NOVEMBER 29, 1983

THE 1983 BART LATENT DEMAND STUDY

PREPARED FOR:
THE BAY AREA
RAPID TRANSIT
DISTRICT

PREPARED BY:

BBW, INC.

Research, Counsel in Marketing & Public Affairs
690 Market Street, Suite 820, San Francisco, CA 94104 (415) 392-0365

TABLE OF CONTENTS

BBW

LIST OF TABLES

LIST OF TABLES (cont.)

LIST OF TABLES (cont.)

LIST OF TABLES (cont.)

RECOMMENDATIONS

* Since convenience is the single most important reason for mode choice, BART should investigate ways of making BART more convenient to more people. This would include working closely with feeder bus systems to assure better coordinated schedules.

* Perceptions that BART parking lots are not safe inhibit many from taking BART. Since BART has made considerable improvement in this area, it should be publicized. Many think that BART takes little or no responsibility for the parking areas. This perception might be modified if parking lots were better lighted and security more visible.

* Another source of insecurity about BART is the perceived aloofness of station atendendants. This problem should be examined closely and corrective measures taken. Advertising can help also to humanize the image of the BART station agent.

* BART has an untapped potential of more than 340,000 commuters who do not ride BART at least once per week and more than 50,000 commuters who ride BART irregularly. This market can be reached most effectively with a retail marketing approach that stresses availability and price and encourages trial.

* Availability messages are those that suggest new ways for people to use BART, such as the recent promotions of BART for leisure and entertainment activities. These promotions could be strengthened if weekend hours were extended since BART's midnight closing is a major reason for not using BART on weekend evenings.

* Messages based on price -- for example, the savings one can make by using BART instead of driving -- have great appeal but are often viewed as applying to other people. There are simply so many variables that must be considered in computing the cost of an auto commute trip that commuters tend not to believe average figures. If such an appeal were to be used, we suggest that it be set up as a custom computer game in BART stations so that commuters can compute the costs of their own commute trip via car and via BART. If successful, such computer games could be set up in other central places, such as shopping centers.

* The high level of satisfaction among current BART commuters suggests that stimulated trial among nonriders would result in converts. Incentives like special reduced fare or discounted monthly passes available through employers can stimulate trial. This strategy has been used successfully by the marketers of coffee, cosmetics, and other goods and services that are used habitually or command strong brand loyalty. Often, to lure a customer away from their customary brand, a free or nearly free sample of a new brand must be offered.

* Future research should assess BART's share of the commuter market at the county, rail line, and station level. A special effort should be made to identify the problems and opportunities faced by each line.

* Research on perceptions of safety and the approachability of station personnel also should be conducted at the station level. As improvements in safety are made, the effects on perceptions should be tracked.

* In order to fashion advertising and public relations messages that will give nonriders new and compelling reasons to try BART, research on specific perceptions should be conducted. Sophisticated research designs and analytic procedures can be used to discover the kinds of perceptions that actually govern mode choice and, thus, have the power to change commuter's behavior.

EXECUTIVE SUMMARY OF QUANTITATIVE AND QUALITATIVE RESULTS

BART'S COMMUTER MARKET POTENTIAL AND MARKET SHARE

- Fifty-two percent (52%) of employed persons living within a three-mile radius of a BART station commute five miles or more to a workplace served by BART. Thus, within this primary service area, BART has an estimated potential commuter market of more than 462,000 commuters (Table 1).

- Of this potential market:

  --Fifteen percent (15%) take BART on at least eighty percent (80%) of all commute days. However, in Contra Costa County, this percentage is twenty-two percent (22%)(Table 1.2).

  --Eleven percent (11%) take BART on less than eighty percent (80%) of all commute days (Table 1.2).

  --Seventy-four percent (74%) do not take BART to work. However, in Contra Costa County, just sixty-three percent (63%) do not take BART (Table 1.2).

- Of the total number of commute trips made by the potential market:

  --Sixteen percent (16%) are made on BART (Table 1.3).

  --Fifty-eight percent (58%) are made by solo drivers (Table 1.3).

  --Nineteen percent (19%) are made by bus or other surface transit (Table 1.3).

  --Seven percent (7%) are made in carpools or vanpools (Table 1.3).

DEMOGRAPHIC DIFFERENCES BETWEEN BART COMMUTERS AND OTHER COMMUTERS

Demographic groups with a greater likelihood of being regular BART riders include:

- Blacks, Asians and Spanish-Americans (Table 2.2).

- White collar workers, including professionals, technicals, managers, proprietors, clericals and sales personnel. Blue collar workers are unlikely to ride BART (Table 2.4).

- Higher status workers--professionals, technicals, managers and proprietors--with annual household incomes less than $30,000 (Table 2.5).

- Those who own one automobile or less (Table 2.9).

- Those who commute ten or more miles to work (Table 4.1).

- Those who commute to San Francisco, especially from Contra Costa County (Table 4.2).

PERCEPTIONS OF BART'S RELIABILITY

- While flextime workers are no more likely than fixed time workers to use BART (Table 3.1), and those who say it is "very important" to be on time are just as likely as those who say it is "not important at all" (Table 3.2), those who can be more than ten minutes late without creating a problem are more likely to take BART than those who must be on time (Table 3.3). In addition, just thirty nine percent (39%) of non-BART commuters believe that they could estimate their arrival accurately if they took BART (Table 6.6).

- The focus groups suggest that the source of this perceived unreliability has three bases:

  --Unawareness of the printed timetables, even among regular BART commuters.

  --Dissatisfaction with the frequency and reliability of connecting transit to BART. Better than more closely-timed connecting transit would do much to allay this perception.

  --The feeling that anything less than perfect reliability may cause a long delay. As one respondent observed, "Ninety-nine percent reliability isn't good enough if one breakdown can tie up the whole system." BART may need to clarify what it means by the published reliability figures.

PERCEPTIONS OF BART: SAFETY

- When asked about overall safety, the majority rated BART "very safe," with BART commuters giving higher ratings than non-BART commuters (Table 10.1). However, when

asked about specific aspects of safety, ratings were considerably lower. Specific trouble spots are security in BART parking lots and the safety of the Berkeley Hills Tunnel (Table 10.2).

- The focus groups revealed that there is considerable anxiety about personal safety in both stations and parking lots among non-BART commuters. Worry about leaving cars in the parking lots is near universal. These concerns are linked to a feeling that there is no visible security in the lots. BART commuters were not nearly as concerned but did express worry about being in certain stations and waiting for connecting transit in unsafe areas at night as well as walking to parking places away from the BART station.

PERCEPTIONS OF BART: TIME AND COST

- Non-BART commuters are likely to believe that taking the BART would both cost more and take more time than their current mode. However, most do not know how much BART would cost (Tables 6.2, 6.3, 6.4).

- When focus group participants were shown the BART-provided material on potential savings the modal reaction in all the groups was disbelief. Many said the auto costs were not relevant because of high mileage cars, ridesharing, no bridge tolls, or free parking at work. Most said there are just too many variables for average figures to be applied to everyone. However, the idea of a $1,500 yearly saving was appealing to most. Some non-BART commuters however noted that it was not worth an extra hour spent commuting.

REASONS FOR MODE CHOICES

- Convenience is the single most important reason for taking BART, driving alone, or taking the bus. However, carpoolers and vanpoolers are more likely to mention lower cost (Table 5.1). The focus groups reinforced this. Drivers also mentioned feelings of independence and privacy. However, both BART and non-BART commuters agree that driving creates tension and frustration.

- For BART commuters, "less aggravation" is the second most important reason. BART commuters gave this response twice as frequently as bus commuters and carpoolers/vanpoolers and more than thirty times more frequently than drivers (Table 5.1). In the focus groups, BART commuters were unanimous in their agreement that BART provides a comfortable, tension-free commute. They prefer BART to other transit because it is cleaner, smoother,

and cooler. They think of their commute time as a private time, and do not normally strike up conversations with strangers.

REASONS FOR NOT TAKING BART

- The survey identified three important types of reasons for driving instead of taking BART:

  --Inconvenient location of BART stations--thirty-three percent (33%).

  --No reasons--twenty-one percent (21%), which means that the respondent has not thought about taking BART, or simply does not want to take BART.

  --Need car during day--eighteen percent (18%). Eighty percent (80%) of those who gave this reason also say they need their car every day (Table 11.1).

- Those who reported a need for a car during the workday were no less likely, however, than were other commuters to say they would use BART more often if a series of service improvements were made. These results suggest than need for a car during the day may be more a matter of convenience than necessity (Table 11.3).

- Focus group participants agreed that convenience is the most important criterion for mode choice. The primary reason non-BART commuters don't take BART is that it doesn't go where they want to go. The group discussions also identified another important reason for not taking BART--anxiety about personal safety in stations and parking lots.

TRAVEL TO AND FROM BART STATIONS

Travel time between work and BART is more important in mode choice than travel time between home and BART. Specifically:

- BART commuters are considerably more likely to say they can get from work to BART in five minutes or less than non-BART commuters. There are no differences for time from home to BART (Table 7.2).

- Non-BART commuters are about equally likely to say they would take the bus as walk from work to BART if they were to take BART, while BART commuters are three times more likely to walk as take a bus. There were no important differences in mode chosen for travel between home and BART (Table 8.1).

The focus groups reinforced the idea that time spent traveling between BART and work is perceived as more expensive than time spent traveling between BART and home. There is, however, one exception: commuters are extremely sensitive to time spent waiting for connecting transit in the evening, especially if they must wait in poorly-lighted areas away from the BART station.

CONNECTING TRANSIT

- Less than one-third of BART commuters use transit to travel from home to BART, and just one in five use transit to go from work to BART. However, two in five non-BART commuters say they would use transit from work to BART if they were to use BART (Table 8.1).

- Those who use connecting transit to travel to or from BART are more satisfied with travel time and costs than with the reliability of schedules or waiting time (Table 8.2).

- Just eleven percent (11%) of non-BART commuters both believe that their home is not served by a direct bus to BART and would be more likely to take BART if one were available (Table 8.4). The focus groups suggest that non-BART commuters would rather use connecting transit than drive and park. However, this preference was highly qualified. They would prefer connecting transit if they did not have to wait for buses, if waiting areas were better lighted and more secure, and if they did not feel vulnerable on buses.

PARKING AT BART STATIONS

- Over one-third of BART commuters who drive to BART arrive earlier than necessary to find a parking place (Table 9.2).

- When asked if parking is a reason they don't take BART, few (thirteen percent--13%) non-BART commuters said yes (Table 9.4), nor is guaranteed parking a major incentive to take BART (Table 9.5).

- However, the focus groups suggest that parking problems may affect ridership in more subtle ways. Commuters are more worried about having to park far from the BART stations in an unlighted, unsecured place, than about finding a parking place at all. The non-BART commuters argued that only well-lighted guaranteed parking near the station would be a major incentive to take BART.

Another reason that more parking or guaranteed parking is not greeted with enthusiasm by BART commuters is than many perceive the process of driving, parking and taking BART to work as being much more time-consuming than simply driving. Once the car is out of the garage, the tendency is to drive straight to work, especially if there is no parking problem at work.

WHAT WOULD MAKE COMMUTERS TAKE BART MORE OFTEN?

- Only five possible improvements were tested in the survey. Of these, the most potentially productive improvement that BART could make, short of building new stations nearer the homes and workplaces of commuters, is a monthly pass. If this pass were both discounted and available through employers, it will draw even more ridership, especially among irregular BART commuters (Table 11.1).

- Focus group participants were asked to suggest improvements as well as to respond. Both BART commuters and non-BART commuters suggested better, more closely-timed connecting transit and clearer information in the stations on how to use the transit. They were not enthusiastic about reserved parking for a fee, unless places in the better-lighted areas near the station could be guaranteed or a shuttle could be provided. Monthly passes were warmly received, but only if discounted by at least ten percent (10%) to twenty percent (20%). Otherwise, participants found that less than perfectly regular use would cause them to lose money. There was also some concern over losing the pass itself. Reactions to debit and credit cards were mixed. These possible innovations provoked anxiety in some participants. The multi-operator pass was warmly received, but all of the groups had difficulty envisioning how it could be done fairly to reflect commute differences.

OFF-PEAK RIDERSHIP

- BART commuters are more likely than non-BART commuters to ride BART for non-commute purposes during off-peak weekday hours, weekday evenings, and weekends (Table 13.1). However, in the focus groups, non-BART commuters were more enthusiastic about the idea of using BART evenings and weekends than were BART commuters. BART commuters associate BART with work while non-BART commuters (primarily drivers) associate their cars with work. Both would like a change of pace when they are at leisure. This apparent inconsistency is due to the qualifications non-BART commuters placed on using BART evenings and weekends.

They would use BART if improvements were made, including:

--A 2:30 a.m. or 3:00 a.m. closing on Fridays and Saturdays.

--Increased visible security at night (for most respondents, night begins when it gets dark, or at the end of the peak rush hour).

- o About four in ten of both BART commuters and non-BART commuters who use BART for non-commute purposes say they would ride BART more often if they could buy a discounted weekend pass for their entire family (Table 13.4).

- o All focus group participants reacted enthusiastically to the idea of reduced fares on weekends and most liked the idea of a reduced fare weekend pass for the whole family. BART riders suggested an occasional free ride with the free tickets distributed to avoid everyone using it at once. Their reasoning was that people generally do not know how nice it can be to ride BART, predicting that people who try BART will keep on riding.

EVALUATIONS OF BART ADVERTISING (FOCUS GROUPS ONLY)

- o Awareness of BART advertising was very low among non-BART commuters and infrequent BART commuters, but somewhat higher for BART commuters. Generally, BART commuters liked the television ads, although they noted that BART is not a place to meet people. Non-BART commuters were more critical. Generally, they want more information and less image. BART commuters concur, and were nearly unanimous in suggesting that BART stress the idea of a hassle-free commute and meet head-on misperceptions about BART safety and reliability. The non-BART commuters especially want ads that tell them something they don't already know about BART.

- o Joe Kapp and Al Davis were recognized by men but not for the most part by women. The reaction to Davis was extremely negative. The group suggested other possible personalities. Those with both high identification and appeal included Stella and Meara and a trainload of Bay Area mayors. Generally, the idea of a big-name celebrity did not fare well with the groups because the participants did not think the rich and famous would actually use BART. However, about half of the participants thought a well-known local person would catch viewers' attention.

INTRODUCTION

This section describes the background, objectives, and methodology of both the quantitative and qualitative research conducted by BBW, Inc. for the Bay Area Rapid Transit District.

1. Background and Objectives of the Quantitative Research

This study was conducted at the request of the Bay Area Rapid Transit District to:

- estimate BART's market potential and market share within its primary service area.
- compare BART commuters with non-BART commuters living within BART's primary service area who have a reasonable opportunity to take BART.
- ascertain the reasons why non-BART commuters do not take BART and assess the impact of BART improvements on ridership.

This research is the latest in a series of studies conducted over the past twelve years. It differs from previous studies in that it allows us to compare the demographic differences, commute trip characteristics, perceptions and motivations of regular and irregular BART commuters to non-BART commuters who could take BART. This study also represents the first attempt to define BART's market in terms of actual trips.

2. Quantitative Methodology

The 1983 BART Latent Demand Study is based on 1135 telephone contacts with employed persons living within a three-mile radius of a BART station and 584 interviews with employed persons ascertained to be commuters with a reasonable opportunity to take BART to work. Interviews averaged about twenty minutes in length.

A probability sample of households was drawn from census tracts with at least sixty percent (60%) of their area within the three-mile radius by Survey Sampling, Inc. of Westport, Connecticut. Thus, some households beyond the three-mile limit were included. In addition, those who have recently moved but who have retained their previous telephone numbers would also introduce error into the sample. However, since Survey Sampling, Inc. updates its sample frame every three months, this error is likely to be small.

The sample was divided into 1000 clusters of five households. Interviewers were required to make three separate properly-timed attempts to reach one household member among each of these five households before moving on to another cluster. Interviewers could not replace a cluster without the authorization of a supervisor.

If no qualified respondent was at home when the first attempt was made to complete an interview, a callback was scheduled. Households with non-working phone numbers, respondents refusing to be interviewed and language problems were eleminated on the first attempt. Respondents terminating interviews were referred to supervisors for all callbacks. The callback rules were designed to limit interviewer discretion and control for non-response bias. To be qualified, a respondent had to (1) be employed outside of the home; (2) commute at least five miles to work, and (3) work within one mile of a BART station or in a location serviced by a direct means to transportation to BART. Only one person was interviewed in any given household.

All study design, sampling questionnaire development, data reduction, tabulation and analysis work was performed by BBW, Inc. personnel. Ten percent (10%) of all interviews were independently validated for procedure and content by supervisory personnel.

Rebecca Quarles, Ph.D., served as project director and senior analyst. Dr. Quarles was assisted by Mr. Jeffrey Henne with questionnaire development, data analysis and report publication. The questionnaire was pretested for length, bias and clarity. Fifteen pretest interviews were completed. Following the pretest, the questionnaire was revised after consultation with BART.

Given a sample size of approximately six hundred (600), results are projectable to the universe of those living within three miles of a BART station to within plus or minus four percent (4%), given a ninety-five percent (95%) confidence level. This means that we can have "95% confidence" that if everyone had been surveyed with the same questionnaire, the results would vary no more than plus or minus four percent (4%). In actuality, sampling error varies from data item to data item. For example, survey findings show that a one-sided distribution of opinion, such as seventy percent (70%) to thirty percent (30%) or ninety percent (90%) to ten percent (10%) are usually subject to slightly lower sampling tolerance.

BBW

3. Background and Objectives of the Qualitative Research

Four focus group discussions were commissioned by BART as a follow-up to the 1983 BART Latent Demand Survey, also conducted by BBW, Inc. That survey provided estimates of BART's market share and potential market within its primary service area, as well as comparisons between BART and non-BART commuters in terms of demographics and commute trip characteristics.

The focus group research was undertaken to probe more deeply perceptual differences between BART and non-BART commuters, to identify barriers to taking BART and strategies for increasing both commute and non-commute trips, and to test potential service upgrades and advertising messages.

4. Qualitative Methodology

Four two-hour discussion sessions were held on September 19 and 20 in the BBW, Inc. Qualitative Research Center in San Francisco. Participants were recruited from respondents to the 1983 BART Latent Demand Study, all of whom live within three miles of a BART station and commute to a workplace served by BART.

Two groups were composed of non-BART commuters. Of the eighteen participants in these two groups, fourteen drive alone to work, three mix driving and transit use, and one is a member of a carpool. As the survey results showed, commuting drivers have higher incomes on the average and are more likely to be white than are BART commuters. This difference is apparent in the composition of the focus groups. *

One group consisted of irregular BART commuters, or commuters who use BART on less than eighty percent (80%) of all their commute days. Most of these commuters alternate BART use with driving but others alternate BART with other transit. Again, demographic differences found in the survey were mirrored in the focus group. Irregular BART commuters tend to be younger than either drivers or regular BART users.

The final group consisted of regular BART commuters, or those who use BART on at least eighty percent (80%) of all commute days. This group was included as a control so that attitudinal and perceptual differences between BART commuters and non-BART commuters could be identified.

---

*Please see Figure A for a breakdown of the demographic composition of the groups.

BBW

Focus group participants were recruited by the BBW, Inc. Qualitative Research Center recruiting staff according to specifications developed by BBW, Inc. and BART. An outline of topics to be covered in the discussions was developed jointly by BART and BBW, Inc. research analysts. Respondents were each paid a $25 incentive for participating in the discussions.

Moderator for the sessions was Rebecca C. Quarles, Ph.D., senior analyst, BBW, Inc.

5. Interpreting Focus Group Findings

Small sample qualitative research like these focus group discussions is a useful tool for gaining insight into the feelings and opinions of people. Since samples are necessarily small, the findings cannot be projected to the greater population. However, they can be used to add depth to quantitative surveys such as (in this case) the 1983 BART Latent Demand Study. Focus group findings also are particularly helpful in generating questions for future quantitative research, or developing a general understanding of how promotional messages are received by particular audiences.

FIGURE A

DEMOGRAPHIC COMPOSITION OF GROUPS

	Non-BART Commuters	Irregular BART Commuters	Regular BART Commuters
Age:			
Under 25	3	1	1
25 to 34	3	6	2
35 to 44	6	2	2
45 to 54	5		2
55 and older	1		1
Occupation:			
Professional/Technical	7	3	4
Managers/Proprietors	3	2	1
Sales/Clerical	1	2	1
Blue Collar	7	2	2
Ethnicity:			
White	12	5	4
Black	2	4	3
Mexican-American	1		1
No Response	3		1
Income:			
Under $15,000	2	3	1
$15,000 to $29,999	7	4	5
$30,000 or more	8	2	2
No response	1		

I. SIZE AND POTENTIAL OF BART'S COMMUTER MARKET

The 1983 BART Latent Demand Study was based on a probability sample of employed persons living within three miles of a BART station. The radius was chosen because it represents BART'S estimate of its primary service area.

Within the three-mile radius, BART's target commuter market was further defined to include only employed persons who commute at least five miles to work and whose workplace is served by BART. The full questionnaire was administered only to those who met all these criteria, but incidence levels were documented to enable market potential projections to be made.

Of the 1,135 employed persons contacted:

- Thirty-three point seven percent (33.7%) were not interviewed because of a short commute.
- Fourteen point eight percent (14.8%) were not interviewed because their workplace is not served by BART.
- Fifty-one point five percent (51.5%) were classified as part of BART's potential commuter market and interviewed.

1.1 BART's Maximum Potential Primary Market Size

Table 1.1 shows BART's maximum potential market within its primary market area. The projections were made using census data form census tracts within three miles of a BART station. Only census tracts with sixty percent (60%) or more of their area within the three-mile radius were included.

- BART's potential market within its primary service area approaches one half million commuters.

TABLE 1.1

TOTAL EMPLOYED PERSONS AND COMMUTERS WHOSE WORKPLACE IS SERVED BY BART LIVING WITHIN BART'S PRIMARY SERVICE AREA*

	TOTAL EMPLOYED	% OF EMPLOYED WHOSE WORKPLACE IS SERVED BY BART**	TOTAL EMPLOYED WHOSE WORKPLACE IS SERVED BY BART**
TOTAL TRI-COUNTY	897,749	51.5%	462,341

* Defined as living within three miles of a BART station.

** Defined as

- commuting five miles or more to work
- having a BART station within one mile of the workplace or a direct means of transportation from the station to work.

1.2 Actual and Potential Ridership in the Three Counties

Table 1.2 shows actual and potential ridership for the Alameda, Contra Costa, and San Francisco County BART service areas. The proportions of BART riders and non-riders for each county were derived from the survey data.

- Overall, BART riders constitute twenty-six percent (26%) of commuters in the service area, or about 120,000 commuters. However, only 14.7%, or about 68,000 commuters, ride BART on at least 80% of all commute days while 11.3%, or about 52,000, ride BART less regularly.

- BART's unrealized potential includes the 74.0% of the commuter market, or about 342,000 commuters, who do not ride BART plus the 11.3%, or 52,000 commuters, who ride BART on an irregular basis. Thus, in the Tri-County service area, BART's unrealized potential market is about 394,000 commuters, or 85.3% of all commuters whose workplace is served by BART.

- BART's potential is best realized in Contra Costa County where fully 36.7% of commuters with a reasonable opportunity to ride BART do so at least once a week and 21.9% ride BART regularly. Thus, Contra Costa County commuters who have an opportunity to ride BART are about 40% more likely to do so at least once a week and nearly 50% more likely to ride regularly than are Alameda and San Francisco County commuters.

TABLE 1.2

ACTUAL AND POTENTIAL BART RIDERSHIP IN ALAMEDA, CONTRA COSTA, AND SAN FRANCISCO COUNTIES

	Total commuters Whose Work-place Is Served By BART	Regular BART Commuters[1]	Non-regular BART Commuters[2]	Commuters Who Do Not Ride BART[3]
Percentage of Alameda County Service Area	100%	13.4%	9.9%	76.7%
Percentage of Contra Costa County Service Area	100%	21.9%	14.8%	63.3%
Percentage of San Francisco County Service Area	100%	13.9%	10.7%	75.4%
PERCENTAGE OF TOTAL SERVICE AREA	100%	14.7%	11.3%	74.0%
Number of Commuters	462,341	67,964	52,245	342,132

1. Commuters who ride BART on 80% or more of commute days.
2. Commuters who ride BART on less than 80% of all commute days.
3. Commuters who do not ride BART at least once a week.

1.3 Market Size: Number of Trips

Respondents were asked to identify all the transportation modes used in a typical week to commute to work. For each mode, they were asked the number of one-way trips taken on a weekly basis.

For each mode, the mean number of trips was calculated and then projected to the population of the primary service area on the basis of census data.

Table 1.5 shows these projections for each major transportation mode.

- The primary service area currently generates about 380,000 one-way BART trips each week.
- This constitutes sixteen percent (16%) of all major-mode trips. This percentage would increase to about 26% if all those who ride BART at least once per week took BART for all their commute trips. Thus, significant gains can be made by converting irregular riders to regular riders.

TABLE 1.3

NUMBER OF WEEKLY ONE-WAY COMMUTE TRIPS ORIGINATING IN BART'S PRIMARY SERVICE AREA BY MODE[1]

	Number of Trips	Percentage of Trips
BART	398,000	16%
Driving Alone	1,389,000	58
Bus/Surface Transit	458,000	19
Carpool/Vanpool	171,000	7
TOTAL	2,416,000	100%

1 Includes both trips to work and trips from work.

1.4 Market Size: Number of Trips to Work by Arrival Time

Like all survey results, the percentage and estimated number of trips shown in Table 1.4 are affected by sampling error. Thus, the figures are expressed in ranges.

- For all modes, most trips to work are made during the morning peak hours.
- However, considerable latent demand during off-peak hours. For example, between 153,000 and 250,000 auto trips are made during midday off-peak hours and another 167,000 to 278,000 trips are made in the early morning off-peak period.
- BART's share of the market remains constant during the day but drops off in the evening.

TABLE 1.4

PERCENTAGE AND ESTIMATED NUMBER OF TRIPS TO WORK FOR EACH MAJOR MODE BY WORK ARRIVAL TIME.

	BART		DRIVE ALONE		BUS/SURFACE TRANSIT	
	Percent	Numbers	Percent	Numbers	Percent	Numbers
MORNING PEAK (7:01AM-9:00AM)	62% to 77% [1]	247,000 [2] to 306,000 [3]	61% to 71%	848,000 to 986,000	54% to 74%	247,000 to 339,000
MIDDAY OFF-PEAK (9:01AM-4:30PM)	11% to 23%	44,000 to 91,000	11% to 18%	153,000 to 250,000	16% to 34%	73,000 to 156,000
EARLY AM OFF-PEAK (1:01AM-7:00AM)	7% to 17%	28,000 to 68,000	12% to 20%	167,000 to 278,000	4% to 16%	18,000 to 73,000
EVENING (4:31PM-1:00AM)	0% to 3%	0 to 12,000	1% to 5%	14,000 to 69,000	0% to 3%	0 to 14,000
TOTAL	100%	398,000	100%	1,389,000	100%	458,000

(1) Range reflects the sampling error for each percentage and base, as derived using the formula:

$$\text{Sampling Error} = \sqrt{\frac{pq}{N}}\ (1.96)$$

for sampling error at the 95% confidence level.

(2) Numerical projections were derived by first calculating the total number of trips to work for each mode by work arrival times for the survey sample, and then projecting these figures to the total population on the basis of census data for the primary service area.

(3) Rounded to the nearest 1,000 trips.

1.5 Market Size: Numbers of Trips Home from Work by Work Leaving Time

Like all survey results, the percentage and estimated numbers of trips shown in Table 1.5 are affected by sampling error. Thus, the figures are expressed in ranges.

- For all modes, most trips home from work are made between 4:30 and 7:00 p.m., or evening peak hours.
- The number of trips is even greater if the 3:00 to 4:30 time period is included in the evening peak (see Footnote 5, Table 1.5).
- BART's share drops to about half its daytime level after 7:00 p.m.

TABLE 1.5

PERCENTAGE AND ESTIMATED NUMBER OF TRIPS HOME FROM WORK FOR EACH INDICATOR MODE BY WORK LEAVING HOURS

	BART			DRIVE ALONE			BUS/SURFACE TRANSIT		
	Percentage of BART Commuters	Numbers	Share	Percentage of Drivers	Numbers	Share	Percentage of Bus Commuters	Numbers	Share
EVENING PEAK (4:31pm-7:00pm)	56% to 72%[1]	222,000[2] to 285,000[3]	20%	49% to 59%	684,000 to 823,000	59%	51% to 69%	234,000 to 316,000	21%
EVENING (7:01pm-12:00am)	1% to 7%	4,000 to 28,000	3%	6% to 12%	84,000 to 167,000	72%	2% to 12%	9,000 to 55,000	18%
EARLY AM (12:01am-6:00 am)[4]	0% to 0%	0 to 0	0%	0% to 2%	0 to 28,000	100%	0% to 0%	0 to 0	0%
AM (6:01 am to 11:00 am)[4]	0% to 2%	0 to 8,000	10%	0% to 4%	0 to 56,000	72%	0% to 3%	0 to 14,000	18%
MIDDAY (11:01am-4:30 pm)[4]	24% to 38%	95,000 to 151,000[5]	17%	29% to 38%	405,000 to 530,000[5]	64%	21% to 39%	96,000 to 179,000[5]	19%
TOTAL	100%	396,000		100%	1,395,000		100%	458,000	

1. Range reflects the sampling error for each percentage and base, as derived using the formula:

SAMPLING ERROR $= \sqrt{\frac{pq}{N}}\ (1.96)$ for sampling error at the ninety-five percent (95%) confidence level.

2. Numerical projections were derived by first calculating the total number of trips from work for each mode by work leaving times for the survey sample, and then projecting these figures to the total population on the basis of census data for the primary service area

3. Rounded to the nearest 1,000 trips.

4. Because a different category system was used in the questionnaire for work leaving and work arrival times, these categories differ from those presented on Table 1.4.

5. Most of the trips in the midday category were intitiated between 3:00 p.m. and 4:30 p.m. Thus, it may be appropriate to include these trips in the evening peak period. If this were done, the evening peak would increase by about twenty-six percent (26%) or 101,000 trips for driving alone, and twenty-seven percent (27%) or 123,000 trips for the bus and other surface transit. The midday period would decrease by a commensurate amount.

II How Demographic Variables Are Related to BART Ridership and the Use of Other Commute Modes

The 1980 BART Passenger Profile Study compared the demographic characteristics of a sample of BART riders with Bay Area census data. The results showed that BART riders are more affluent, better educated, and more likely to be between the ages of 25 and 50 than is the Bay Area population as a whole.

In the 1983 BART Latent Demand Study, BART riders are compared to other commuters in the BART service area, defined as living within three miles of a BART station and working at a place that is either within one mile of a BART station or served by direct transportation. Thus, in the current study, the demographic characteristics of BART commuters are compared to those of other commuters who have at least a reasonable opportunity to ride BART to work.

In the tables that follow, BART riders also are analyzed according to whether ridership is regular or irregular. Regular riders are those who use BART on at least 80% of their total commute days.

2.1 THE RELATIONSHIP BETWEEN AGE AND COMMUTER MODE USE

- The younger the commuter, the more likely he is to ride BART at least once per week. Commuters who are 24 or younger are about twice as likely to use BART at least once per week as are those 55 or older. However, the youngest age group is only about five percent (5%) more likely than the oldest age group to be a regular BART commuter.

- Older commuters are more likely to drive to work alone than are younger commuters. Fewer than half of those 24 or younger but nearly seven in ten of those 45 or older drive alone.

- Buses and other surface transit are used most frequently by the youngest and oldest age groups, but these differences are not statistically significant.

TABLE 2.1

THE RELATIONSHIP BETWEEN AGE AND COMMUTER MODE USE

	Age: 24 or Younger	25-34	35-44	45-54	55 or Older	Total Sample
Uses BART at least once per week	34%	28%	25%	22%	18%	26%
Uses BART on at least 80% of all commute days	16%	15%	17%	12%	11%	15%
Uses BART on less than 80% of all commute days	18%	13%	8%	10%	7%	11%
Does not use BART at least once per week[1]	66%	72%	75%	78%	82%	
Drives alone on at least 80% of all commute days	47%	57%	58%	70%	66%	59%
Rides bus/surface transit on at least 80% of all commute days	21%	15%	15%	12%	21%	16%
Rides in carpool/ vanpool on at least 80% of all commute days	8%	5%	5%	2%	5%	5%
	N=77	N=217	N=137	N=83	N=62	N=576

* 8 respondents did not disclose their age

(Qn.12, Qn.60)

1. The percentage for at least eighty percent (80%) use of each mode does not add to the total of those who do not use BART at least once per week. This is true because, (1) those who use BART on less than eighty percent (80%) of all commute days also use other modes, and (2) the table does not include all possible modes.

2.2 THE RELATIONSHIP BETWEEN ETHNICITY AND COMMUTER MODE USE

- Whites are less likely to ride BART at least once a week than are Blacks, Asians and Spanish-Americans.

- Asians and Spanish-Americans are particularly likely to ride BART regularly. Both groups are about twice as likely as Whites to use BART on 80% or more of all commute days.

- Blacks, Spanish-Americans and Asians are more likely than Whites to use buses or other surface transit, but Spanish-Americans are just as likely as Whites to drive alone.

TABLE 2.2

THE RELATIONSHIP BETWEEN ETHNICITY AND COMMUTER MODE USE

	Ethnic Group:				
	White	Black	Asian	Spanish American	Total Sample
Uses BART at least once per week	22%	33%	37%	35%	26%
Uses BART for at least 80% of all commute days	12%	17%	24%	27%	15%
Uses BART for less than 80% of all commute days	10%	16%	13%	8%	11%
Does not use BART at least once per week[1]	78%	67%	63%	65%	74%
Drives alone for at least 80% of all commute days	63%	44%	41%	62%	58%
Rides bus/surface transit on at least 80% of all commute days	13%	20%	43%	22%	16%
Rides in carpool/ vanpool on at least 80% of all commute days	4%	8%	4%	5%	5%
	N=409	N=64	N=51	N=37	N=561

(Qn.12, Qn.61)

*23 respondents either gave other responses or did not answer the question.

1. Same as previous table.

2.3 THE RELATIONSHIP BETWEEN INCOME AND COMMUTER MODE USE

- Commuters with household income less than $20,000 per year are more likely to ride BART at least once per week than are those with higher incomes. However, there is no difference between higher and lower income groups in terms of regular ridership.

- Commuters whose income is less than $20,000 are less likely to drive alone and more likely to take a bus or other surface transit than are higher income riders. Still, on eighty percent (80%) of all commute days this group is just as likely to drive alone as to take mass transit.

TABLE 2.3

THE RELATIONSHIP BETWEEN INCOME AND COMMUTER MODE USE

	Household Income:				
	Less than $20,000	$20,000-$29,999	$30,000-$39,999	$40,000 or more	Total Sample
Use BART at least once per week	35%	26%	19%	24%	26%
Use BART at least 80% of all commute days	16%	16%	10%	16%	15%
Use BART on less than 80% of all commute days	18%	10%	9%	9%	11%
Does not use BART at least once per week [1]	65%	74%	81%	76%	74%
Drives alone at least 80% of all commute days	44%	60%	64%	65%	58%
Rides bus/surface transit at least 80% of all commute days	25%	17%	10%	12%	16%
Rides in carpool/ vanpool on at least 80% of all commute days	4%	5%	5%	5%	5%
	N=142	N=134	N=106	N=155	N=537*

(Qn.12, Qn.65)

* 47 respondents did not disclose their income.

1. Same as previous table.

2.4 THE RELATIONSHIP BETWEEN OCCUPATION AND COMMUTER MODE USE

- All professional, managerial, and other white collar workers are about equally likely to take BART, but blue collar workers are only about half as likely to do so. Blue collar workers represent twenty-four percent (24%) of BART's target market and only thirteen percent (13%) of its riders.[1]

- Full-time managers, proprietors, and blue collar workers are more likely than full-time professionals, technical workers, clericals, salespeople, or part-time workers to drive alone.

- Sales and clerical workers and part-time workers are more likely than other groups to use the bus or other surface transit.

1. In the sample of the target market, there were 137 blue collar workers, or twenty-four percent (24%) of the total sample. However, just 19 of these ride BART at least once per week. These 19 represent thirteen percent (13%) of all those in the sample who ride BART at least once per week.

TABLE 2.4

THE RELATIONSHIP BETWEEN OCCUPATION AND COMMUTER MODE USE

	Occupation:					
	Full-Time Professional/ Technical	Full-Time Managers/ Proprietors	Full-Time Sales/ Clerical	Full-Time Blue Collar	Part-Time	Total Sample
Uses BART at least once per week	27%	29%	32%	14%	36%	26%
Uses BART on at least 80% of all commute days	16%	16%	18%	8%	20%	16%
Uses BART on less than 80% of all commute days	11%	13%	14%	6%	16%	11%
Does not use BART at least once per week [1]	73%	71%	68%	86%	64%	74%
Drives alone on at least 80% of all commute days	54%	69%	56%	65%	44%	58%
Rides bus/surface transit on at least 80% of all commute days	14%	12%	23%	12%	22%	16%
Rides in carpool/ vanpool on at least 80% of all commute days	7%	1%	4%	6%	6%	5%
	N=154	N=90	N=146	N=137	N=50	N=577

* 1 respondent was not classifiable; 6 others did not declare their occupations (Qn.3, Qn.12, Qn. 62)

1. The percentage for at least eighty percent (80%) use of each mode does not add to the total of those who do not use BART at least once per week. This is true because, (1) those who use BART on less than eighty percent (80%) of all commute days also use other modes, and (2) the table does not include all possible modes.

2.5 THE RELATIONSHIP BETWEEN INCOME AND MODE USE FOR DIFFERENT OCCUPATIONAL GROUPS

- Fully forty percent (40%) of higher status workers (Professionals, technicals, managers, and proprietors) who have household incomes less than $30,000 take BART, while just twenty-five percent (25%) of high status workers with higher incomes do so. This relationship holds for regular ridership as well. Thus, higher status but lower income commuters are more likely than any other group to be regular BART users.

- Blue collar workers, particularly higher income blue coller workers, are less likely than any other group to take BART regularly.

- Blue collar workers are less likely than any other occupational group to take BART, but as in the other occupational groups, lower income commuters take BART more than higher income commuters. However, those high-income blue collar workers who do take BART do so regularly.

- Within all the occupational groups, driving alone increases as income increases. However, this pattern is much stronger for lower status than for higher status occupations. Among the higher status commuters, those with lower incomes are just about as likely to drive alone as are those with higher incomes.

- The opposite pattern occurs for bus ridership. For lower status occupations, bus ridership increases as income decreases, but there is only a negligible difference between higher and lower income members of the higher status occupations.

TABLE 2.5

THE RELATIONSHIP BETWEEN INCOME AND MODE USE FOR DIFFERENT OCCUPATIONAL GROUPS

	Occupation/Income Groups						
	Higher** Status/ Lower Income***	Higher** Status/ Higher Income	White Collar/ Lower Income	White Collar/ Higher Income	Blue Collar/ Lower Income	Blue Collar/ Higher Income	TOTAL SAMPLE
Uses BART at least once per week	40%	25%	34%	29%	20%	6%	26%
Uses BART on at least 80% of all commute days	23%	15%	17%	17%	11%	6%	15%
Uses BART on less than 80% of all commute days	17%	10%	18%	13%	10%	0	11%
Does not use BART at least once per week[1]	60%	75%	66%	71%	80%	94%	74%
Drives alone on at least 80% of all commute days	52%	60%	46%	67%	55%	76%	58%
Rides bus/surface transit at least 80% of all commute days	17%	13%	30%	10%	17%	6%	16%
Rides in carpool/ vanpool on at least 80% of all commute days	2%	5%	5%	4%	5%	6%	5%
	N=82	N=159	N=97	N=48	N=94	N=54	N=533*

1. Same as previous table.

* 51 respondents did not disclose either occupation or income.

** Higher status workers include those in professional or managerial occupations, white collar riders to sales and clerical occupations

*** Lower income = household incomes of less than $30,000; higher income = $30,000 or more

2.6 THE RELATIONSHIP BETWEEN AGE AND MODE USE FOR DIFFERENT OCCUPATIONAL GROUPS

- Younger white collar and blue collar workers are more likely to ride BART at least once per week than are their older peers, but the relationship does not hold for regular ridership.

- Among those in higher status occupations, younger and older commuters are equally likely to ride BART, both on a regular and irregular basis.

- Among all occupational groups, older workers are more likely to drive alone than are younger workers. However, this tendency is considerably stronger among blue collar workers.

TABLE 2.6

THE RELATIONSHIP BETWEEN AGE AND MODE USE
FOR DIFFERENT OCCUPATIONAL GROUPS

	Occupation/Age Groups:						
	Higher Status/ Under 35	Higher Status/ Over 35	White Collar/ Under 35	White Collar/ Over 35	Blue Collar/ Under 35	Blue Collar/ Over 35	TOTAL SAMPLE
Uses BART at least once per week	29%	28%	39%	26%	22%	7%	26%
Uses BART on at least 80% of all commute days	15%	17%	18%	16%	11%	7%	15%
Uses BART on less than 80% of all commute days	13%	11%	20%	10%	12%	0	11%
Does not use BART at least once per week[1]	71%	72%	61%	74%	78%	93%	74%
Drives alone on at least 80% of all commute days	57%	61%	49%	59%	54%	72%	58%
Rides bus/surface transit on at least 80% of all commute days	12%	16%	28%	18%	13%	13%	16%
Rides in carpool/van-pool on at least 80% of all commute days	5%	4%	7%	3%	6%	6%	5%
	N=122	N=138	N=85	N=73	N=85	N=71	N=571*

(Qn.12, Qn.60, Qn.62)

1. Same as previous table.

* 8 respondents did not disclose age and 5 respondents did not disclose occupation

2.7 THE RELATIONSHIP BETWEEN INCOME AND MODE USE FOR OLDER AND YOUNGER COMMUTERS

- Younger commuters with household incomes of less than $30,000 are more likely to ride BART at least once per week than are any other groups. However, these commuters are also likely to be irregular BART riders so the relationship does not hold for regular ridership.

- Higher income/older commuters are more likely than other age/income groups to drive to work alone.

TABLE 2.7

THE RELATIONSHIP BETWEEN INCOME AND MODE USE FOR OLDER AND YOUNGER COMMUTERS

	Income/Age Groups: Less Than 35 Years Old/ Income Less Than $30,000	Less Than 35 Years Old/ Income More Than $30,000	More Than 35 Years Old/ Income Less Than $30,000	More Than 35 Years Old/ Income More Than $30,000	TOTAL SAMPLE
Uses BART at least once per week	34%	22%	25%	22%	26%
Uses BART on at least 80% of all commute days	16%	14%	17%	13%	15%
Uses BART on less than 80% of all commute days	19%	9%	9%	9%	11%
Does not use BART at least once per week [1]	66%	78%	75%	78%	74%
Drives alone on at least 80% of all commute days	50%	59%	54%	69%	58%
Rides bus/surface transit on at least 80% of all commute days	19%	14%	25%	9%	16%
Rides carpool/vanpool on at least 80% of all commute days	5%	6%	4%	4%	5%
	N=160	N=118	N=114	N=142	N=534*

(Qn.12, Qn.60, Qn.65)

* 50 respondents did not disclose their age or their income

1. Same as previous table.

2.8 THE RELATIONSHIP BETWEEN EDUCATION AND COMMUTER MODE USE

- Educational differences in mode use are small and not statistically significant.

TABLE 2.8

THE RELATIONSHIP BETWEEN EDUCATION AND COMMUTER MODE USE

	Education:				
	High School or Less	Some College	College Graduate	Post Graduate	Total Sample
Uses BART at least once per week	22%	29%	28%	25%	26%
Uses BART on at least 80% of all commute days	13%	18%	15%	12%	15%
Uses BART on less than 80% of all commute days	9%	11%	13%	12%	11%
Does not use BART at least once per week [1]	78%	71%	72%	75%	74%
Drives alone on at least 80% of all commute days	64%	58%	49%	62%	58%
Rides bus/surface transit on at least 80% of all commute days	16%	18%	21%	11%	16%
Rides in carpool/ vanpool on at least 80% of all commute days	7%	4%	4%	5%	5%
	N=135	N=177	N=138	N=130	N=580

(Qn.12, Qn. 64)

* 4 respondents did not disclose education.

1. Same as previous table.

2.9 THE RELATIONSHIP BETWEEN HOUSEHOLD AUTOMOBILE OWNERSHIP AND COMMUTER MODE USE

- Commuters who have less than two automobiles at home are more likely to ride BART than are those who have two or more.

- As would be expected, driving alone increases and the use of buses or surface transit decreases with the number of automobiles owned.

TABLE 2.9

THE RELATIONSHIP BETWEEN HOUSEHOLD AUTO OWNERSHIP AND COMMUTER MODE USE

	Number of Automobiles:				
	None	One	Two	Three or More	Total Sample
Uses BART at least once per week	34%	31%	20%	24%	26%
Uses BART on at least 80% of all commute days	23%	19%	12%	10%	15%
Uses BART on less than 80% of all commute days	11%	12%	9%	14%	11%
Does not use BART at least once per week[1]	66%	69%	80%	76%	74%
Drives alone on at least 80% of all commute days	6%	52%	66%	69%	58%
Rides bus/surface transit on at least 80% of all commute days	57%	21%	10%	7%	16%
Rides in carpool/ vanpool on at least 80% of all commute days	3%	4%	7%	5%	5%
	N=35	N=202	N=201	N=141	N=579

(Qn.12, Qn.63)

* 5 respondents did not disclose the number of automobiles present in the household.

1. Same as previous table.

2.10 THE RELATIONSHIP BETWEEN GENDER AND COMMUTER MODE USE

- Female commuters are more likely to ride BART than are males, but they are about equally likely to be regular riders.

- Females are more likely than males to use buses and other surface transit while males are more likely to drive alone. However, these differences are modest.

TABLE 2.10

THE RELATIONSHIP BETWEEN GENDER AND COMMUTER MODE USE

	Gender: Males	Females	Total Sample
Uses BART at least once a week	23%	30%	26%
Uses BART at least 80% of all commute days	13%	16%	15%
Uses BART on less than 80% of all commute days	10%	13%	11%
Does not use BART at least once per week[1]	77%	70%	74%
Drives alone on at least 80% of all commute days	62%	54%	58%
Rides bus/surface transit on at least 80% of all commute days	13%	20%	16%
Rides carpool/vanpool on at least 80% of all commute days	4%	7%	5%
	N=315	N=269	N=584

(Qn.12)

1. Same as previous table.

III HOW JOB CHARACTERISTICS ARE RELATED TO BART RIDERSHIP AND THE USE OF OTHER COMMUTE MODES

This section examines the possibility that such job characteristics as flexibility of hours and importance of being on time affect commute mode use.

3.1 The Effect of Flextime

Workers with flexible hours do not differ significantly from those with fixed hours in terms of mode use. For example, twenty-six percent (26%) of both fixed and flextime workers use BART at least once per week and the difference between the fifty-seven percent (57%) of fixed-time workers and the sixty percent (60%) of flextime workers who drive alone is negligible.

TABLE 3.1

THE RELATIONSHIP BETWEEN FLEXIBLE WORK HOURS AND COMMUTER MODE USE

	"Are Your Work Hours Flexible?"			
	Fixed	Flexible	Both	Total Sample
Uses BART at least once per week	26%	26%	14%	26%
Uses BART on at least 80% of all commute days	14%	15%	14%	15%
Uses BART on less than 80% of all commute days	12%	11%	0	11%
Does not use BART at least once per week	74%	74%	86%	74%
Drives alone on at least 80% of all commute days	57%	60%	57%	58%
Rides bus/surface transit on at least 80% of all commute days	17%	15%	14%	16%
Rides in carpool/ vanpool on at least 80% of all commute days	6%	4%	0	5%
	N=375	N=201	N=7	N=583*

* 1 respondent refused to say whether work hours were flexible or not

(Qn.6, Qn.12)

1. The percentage for at least eighty percent (80%) use of each mode does not add to the total of those who do not use BART at least once per week. This is true because, (1) those who use BART on less than eighty percent (80%) of all commute days also use other modes, and (2) the table does not include all possible modes.

3.2 The Effect of Importance of Being on Time

Neither does the importance of being on time affect mode use. Twenty-six percent (26%) who say that being on time is very important use BART, as do twenty-five percent (25%) who say that it is not important at all.

TABLE 3.2

THE RELATIONSHIP BETWEEN THE IMPORTANCE OF BEING ON TIME FOR WORK AND COMMUTER MODE USE

	"How Important Is It for You to Be at Work on Time?"			
	Very Important	Somewhat Important	Not Important at All	TOTAL SAMPLE
Uses BART at least once per week	26%	27%	25%	26%
Uses BART on at least 80% of all commute days	15%	15%	13%	15%
Uses BART on less than 80% of all commute days	11%	12%	11%	11%
Does not use BART at least once per week[1]	74%	73%	75%	74%
Drives alone on at least 80% of all commute days	59%	54%	62%	58%
Rides bus/surface transit on at least 80% of all commute days	17%	18%	9%	16%
Rides in carpool/ vanpool on at least 80% of all commute days	5%	6%	0	5%
	N=387	N=140	N=53	N=580*

(Qn.7, Qn.12)

1. Same as previous table.

3.3 The Relationship Between Allowable Lateness and Commuter Mode Use

- As Table 3.3 shows, those who have a small margin for error in their arrival time are less likely to use BART than those with a larger margin.

- As the focus groups showed, few commuters--particularly non-BART commuters--are aware of BART's increased reliability and printed schedule. Those who are aware tend to dismiss the increased reliability on the grounds that one problem train on the line can stop the whole system.

TABLE 3.3

THE RELATIONSHIP BETWEEN ALLOWABLE LATENESS AND COMMUTER MODE USE

	How Late Can You Be Without Creating a Problem?						
	Less Than 5 Minutes	5-10 Minutes	11-15 Minutes	16-30 Minutes	More Than 30 Minutes	Doesn't Matter	TOTAL SAMPLE
Uses BART at least once per week	17%	23%	31%	31%	36%	27%	26%
Uses BART on at least 80 % of all commute days	9%	13%	18%	17%	20%	15%	15%
Uses BART on less than 80% of all commute days	8%	10%	13%	14%	16%	12%	11%
Does not use BART at least once per week [1]	83%	77%	69%	69%	64%	73%	74%
Drives alone on at least 80% of all commute days	64%	59%	49%	55%	52%	66%	58%
Rides bus/surface transit on at least 80% of all commute days	16%	18%	17%	19%	14%	14%	16%
Rides in carpool/ vanpool on at least 80% of all commute days	6%	4%	8%	6%	4%	2%	5%
	N=160	N=99	N=87	N=88	N=81	N=59	N=574*

*10 respondents did not say how late they could be to work. (Qn.8, Qn.10)

1. Same as previous table.

IV. HOW COMMUTE TRIP CHARACTERISTICS ARE RELATED TO BART RIDERSHIP AND THE USE OF OTHER COMMUTE MODES

4.1 The Relationship Between Commute Distance and Commuter Mode Use

- The longer the commute, the more likely the commuter is to take BART. Just sixteen percent (16%) of those who commute less than five miles but thirty-one percent (31%) of those who commute ten or more miles use BART. Put another way, seventy-one percent (71%) of all BART commuters commute ten or more miles.

- In contrast, bus or other surface transit travel is used more for short than for longer commutes.

TABLE 4.1

THE RELATIONSHIP BETWEEN COMMUTE DISTANCE AND COMMUTER MODE USE

	One-Way Commute Distance:			
	5 miles or less	6-9 miles	10 or more miles	Total Sample
Uses BART at least once per week	16%	19%	31%	26%
Uses BART for at least 80% of all commute days	8%	7%	19%	15%
Uses BART for less than 80% of all commute days	7%	12%	12%	11%
Does not use BART at least once per week[1]	84%	81%	69%	74%
Drives alone for at least 80% of all commute days	46%	66%	61%	58%
Rides bus/surface transit on at least 80% of all commute days	29%	15%	12%	16%
Rides in carpool/ vanpool on at least 80% of all commute days	1%	2%	7%	5%
	N=110	N=113	N=346	N=569

*15 respondents did not say how far they commute each way to work

(Qn.4, Qn.12)

1. The percentage for at least eighty percent (80%) use of each mode does not add to the total of those who do not use BART at least once per week. This is true because, (1) those who use BART on less than eighty percent (80%) of all commute days also use other modes, and (2) the table does not include all possible modes.

4.2 The Relationship Between Trip Corridor and Commuter Mode Use

- Forty-one percent (41%) or all commuters travelling to work in San Francisco use BART at least once per week. Put another way, travel to the city constitutes three-quarters of all BART commuter patronage.

- Fully sixty-nine percent (69%) of those who commute from Contra Costa County to San Francisco use BART. In contrast, just twenty-nine percent (29%) of Contra Costa County residents who commute to Alameda County and eight percent (8%) of those commuting within the county use BART.

- Nearly half of Alameda residents who commute to the city and nearly one-third who commute to Contra Costa County use BART. Thus, Alameda County residents are another important part of BART's current market. However, just twelve percent (12%) of those commuting within Alameda County use BART.

- For all destinations, within-county commuters are less likely to take BART than are those who commute across county lines. However, twenty-one percent (21%) of San Francisco residents who work in the city take BART to work. Very few San Franciscans commute to other counties.

- Those who work in San Francisco are considerably less likely to drive alone to work than are other commuters. These commuters are just as likely to take BART and nearly twice as likely to take some form of transit as to drive alone.

- The percentage of bus and other surface transit users is more than three times as high for San Francisco destinations as for Alameda County destinations and ten times greater than for Contra Costa destinations.

TABLE 4.2

THE RELATIONSHIP BETWEEN TRIP CORRIDOR AND COMMUTER MODE USE

	To San Francisco from:				To Alameda from:				To Contra Costa from:				
	Total	San Francisco	Alameda	Contra Costa	Total	San Francisco	Alameda	Contra Costa	Total	San Francisco	Alameda	Contra Costa	Total Sample
Use BART at least once per week	41%	21%	48%	69%	17%	41%	12%	29%	19%	33%	32%	8%	27%
Use BART for at least 80% of all commute days	29%	12%	35%	49%	7%	27%	4%	10%	8%	0	12%	6%	16%
Use BART for less than 80% of all commute days	13%	9%	13%	20%	10%	14%	8%	19%	11%	33%	20%	3%	11%
Do not use BART at least once per week[1]	59%	79%	52%	31%	83%	59%	88%	71%	81%	67%	68%	92%	73%
Drives alone on at least 80% of all commute days	38%	40%	28%	53%	70%	59%	74%	60%	72%	67%	56%	83%	57%
Rides bus/surface transit on at least 80% of all commute days	31%	34%	40%	9%	9%	5%	10%	7%	3%	0	8%	0	17%
Rides in carpool/ vanpool on at least 80% of all commute days	5%	0	8%	9%	5%	5%	5%	5%	6%	0	8%	6%	5%
(Qn.5, Qn.12)	N=220	N=89	N=86	N=45	N=248	N=22	N=184	N=42	N=64	N=3	N=25	N=36	N=532 *

*52 respondents declined to give this information or commuted outside the Tri-County area.

1. Same as previous table.

V. HOW COMMUTERS MAKE MODE CHOICES

5.1 Reasons for Using Different Commute Modes

Respondents were asked why they use each of the commute modes they identified. Table 5.1 shows these open-ended responses.

- For all mode choices except carpools and vanpools, the most frequently given reason for use is convenience and directness. However, carpools and vanpools are preferred primarily because they are less expensive.

- For BART commuters, the second most common reason for use is that BART is less aggravating than other commute options. Nearly one-third of BART commuters gave this reason, compared to fifteen percent (15%) of bus users, seventeen percent (17%) of carpoolers/vanpoolers, and just one percent (1%) of drivers. Thus, less aggravation is an important reason for choosing BART, particularly when the alternative is the automobile.

- BART commuters are just as likely to mention a faster commute as are drivers and more likely to do so than are bus users or carpoolers/vanpoolers.

- BART commuters are ten times more likely than drivers but less than half as likely as carpoolers/vanpoolers to say their mode is less expensive than other options. Curiously, they are also more likely to cite less expense as a reason than are bus users. However, since BART trips are predominately long commutes and bus trips short commutes, these two groups of commuters probably view their commute options quite differently.

- Needing a car during the day was cited as a reason for driving alone by nearly one-quarter of those driving, making it the second most common response. Other important reasons for driving alone are a faster commute and problems with transit.

TABLE 5.1

FREQUENCY DISTRIBUTION

REASONS FOR USING DIFFERENT COMMUTE MODES
(OPEN-ENDED)

Percentage of:

	BART Commuters	Drivers	Bus Users	Carpoolers/ Vanpoolers
Convenient, more direct	37%	32%	35%	21%
Less aggravating	32%	1%	15%	17%
Faster commute	21%	21%	9%	14%
Less expensive	20%	2%	14%	46%
Only possible way to commute	7%	5%	11%	4%
Use when ride is not available	9%	1%	6%	1%
Safer	3%	2%	0	3%
Problems with transit or other transit rates and schedules	1%	14%	1%	9%
Use to connect with BART or bus	1%	2%	2%	1%
Need car during day	0	23%	0	0
Don't like public transit	0	7%	0	0
Public transit is not dependable	0	4%	0	1%
Commute with spouse/ neighbor/co-worker	0	2%	0	20%
Company helps with commuting arrangements	0	1%	1%	1%
Other	2%	0	0	1%
TOTAL	136%**	117%**	94%**	139%**
	N=152	N=331	N=95	N=49

(Qn.13a, Qn.13b, Qn.13e, Qn. 13f)

**Percentages add to more than 100% due to multiple responses

VI. COST, TIME AND RELIABILITY OF BART: PERCEPTUAL DIFFERENCES BETWEEN BART AND NON-BART COMMUTERS

6.1 Non-BART Commuters' Experience with BART

Since this section of the report deals with perceptions, it is important to look at the amount of experience non-BART commuters have had with BART. As Table 6.1 shows:

- Just thirteen percent (13%) of non-BART commuters have never taken BART, and sixty-nine percent (69%) taken BART within the past year.

- However, most who have done so took BART for non-commute purposes. Only about one-quarter have taken BART to work within the past year, and less than one in three have ever taken BART to work.

- Thus, only a small proportion of non-BART commuters could be expected to have a clear perception of BART as a commuter mode.

TABLE 6.1

FREQUENCY DISTRIBUTION

CURRENT NON-BART COMMUTERS' PAST USE OF BART

	Percentage of Non-Bart Commuters	
Has taken BART to work in the past year	24%	69%
Has taken BART in the past year, but not to work	45%	
Has taken BART to work more than one year ago	6%	18%
Has taken BART more than a year ago, but not to work	12%	
Never taken BART	13%	
TOTAL	100%	

N=432

(Qn.30, Qn.31a, Qn.31b)

6.2 Perceptions of Actual Cost of Commute Trips

Non-BART commuters were asked to give an open-ended estimate of the total cost, including related expenses such as connecting transit, of a round-trip BART commute. In addition, all respondents, including BART commuters, were asked the same question for their usual mode. As Table 6.2 shows:

- The majority of non-BART commuters were simply unable to make such an estimate. Again, this shows that most non-BART commuters are not very familiar with BART.

- However, it is clear that BART commuters spend more on the average than non-BART riders. This may be partly because of the longer commutes associated with BART ridership.

TABLE 6.2

NON-BART COMMUTERS' PERCEPTIONS OF
BART/ACTUAL COST OF COMMUTER TRIP

	Non-BART Commuters	Reported Cost: Current Mode	
	Perceived Cost of BART Commute	BART Commuters	Non-BART Commuters
Round-Trip Cost			
Less than $2.00	8%	19%	36%
$2.00 to $3.99	24%	40%	38%
$4.00 or more	8%	40%	17%
Not sure/refused	60%	5%	9%
TOTAL	100%	99%	100%
	N=432	N=86**	N=432

(Qn.14, Qn.35)

** Only BART commuters who use BART on 80% of all commute days were included

6.3 Perceptions of the Relative Costs of Commute Trips

Non-BART commuters were asked also whether taking BART would cost more than using their current mode.

- Nearly half say BART would cost more; and just twenty-seven percent (27%) say it would be the same or less.

- Since most non-BART riders are not familiar with actual BART costs, this may be a misperception for many users of other modes, particularly drivers. This possibility should be investigated in subsequent research.

TABLE 6.3

FREQUENCY DISTRIBUTION

NON-BART COMMUTERS' PERCEPTION OF
BART COSTS COMPARED TO CURRENT MODE

	Percentage of Non-BART Commuters	
BART would cost more than current mode	48%	
BART would cost less than current mode	15%	27%
BART would cost the same	12%	
Not sure	17%	
Refused	7%	
TOTAL	99%*	
	N=432	

(Qn.36)

6.4 Perceptions of Actual Time Required for Commute Trips

Non-BART commuters were asked to give an open-ended estimate of the time required for a one-way commute on BART, including time spent getting to and from BART. In addition, all respondents, including BART commuters, were asked the same question for their usual commute mode. As Table 6.4 shows:

- Non-BART commuters are not nearly so likely to be uncertain about the time required for a BART commute as they are about its cost. This suggests that commuters do not even consider cost unless a commute mode is practical in terms of time.

- BART commuters perceive that they spend more time commuting than do non-BART commuters. This is probably partly a function of the longer distances associated with BART commutes and the waiting time involved.

- On the average, non-BART commuters believe that BART would take longer than does their current mode. For example, seventy-eight percent (78%) now travel to work in less than 40 minutes, while just fourteen percent (14%) believe BART would take them to work as quickly.

TABLE 6.4

NON-BART COMMUTERS' PERCEPTIONS OF BART/ACTUAL TIME

One-Way Trip Time	Non-BART Commuters: Perceived Time of BART Commute		Reported Time:Current Mode BART Commuters		Non-BART Commuters	
Less than 20 minutes	2%	14%	4%	23%	29%	78%
20 to 39 minutes	12%		19%		49%	
40 to 59 minutes	23%		44%		15%	
One hour or more	42%		34%		6%	
Not sure/refused	21%		0		1%	
TOTAL	100%		101%		100%	
	N=432		N=86**		N=584	

(Qn.15, Qn.33)

**Only BART commuters who use BART in 80% of all commute days were included.

6.5 Perceptions of Relative Time Needed for BART Trips

Non-BART commuters were asked also if taking BART would take more time than using their current mode.

- More than three-quarters believe that BART would take more time, and just one in twenty believe it would take less time.

TABLE 6.5

FREQUENCY DISTRIBUTION

NON-BART COMMUTERS' PERCEPTIONS OF
BART TIME COMPARED TO CURRENT MODE

	Percentage of Non-BART Commuters
BART would take more time than current mode	77%
BART would take less time than current mode	5%
BART would take the same amount of time	7%
Not sure/don't know	6%
Refused/no answer	6%
TOTAL	101%*

N=432

(Qn.34)

6.6 Perceptions of BART Reliability

Non-BART commuters were asked whether or not they could accurately estimate their arrival time within ten minutes if they took BART.

- Although eighty-five percent (85%) of BART users say they arrive on time [1] when they take BART, only thirty-nine percent (39%) of non-BART commuters believe BART is reliable within ten minutes.

- This important point should be examined more closely in future research.

1. See marginal data in Appendix A, Question 12a.

TABLE 6.6

FREQUENCY DISTRIBUTION

NON-BART COMMUTERS' PERCEPTION OF BART RELIABILITY

	Percentage of Non-BART Commuters
If taking BART...	
could estimate arrival time within 10 minutes	39%
could not estimate arrival time within 10 minutes	32%
depends	2%
not sure/don't know	21%
refused/no answer	6%
TOTAL	100%
	N=432

(Qn.37)

VII. DISTANCE FROM BART: DIFFERENCES BETWEEN BART COMMUTERS AND NON-BART COMMUTERS

The results reported in this section are based on respondents' estimates of their distance from the nearest BART station, both from home and their workplace. Such estimates, particularly when given in miles, are not reliable since they are influenced by familiarity and other perceptual factors.[1] For example, when distance is held constant, those who visit a place frequently tend to believe it is closer than those who travel there less frequently. Since urban Americans tend to think of distances in terms of minutes rather than miles, traffic congestion also can influence perceptions of distance. Thus, the results presented in this section should be interpreted only as rough indications of actual distance.

1. The phenomenon of "psychological distance" was first identified by Dr. Peter Clarke, Dean of the Annenberg School of Communication at the University of Southern California.

7.1 Distance from BART in Miles for Non-BART Commuters

Table 7.1 shows that:

- Twenty-one percent (21%) of non-BART commuters say that they live more than three miles from BART. Although the sample was drawn from households within a three-mile radius of BART stations, it is possible that some respondents do live more than three miles from BART. First, the sample contained some census tracts that extended beyond the three-mile radius since the rule for inclusion was that at least sixty percent (60%) of the tract fall within the designated area. However, such instances are rare and generally were tracts with very low population density. Second, some individuals move outside of a census tract but retain their original telephone number. This practice introduces some degree of error in every geographically-based sample. Third, there is the perceptual problem. It is quite likely that many non-BART commuters believe that the closest BART station is more distant than it is since they would have little reason to make the trip often. Such commuters may not even know which station is nearest to their home.

- Forty-three percent (43%) of non-BART commuters say they work within one mile of a BART station. Since seventy percent (70%) of all respondents indicated that there was a BART station within one mile of their workplace (the other thirty percent (30%) said there was a direct means of transportation) on the screening question, there must have been slippage between respondents' answers to the simple yes/no screening question and the more difficult open-ended question. Again, we believe that perception played a major role. The commuter who does not take BART is likely to overestimate distance to the station especially when asked in an open-ended format to make an estimate.

TABLE 7.1

FREQUENCY DISTRIBUTION

DISTANCE IN MILES FROM CLOSEST STATION
(HOME AND WORKPLACE) FOR NON-BART COMMUTERS

	Percentage of Non-BART Commuters		
Miles (estimated)	From Home	From Workplace	
0.25 or less	6%	22%	
0.26 to 0.50	6%	6%	43%
0.51 to 0.75	3%	2%	
0.76 to 1.00	14%	13%	
1.01 to 1.50	12%	8%	
1.51 to 2.00	13%	7%	
2.01 to 2.50	5%	4%	
2.51 to 3.00	15%	5%	
3.01 or more	21%	21%	
Not sure/don't know	4%	11%	
Refused/no answer	0	1%	
TOTAL	99%*	100%	

N=432

(Qn.39, Qn.41)

* Percentages do not add to 100% due to rounding.

7.2 Distance from BART in Minutes for BART and Non-BART Commuters

Minutes are normally a more accurate measure of the time it takes to reach a location than are miles, but they do not reflect actual distance. This is true because of the large degree of variability of speed that can be maintained on different streets at different times of day.

However, to the degree that commuters perceptions are accurate, Table 7.2 shows that:

- BART and non-BART commuters differ in that BART commuters can reach BART from their workplace more quickly.
- It takes both BART commuters and non-BART commuters about the same amount of time to reach the station nearest their home.
- Thus, distance from work (or the presence of convenient connecting transportation from BART to work) may be more important in defining BART's primary service area than is distance from home.

TABLE 7.2

FREQUENCY DISTRIBUTION

DISTANCE IN MINUTES FROM CLOSEST STATION
(HOME AND WORKPLACE) FOR BART AND NON-BART COMMUTERS

Minutes (estimated)	Percentage of BART Commuters		Percentage of Non-BART Commuters	
	From Home	From Workplace	From Home	From Workplace
5 minutes or less	32%	45%	29%	28%
6 to 10 minutes	36%	24%	30%	21%
More than 10 minutes	30%	28%	33%	32%
Not sure/refused	2%	3%	8%	19%
TOTAL	100%	100%	100%	100%
	N=152		N=432	

(Qn.16, Qn.17, Qn.40, Qn.42)

VIII. CONNECTING TRANSPORTATION TO BART STATIONS

8.1 BART and Non-BART Commuters' Connecting Transportation Choices

BART commuters were asked to identify the kinds of connecting transportation they use to get to BART, while non-BART commuters were asked which options they would choose if they were to take BART. Table 8.1 shows that:

- Except for BART commuters' somewhat greater tendency to walk, BART commuters do not differ from non-BART commuters in their choice of modes for getting from home to BART.

- However, there are major differences in modes chosen for getting from work to BART. BART commuters are much more likely to walk, much less likely to take the bus or other surface transit than non-BART commuters. Again, these differences reflect the importance of distances of BART from the workplace as an important factor in whether or not BART is used.

TABLE 8.1

FREQUENCY DISTRIBUTION

CONNECTING TRANSPORTATION THAT BART COMMUTERS USE
AND NON-BART COMMUTERS WOULD USE
(IF THEY TOOK BART) TO REACH BART STATIONS

	Percentage of BART Commuters		Percentage of Non-BART Commuters	
	From Home	From Work	From Home	From Work
Bus/surface transit	29%	20%	29%	42%
Drive alone	37%	3%	41%	2%
Carpool/vanpool or ride with others	6%	7%	3%	3%
Walk	24%	66%	15%	38%
Bicycle	1%	1%	1%	0
Taxi	0	1%	0	0
Other	1%	1%	0	0
Would not use BART	--	--	4%	5%
Not sure/don't know	1%	0	2%	5%
Refused/no answer	1%	1%	3%	3%
TOTAL	100%	100%	100%	98%*
	N=152		N=432	

(Qn.18, Qn.43, Qn.44)

* Percentages do not add to 100% due to rounding.

8.2 Satisfaction With Connecting Transit Among BART Users

Because relatively few BART commuters use the bus or other surface transit to get to BART, the differences shown in Table 8.2 are not statistically significant. They do show, however, that only a small minority of BART commuters who use transit are very satisfied with regard to travel time, schedule reliability, waiting time, or cost.

TABLE 8.2

FREQUENCY DISTRIBUTION

SATISFACTION WITH CONNECTING TRANSIT

AMONG BART COMMUTERS WHO USE IT

	Percentage of BART Commuters Who Use Connecting Surface Transit			
	Level of Satisfaction With:			
	Travel Time	Reliability of Schedule	Waiting Time	Cost
Very satisfied	31%	20%	22%	33%
Somewhat satisfied	50%	46%	44%	43%
Not satisfied	17%	28%	30%	20%
Not sure/don't know	0	4%	2%	0
Refused/no answer	2%	2%	2%	4%
TOTAL	100%	100%	100%	100%

N=58

(Qn.19)

8.3 How Problems With Connecting Transportation Affect Patronage Among BART Commuters

- Table 8.4 shows that problems with adequate bus service, parking, or carpooling do not stop most BART commuters from taking BART.

- However, taken together, these problems may contribute to irregular ridership.

TABLE 8.3

PERCENTAGE OF BART COMMUTERS WHO HAVE SOMETIMES NOT TAKEN BART TO WORK BECAUSE...

	Percentage Saying "Yes"
...Adequate bus service was not available	13%
...Parking was too difficult	16%
...Carpooling was not possible	7%

N=152

(Qn. 28)

8.4 Availability of Direct Bus Service from Home to BART

Both BART and non-BART commuters were asked if direct bus service is available from their home to BART. Table 8.4 shows that:

- Significantly more BART then non-BART commuters say such service is available.
- However, this may be primarily a perceptual difference since non-BART commuters have little reason to know about connecting transit to BART. In fact, twice as many non-BART as BART users say they are not sure.

TABLE 8.4

FREQUENCY DISTRIBUTION

AVAILABILITY OF DIRECT BUS SERVICE FROM HOME TO BART FOR BART AND NON-BART COMMUTERS

	Percentage of BART Commuters	Percentage of Non-BART Commuters
Direct bus service is available	74%	56%
Direct bus service is not available	15%	26%
Lives within walking distance	3%	1%
Not sure/don't know	7%	16%
Refused/no answer	1%	1%
TOTAL	100%	100%
	N=152	N=432

(Qn.26, Qn.45)

8.5 Willingness to Use Direct Bus Service Among BART Commuters

BART commuters who said they do not have access to direct bus service from home to BART were asked if they would take such a bus if it were available. Since there were only 34 commuters in this category, the results are not statistically stable.

TABLE 8.5

FREQUENCY DISTRIBUTION

WOULD YOU TAKE A DIRECT BUS TO BART
IF ONE WERE AVAILABLE?

	Percentage of BART Commuters Without Access to Direct Bus Service
Would take direct bus if available	48%
Would not take direct bus if available	39%
Not sure/don't know	6%
Refused/no answer	6%
TOTAL	99%*
	N=34

(Qn.27)

*Percentages do not add to 100% due to rounding.

8.6 Non-BART Commuters' Willingness to Use BART If Direct Bus Service Were Available

Non-BART commuters were asked if they would be more willing to use BART if they had direct bus service from home to BART. Table 8.6 shows that:

- Only about one quarter say "yes."
- This indicates that better connecting transit from home to BART is not a powerful incentive for the non-BART commuter to use BART. This also reinforces previously reported results that suggest that work-to-BART transportation improvements may be more effective in increasing patronage.

TABLE 8.6

FREQUENCY DISTRIBUTION

WOULD YOU BE MORE WILLING TO USE BART IF THERE WERE DIRECT BUS SERVICE TO THE STATION NEAREST YOUR HOME?

	Percentage of Non-BART Commuters Without Access To Direct Bus Service
Yes	25%
No	64%
Not sure/don't know	8%
Refused/no answer	3%
TOTAL	100%
	N=182

(Qn.46)

IX PARKING AT BART STATIONS

9.1 Bart Commuters' Customary Arrival Times at BART Stations

As the results on arrival at work presented in Section 1.7 indicate, most BART commute trips occur early in the morning. The data shown in Table 9.1 indicate that:

- By 7:00 a.m., fifty-one percent (51%) of BART commuters have arrived at the BART station.
- By 8:00 a.m., eighty-three percent (83%) have arrived.

TABLE 9.1

FREQUENCY DISTRIBUTION

BART COMMUTERS' CUSTOMARY ARRIVAL TIME
AT BART STATIONS

	Percentage of BART Commuters	
Before 6:30 a.m.	22%	51%
6:31 to 7:00 a.m.	29%	
7:01 to 7:15 a.m.	13%	32%
7:16 to 7:30 a.m.	8%	
7:31 to 7:45 a.m.	3%	
7:46 to 8:00 a.m.	8%	
8:01 to 8:15 a.m.	2%	
8:16 to 8:30 a.m.	5%	
8:31 to 9:00 a.m.	5%	
After 9:00 a.m.	2%	
Not sure/don't know	3%	
Refused/no answer	2%	
TOTAL	102%*	
	N=152	

(Qn.20)

*Percentages do not add to 100% due to rounding.

9.2 How Many Arrive Earlier Than Necessary to Find a Parking Place?

- As Table 9.2 shows, thirty-five percent (35%) arrive earlier than necessary to find a parking place.

TABLE 9.2

FREQUENCY DISTRIBUTION

DO BART COMMUTERS DRIVING TO THE STATION ARRIVE EARLIER THAN THEY HAVE TO SO THEY CAN FIND A PARKING PLACE

	Percentage of BART Commuters Who Use a Car or Carpool/Vanpool to Get to BART Station
Yes	35%
No	65%
Not sure/don't know	0
Refused/no answer	0
TOTAL	100%
	N=64

(Qn.21)

9.3 Knowledge of and Use of Carpool Parking

- Just one in five BART commuters is aware of special carpool and vanpool arrangements at BART stations.
- None of those sampled is a member of a carpool or vanpool registered with BART.

TABLE 9.3

FREQUENCY DISTRIBUTION

KNOWLEDGE AND USE OF SPECIAL
CARPOOL PARKING AMONG BART COMMUTERS

	Percentage of BART Commuters	
	Knows That Station Offers Reserved Parking For Carpools	Is Part of Carpool/Vanpool Registered With BART
Yes	20%	0
No	33%	97%
Not sure/don't know	46%	1%
Refused/no answer	1%	1%
TOTAL	100%	99%*

N=152

(Qn.24, Qn.25)

*Percentages do not add to 100% due to rounding.

9.4 Do Parking Problems Discourage Patronage Among Non-BART Commuters?

- Only thirteen percent (13%) of non-BART commuters say that parking is a reason they don't take BART, and just fourteen percent (14%) say they would take BART if guaranteed a parking place.

- Still, this small proportion would significantly increase patronage and revenues if this group could be converted through improvements to the parking system.

TABLE 9.4

FREQUENCY DISTRIBUTION

THE IMPORTANCE OF PARKING PROBLEMS
IN DISCOURAGING PATRONAGE AMONG NON-BART COMMUTERS

	Percentage of Non-BART Commuters	
	Is Parking a Reason for Not Taking BART Now?	Would You Take BART if Guaranteed a Parking Place?
Yes	13%	14%
No	86%	76%
Not sure/don't know	0	4%
Refused/no answer	1%	6%
TOTAL	100%	100%

N=432

(Qn.47, Qn.48)

9.5 Willingness to Pay for Guaranteed Parking

- Only a relatively small percentage of BART and non-BART commuters are willing to pay for guaranteed parking at BART stations.

TABLE 9.5

FREQUENCY DISTRIBUTION

WILLINGNESS TO PAY A MONTHLY PARKING FEE
FOR A GUARANTEED PARKING PLACE

	Percentage of:	
	BART Commuters	Non-BART Commuters
Yes	16%	9%
No	73%	78%
Depends on cost	6%	2%
Not sure/don't know	3%	2%
Refused/no answer	2%	9%
	100%	100%
	N=152	N=432

(Qn.22, Qn.49)

X. PERCEPTIONS OF BART SAFETY

10.1 Overall Safety

- o A majority of respondents say that, overall, BART is very safe, and more than nine in ten say BART is at least somewhat safe.

- o This pattern holds regardless of commute mode use. BART commuters do not rate BART safety significantly higher than non-BART commuters.

TABLE 10.1

FREQUENCY DISTRIBUTION

PERCEPTIONS OF OVERALL BART SAFETY
AMONG USERS OF DIFFERENT COMMUTE MODES

Would you rate the overall safety of BART as....	Percentage of: BART Commuters	Drivers	Bus Users	Carpoolers/ Vanpoolers	Total Sample
Very Safe	74%	58%	61%	76%	61%
	99%	91%	94%	100%	92%
Somewhat Safe	25%	33%	33%	24%	31%
Not Very Safe	**	2%	0	0	1%
Not Safe At All	0	**	0	0	**
Not Sure/Don't Know	1%	7%	6%	0	6%
Refused/No Answer	0	0	0	0	**
TOTAL	100%	100%	100%	100%	99%*
	N=152	N=340	N=95	N=29	N=584

(Qn.58)

** Less than 1%

*Percentages do not add to 100% due to rounding.

10.2 Specific Aspects of BART Safety

When respondents were asked to rate specific aspects of BART safety, the results were not so positive as for overall safety. Specifically:

- A minority of forty-four percent (44%) rated the safety of the Transbay Tube either excellent or very good, and twenty-one percent (21%) said they are not sure.

- Excellent and very good ratings were just thirty percent (30%) for the Berkeley Hills Tunnel, with forty-seven percent (47%) unsure. Since an accident and fire occurred in the Tunnel while this survey was in the field, this result is not surprising.

- Only forty-two percent (42%) gave BART stations excellent or very good ratings, with ten percent (10%) unsure.

- The lowest ratings of all were for BART parking lots, with just twenty-one percent (21%) giving excellent or very good ratings and twenty-eight percent (28%) unsure.

TABLE 10.2

FREQUENCY DISTRIBUTION

PERCEPTION OF SPECIFIC ASPECTS OF BART SAFETY

Safety Rating	Percentage of Respondents			
	Transbay Tube	Berkeley Hills Tube	BART Parking Lots	BART Stations
Excellent	20%	13%	9%	16%
Very Good	24%	17%	12%	26%
	44%	30%	21%	42%
Good	24%	16%	20%	28%
Fair	9%	6%	20%	16%
Poor	2%	1%	11%	5%
Not sure/don't know	21%	47%	28%	10%
Refused/no answer	0	1%	0	0
	100%	101%*	100%	101%*

N=584

(Qn.59)

* Percentages do not add to 100% due to rounding.

10.3 Ratings of Specific Aspects of BART Safety Among Users of Different Commute Modes

In order to more fully understand the reasons behind these ratings, patterns among the users of different commute modes were examined.

- For safety ratings of the Transbay Tube, the Berkeley Hills Tunnel, and BART stations, BART commuters are more likely to give high ratings and less likely to be uncertain than is the sample as a whole, while drivers are less likely to be positive and more likely to be uncertain. This suggests that concern for safety is more a matter of perception than reality.

- Both BART commuters and non-BART commuters rate safety in BART parking lots and stations low. This finding was reinforced in the focus groups. However, non-BART commuters were considerably more concerned than BART commuters about both personal safety and the safety of their automobiles in the parking lots.

TABLE 10.3

FREQUENCY DISTRIBUTION:

PERCEPTIONS OF SPECIFIC ASPECTS OF BART SAFETY

Percentage of:

Safety Ratings	BART Commuters	Drivers	Bus Users	Carpools/ Vanpools	Total Sample
Transbay Tube					
Excellent/ Very Good	52%	39%	42%	55%	43%
Not Sure	15%	23%	20%	17%	21%
Berkeley Hills Tunnel					
Excellent/ Very Good	38%	26%	32%	41%	30%
Not Sure	39%	50%	51%	35%	47%
BART Stations					
Excellent/ Very Good	51%	35%	39%	55%	41%
Not sure	3%	13%	7%	3%	10%
BART Parking Lots					
Excellent/ Very Good	19%	20%	17%	28%	21%
Not Sure	24%	26%	37%	21%	28%
	N=152	N=340	N=95	N=29	N=584

(Qn.12, Qn.59)

XI. WHY NON-BART COMMUTERS DON'T TAKE BART

11.1 Open-Ended Reasons for Not Taking BART to Work

When asked if there was a reason they could not take BART if they wanted to:

- Fully twenty-one percent (21%) could not or did not wish to give a reason.
- Aspects of convenience were the most commonly cited reasons. These reasons included the location of BART stations, the relative convenience of other modes, the need for a car during the day.
- Eighteen percent (18%) of drivers mentioned the need for a car during the day. Of those who mentioned this reason, eighty-one percent (81%) say they need a car every day.
- Those who need a car during the day are particularly likely to be:

  --flextime workers.

  --higher income ($30,000 or more) professionals, managers or other white collar workers.

TABLE 11.1

FREQUENCY DISTRIBUTION

OPEN-ENDED REASONS FOR NOT TAKING BART TO WORK

	Percentage of:			
	Drivers	Bus Users	Carpoolers/ Vanpoolers	Total Non-BART Commuters
No Reasons	21%	24%	32%	21%
BART Located Wrong/ Inconvenient Commute	23%	14%	23%	21%
Need Car During Day	18%	0	5%	13%
BART Too Far From Home or Work	10%	22%	0	13%
Do Not Commute Far Enough	11%	14%	14%	12%
Takes Too Long	12%	3%	14%	12%
Dislike BART	8%	5%	14%	7%
More Expense	2%	11%	0	4%
Other Transportation More Convenient	1%	9%	5%	3%
Parking Problems	1%	0	0	*
	107%**	102%**	107%**	106%**
	N=300	N=66	N=22	N=388

* Less than one percent

**Percentages add up to more than 100% due to multiple responses

(Qn.12, Qn.32)

11.2 How Common Is the Need for an Automobile During the Workday?

Respondents were asked how often they need an automobile for business or other purposes during the workday.

- Non-BART commuters are about evenly split between those who need their automobiles once a week or more and those who never need a car or need it less than once a week.
- Twenty-seven percent (27%) of non-BART commuters say they need an automobile every day.
- However, we do not know whether the reported need for an automobile is pressing or simply a matter of convenience.

TABLE 11.2

FREQUENCY DISTRIBUTION

FREQUENCY OF USING AUTOMOBILE FOR BUSINESS OR OTHER PURPOSES DURING THE WORKDAY

	Percentage of Non-BART Commuters	
Every day	27%	
Four days a week	4%	22%
Three days a week	6%	
Two days a week	5%	
One day a week	7%	
Less than one day a week	22%	
Never	26%	
Not sure/don't know	2%	
Refused/No answer	3%	
TOTAL	102%	
	N=436	

(Qn. 51)

11.3 Does the Reported Need for an Automobile During the Workday Preclude BART Ridership?

To test the strength of the reported need for an automobile as a constraint on BART ridership, we compared non-BART commuters who gave the need for an automobile as a reason for not riding BART to other non-BART commuters on the basis of whether they would be more inclined to ride BART if certain improvements were made. If the stated need for an automobile does preclude BART ridership, there should be striking differences between these two groups of non-BART commuters.

- Although there are differences in the expected direction on four of the five possible improvements, they are small and not statistically significant. Thus, those who report the need for an automobile are just about as inclined to use BART as are other non-BART commuters when improvements are made.

TABLE 11.3

THE RELATIONSHIP BETWEEN REPORTED NEED FOR AN AUTOMOBILE DURING THE WORKDAY AND INCLINATION TO USE BART MORE OFTEN

	Percentage More Inclined to Use BART If Improvements Were Made Among...	
	Non-BART Commuters Reporting Need For Auto During Workday	Other Non-BART Commuters
Shops and services in station	18%	15%
Monthly pass available	19%	24%
Discounted monthly pass available through employer	25%	30%
There were a station nearer home	35%	43%
There were a station nearer workplace	44%	43%
	N=57	N=375

(Qn.51, Qn.52)

XII WHAT WOULD MAKE COMMUTERS RIDE BART MORE OFTEN?

All respondents were asked whether or not each of a series of possible changes in the system would make them ride BART more often. It is important to note that there is usually considerable slippage between reported intentions and actual behavior, especially when the respondent views the behavior in question as socially desirable. Thus, these results should be interpreted in relative rather than absolute terms.

12.1 Possible Improvements

- For all improvements, those who now ride BART irregularly are more likely than non-BART commuters to say they would ride more frequently if the improvement were made. Thus, this group is particularly sensitive to possible improvements in the BART system. The least sensitive are those who now drive alone.

- Aside from the actual extension of BART lines, the most potentially productive improvement is the distribution of a discounted monthly pass through employers.

- However, more than one in three indicated they would take BART more often if a monthly pass were sold at a regular price.

TABLE 12.1

IMPROVEMENTS THAT COMMUTERS SAY WOULD MAKE THEM TAKE BART MORE OFTEN

	Percentage Who Would Use BART More Often If Improvements Were Made, Among:				
	Irregular BART Commuters	Drivers	Bus Users	Carpoolers/* Vanpoolers	Total Sample
Shops and service in BART stations	30%	17%	22%	35%	20%
Monthly pass available	56%	25%	40%	41%	31%
Discounted monthly pass available through employer	65%	31%	53%	52%	39%
Station nearer home	47%	37%	62%	31%	42%
Station nearer work	49%	42%	40%	52%	41%
	N=66	N=340	N=95	N=29	N=584

(Qn.12, Qn.52)

* Base too small for valid inference

12.2 What Should a Monthly Pass Cost?

- Of the thirty-one percent (31%) who say a nondiscounted monthly pass would cause them to take BART more often, just thirty-six percent (36%) say it should cost more than $30.

- Twenty-nine percent (29%) do not know what the pass should cost.

TABLE 12.2

FREQUENCY DISTRIBUTION

WHAT SHOULD A MONTHLY PASS COST?

	Percentage of Those Who Would Take BART More Often If a Monthly Pass Were Available	
Less than $20	11%	
$20 to $29	24%	
$30 to $49	22%	36%
$50 or more	14%	
Not sure/don't know	29%	
Refused/no answer	*	
TOTAL	100%	
	N=180	

(Qn.53a)

*less than one percent

12.3 Required Percentage Discount on Discounted Pass Distributed Through Employer

- Fifty-two percent (52%) say they would buy a monthly pass if it were discounted twenty percent (20%).
- Just twenty-seven percent (27%) say they would buy it if it were discounted ten percent (10%).

TABLE 12.3

FREQUENCY DISTRIBUTION

HOW MUCH DISCOUNT FROM YOUR EMPLOYER WOULD IT TAKE FOR YOU TO BUY AND USE A MONTHLY BART PASS?

	Percentage of Those Who Would Take BART More Often If an Employer's Discounted Monthly Pass Were Available	
10% or less	27%	52%
11% to 20%	25%	
21% or more	24%	
Not sure/don't know	22%	
Refused/no answer	1%	
TOTAL	99%*	

N=225

(Qn.53b)

XIII OFF-PEAK RIDERSHIP

Both BART commuters and non-BART commuters were asked a series of questions probing the use of BART on weekends, on weekdays between 9:00 a.m. and 3:00 p.m., and on weekday evenings.

13.1 BART and Non-BART Commuters Use of BART for Non-Commute Purposes

- BART commuters are much more likely to use BART for non-commute purposes than are non-BART commuters.
- Yet, twenty-eight percent (28%) of non-BART commuters do use BART for noncommute purposes.

TABLE 13.1

FREQUENCY DISTRIBUTION

BART AND NON-BART COMMUTERS' USE OF BART
FOR NON-COMMUTE PURPOSES

	Percentage of BART Commuters	Percentage of Non-BART Commuters
Use weekdays during off-peak hours for purposes other than commuting	29%	10%
Use evenings during the week	27%	13%
Use weekends	43%	23%
Never use	52%	72%
TOTAL	151%**	118%**
	N=152	N=432

(Qn.55, Qn.56, Qn.57a)

** Responses add to more than 100% due to multiple responses.

13.2 Frequency of Non-Commute Uses of BART

- BART commuters are not only more likely to ride BART for non-commute purposes, but they ride it more frequently.

TABLE 13.2

FREQUENCY DISTRIBUTION

FREQUENCY OF BART USE FOR ALL NON-COMMUTE PURPOSES FOR BART AND NON-BART COMMUTERS

Weekly Use	Percentage of BART Commuters	Percentage of Non-BART Commuters
Never use BART for non-commute purposes	52%	72%
Less than one day	17%	20%
1 to 2 days	23%	6%
3 to 4 days	5%	*
More than 4 days	2%	0
Not sure/refused	0	0
TOTAL	99%*	100%
	N=152	N=432

(Qn.54)

*Percentages do not add to 100% due to rounding.

13.3 Frequency of Non-Commute Uses of BART for Different Off-Peak Time Periods

- Among BART commuters, those who ride during off-peak weekday times and weekends do so more frequently than do evening riders.

- Among non-BART commuters, frequency is higher on weekends than for either weekdays or weekday evenings.

TABLE 13.3

THE RELATIONSHIP BETWEEN THE FREQUENCY OF BART USE FOR NON-COMMUTE PURPOSES AND TIME OF WEEK USED AMONG BART AND NON-BART COMMUTERS

Weekly Non-Commute Trips	Percentage of BART Commuters			Percentage of Non-BART Commuters		
	Weekdays Off-Peak	Evenings	Weekends	Weekdays Off-Peak	Evenings	Weekends
Less than 1 day	16%	44%	14%	77%	86%	38%
1 to 2 days	41%	27%	39%	18%	14%	48%
3 to 4 days	23%	22%	30%	0	0	10%
More than 4 days	20%	7%	17%	5%	0	4%
Not sure/refused	0	0	0	0	0	0
TOTAL	100%	100%	100%	100%	100%	100%
	N=44	N=41	N=66	N=44	N=58	N=99

(Qn.55, Qn. 56, Qn.57a)

13.4 The Impact of a Discounted Weekend Pass for the Entire Household

- More than four in ten commuters who ride BART for non-commute purposes would ride BART more often if a discounted weekend pass were available.

- The percentage is not significantly lower for non-BART commuters than for BART commuters.

TABLE 13.4

FREQUENCY DISTRIBUTION

WOULD YOU USE BART MORE OFTEN IF YOU COULD BUY A DISCOUNTED WEEKEND PASS FOR YOUR ENTIRE HOUSEHOLD?

	Percentage of BART Commuters	Percentage of Non-BART Commuters	TOTAL SAMPLE
Yes	45%	39%	42%
No	51%	51%	51%
Not sure/don't know	3%	9%	7%
Refused/no answer	1%	1%	*
TOTAL	100%	100%	100%
	N=73	N=117	N=190

(Qn.57b)