            |            |           |         |         |
| 2  | DESCRIPTION | TRACT 4002 | TRACT 4003 | TRACT 4004 | ROCKRIDGE | OAKLAND |         |
| 3  |             |            |            |            |           |         | SMSA    |
| 4  | POPULATION  |            |            |            |           |         |         |
| 5  | TOTAL       | 2020       | 4865       | 3850       | 10735     | 339337  | 3250630 |
| 6  | FEMALE      | 1050       | 2653       | 2013       | 5716      | 178440  | 1660313 |
| 7  | MALE        | 970        | 2212       | 1837       | 5019      | 160897  | 1590317 |
| 8  |             |            |            |            |           |         |         |
| 9  | AGE         |            |            |            |           |         |         |
| 10 | UNDER 5     | 81         | 186        | 203        | 470       | 23380   | 193602  |
| 11 | 5-9         | 108        | 163        | 171        | 442       | 21344   | 190964  |
| 12 | 10-14       | 83         | 162        | 183        | 428       | 22506   | 223204  |
| 13 | 15-19       | 91         | 227        | 230        | 548       | 25884   | 264209  |
| 14 | 20-24       | 143        | 555        | 403        | 1101      | 31695   | 295949  |
| 15 | 25-34       | 539        | 1454       | 1156       | 3149      | 68807   | 628016  |
| 16 | 35-44       | 305        | 602        | 491        | 1398      | 37577   | 419283  |
| 17 | 45-54       | 189        | 356        | 296        | 841       | 30247   | 344810  |
| 18 | 55-64       | 161        | 361        | 287        | 809       | 33102   | 327697  |
| 19 | 65-74       | 155        | 411        | 243        | 809       | 25522   | 218584  |
| 20 | 75 & OVER   | 165        | 388        | 187        | 740       | 19273   | 144312  |
| 21 |             |            |            |            |           |         |         |
| 22 | PERCENTAGES |            |            |            |           |         |         |
| 23 |             | TRACT 4002 | TRACT 4003 | TRACT 4004 | ROCKRIDGE | OAKLAND | SMSA    |
| 24 | FEMALE      | 51.98%     | 54.53%     | 52.29%     | 53.25%    | 52.58%  | 51.08%  |
| 25 | MALE        | 48.02%     | 45.47%     | 47.71%     | 46.75%    | 47.42%  | 48.92%  |
| 26 |             |            |            |            |           |         |         |
| 27 | AGE         |            |            |            |           |         |         |
| 28 | UNDER 5     | 4.01%      | 3.82%      | 5.27%      | 4.38%     | 6.89%   | 5.96%   |
| 29 | 5-9         | 5.35%      | 3.35%      | 4.44%      | 4.12%     | 6.29%   | 5.87%   |
| 30 | 10-14       | 4.11%      | 3.33%      | 4.75%      | 3.99%     | 6.63%   | 6.87%   |
| 31 | 15-19       | 4.50%      | 4.67%      | 5.97%      | 5.10%     | 7.63%   | 8.13%   |
| 32 | 20-24       | 7.08%      | 11.41%     | 10.47%     | 10.26%    | 9.34%   | 9.10%   |
| 33 | 25-34       | 26.68%     | 29.89%     | 30.03%     | 29.33%    | 20.28%  | 19.32%  |
| 34 | 35-44       | 15.10%     | 12.37%     | 12.75%     | 13.02%    | 11.07%  | 12.90%  |
| 35 | 45-54       | 9.36%      | 7.32%      | 7.69%      | 7.83%     | 8.91%   | 10.61%  |
| 36 | 55-64       | 7.97%      | 7.42%      | 7.45%      | 7.54%     | 9.75%   | 10.08%  |
| 37 | 65-74       | 7.67%      | 8.45%      | 6.31%      | 7.54%     | 7.52%   | 6.72%   |
| 38 | 75 & OVER   | 8.17%      | 7.98%      | 4.86%      | 6.89%     | 5.68%   | 4.44%   |
| 39 |             | 100%       | 100%       | 100%       | 100%      | 100%    | 100%    |
| 40 |             |            |            |            |           |         |         |
| 41 |             |            |            |            |           |         |         |
| 42 |             |            |            |            |           |         |         |
| 43 |             |            |            |            |           |         |         |
| 44 |             |            |            |            |           |         |         |
| 45 |             |            |            |            |           |         |         |

