SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

2005-2006 ON-BOARD PASSENGER SURVEY

Final Report

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SANTA CLARA
Valley Transportation Authority

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EXECUTIVE SUMMARY

A. BACKGROUND

Between Fall 2005 and Spring 2006, the Santa Clara Valley Transportation Authority (VTA) conducted an on-board passenger survey of VTA's fixed route bus and light rail services, with assistance from NuStats, Inc. Data collection was completed in three phases. The first phase occurred between October 31 and December 17 in 2005, with a break for Thanksgiving from November 19 – 26. The data collection effort resumed on the weekends of February 4-5 and 11-12 in 2006. The last phase was in the weekend of March 4-5, 2006. These data collection efforts resulted in a total of 13,718 valid surveys.

The study involved designing a survey instrument; developing a sample plan; collecting, processing, and geocoding the data; weighting and expanding the data, and reporting results. This report documents these tasks. Survey methodologies and statistics are provided in Chapter 1.

B. KEY FINDINGS OF SYSTEM-WIDE RESULTS

Chapters 2, 3, and 4 highlight the system-wide study results including passenger demographics, trip characteristics, and service evaluation. Detailed tables for all survey data items can be found in these chapters.

PASSENGER PROFILE

As shown in Table E.1, the typical VTA passenger is from a low-income household, is Hispanic, and is young. More than half of VTA passengers have a household income of less than $25,000 (56%). Thirty-eight percent are employed full-time. The largest percentage of passengers is from the 25- to 34-year old group (24%) and those in the two younger age categories making up another 35% for a total of 59% younger than 35.

There are slight differences between weekday and weekend passengers. Weekday passengers are younger and tend to have a more equal balance between males and females (compared to a larger percentage of male passengers on the weekend). Compared to weekday passengers, a larger percentage of weekend passengers are Hispanic, employed full-time, and have a lower income. Respondents who paid a "Disabled" fare make up about the same percentage (6%) of passengers on both weekday and weekend service.

TABLE E.1: VTA PASSENGER PROFILE

DEMOGRAPHIC	WEEKDAY PASSENGERS	WEEKEND PASSENGERS	OVERALL PERCENT
13 to 34 years of age	61%	55%	59%
Disabled Fare Category	5%	6%	6%
Hispanic	35%	39%	37%
Full-time employed	36%	40%	38%
Income <$25,000	53%	60%	56%
No auto available for trip	63%	68%	65%
Rides 4 days/week or more	79%	71%	75%
Walks to stop	71%	71%	71%

TRIP CHARACTERISTICS

Overall, most trips made on VTA originate from home at 45%, followed by work at 21%. Likewise, 37% of trips had a destination of home and 23% had a destination of work. VTA passengers also typically walk to (71%) and from (73%) their origin to the bus stop/light rail station and from the bus stop/light rail station to their final destination.

The trip characteristics between weekday and weekend passengers are fairly comparable with regards to trip origin and destination location and access and egress mode.

TABLE E.2: VTA TRIP CHARACTERISTICS

TRIP CHARACTERISTIC	WEEKDAY PASSENGERS	WEEKEND PASSENGERS	OVERALL PERCENT
Trip Origin – Home	43%	46%	45%
Trip Destination - Home	40%	43%	37 %
Access Mode – Walk	71%	71%	71 %
Egress Mode – Walk	73%	74%	73 %

Other overall demographic and trip characteristics findings include:

- More than three quarters of the respondents make the same trip they were surveyed on in the reverse direction (77%).
- Most (81%) can get from their origin to their final destination in no more than two buses/trains, with 39% making their one-way trip using one bus or train.
- Nearly half (45%) of the respondents can make their one-way trip in less than 30 minutes.
- The majority (55%) of respondents have made their surveyed trip in a car and estimate that it takes just under 20 minutes to do so.
- Nearly one-third (31%) said that if transit didn't exist, they would get a ride or carpool to make the trip.
- Just over one-third (38%) of the passengers used a Monthly Flash Pass and 27% paid cash for a single ride.
- The majority of respondents (65%) did not have a vehicle available to make the surveyed trip.

SERVICE EVALUATION

Overall service evaluation findings include:

- Passengers gave highest scores to VTA for providing good (47%) or excellent (41%) accessibility to disabled passengers. They gave the lowest scores on the cost of the fare, with just half indicating a good (19%) or excellent (31%) score.
- Respondents feel strongly about VTA providing more frequent service with 64% citing this as a "Very Important" service improvement and an additional 28% said it was "Important."
- "VTA Take One" was cited as the most popular media to provide information to passengers (23%), followed by VTA website and email (19%).

C. Trend Analysis

Chapter 5 compares the key findings of this survey with those from the previous survey, conducted in 2000. Comparisons were made in transit travel characteristics and passenger demographics and the trends were examined.

- VTA has experienced a decline in the overall share of young passengers since the 2000 survey. Shares in both the 13 – 17 and 18 – 24 age groups have decreased. The largest increase was in the 45-to-64-age group, from 15% in 2000 to 21% in 2005.
- In 2000 male passengers accounted for 57% of the passengers surveyed, which was slightly higher than the 54% in the 2005 survey. The largest ethnic group, Hispanic/Latino, remained the same in the two surveys (38% in 2000 and 37% in 2005). The percentage of whites has declined from 32% to 28%.
- Some notable changes are found in the employment status since the 2000 survey. The proportion of passengers who were full time workers has declined from 47% to 38%. All other categories have increased, with the biggest increase occurring in the student category.
- The most common fare, "adult", has increased slightly from the 2000 survey, from 74% to 76%. "Youth" and "senior" fares have both declined. "Disabled" fares have increased, but from a small base.
- Monthly Flash Pass and Day Pass usages have declined by 3% and 11%, respectively. More passengers used cash (increased by 11%) or Eco Pass / San Jose State University pass (increased by 3%). VTA's fare policies and structure have changed since 2000, which may explain the changes in the ways passengers pay their fares.
- The majority of the passenger population is still dependent on transit. The percentage of passengers answered "Would not make trip" remained about the same as in 2000. The largest percentage of the passenger population cited "no other way" as the main reason for using VTA transit in both the 2000 and 2005 surveys. The percentage of passengers with no automobile available for their trips decreased slightly, from 70% in 2000 to 65% in 2005.
- Walking to/from transit remained the overwhelmingly predominant mode for access and egress, at 71% and 73%, respectively. The breakdown of walking and other modes to access bus stops/stations remained about the same from 2000 to 2005.
- Average trip length varied in almost all categories in the results from the last two surveys. The most significant differences are in trips 20 – 29 minutes and 30 – 39 minutes. Trips completed within 30 minutes increased from 38% in 2000 to 44% in 2005.
- The length of VTA passengers using the services remained fairly stable from 2000 to 2005. The percentage of passengers who have been riding VTA "more than 3 years" increased by 2 percentage points, from 48% to 50%, while passengers using VTA for "less than one year" decreased slightly.

D. Weekend Summary

Chapter 6 compares weekend survey responses with weekday responses. There are some notable distinctions between weekday and weekend passengers.

- System-wide weekend passengers were less likely to be students (18%) than were weekday passengers (30%). Fewer weekend light rail passengers (43%) were employed full-time than were weekday passengers (50%).

- Weekend passengers were more likely to be transit-dependent. If transit didn't exist, weekend passengers were less likely to make the trip (21% vs. 17%). Approximately 5% more weekend passengers did not have a car available for the trip and 2% more had no other way.
- Weekend passengers were more likely to pay cash for a single ride (28%) than were weekday passengers (26%), but less likely to use Eco Pass/SJSU pass (8% vs. 14%). Monthly flash pass usage was about the same in weekdays and weekends.
- Weekend passengers, on average, have been riding VTA for a longer duration than have weekday passengers (52% more than 3 years versus 48%).
- "More weekend service" was selected by 91% of weekend passengers as "very important" or "important" to them, compared to 82% for weekday passengers. Weekday and weekend passengers also differ on the importance of "later service" and "earlier service".

E. Comparison of Bus and Light Rail

Chapter 7 compares responses from bus and light rail passengers in several categories. The major findings are summarized below.

- Bus and light rail passengers show similar age distribution patterns. The major distinctions are in the 13-to-17 and the 35-to-44 age groups. Light rail passengers have a smaller share in the youngest age group and a larger share in the working adult age groups (25 – 34, 35 – 44, and 45 – 64).

- There are noticeable differences in income level and employment status by mode. Light rail passengers are more likely to be employed full-time while bus passengers have a higher percentage of students. Light rail passengers also reported higher income levels than bus passengers. Approximately 60% of bus passengers belonged to the low-income categories ($24,999 and lower), compared to 41% of light rail passengers. There were higher percentages of light rail passengers in each income category of $25,000 and higher.

- Light rail passengers are less likely to be transit dependent, with 49% of them indicating they had no other way to travel if transit did not exist, compared to 66% among bus passengers. 67% of the bus passengers said there was not an automobile available for their trips, while only 51% of light passengers indicated such.

- A higher percentage (83%) of light rail passengers are in the "adult" fare category, compared to bus passengers (75%). The bus system has a higher percentage of passengers in the "youth" fare category, 14% in bus vs. 10% in light rail. There are slightly higher percentages of light rail passengers in the "senior" and "disabled" fare categories.

- More bus passengers use a day pass or monthly pass, while more light rail passengers use cash or Eco Pass/SJSU pass.

- Most one-way trips by transit can be completed using only one or two buses or trains. The responses to the number of buses/trains needed to complete the trip show some variation by mode. Approximately 8% more light rail passengers complete their one-way trips boarding one train.

- Travel times are similar for both bus and light rail passengers. The most noticeable differences are in the less-than-10-minute and the 20-to-29-minute categories. Light rail passengers are more likely to complete their one-way trips in less than 10 minutes, while a higher percentage of bus passengers completed theirs in 20 to 29 minutes.

- Bus passengers tend to ride VTA very often. 47% of bus passengers ride 6 to 7 days a week, compared to 38% of light rail passengers. There are more infrequent passengers (less than once a week) on light rail, 13% vs. 5% of bus passengers.

- More bus passengers have been riding VTA for a longer duration than have light rail passengers. 51% of bus passengers had been riding for more than 3 years, compared to 44% of light rail passengers.

- In response to the question of which service improvement is important, bus and light rail passengers ranked all improvement options in the same order of importance. More bus passengers (64%) rated "more weekend service" "very important" than light rail passengers (54%).

F. Target Lines

There were a total of 14 target lines of special interest to VTA. Chapter 8 presents the key variables for each of these lines, including bus lines 22, 23, 25, 26, 55, 62, 64, 66, 68, 70, 72, 81, 522, and light rail lines 900, 901, 902, which were combined as one route.

- Among the target lines, "walked" was the most prevalent access and egress mode, with 58% to 84% of passengers walking to/from a bus stop or light rail station. "Transferred from VTA bus/shuttle" was a distant second – the access mode was between 7% and 24% of passengers.

- There was a wide variance in reported trip length measured by minutes among the target lines. Trips on the LRT lines were among the shortest trip reported. Trips on lines 68 and 522 were among the longest trips. The most prevalent lengths of trips on the target lines were 20-29 minutes (24% of all target line trips), followed by 40-49 minutes (19% of all target line trips).

- The majority of fares recorded for the target lines were "adult" fares. However, less than half of fares on line 55 were "adult", 44% were "youth." The highest levels of "senior" fares were on lines 26 and 62. For "disabled", the lines with the highest percentages were 23, 62, 68, and 81.

- A comparison between lines 22 and 522 shows that although there are few differences in passenger demographics, passengers' travel patterns are quite different. Passengers on Line 22 tend to make shorter trips, with 46% passengers making trips less than 30 minutes, compared to 29% on Line 522. More passengers on Line 22 (76%) walked to a bus stop than on Line 522 (62%). However, Line 522 has a higher percentage (24%) of passengers transferring to and from VTA bus and light rail.

- There was high variation in age of passengers among the target routes. Line 55 had the highest proportion of teen passengers (ages 13-17), followed by line 70. Line 72 had the highest proportion of young adults (ages 18-24). Lines 26 and 62 had the highest proportion of older passengers (ages 65 and older).

- The majority of target line passengers (56%) reported incomes of less than $25,000. Passengers of lines 25, 64, and 72 reported the lowest incomes. Light rail passengers reported the highest household incomes.

- Lines 22 and 68 as well as the LRT lines have a slightly higher percentage of male passengers than the other lines at about 60% of the passengers for each line. Lines 25 and 81 have the highest percentage of female passengers at 57% and 58%, respectively.

1. SURVEY METHODOLOGY AND STATISTICS

A. SAMPLING PLAN AND ISSUES

The sampling plan developed for the VTA On-Board Survey was designed to achieve a system-wide confidence level of 95% with a ± 0.8% margin of error. The sampling plan provided for the collection of data from 67 routes operating during weekdays, 44 routes operating on Saturdays, and 38 routes operating on Sundays. Route 141 was not surveyed due to its seasonal operations.

Based on average daily ridership data for October 2005, an initial sample plan (Appendix A) was drafted by NuStats, Inc., in which the confidence level for routes was tiered to allow for a lower standard error level for the routes with the highest ridership, average standard error level for mid-ridership level routes, and a higher standard error level for routes that do not carry enough daily passengers to obtain a lower standard error level. The initial sampling plan required the collection of a minimum of 16,000 surveys. It was developed under the following guidelines at the 95% confidence interval:

- Routes with average daily ridership of 3,500 or more were sampled at the standard error rate of ±4.4 percentage points (500 questionnaires).
- Routes with average daily ridership of 2,500 to 3,499 were sampled at the standard error rate of ±8.7 percentage points (125 questionnaires).
- Routes with average daily ridership of 1,000 to 1,999 were sampled at the standard error rate of ±10.0 percentage points (96 questionnaires).
- Routes with average daily ridership of 500 to 999 were sampled at the standard error rate of ±11.3 percentage points (75 questionnaires).
- Routes with average daily ridership of 100 to 499 were sampled at the standard error rate of ±14.6 percentage points (45 questionnaires).
- Routes with less than 100 average daily passengers were clustered and sampled at the standard error rate of between ±8.7 and ±7.0 percentage points (125-196 questionnaires total for the cluster[1]).

Subsequent to the Fall 2005 data collection effort (Phase 1), the sample plan was modified to account for minimum samples by route as a result of the lower-than-expected return on completed surveys. Routes were individually reviewed and the required sample size for each was adjusted. The table on the following page summarizes the sample size goals for weekday, Saturday, and Sunday for each route.

Situations in which the actual number and the goal differed were determined to be close enough to the goal that additional survey efforts were not required. The second and third data collection phases focused on increasing the weekend sample sizes for specific routes.

The results of this sample plan were designed to yield 13,736 complete and usable questionnaires from weekday, Saturday, and Sunday fixed-route services, while still achieving the overall standard error rate of ± 0.8 percentage points at the 95% confidence interval. The final data collection effort resulted in 13,718 valid surveys as shown in Table 1.1.

[1] A cluster is an aggregation of two or more routes. A cluster goal is one in which the individual routes within a cluster do not have a specific sample goal but rather the cluster itself has a sample goal.

TABLE 1.1: FINAL SAMPLE PLAN

ROUTE	WEEKDAY		SATURDAY		SUNDAY		TOTAL	
	GOAL	ACTUAL	GOAL	ACTUAL	GOAL	ACTUAL	GOAL	ACTUAL
10	75	94	30	32	63	79	168	205
12	0	0	30	33	63	61	93	94
13	30	43	20	47	Cluster	N/A	50	90
15	Cluster	N/A	0	0	0	0	N/A	N/A
16	45	35	0	0	0	0	45	35
17	45	23	Cluster	N/A	Cluster	N/A	45	23
19	45	27	Cluster	N/A	Cluster	N/A	45	27
22	400	354	120	122	120	125	640	601
23	400	434	120	123	120	130	640	687
25	400	306	120	142	120	135	640	583
26	400	460	120	130	120	108	640	698
27	75	110	30	25	30	14	135	149
31	75	110	67	66	30	16	172	192
32	75	73	20	27	0	0	95	100
33	45	61	Cluster	N/A	30	18	75	79
34	45	47	Cluster	N/A	0	0	45	47
35	75	60	30	57	30	26	135	143
36	75	77	30	43	67	61	172	181
37	30	49	Cluster	N/A	0	0	30	49
38	45	28	0	0	0	0	45	28
39	75	50	20	12	30	28	125	90
40	75	63	20	45	30	11	125	119
44	Cluster	N/A	0	0	0	0	N/A	N/A
45	Cluster	N/A	Cluster	N/A	Cluster	N/A	N/A	N/A
46	75	116	30	40	30	24	135	180
47	75	59	30	26	30	27	135	112
48	45	58	20	20	Cluster	N/A	65	78
49	45	62	20	12	30	28	95	102
51	75	83	20	22	0	0	95	105
52	45	188	0	0	0	0	45	188
53	75	80	0	0	0	0	75	80
54	75	98	20	22	30	23	125	143
55	96	177	30	41	44	62	170	280
57	75	87	30	41	30	27	135	155
58	75	75	30	30	45	28	150	133
59	45	46	0	0	0	0	45	46
60	200	189	100	124	Cluster	N/A	300	313
62	400	254	120	156	120	119	640	529
63	75	79	20	24	30	36	125	139
64	200	186	120	91	120	127	440	404

ROUTE	WEEKDAY		SATURDAY		SUNDAY		TOTAL	
	GOAL	*ACTUAL*	*GOAL*	*ACTUAL*	*GOAL*	*ACTUAL*	*GOAL*	*ACTUAL*
65	75	74	45	29	20	26	140	129
66	400	294	120	142	120	121	640	557
67	Cluster	N/A	0	0	0	0	N/A	N/A
68	320	189	120	81	120	108	560	378
70	400	326	120	127	120	120	640	573
71	96	99	30	38	30	28	156	165
72	200	130	120	126	120	114	440	370
73	200	218	30	28	Cluster	N/A	230	246
76	Cluster	N/A	0	0	0	N/A	N/A	N/A
77	96	86	125	85	54	45	275	216
81	400	298	120	114	150	112	670	524
82	75	70	30	39	30	28	135	137
85	75	98	0	0	0	0	75	98
88	45	81	Cluster	N/A	0	0	45	81
101	Cluster	N/A	0	0	0	0	0	N/A
102	45	40	0	0	0	0	45	40
103	45	26	0	0	0	0	45	26
104	Cluster	N/A	0	0	0	0	N/A	N/A
120	Cluster	N/A	0	0	0	0	N/A	N/A
121	45	60	0	0	0	0	45	60
122	Cluster	N/A	0	0	0	0	N/A	N/A
140	45	50	0	0	0	0	45	50
141*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
180	75	145	67	62	Cluster	N/A	142	207
182	Cluster	N/A	0	0	0	0	N/A	N/A
304	45	22	0	0	0	0	45	22
305	45	20	0	0	0	0	45	20
321	Cluster	N/A	0	0	0	0	N/A	N/A
328	Cluster	N/A	0	0	0	0	N/A	N/A
330	45	31	0	0	0	0	45	31
522	400	494	120	145	0	0	520	639
900	96	93	36	6	36	20	168	119
901	400	432	67	139	150	133	617	704
902	400	455	67	138	120	91	587	684
Cluster	125	182	196	40	125	213	446	435
Total	8,399	8,354	2,780	2,892	2,557	2,472	13,736	13,718

**Route 141 was excluded from the sample plan because of its seasonality and limited ridership.*

B. TRIP SELECTION

The number of trips to be sampled was calculated by assuming an average response rate for a typical trip. For example, consider a route with an average weekday passenger load of 500 passengers, making 10 trips a day, and having a survey sample goal of 50 completed surveys.

The average passenger load was assumed to be 50 passengers per trip (500 daily passengers/10 trips). A response rate of 30% for weekday passenger loads by trips is typical, so 15 completed surveys were expected for each trip (50 passengers/trip x 30% response rate). Thus, since the sample goal was 50 completed questionnaires, it was determined that 3.3 trips would need to be sampled to meet quota requirements (50 completed surveys required / 15 responses per trip = 3.3 trips). The number of trips to be sampled was rounded to the nearest higher whole number for trip selection purposes; so 4 trips would be surveyed for this route.

Trips to be sampled were randomly selected from the entire universe of trips (weekday, Saturday, or Sunday as appropriate) and stratified by route, direction (inbound, outbound, N, S, E, W, loop, etc.), and service period.

Trips were clustered by block (i.e., consecutive trips a specific vehicle makes for a certain duration) for the purpose of efficient use of surveyor labor. The amount of time a surveyor spends in finding, boarding, and setting up on individually sampled trips is minimized if the surveyor boards the vehicle at the start of its trip and stays on board that vehicle surveying all of the sampled revenue trips in the sample cluster. The use of clustering consecutive vehicle trips representing the trips in all or part of the run had the further advantage of de facto stratification by direction (most runs consist of bus trips alternately traveling inbound, outbound, inbound, etc.) as well as stratification by route and time of day.

C. SAMPLING METHODOLOGY

To provide a representative distribution of trips and to achieve the sampling goals, the following steps were taken to create the sample structure for this project:

VTA provided a route-by-route listing of daily vehicle trips and average ridership for weekday, Saturday, and Sunday. Ridership reflects the number of boardings on a specific route. Since many passengers make multiple trips on the same route, ridership figures are normally greater than the actual number of “unique” or individual passengers.

Based on an anticipated response rate of 30%, the number of surveyed trips required to meet the standard error level was calculated as previously described. Because the number of boardings per trip was not known, each trip assumed an equal number of boardings (e.g., 500 boardings on a route with 10 total trips assumed 50 boardings per trip).

Once the number of trips on each route was determined, the sample was developed using the transit system’s headway information. Each trip had an equal chance of being included in the sample, but the sample was balanced to reflect passenger loads by service time periods.

Only passengers age 13 or older were asked to complete a questionnaire. Surveyors tallied boarding passengers, which included the number of passengers under age 13.

The final task was creating surveyor assignment sheets, which provided the surveyor with all of the necessary information required to correctly identify and board each assigned trip.

D. DATA WEIGHTING AND EXPANSION

WEIGHT FACTOR COMPUTATION

To create a more accurate picture of the VTA transit system, the data are weighted and expanded. This was conducted in order for each route to be properly represented in the survey total. As a simple example, one route may have 1,000 adult passengers per day and another, 100. If 50 questionnaires were collected on each route, the percentage collected would be 5% and 50%, respectively. Without weighting, the data would cause one route to be over-representative and the other route under- representative in the results. Weighting the data to actual ridership proportions balances these differences so that the reported system-wide trip characteristics more accurately reflect the entire system as well as the individual route.

The weighting process was constructed on two levels. First, on the individual one-way trip level and secondly on the Route-Time of day-Direction (RTD) level. That is, each record in the final database was assigned a weight based on their individual one-way trip response rate and by route, time of the day, and direction. In order to do so, the number of completed questionnaires and total passengers on board for each trip are used for the Response Factor (RF). The total number of trips and the number of sampled trips were summarized by each RTD for the Vehicle Factor (VF). The Boarding Factor (BF), or final weight, is the product of the RF and the VF. The formulas are shown below.

Response Factor = Total Boarding / Usable Questionnaires

Because not all adult passengers return usable questionnaires, an RF is needed to account for these passengers. The RF is then assigned to the passengers who were successfully surveyed. For example, if there were 200 passengers on board in a given RTD level, and only 100 returned a valid questionnaire, each of these passengers was assigned a RF of 2 (200 divided by 100).

A tally count of passengers on board was made for all the surveyed trips. This count is utilized to compute the Total Boarding by RTD. To account for human error while tallying (especially on trips with standing room only loads), the number of questionnaires distributed on each trip was compared against the tally of passengers age 13 and older. In general, those two numbers were expected to be equal, but where there is a discrepancy, the number of distributed questionnaires prevailed.

Vehicle Factor = Total Trips / Sampled Trips

Given that only a sample of trips was surveyed out of the total revenue trips for a given route, a factor to account for the non-surveyed trips in each RTD was calculated and applied to the dataset. For example, if the RTD Weekday – Route 12 – AM Peak (5:31 a.m. to 9:00 a.m.) - Inbound has a total of 14 trips, but only 4 were surveyed, its VF is 14 divided by 4, or 3.5.

Boarding Factor = Response Factor * Vehicle Factor

ADJUSTING FOR VARIANCES IN BOARDING ESTIMATES

By applying the Boarding Factor (weight variable) to the questionnaires associated with the various routes, it was expected that the resulting boarding estimate for adult passengers at the route level would be very close to the actual ridership figures VTA provided. The accuracy of the estimate was dependent, however, upon sample size, boarding rate, and randomness. To ensure the validity of the extrapolation, the estimated figures were compared to ridership numbers provided by VTA. Following this review, weights for all routes were adjusted accordingly.

ASSIGNMENT OF BOARDING FIGURES

Since it was not possible to survey at least one trip from all VTA's routes requiring sampling of less than ten trips, it was necessary to estimate boardings for the missed time periods. The assignment was performed as explained below.

The most accurate way to assign a boarding estimate for any given RTD not surveyed is to use the boarding figure from its "best opposite," that is, a RTD in the same day and route but in the opposite direction and time of the day. (The assumption being that passengers boarding a bus in the morning to go to work are likely to board the same bus on their way back to home in the afternoon.) For example, the boarding figure for 77 – AM Peak - Inbound direction (non-surveyed RTD) would be taken from 77 – PM Peak - Outbound direction.

In a few instances, however, there was not a clear "opposite" for a non-surveyed RTD, so a figure from the one RTD that most closely resembled it was chosen. For example, if a sample was not collected on a route that operates as a loop during a certain time period, and there is no opposite direction, the number from the opposite time period was used. Other periods of the day are not as clear-cut and are collapsed regardless of direction within itself including Mid-day, Evening and Late Evening/Early Morning.

Following the calculation of weighting factors, the number of questionnaires collected from adult boarding passengers was expanded to represent the ridership figures shown in Table 1.2. The columns titled "Unexpanded" shows the total number of completed questionnaires (defined as having the origin or destination and bus on or bus off location collected).

TABLE 1.2: DATA COLLECTION AND EXPANSION RESULTS BY ROUTE

ROUTE	WEEKDAY		SATURDAY		SUNDAY		TOTAL	
	UNEXPANDED	*EXPANDED*	*UNEXPANDED*	*EXPANDED*	*UNEXPANDED*	*EXPANDED*	*UNEXPANDED*	*EXPANDED*
10	94	1,476	32	953	79	1,047	205	3,476
12	0	0	33	874	61	1,020	94	1,894
13	43	247	47	100	Cluster	0	90	347
15	Cluster	33	0	0	0	0	Cluster	33
16	35	241	0	0	0	0	35	241
17	23	134	Cluster	23	Cluster	41	23	198
19	27	193	Cluster	66	Cluster	0	27	259
22	354	18,048	122	11,891	125	11,325	601	41,264
23	434	5,954	123	3,727	130	2,974	687	12,655
25	306	7,311	142	3,817	135	3,155	583	14,283
26	460	4,280	130	2,242	108	1,863	698	8,385
27	110	1,355	25	702	14	386	149	2,443
31	110	1,852	66	625	16	476	192	2,953
32	73	1,025	27	242	0	0	100	1,267
33	61	389	Cluster	248	18	168	79	805
34	47	256	Cluster	128	0	0	47	384
35	60	1,446	57	751	26	465	143	2,662
36	77	812	43	846	61	720	181	2,378
37	49	233	Cluster	66	0	0	49	299

ROUTE	WEEKDAY		SATURDAY		SUNDAY		TOTAL	
	UNEXPANDED	*EXPANDED*	*UNEXPANDED*	*EXPANDED*	*UNEXPANDED*	*EXPANDED*	*UNEXPANDED*	*EXPANDED*
38	28	182	0	0	0	0	28	182
39	50	503	12	295	28	241	90	1,039
40	63	574	45	335	11	194	119	1,103
45	Cluster	0	Cluster	32	Cluster	17	Cluster	49
46	116	928	40	133	24	101	180	1,162
47	59	1,225	26	674	27	378	112	2,277
48	58	339	20	230	Cluster	0	78	569
49	62	340	12	263	28	215	102	818
51	83	1,000	22	150	0	0	105	1,150
52	188	191	0	0	0	0	188	191
53	80	943	0	0	0	0	80	943
54	98	1,212	22	473	23	346	143	2,031
55	177	2,437	41	731	62	502	280	3,670
57	87	1,391	41	562	27	379	155	2,332
58	75	1,439	30	502	28	397	133	2,338
59	46	323	0	0	0	0	46	323
60	189	2,701	124	1,343	Cluster	950	313	4,994
62	254	3,636	156	1,501	119	1,220	529	6,357
63	79	1,162	24	343	36	256	139	1,761
64	186	3,483	91	2,126	127	2,118	404	7,727
65	74	1,159	29	324	26	276	129	1,759
66	294	5,955	142	2,976	121	2,583	557	11,514
67	Cluster	87	0	0	0	0	Cluster	87
68	189	6,136	81	3,273	108	2,689	378	12,098
70	326	6,737	127	3,764	120	2,946	573	13,447
71	99	2,247	38	998	28	618	165	3,863
72	130	3,526	126	1,462	114	1,266	370	6,254
73	218	2,644	28	839	Cluster	610	246	4,093
76	Cluster	84	0	0	Cluster	0	Cluster	84
77	86	2,045	85	1,079	45	1,119	216	4,243
81	298	3,854	114	1,456	112	1,137	524	6,447
82	70	1,941	39	721	28	683	137	3,345
85	98	1,298	0	0	0	0	98	1,298
88	81	400	Cluster	66	0	0	81	466
101	Cluster	97	0	0	0	0	Cluster	97
102	40	122	0	0	0	0	40	122
103	26	124	0	0	0	0	26	124
104	Cluster	76	0	0	0	0	Cluster	76
120	Cluster	69	0	0	0	0	Cluster	69

ROUTE	WEEKDAY		SATURDAY		SUNDAY		TOTAL	
	UNEXPANDED	*EXPANDED*	*UNEXPANDED*	*EXPANDED*	*UNEXPANDED*	*EXPANDED*	*UNEXPANDED*	*EXPANDED*
121	60	180	0	0	0	0	60	180
122	Cluster	29	0	0	0	0	Cluster	29
140	50	134	0	0	0	0	50	134
180	145	1,661	62	975	Cluster	807	207	3,443
182	Cluster	91	0	0	0	0	Cluster	91
304	22	238	0	0	0	0	22	238
305	20	126	0	0	0	0	20	126
321	Cluster	47	0	0	0	0	Cluster	47
328	Cluster	20	0	0	0	0	Cluster	20
330	31	99	0	0	0	0	31	99
522	494	5,232	145	3,309	0	0	639	8,541
900	93	1,087	6	1,008	20	812	119	2,907
901	432	15,342	139	10,780	133	9,014	704	35,136
902	455	6,739	138	3,226	91	2,606	684	12,571
Cluster	182		40		213		435	
Total	8,354	138,920	2,892	73,250	2,472	58,120	13,718	270,290

The final weight factor that is used outside of the main weight factors is the linked trip factor – used in linked trip analysis (the previously described factors are used in unlinked trip analysis. This factor accounts for the fact that a person who transfers from one transit vehicle to another has double the chance of being sampled than does a person who uses only one transit vehicle to accomplish a one-way journey. The linked trip factor is equal to the reciprocal of the number of transit vehicles used. Table 1.3 illustrates how the linked trip factor is calculated using the mode of access and the mode of egress data from the questionnaire.

A person who did not transfer during the completion of a one-way transit trip would have a linked trip factor of 1.0. A person who transferred from another route before boarding the sampled trip, but did not intend to transfer again would have a weight of 0.5, as would a person who didn't transfer before boarding the sampled trip but who intended to transfer in order to get to their final destination. A person who transferred to and from the sampled trip would have a weight of 0.333. This linked trip factor is entered into each individual, completed questionnaire record.

TABLE 1.3: LINKED TRIP FACTOR

EGRESS TRANSFER? (Q6)	ACCESS TRANSFER? (Q3)	
	YES	*NO*
Yes	.333	.500
No	.500	1.00

E. THE SURVEY FORM

The survey instrument was designed as a self-completion questionnaire consisting of 29 primarily self-coded questions. The form was pre-printed with a unique serial number, which links each questionnaire to a specific route, time, day, and trip. The questionnaire was designed to obtain information in four major

categories: origin/destination travel patterns, access and egress modes, service evaluation, and passenger demographics.

Questionnaires were designed in a two-sided 11X17, folded format, and printed on heavy card stock for easy distribution and completion. The questionnaire presents English on one side and Spanish on the reverse. The Asian language survey contained Chinese and Vietnamese on reverse sides with colored card stock to distinguish from the English/Spanish version. The questionnaire contained a contest entry form for the purpose of encouraging respondent participation and capturing accurate home address information since approximately 60% of transit trips begin or end at home. Questionnaires were designed for electronic scanning of data elements. Appendix B includes questionnaires in all four languages.

F. Survey Procedures

In order to track and monitor all of the trips required in the sampling plan, a surveyor assignment sheet was developed, which included key information for each assignment, including trip number, trip direction, time period, block number, route number, start and end times, and start and end locations. A sample assignment sheet is included in Appendix C of this report. All assignments for each day were recorded in an electronic master control file used by supervisors to track and monitor surveyors in the field, as well as document data collection efforts upon completion of an assignment. The control file also monitored trip completion and response rates.

Surveyors were provided with slightly more questionnaires than the anticipated number of passengers expected to board the trips comprising an assignment. The serial number range for the questionnaires given for an assignment was recorded in the electronic control file. These numbers ensured that returned surveys could be linked to the assignment (and trip) from which they were distributed.

In addition, surveyors documented each trip of each assignment using a customized trip log. Surveyors used this log to record the number of boarding passengers and range of questionnaires distributed during each trip of the assignment. A sample trip log form is in Appendix D of this report.

To ensure the highest quality results during data collection efforts, the following quality control measures were enforced:

- Careful screening, training, and selection of survey staff. Surveyors attended a four-hour training session. Because some surveyors were replaced, several training sessions were held. The training sessions were required prior to the surveyor working on an assignment. Surveyors were also required to practice distribution, collection, and record-keeping tasks prior to actually conducting survey efforts. All surveyors were provided with a comprehensive training manual detailing surveying techniques. A copy of the training manual is included in this report as Appendix E.
- High level of effective field supervision. Supervisors met with each surveyor at the end of every assignment and reviewed his/her work before making his/her next assignment. Quality control was an ongoing process and surveyors were retrained or replaced when problems arose. VTA staff also assisted in reviewing the surveys as they came back to the command center to assess data quality and provide feedback to the field supervisor.

Labor Recruitment and Training

Surveyors, provided through Manpower (a local San Jose temporary employment agency), were required to be able to work as early as 5:00 a.m. to as late as 1 a.m., work split shifts, have reliable transportation (for assignments that start/end before or after a revenue trip), and have a basic understanding of the transit system. They were trained basic survey skills to encourage respondent participation.

The training sessions were held at VTA headquarters, located at 3331 North First Street in San Jose. Surveyors were trained in the use of assignment sheets, survey procedures, etiquette, and how to approach and encourage passengers. The training included role-playing and one-on-one feedback during training and upon assignment completion. Directly following training, supervisors provided assignments ranging from one to three hours in length to each of the surveyors as "practice assignments."

Following completion of the initial assignments, surveyors were required to return to the survey command center (located at VTA's headquarters) where NuStats supervisors checked and verified the accuracy of the surveyor's work. Assignments were then handed out for the next day.

Conducting the Survey

During the course of the entire data collection period, surveyors were required to pick up one work assignment at a time from the field supervisor each day. Assignments were matched to surveyors' unique skills or situation (i.e., proximity of start location to the surveyor's home, familiarity with route, etc.).

Surveyors were asked to board the bus and introduce themselves to the operator as well as confirm they were surveying the correct block according to the information provided on the assignment sheet. A Questionnaire Return Box was placed in the rear stairwell and a "Survey Today" sign was affixed to the fare box facing the front stairwell.

Surveyors were asked to station themselves directly behind the operator so they would have easy access to passengers as they boarded the vehicle, while not impeding boarding. A survey collection envelope (one each per trip in the assignment) with an attached Trip Log was clipped to a clipboard. Information including the operator's name, vehicle number, surveyor's name, the date, and the day of week was recorded on the Trip Log prior at the start of the assignment. Additionally, surveyors recorded the serial number of the first questionnaire to be handed out on that trip.

Questionnaires were given to all passengers age 13 or older with instructions from the surveyor to complete the questionnaire and return it to the surveyor prior to exiting the vehicle.

At the conclusion of each sampled trip, surveyors recorded the serial number of the next questionnaire that had not yet been distributed. The number of boarding passengers was tallied at each stop as they boarded the vehicle, whether or not they took a questionnaire. At the end of each trip, surveyors collected all of the questionnaires from the Return Box, and checked the floor and all seats for questionnaires left on-board the vehicle.

Surveyors returned to the survey command center after each assignment to have their work checked, and to receive a work assignment for the next survey day.

G. Response Rate

A total of 47,218 questionnaires were distributed to all eligible passengers. The 13,718 valid questionnaires comprising the final data file equates to a 29% response rate. A valid survey is defined as 1) sufficient data to provide a valid origin and destination pair; and 2) more than half of other questions returned valid answers.

The response rate was calculated as the number of valid surveys as a percentage the number of questionnaires distributed, according to the formula below:

Response Rate = Completed and Valid Survey / Surveys Distributed to Eligible Respondents

For the purpose of this study, an eligible respondent was defined as:

A passenger age 13 or older; and

Not previously asked to complete a questionnaire on the line being surveyed.

The survey questionnaire was offered in four languages: English, Spanish, Chinese, and Vietnamese. Of all the valid surveys, 88% were completed in English, 12% in Spanish, 0.4% in Chinese, and 0.2% in Vietnamese.

The frequency of responses to each question is shown on a Questionnaire with Frequencies in Appendix F.

H. QUESTIONNAIRES COLLECTED BY TIME PERIOD

Questionnaires collected by time period for lines sampled on weekdays, Saturdays and Sundays are summarized in the following two tables. Table 1.4 shows a comparison of questionnaires collected (unweighted) by time period and ridership distribution by time periods. There is a close correlation between the percentage of the weekday surveys collected in the time periods and the ridership distribution during the survey period.

TABLE 1.4: WEEKDAY TIME OF DAY DISTRIBUTION

TIME PERIOD	SURVEY PERCENT	RIDERSHIP
AM and PM Peaks	48%	47.8%
Mid-day = 9:01 a.m. to 3:00 p.m.	44%	42.5%
Evening = 6:01 p.m. to 9:00 p.m.	6%	7.0%
Late Night/Early Morning = 9:01 p.m. to 5:31 a.m.	1%	2.7%

Notes: Questionnaires collected during AM Peak (5:31 a.m. to 9:00 a.m.) and PM Peak = 3:01 p.m. to 6:00 p.m. were 24% each.
Ridership distribution is based on Nov. 05 to Mar. 06 ridership data.

Table 1.5 shows the unweighted distribution for the weekend samples.

TABLE 1.5: WEEKEND TIME OF DAY DISTRIBUTIONS

TIME PERIOD	SURVEY PERCENT
Morning = 5:31 a.m. to 9:00 a.m.	17%
Mid-day = 9:01 a.m. to 6:00 p.m.	75%
Evening = 6:01 p.m. to 9:00 p.m.	6%
Late Night/Early Morning = 9:01 p.m. to 5:30 a.m.	2%

I. DATA ENTRY AND GEOCODING PROCESSES

DATA ENTRY

Data entry was conducted using scanning technology in order to minimize human error resulting from traditional, manual data entry methods. The scanning process involves scanning batches of approximately 20 questionnaires to produce an electronic image file of each document. Data results derived from the image files were individually reviewed and verified by comparing the scanned image to the data contained in the data file. Text data (primarily origin, destination, bus on, and bus off location data) were

reviewed for the purpose of correcting misspellings and verifying that the scanner correctly read the respondent-provided data.

As the database of scanned images was created, data were checked for integrity. Various edit routines were programmed to check the consistency of data and to identify reporting, scanning, or entry errors. Data in the Control Register was matched against survey data to ensure that all information was consistent between the two files. Routine edit checks were conducted to examine questionnaire responses for reasonableness and consistency across items. Routine checks included such items as:

- Response code range checks,
- Checks for proper data skips and patterns of answering questions consistent with prior answers,
- Checks for reasonable responses (e.g., age and employment category), and
- Checks for high frequency of item non-response (missing data).

Flagged errors were checked against the actual survey and corrected as necessary. In cases where the data file matched the respondent-provided data, the respondent-provided data prevailed.

GEOCODING

The On-Board Survey location data consisted of four location types: trip origin, bus-on, bus-off, and trip destination. Each of these data had a slightly different strategy in the geocoding process.

Trip Origin/ Destination

Look-up tables of origin/destination and bus stop locations were used during the editing stage. The look-up tables consisted of major trip attractors/generators and bus stops by route. The major trip attractors/generators included major employers, schools, public places, and hospitals. If a survey location or bus stop was found in the look-up table, a code was entered on the survey. Each code in the look-up table were pre-geocoded to minimize the number of locations that either needed to be batch matched or manually geocoded.

Geocoding of origin/destination addresses consisted of two stages. An automated batch run was first attempted in order to successfully geocode origin/destination responses that included exact addresses (address number, street name, city, and zip code) or cross-streets. The batch run attempted to match exact addresses or cross-streets obtained from respondents to a street coverage file provided by VTA. Addresses or cross-streets matching the coverage file were assigned an X/Y coordinate and coded “matched”. Addresses or cross-streets not matched during the batch run were flagged as “unmatched”, and passed to the second geocoding stage involving a manual geocoding process.

During the next stage, addresses were researched using a series of resources, including Switchboard.com, Google.com (Internet search engines), Thomas Brothers Guide, and DeLorme Street Atlas USA (mapping software). Addresses that were matched to an exact address or cross-streets during this stage were assigned an X/Y coordinate and coded as “matched”. Addresses that are located outside of Santa Clara County are coded as “out of area”. Addresses not geocoded were not assigned an X/Y coordinate, and were given status of “unmatched”. All addresses matching to some level of geography were then spatially joined to a TAZ coverage, and the appropriate TAZ number placed in the field “TAZ”.

Bus On / Off

Bus-on and Bus-off locations were geocoded using the same three-stage process as origin/destination geocoding. However, the bus on and off geocoding rates would had a lower probability if only the information respondents provided was used. Therefore, additional geocoding was conducted using a bus stop list provided by VTA. NuStats was able to accurately match respondent-provided on and off

locations to the proper cross-street or exact address. In addition, bus-on locations that are left blank could often times be determined by looking at the bus-on response of the questionnaires with serial numbers immediately before and after.

If the two questionnaires had the same bus-on location, NuStats assigned that location to the questionnaire missing the information. Another method of assigning was based on reviewing the geography related to the streets associated with a particular bus route, if a single street was provided and that street intersected the street on a particular route, the bus-on/off location was assigned to that intersection. All assigned locations are identified with an "imputed" code.

The final imputing method was based on the Origin and Destination locations being geocoded and where access and egress mode was walked or by mobility device of less than ten minutes. Using the geocoded bus stop file by route, we selected the nearest bus stop (within five miles) to either their origin or destination.

It is reasonable to expect that 90% of addresses for trips with valid address information would be geocoded in a study of this size and scope. A trip was defined as a "pair" of start and end points, with each trip having an origin or bus-on and either a bus-off or destination.

The final geocoding match rates are included in Table 1.6. The total number of matched pairs of either origin and destination, or origin and bus-off, or bus-on and destination, or bus-on and bus-off is 13,718.

TABLE 1.6: GEOCODING MATCH RATES

LOCATION TYPE	TOTAL RECORDS	RECORDS WITH ADDRESS DATA	MATCHED	PERCENT MATCHED
Origin	13,718	12,023	10,586	88%
Destination	13,718	11,319	9,971	88%
Bus-on	13,718	12,748	12,614	99%
Bus-off	13,718	12,613	12,592	99%
Total	54,872	48,707	45,763	94%
O/D Pair*	13,718	13,718	13,718	100%

**An Origin/Destination (O/D) pair is defined as the origin or bus on and destination or bus off geocoded.*

Geocoding Quality Control

Once geocoded, records were subjected to a series of strict quality control checks. The checks included:

- All unmatched locations are run through the geocoding process for a final attempt to be geocoded.
- A straight-line distance was calculated between the boarding/origin and bus off/destination locations when the respondent's access or egress mode was "walk." Extreme distances were checked and locations that were not near the route were verified to be respondent error or were coded as unmatched.
- A random selection of 5% of the geocoded address file is reviewed in detail to ensure proper placement of the overall latitude/longitude points. This entails using ArcView and displaying the points on the street layer and comparing the points with Thomas Brothers Guide and DeLorme.
- Since a cross-street geocode does not reference a zone (zip code or city) in ArcView, all cross-street geocodes are queried and analyzed to ensure proper placement of the geocodes. (The ArcView default placement of a geocoded cross street places the point in the Southeast quadrant of that intersection).

- Visual quality control check by route. Geocoding was verified for location accuracy by route and analyzing the boarding and alighting locations relative to each route. A visual check was to be done by querying off boarding/alighting geocodes according to each route. For example, all of the boarding/alighting matches for route 26 were selected and displayed in the map view in ArcView. Based on a visual check, most of these points were on or near the route. Points that were not on or near the route were verified to be respondent error or were coded as unmatched.
- Visual quality control check by city. Geocoding was verified by querying of geocoding matches related to each city. Then these points were displayed in the map view in ArcView and visually confirmed, outlying locations were selected and confirmed to be correct.
- Global changes include correcting misspelled place names, misspelled city names, and correcting any other global address problems prior to each data delivery as well as one final pass on the complete location file.

J. Data Analysis and Interpreting the Results

The final data was saved as a database and provided by NuStats, Inc. Data analysis was conducted using the SPSS software. The survey data was analyzed using statistical methods to decide whether differences in survey answers between groups observed in the sample represent real differences in the population of VTA passengers. Unless otherwise noted, differences between groups described in this report are "statistically significant"; that is, they indicate real differences in the passenger population. It is large enough, compared to the difference that sampling error alone might produce, that we can be confident that it represents a difference in the population of VTA passengers.

The final data collection effort resulted in 13,718 valid surveys, achieving the overall standard error rate of ± 0.8% at the 95% confidence interval. This means that we are 95% confident that all VTA passengers would produce results responses to each survey question within approximately 0.8% of the results obtained from this sample.

Table 1.7 summarizes, by route and schedule type (weekday, Saturday, and Sunday), the average weekday passengers in October 2005, the actual number of completed surveys, and the corresponding standard error rate for each.

TABLE 1.7: SUMMARY TABLE OF STANDARD ERRORS

	WEEKDAY ROUTES			WEEKEND ROUTES			TOTAL		
ROUTE	*10/05 WEEKDAY RIDERSHIP*	*WEEKDAY SAMPLES*	*STANDARD ERROR (1)*	*10/05 WEEKEND RIDERSHIP*	*WEEKEND SAMPLES*	*STANDARD ERROR (2)*	*10/05 TOTAL RIDERSHIP*	*TOTAL SAMPLES*	*STANDARD ERROR (3)*
10	1,312	94	9.7	1910	111	9.0	3,222	205	6.6
12				1958	94	9.9	1,958	94	9.9
13	266	43	13.7	116	47	11.1	382	90	9.0
15	52	20	17.4	N/A	N/A		52	20	17.4
16	250	35	15.4	N/A	N/A		250	35	15.4
17	118	23	18.4	92	5	42.9	210	28	17.3
19	136	27	16.9	121	5	43.1	257	32	16.2
22	15,243	354	5.1	21906	247	6.2	37,149	601	4.0
23	5,577	434	4.5	6524	253	6.0	12,101	687	3.6
25	6,604	306	5.5	7142	277	5.8	13,746	583	4.0
26	3,544	460	4.3	3836	238	6.2	7,380	698	3.5
27	1,195	110	8.9	1051	39	15.4	2,246	149	7.8
31	1,417	110	9.0	1221	82	10.5	2,638	192	6.8
32	943	73	11.0	236	27	17.8	1,179	100	9.4
33	389	61	11.5	454	25	19.1	843	86	10.0
34	238	47	12.8	126	3	56.1	364	50	12.9
35	1,289	60	12.4	914	83	10.3	2,203	143	7.9
36	812	77	10.6	1551	104	9.3	2,363	181	7.0
37	221	49	12.4	56	12	25.3	277	61	11.1
38	179	28	17.1	N/A	N/A	N/A	179	28	17.1
39	503	50	13.2	523	40	14.9	1,026	90	9.9
40	574	63	11.7	443	56	12.3	1,017	119	8.4
45				43	7	34.3	43	7	34.3
46	928	116	8.5	297	64	10.9	1,225	180	6.7
47	1,104	59	12.4	953	53	13.1	2,057	112	9.0
48	339	58	11.7	407	20	21.4	746	78	10.5
49	340	62	11.3	478	40	14.8	818	102	9.1
51	1,000	83	10.3	129	22	19.1	1,129	105	9.1
52	405	188	5.2	N/A	N/A	N/A	405	188	5.2
53	943	80	10.5	N/A	N/A	N/A	943	80	10.5
54	1,261	98	9.5	775	45	14.2	2,036	143	7.9
55	2,526	177	7.1	1461	103	9.3	3,987	280	5.6
57	1,291	87	10.2	872	68	11.4	2,163	155	7.6
58	1,405	75	11.0	932	58	12.5	2,337	133	8.3
59	344	46	13.5	N/A	N/A	N/A	344	46	13.5
60	2,338	189	6.8	2194	207	6.5	4,532	396	4.7
62	3,225	254	5.9	2590	275	5.6	5,815	529	4.1
63	839	79	10.5	620	60	12.0	1,459	139	7.9
64	2,958	186	7.0	4032	218	6.5	6,990	404	4.7
65	844	74	10.9	570	55	12.6	1,414	129	8.2
66	4,946	294	5.5	5645	263	5.9	10,591	557	4.0
67	88	18	20.7	N/A	N/A	N/A	88	18	20.7
68	5,067	189	7.0	5864	189	7.0	10,931	378	5.0

	Weekday Routes			Weekend Routes			Total		
Route	*10/05 Weekday Ridership*	*Weekday Samples*	*Standard Error (1)*	*10/05 Weekend Ridership*	*Weekend Samples*	*Standard Error (2)*	*10/05 Total Ridership*	*Total Samples*	*Standard Error (3)*
70	6,198	326	5.3	6723	247	6.1	12,921	573	4.0
71	2,087	99	9.6	1606	66	11.8	3,693	165	7.5
72	3,008	130	8.4	2916	240	6.1	5,924	370	4.9
73	1,954	218	6.3	1387	78	10.8	3,341	296	5.4
76	71	34	12.2	N/A	N/A	N/A	71	34	12.2
77	1,868	86	10.3	2088	130	8.3	3,956	216	6.5
81	3,702	298	5.4	2559	226	6.2	6,261	524	4.1
82	1,478	70	11.4	1334	67	11.7	2,812	137	8.2
85	1,095	98	9.5	N/A	N/A	N/A	1,095	98	9.5
88	400	81	9.7	77	5	42.7	477	86	9.6
101	88	29	15.0	N/A	N/A	N/A	88	29	15.0
102	108	40	12.4	N/A	N/A	N/A	108	40	12.4
103	101	26	16.6	N/A	N/A	N/A	101	26	16.6
104	78	12	26.2	N/A	N/A	N/A	78	12	26.2
120	65	4	47.8	N/A	N/A	N/A	65	4	47.8
121	152	60	9.9	N/A	N/A	N/A	152	60	9.9
122	36	13	22.0	N/A	N/A	N/A	36	13	22.0
140	133	50	11.0	N/A	N/A	N/A	133	50	11.0
180	1,673	145	7.8	1841	138	8.0	3,514	283	5.6
182	89	36	12.7	N/A	N/A	N/A	89	36	12.7
304	225	22	19.9	N/A	N/A	N/A	225	22	19.9
305	126	20	20.2	N/A	N/A	N/A	126	20	20.2
321	29	5	40.6	N/A	N/A	N/A	29	5	40.6
328	25	11	22.6	N/A	N/A	N/A	25	11	22.6
330	115	31	15.1	N/A	N/A	N/A	115	31	15.1
522	5,303	494	4.2	3389	145	8.0	8,692	639	3.7
900	1,087	93	9.7	1820	26	19.1	2,907	119	8.8
901	15,342	432	4.6	19794	272	5.9	35,136	704	3.7
902	6,734	455	4.4	5832	229	6.3	12,566	684	3.6
Total	**126,423**	**8354**	**1.0**	**129408**	**5364**	**1.3**	**255,831**	**13,718**	**0.8**

(1) Standard Error at the 95% Confidence Interval - Weekday samples
(2) Standard Error at the 95% Confidence Interval - Weekend samples
(3) Standard Error at the 95% Confidence Interval - Weekday and Weekend combined

Highlighted routes identify routes that are part of clustered sample

2. PASSENGER DEMOGRAPHICS

This chapter provides detailed information on passenger demographics. These results are weighted and expanded to the VTA system ridership. Demographic questions were asked of respondents both at the person level (age, gender, employment status, and ethnicity) and household level (residence type and income).

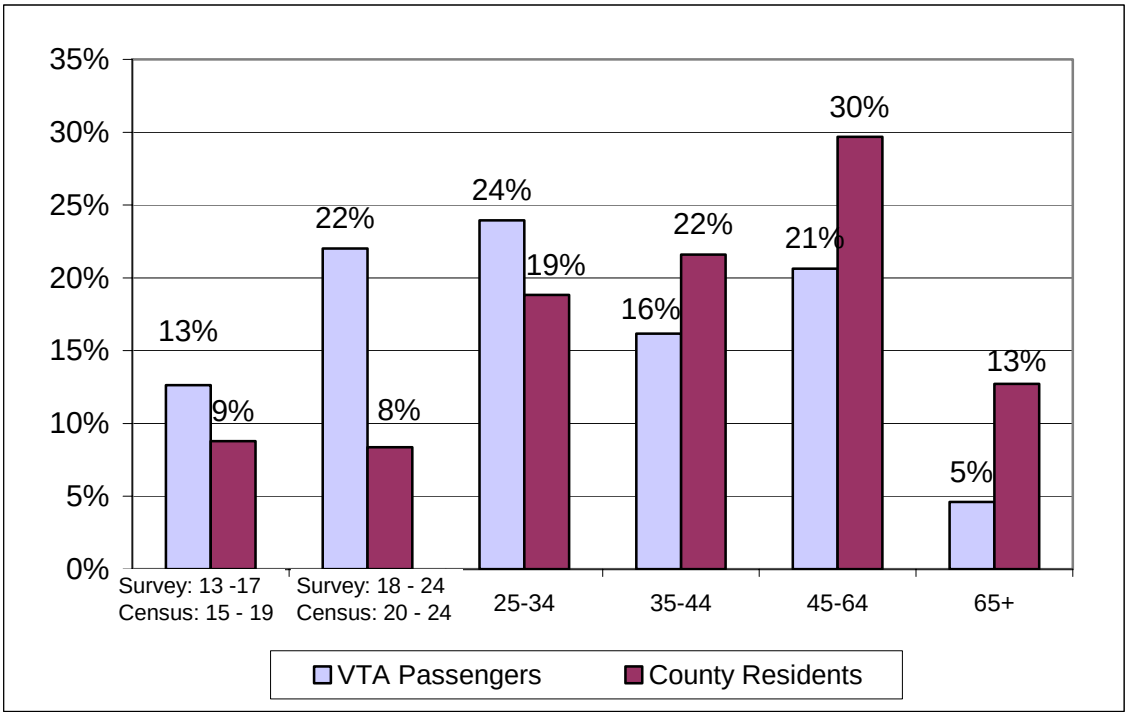
A. INDIVIDUAL

AGE

Figure 2.1 shows the distribution of age groups among VTA passengers and a comparison to Santa Clara County residents' age. VTA passengers are younger than the County population as a whole. The majority of surveyed passengers are younger than 34 (59%) with the highest concentration (24%) between 25 and 34 years of age. In comparison, only 17% of the Santa Clara County residents are between 15 and 24 years of age. It should be noted that the passengers 13 years or younger were not counted because they were not asked to complete a survey.

FIGURE 2.1: COMPARISON OF AGE DISTRIBUTION

VTA PASSENGERS VS. SANTA CLARA COUNTY RESIDENTS



Source: 2000 Census with 2005 update.

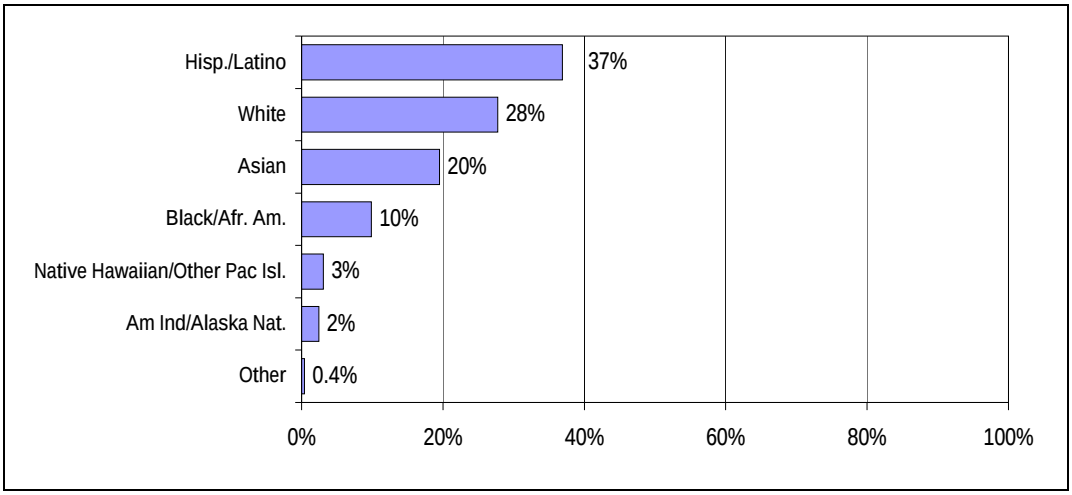
GENDER

A slight majority of surveyed passengers are male at 54%.

ETHNICITY

Respondents were asked their ethnicity and were allowed to check more than one response. The largest percentage (37%) of passengers is Hispanic/Latino followed by White at 28%. One-in-five passengers are Asian (20%) while one-in-ten are Black/African American. The survey question was structured differently than the question on race/ethnicity in the Census. Thus, a direct comparison with the Census data would not be valid.

FIGURE 2.2: ETHNIC BACKGROUND

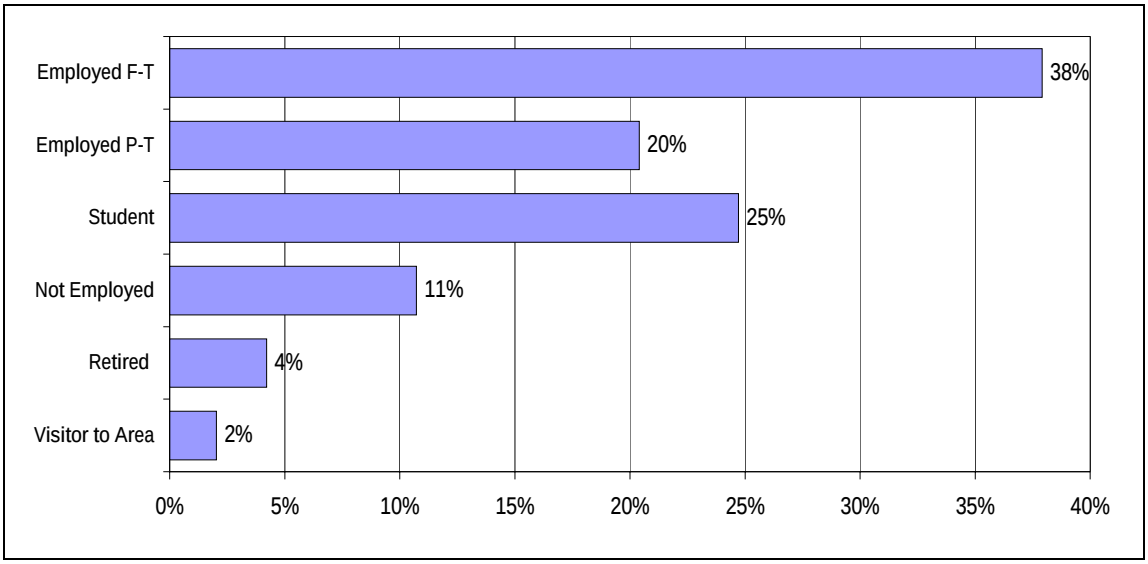


Note: Respondents were allowed to select more than one response.

EMPLOYMENT STATUS

As shown in Figure 2.3, the majority of respondents are employed either full-time (38%) or part-time (20%). One-in-four are students. This question allowed respondents to select more than one response.

FIGURE 2.3: EMPLOYMENT STATUS

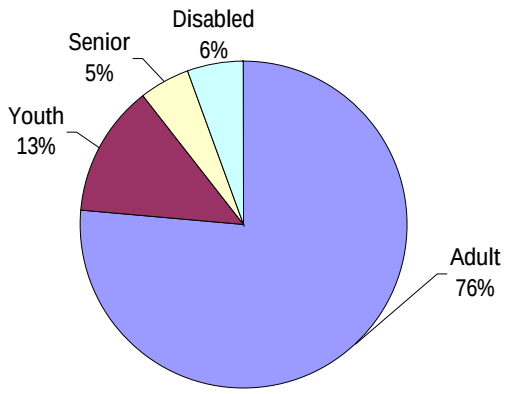


Note: Respondents were allowed to select more than one response.

FARE CATEGORY

Respondents were asked their fare category. The vast majority falls into the "adult" fare category with another 13% falling into the youth category. Six percent reported they belonged to the disabled category.

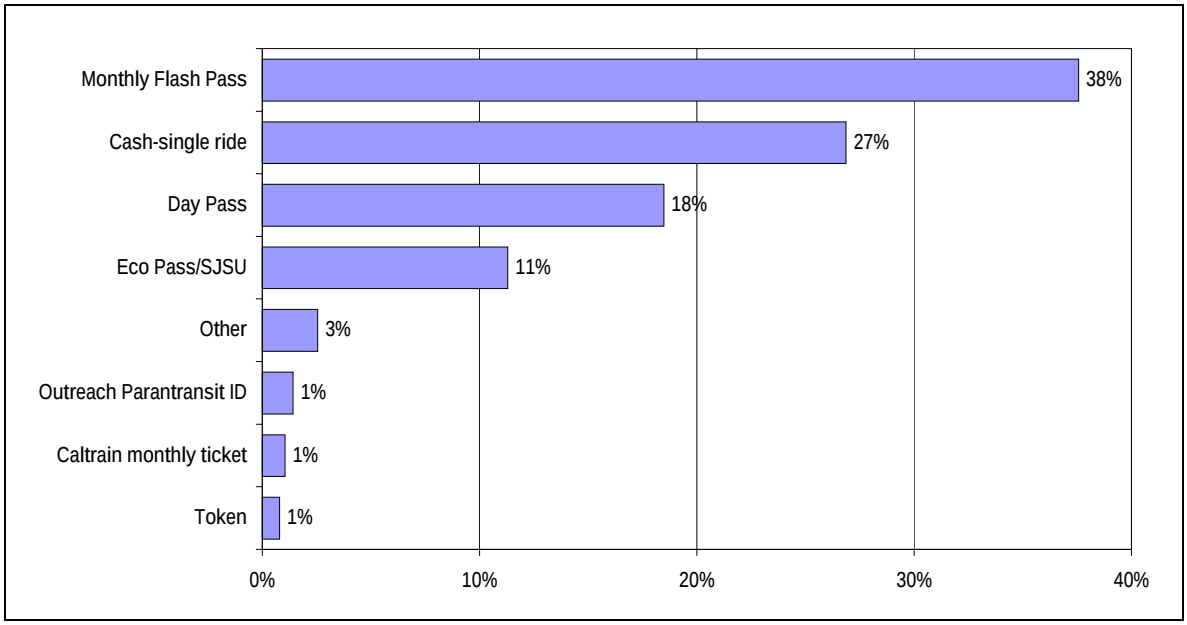
FIGURE 2.4: FARE CATEGORY



FARE PAYMENT

Just over one-third (38%) of the respondents used a Monthly Flash Pass. Over one-in-four paid cash for a single ride. VTA offers a Monthly Pass Subscription Program that allows passengers to pre-purchase 12 monthly passes with a discount. The subscribed passes were grouped in the Monthly Flash Pass category.

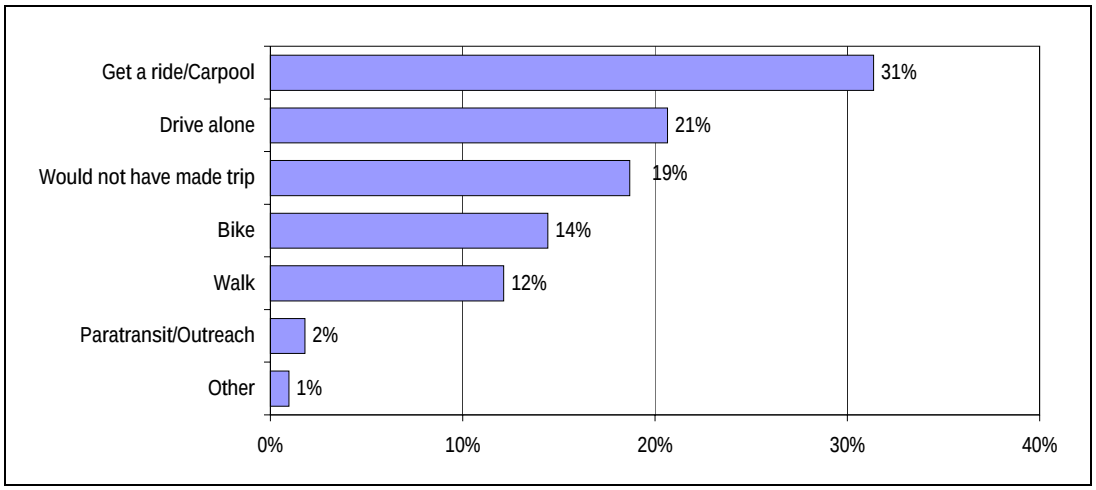
FIGURE 2.5: METHOD OF PAYMENT



TRANSIT DEPENDENCY

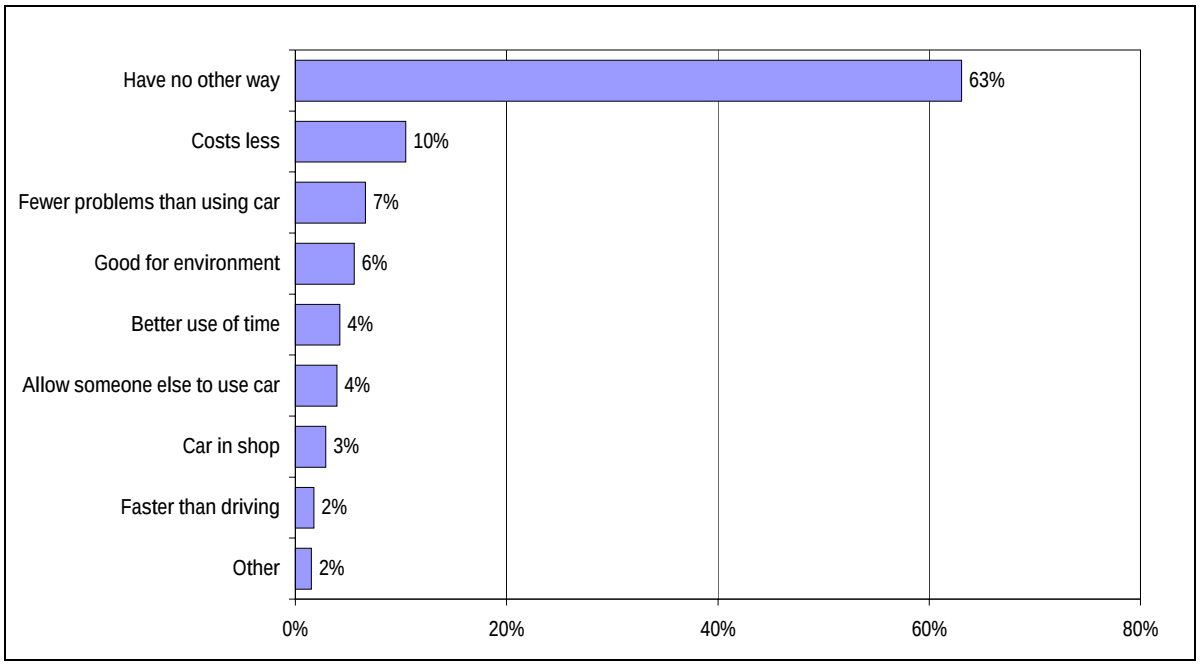
Three questions were asked to determine the incidence of transit dependency and automobile availability among VTA passengers. Question 11 asked how passengers would have made the trip if transit did not exist. Nearly one-in-three (31%) of the respondents said they would get a ride/carpool. Among this group, carpool size is estimated to be less than three persons (2.8 persons). Nearly one-in-five (19%) responded they would not have made the trip if transit did not exist, indicating that they are dependent on VTA to provide transportation.

FIGURE 2.6: IF TRANSIT DIDN'T EXIST, HOW WOULD YOU HAVE MADE THIS TRIP?



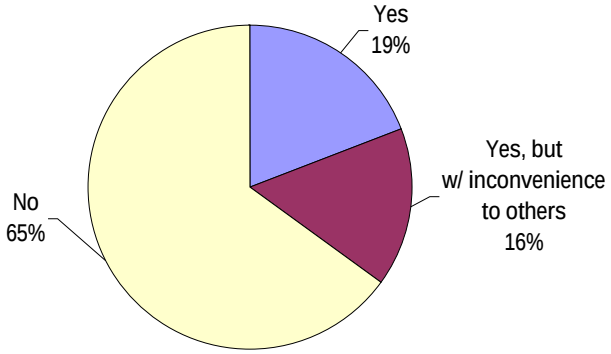
Question 18 asked respondents the main reason why they ride VTA. The majority has no other way. Among those who may have a choice, respondents cited “cost less”, “fewer problems than using a car”, and “good for the environment” as the most popular reasons why they ride VTA rather than drive.

FIGURE 2.7: MAIN REASON FOR RIDING VTA TRANSIT



The majority of respondents relied on VTA to make their sampled trip. Figure 2.8 shows that 65% of the respondents said they did not have an automobile available. Another 16% said they had one available but it would have caused an inconvenience to others if they had used the vehicle. The remaining 19% had an automobile available to make the sampled trip.

FIGURE 2.8: AUTOMOBILE AVAILABLITY ON THIS TRIP?

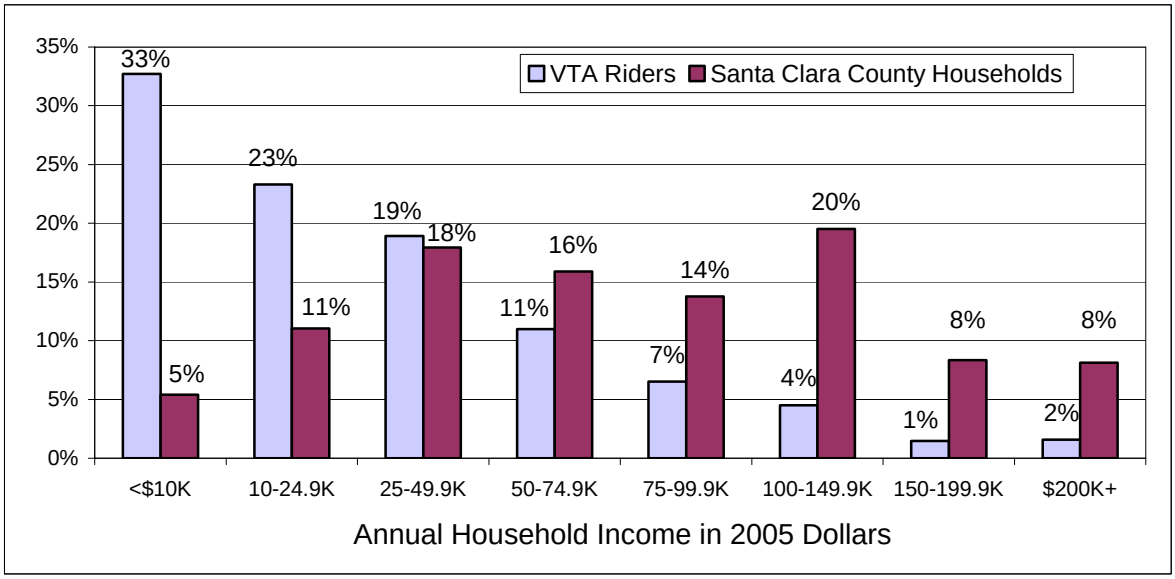


B. HOUSEHOLD

INCOME

The data in Figure 2.9 shows that one-in-three VTA passengers have a household income of less than $10,000 a year. Close to 25% of passengers have an annual household income between $10,000 and $24,999 a year. Fourteen percent of the total respondents have an annual household income greater than $75,000. Also shown in Figure 2.4 are the income levels of Santa Clara County households, based on the latest Census data. Caution should be taken when interpreting the data. Generally, respondents are uncomfortable revealing their income information even in an anonymous survey. The response rate for this question is relatively low. Only 60% of the complete surveys provided a valid response to this question.

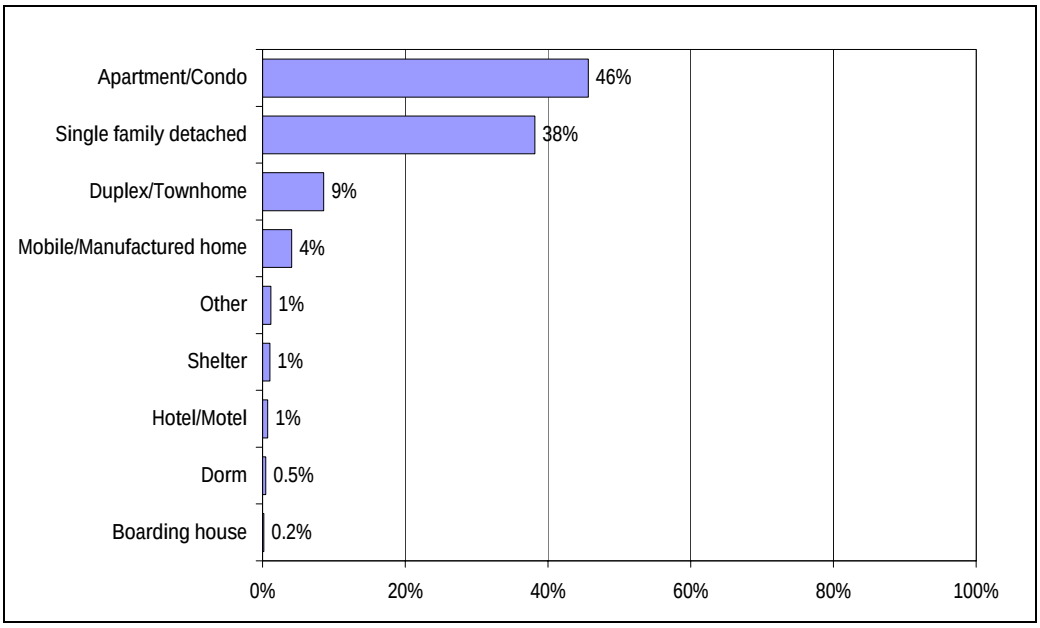
FIGURE 2.9: COMPARISON OF INCOME, VTA PASSENGERS VS. SANTA CLARA COUNTY RESIDENTS



RESIDENCE TYPE

As shown in Figure 2.10, more than one-half of the respondents live in a multi-family type housing structure with 46% living in an apartment and another 9% living in a duplex/town home.

FIGURE 2.10: RESIDENCE TYPE



3. TRAVEL CHARACTERISTICS

This chapter provides detailed information on passenger travel characteristics, such as origin and destination, trip purpose, access and egress, trip length and other key findings. The results are weighted and expanded to the VTA system according to the approach described in Chapter 1.

A. ORIGIN AND DESTINATION ANALYSIS

Passengers were asked where they began and ended their trip and where they got on and off the bus/light rail. In addition, they were asked to provide their home addresses to enter into a drawing for prizes. The purpose of this new question is to encourage participation and allow for follow up contacts in the future. Location data, including home address, trip origin, destination, bus on and bus off, were analyzed through the geocoding process using ArcView Geographical Information System (GIS) software (see Chapter 1 for details).

Maps displaying the survey respondents' home addresses, origin locations, and destination locations are included in Appendix G.

B. TRIP PURPOSE

Table 3.1 indicates that 45% of trips originated from home, whereas 21% were trips from work. Eleven percent was from school/college, and 8% each were for personal business/errands and shopping. Another 6% of the trip origins were from recreation/social visits and 2% from medical. Home was the most popular trip destination, at 37%. Other trip destination purposes mirror a similar breakdown as trip origin purposes.

TABLE 3.1: TRIP PURPOSE

TRIP PURPOSE	ORIGIN	DESTINATION	HOME-BASED TRIPS
Home	45%	37%	
Work	21%	23%	35%
School/College	11%	10%	15%
Shopping	8%	10%	11%
Personal business/errands	8%	9%	9%
Recreation/Social Visit	6%	8%	9%
Medical	2%	2%	3%
Other	<1%	<1%	<1%
Total	100%	100%	81%

Table 3.2 is a cross-tabulation of the origin and destination trip purposes. The table provides the percentage of each of the 56 valid trip purpose pairs in the cases that both the origin and destination trip purposes were provided. Approximately 81% of the trips are home-based, starting or ending at home. Trips between home and work accounted for 33%. School and shopping trips make up a significant percentage of trips to and from home as well, at 15% and 11%, respectively.

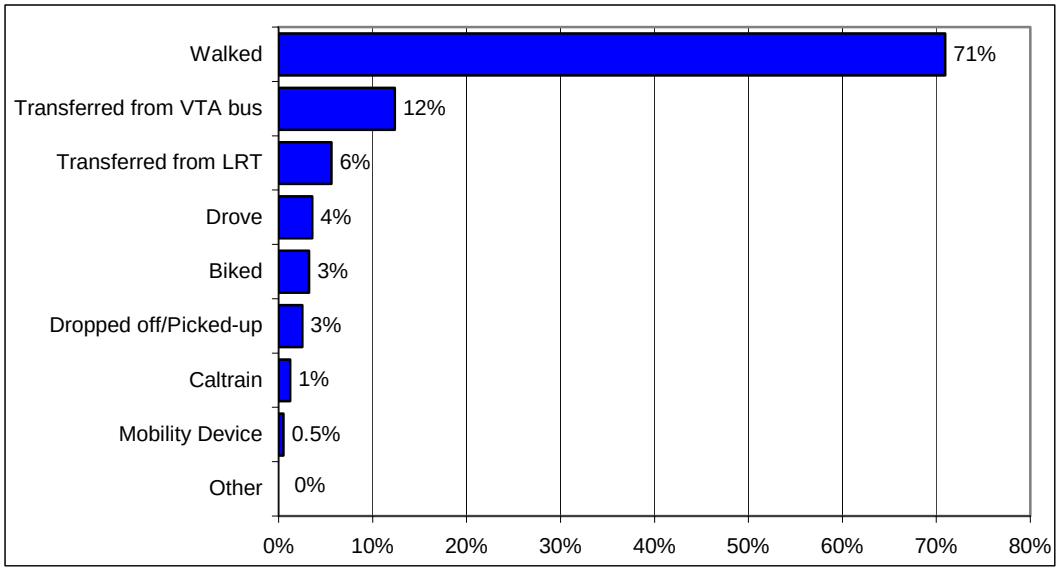
TABLE 3.2: ORIGIN AND DESTINATION TRIP PURPOSE

		ORIGIN PURPOSE								TOTAL
		Work	Home	Shopping	School/ College	Recreation or Social Visit	Medical	Personal business/ errands	Other	
DESTINATION PURPOSE	Work	3.0%	18.1%	0.4%	0.8%	0.3%	0.2%	0.5%	<1%	23.2%
	Home	14.9%	0.0%	5.1%	7.8%	3.6%	1.6%	3.5%	<1%	36.4%
	Shopping	1.3%	6.1%	1.1%	0.5%	0.6%	0.1%	0.6%	<1%	10.3%
	School/ College	0.3%	7.5%	0.3%	0.4%	0.2%	0.1%	0.2%	<1%	9.0%
	Recreation or Social Visit	0.6%	5.6%	0.3%	0.3%	1.0%	0.1%	0.4%	<1%	8.3%
	Medical	0.2%	1.6%	0.1%	0.1%	0.2%	0.2%	0.1%	<1%	2.4%
	Personal business/ errands	0.6%	5.2%	0.5%	0.5%	0.7%	0.1%	2.2%	0.1%	9.9%
	Other	<1%	0.2%	<1%	<1%	<1%	<1%	<1%	<1%	0.3%
TOTAL		21.0%	44.3%	7.7%	10.6%	6.4%	2.3%	7.5%	0.1%	*100.0%*

C. ACCESS AND EGRESS MODES TO TRANSIT STOPS AND STATIONS

The access mode is the way in which passengers travel to the bus/train on which they were surveyed. Access mode is important because it supports the planning of service improvements that increase the ease of access, and potentially ridership levels. As shown in Figure 3.1, 71% of VTA passengers walked to the bus stop/train station.

FIGURE 3.1: ACCESS MODE



Fewer than one-in-five respondents transferred from a VTA bus/shuttle (12%), light rail (6%), or from Caltrain (1%). This survey did not include shuttles (Light Rail, ACE Train, and Caltrain) since separate passenger surveys on the shuttles are conducted regularly by a joint effort of VTA and the shuttle contractor.

The waiting time at the bus stop/train station after transferring was 13.8 minutes from VTA light rail, 15.9 minutes from a VTA bus/shuttle, and 11.3 minutes from a Caltrain vehicle.

For those passengers who used a mobility device to get to the bus stop/train station, more than 80% took less than 10 minutes (9.8 minutes). For those who walked, it took slightly less time (8.9 minutes) to get to their bus stop/train station. The following table summarizes the walk times for respondents who either walked or used a mobility device to access the bus stop/train station.

Among the 12% who transferred from a VTA bus/shuttle and responded to the follow-up question about which route they transferred from, the most common routes were 22 (12%), 25 (8%), 66 (6%), 68 (6%), 23 (6%), and 26 (5%).

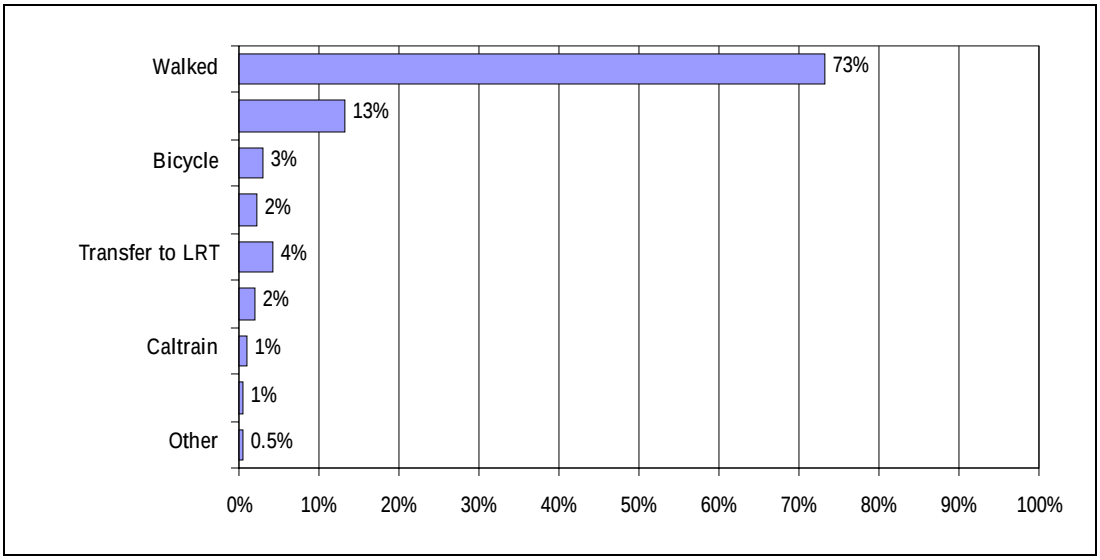
TABLE 3.3: ACCESS AND EGRESS TIMES AMONG PASSENGERS WHO WALKED OR USED A MOBILITY DEVICE

	Access		Egress	
Minutes	Walked	Mobility Device	Walked	Mobility Device
<5	21.5%	14.4%	23.1%	22.7%
5-10	57.1%	70.2%	56.6%	40.5%
11-15	11.3%	3.7%	10.8%	19.9%
16-20	5.7%	3.6%	4.9%	6.2%
21-30	3.3%	6.7%	3.4%	4.6%
31-45	0.9%	1.5%	0.8%	0.0%
> 45	0.2%	0.0%	0.5%	6.1%
Total	100.0%	100.0%	100.0%	100.0%

Among those who drove, it took on average just under 12 minutes to access the bus stop/train station (11.9 minutes) while those who bicycled took about the same time as those who walked, just under nine minutes (8.9 minutes).

Similar to the access mode, 73% of VTA passengers walked (Figure 3.2) from the bus stop/train station to their final destination. The average time it took to walk to their final destination from the bus stop/train station was similar in length to access time, just under nine minutes (8.7 minutes). Those who use a mobility device anticipated taking a longer egress than access time, just over 14 minutes (14.2 minutes compared to 9.8 minutes to access the bus stop/train station).

FIGURE 3.2: EGRESS MODE



Line 22 has the highest percentage of passengers transferring to and from light rail. Table 3.4 shows the bus lines that have the highest transfer rates to or from VTA's light rail service. These lines connect to the busiest transit centers and light rail stations, such as downtown San Jose, Eastridge, Great Mall, and Caltrain Stations in Palo Alto, Mountain, and Santa Clara. Line 10 connects the San Jose International Airport and VTA light rail.

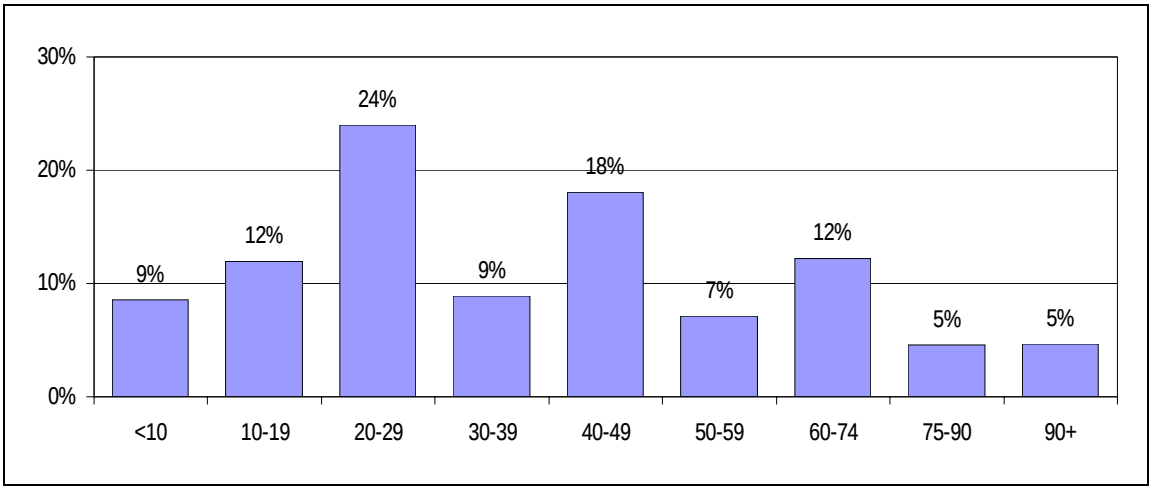
TABLE 3.4: BUS LINES WITH HIGHEST TRANSFER TO/FROM LIGHT RAIL

	Transfer to Light Rail	Transfer from Light Rail
22	7.5%	9.1%
70	6.2%	7.0%
25	6.1%	6.1%
68	5.3%	3.6%
180	4.7%	6.1%
10	3.9%	4.8%
26	3.2%	2.3%
23	2.9%	3.4%
66	2.5%	4.1%
62	2.4%	2.4%
72	2.3%	3.6%
64	1.1%	3.5%
522	2.0%	2.6%

D. TRAVEL TIME

As shown in Figure 3.3, a majority of the respondents anticipate completing their one-way trip in less than half an hour with 24% making their trip in 20 to 29 minutes (Question 9). Nearly one-fourth (22%) anticipate their trip taking one hour or longer.

FIGURE 3.3: NUMBER OF MINUTES TO COMPLETE ONE-WAY TRIP BY TRANSIT



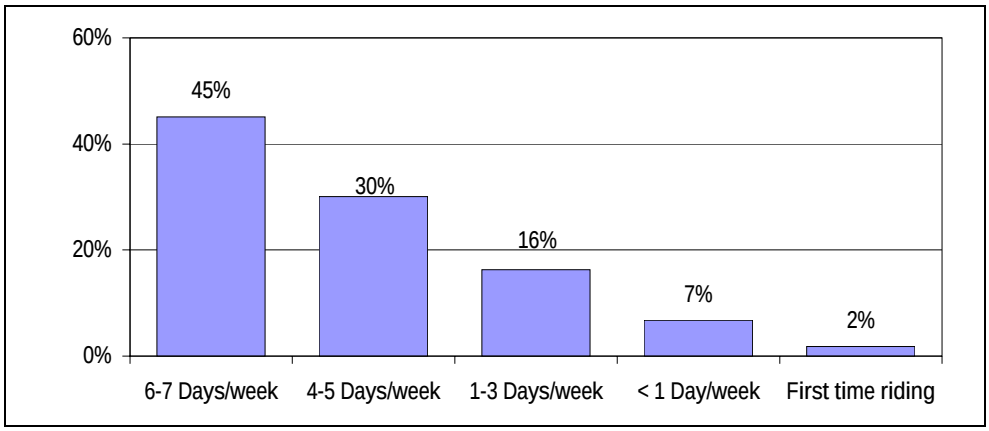
Over half (55%) of respondents have made their sampled trip in a car (Question 10). These passengers estimated that it takes just under 19 minutes to make the trip in a car (18.7 minutes).

When comparing the difference in trip times among respondents who sometimes make the trip by driving, most can make the trip in less time than taking VTA. Half of the respondents can make the trip by driving in about 15 minutes (median drive time) while about half of these respondents estimate that it takes between 30-39 minutes.

E. OTHER TRAVEL CHARACTERISTICS

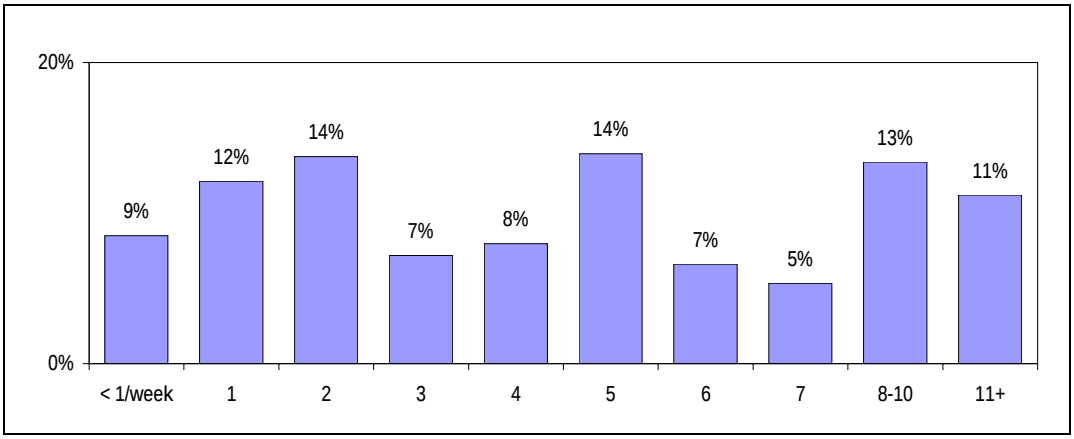
The vast majority of VTA passengers are frequent users with 75% using the system four or more days per week (Figure 3.4). Two percent of the surveyed respondents are first time passengers while another 23% are occasional passengers (less than 3 days per week).

FIGURE 3.4: FREQUENCY RIDING VTA TRANSIT



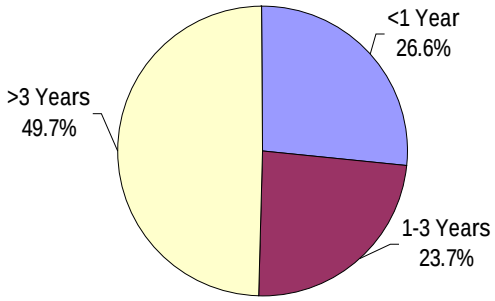
The survey gathered data on the number of one-way trips respondents make in a typical week on the route on which they were surveyed. The number of one-way trips is evenly distributed as shown in Figure 3.5.

FIGURE 3.5: NUMBER OF ONE-WAY TRIPS ON THIS ROUTE IN A TYPICAL WEEK



As Figure 3.6 illustrates, the typical VTA passenger is a loyal passenger. Nearly one-half have been riding VTA for more than three years while another one-fourth have been riding between one and three years.

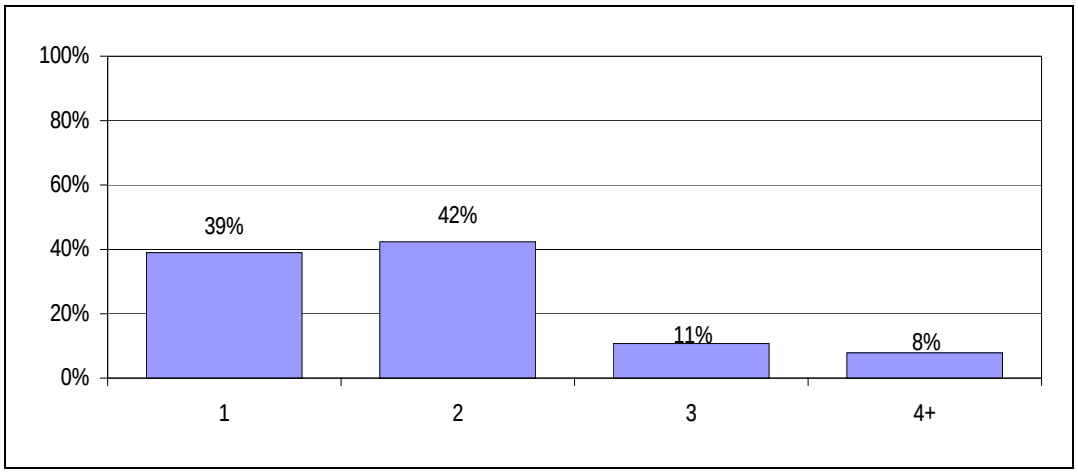
FIGURE 3.6: LENGTH OF TIME RIDING VTA



Respondents were asked if they make the same (sampled) trip in reverse (Question 7). More than three-in-four (77%) said they do.

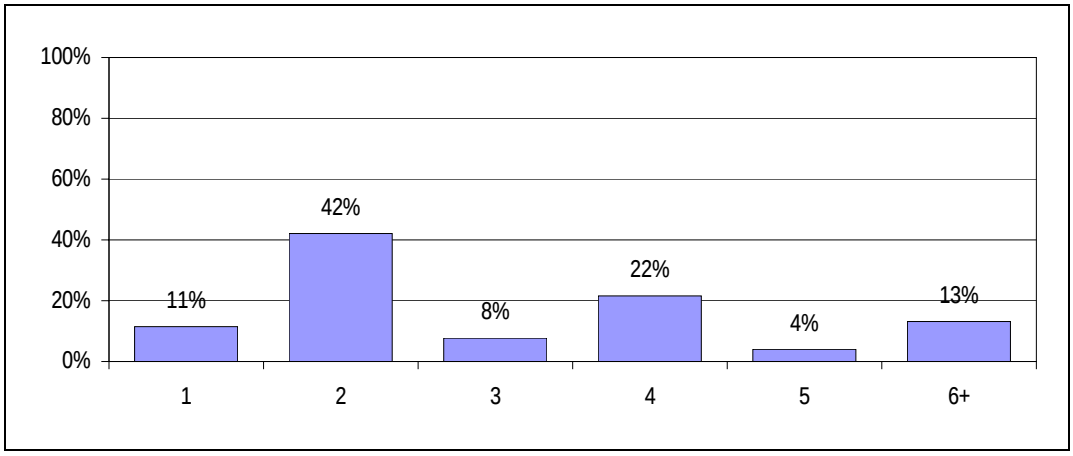
Figure 3.7 summarizes the total number of buses/trains respondents took on their one-way trip from origin to final destination. Nearly four-in-ten would only take one bus/train to get from origin to final destination while another 42% said they would take two buses/trains to make the one-way trip. Nearly one-in-five (19%) would take three or more buses/trains to get to where they are going.

FIGURE 3.7: TOTAL NUMBER OF BUSES/TRAINS WILL TAKE ON ONE-WAY TRIP



Surveyed passengers estimated that they would board a bus/train on average 3.8 times on the day they were surveyed. As shown in Figure 3.8, more than one-half (53%) said they would board a bus/train only one or two times. Another 13% said they would board a bus/train six or more times.

FIGURE 3.8: NUMBER OF TIMES BOARDING A BUS/TRAIN TODAY



4. SERVICE EVALUATION

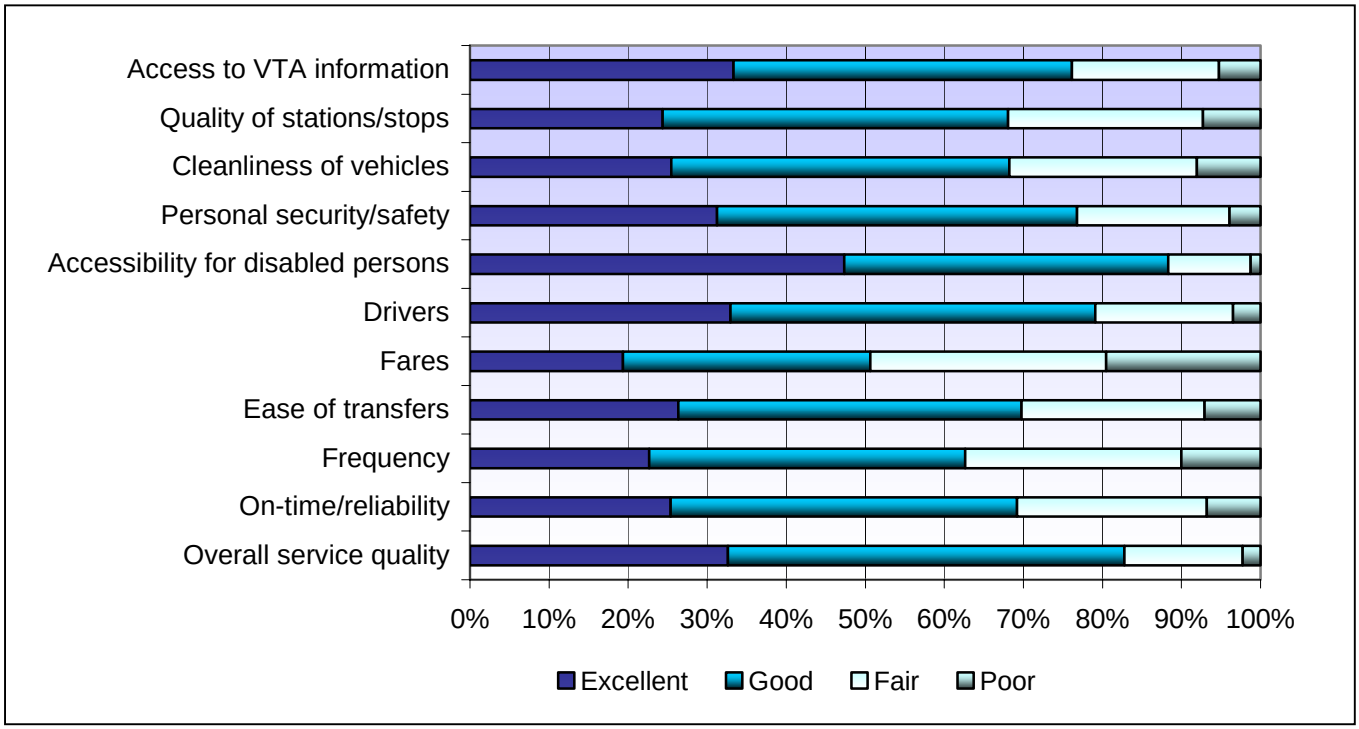
Respondents were asked to rate a variety of VTA service attributes and the level of importance of service improvements. This chapter describes the findings from four survey questions that allow passengers to offer feedback and suggestions on VTA services. The last question (Question 29) asked respondents to provide any additional comments about VTA services. The comments are provided in Appendix H.

A. SERVICE RATINGS

Respondents were asked to rate 11 service attributes ranging from VTA personnel to service delivery (Question 20). Respondents were asked to rate each as "Excellent," "Good," "Fair," or "Poor." They also had the option of offering "No Opinion."

As shown in Figure 4.1, overall, respondents seem generally satisfied with VTA services. Passengers gave highest scores to VTA for providing accessibility to disabled passengers (Good: 47% and Excellent: 41%). Passengers also gave positive ratings to VTA's overall service quality, with more than 80% rating it as "Excellent" or Good". Fares received the lowest scores. Only 50% of the respondents rated fares as Good (19%) or Excellent (31%). Other than the fare charged, the highest percentage of "Poor" ratings was for the frequency of service at 10%.

FIGURE 4.1: SERVICE RATINGS



Note: "No Opinion" responses represent a small percentage of the total and are not included in the above diagram.

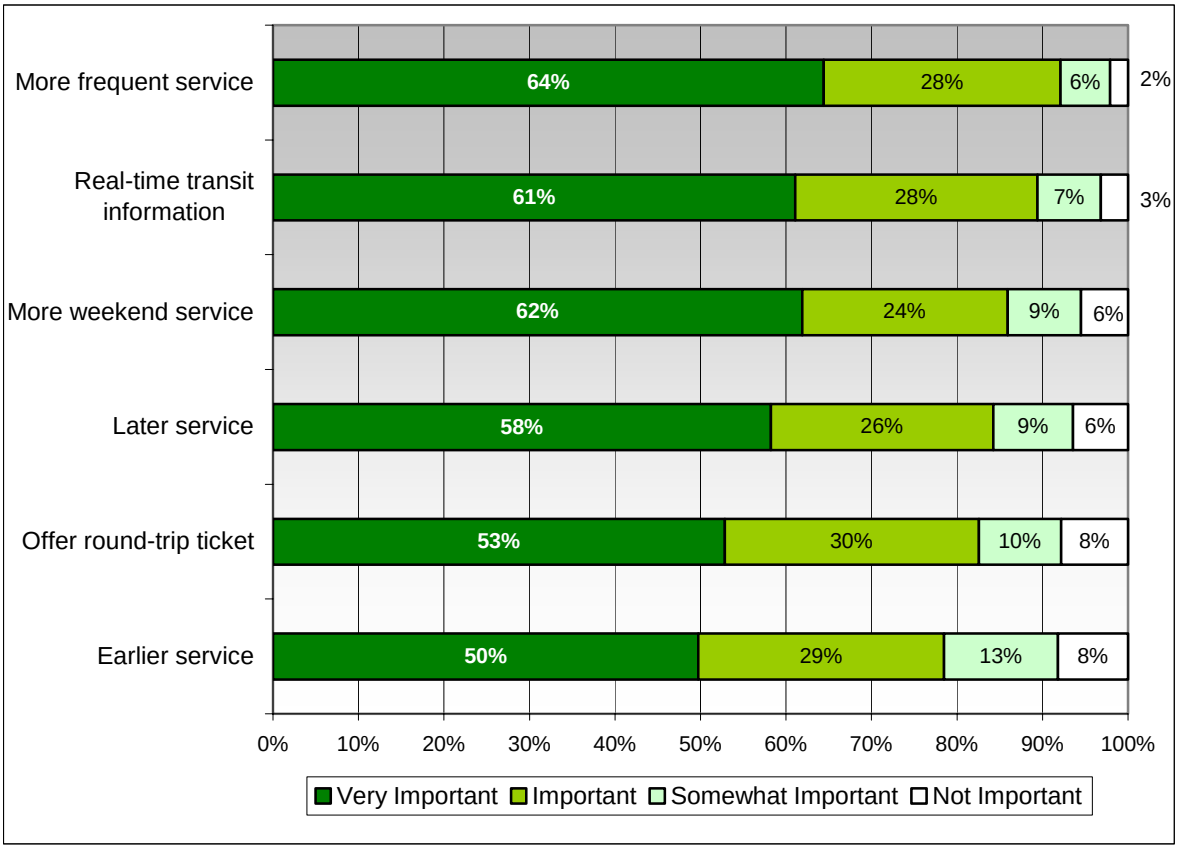
B. IMPORTANCE OF SERVICE IMPROVEMENTS

In Question 21, respondents were asked to rate the level of importance of seven possible service improvements using a scale of "Very Important," "Important," "Somewhat Important," and "Not Important." VTA providing service to a specific location as the service improvement garnered the largest percentage of "Very Important" at 87%. This is an open-ended question asking for a specific travel destination. As a result, any respondent answering this question would have rated it as "Very Important."

As shown in Figure 4.2, all six specific improvements listed in the survey were considered either "Very Important" or "Important" among most passengers. Respondents feel strongly about VTA providing more frequent service with 64% citing this as a "Very Important" service improvement and an additional 28% saying it was "Important." Providing real time information, 61% "Very Important" and 28% "Important, and more weekend service, 62% "Very Important" and 24% "Important" also ranked very high amongst passengers.

The service improvement seen as the least important, in terms of the highest percentage of "Not Important" responses is providing earlier service or the offering of round-trip tickets (8% each).

FIGURE 4.2: IMPORTANCE OF SERVICE IMPROVEMENTS



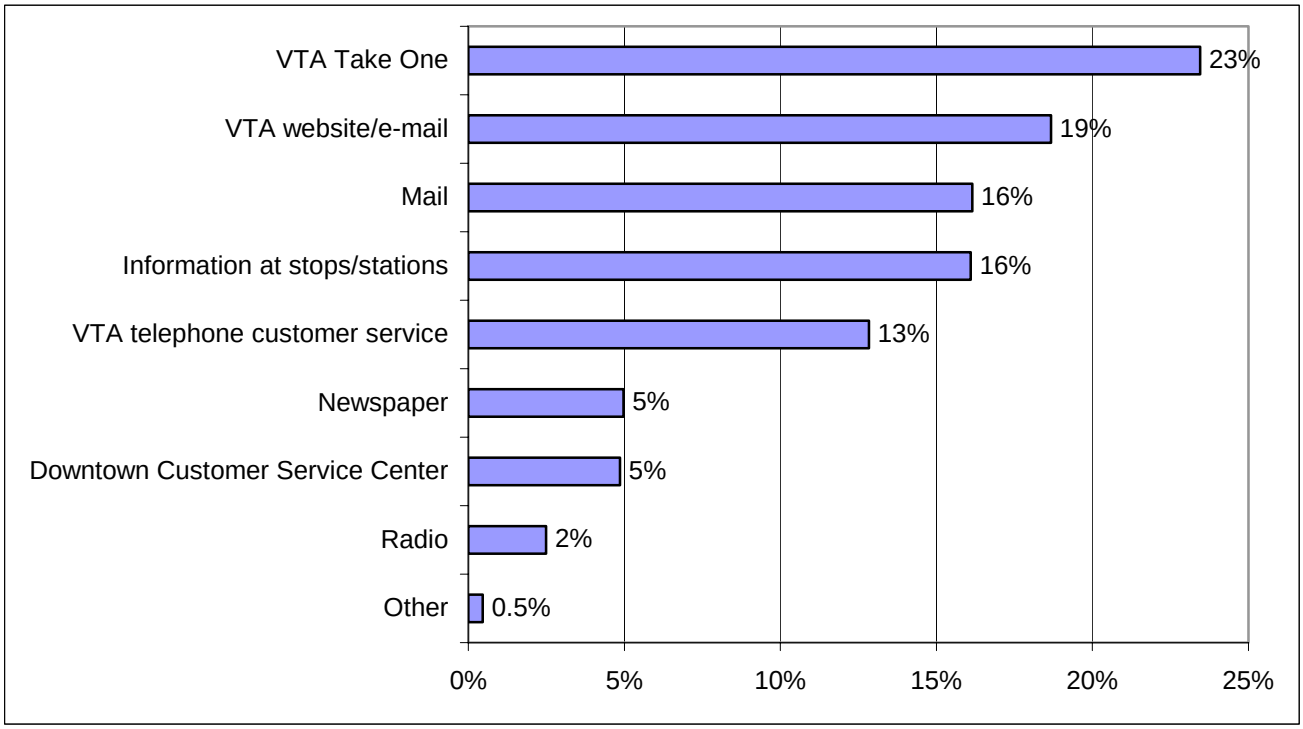
C. BEST WAYS TO DELIVER INFORMATION

So that VTA can get information to passengers in the most effective way, respondents were asked what methods were the best ways to reach them (Question 22). Nine choices were provided and the respondents were asked to choose up to three. The "VTA Take One" is the most popular, cited by nearly one-in-four respondents as the best way to receive information from VTA. Nearly one-in-five respondents said the best way to reach them was through the VTA website or e-mail (19%), 16% each said getting information at the bus stops/stations or by mail are the best ways, and another 13% said the Downtown VTA Customer Service Center was the best way. The least effective methods are through radio or television (each was at 2% or less).

Of the 5% who said the newspaper was the best way to get VTA information, the most popular by far is the San Jose Mercury News (82%). Those who cited the radio as the best way, 24% cited "WILD 94.9."

Approximately 7% of the respondents specified a preferred written language. Among them, 55% preferred English and 38% chose Spanish. Another 4% said they preferred bilingual materials, in both English and another language. Vietnamese was mentioned as the next preferred language at 1.3%, followed by Chinese and Japanese, at 0.7% and 0.6%, respectively.

FIGURE 4.3: BEST WAYS FOR VTA TO GET INFORMATION TO YOU



5. TREND ANALYSIS

This chapter examines trends from 2000 to 2005, comparing current transit and demographic characteristics of passengers with similar data gathered from the 2000 survey. Several interesting trends emerge.

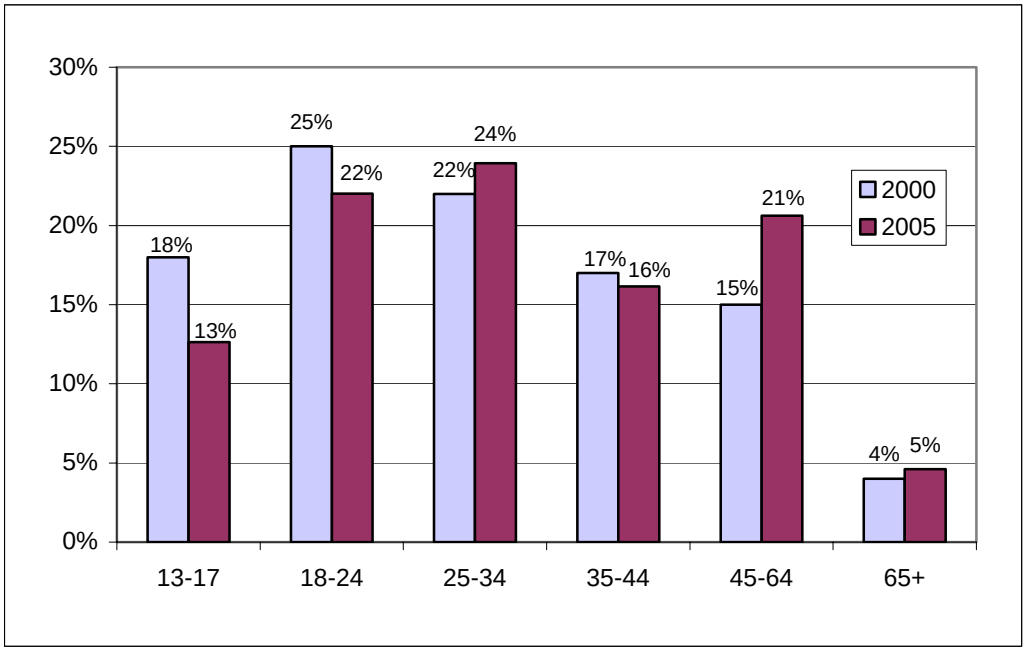
Since the 2000 survey, VTA has gone through both service expansion and reduction. New light rail lines were introduced. To the northeast of the County is the Capitol line, with its terminal at Alum Rock. To the southwest is the Vasona Light Rail, serving Campbell and San Jose. Rapid 522 was introduced in July 2005, partially to replace Line 300. Community Bus lines 48 and 49 started service in Los Gatos in July 2005. Several transit centers have been opened or renovated, including Great Mall, Palo Alto, and Winchester.

VTA has also gone through major service reductions due to budget constraints, with cuts largely targeting midday and weekend services. As for light rail, while two new lines have been opened, the base headways have been changed from 10 minutes to 15 minutes. Total bus service hours have been reduced to the levels in 1981. Overall service level is down by nearly 20% and ridership has been negatively affected.

A. PASSENGER DEMOGRAPHICS

Figure 5.1 shows that VTA has experienced a decline in the overall share of young passengers since the 2000 survey. Shares in both the 13 – 17 and 18 – 24 age groups have decreased. The largest increase from 2000 was in the 45-to-64 age group, from 15% in 2000 to 21% in 2005.

FIGURE 5.1: AGE COMPARISON - 2005 VS. 2000



In 2000 male passengers accounted for 57% of the passengers surveyed, which was slightly higher than the 54% in the 2005 survey. In the 2000 survey the ethnic background question was structured differently thus few comparisons can be made. The largest ethnic group, Hispanic/Latino, remained

the same in the two surveys (38% in 2000 and 37% in 2005). The percentage of whites has declined from 32% to 28%.

The income question in the 2005 survey has different categories than the one in the 2000 survey. The categories in the 2005 survey were chosen to be consistent with the Census income question. Direct comparison of the results from these two surveys can't be made. However, results from both surveys show large percentages of passengers with low income. In the 2000 survey, passengers with annual income of $20,000 or less (2000 dollars) accounted for 35%. In 2005, 56% of passengers were in the two lowest income categories, $10,000 or less and $10,000 to $24,999 (2005 dollars).

Figure 5.2 shows that the proportion of passengers who were full time workers has declined from 47% to 38%. All other categories have increased, with the biggest increase occurring in the student category.

FIGURE 5.2: EMPLOYMENT STATUS - 2005 VS. 2000

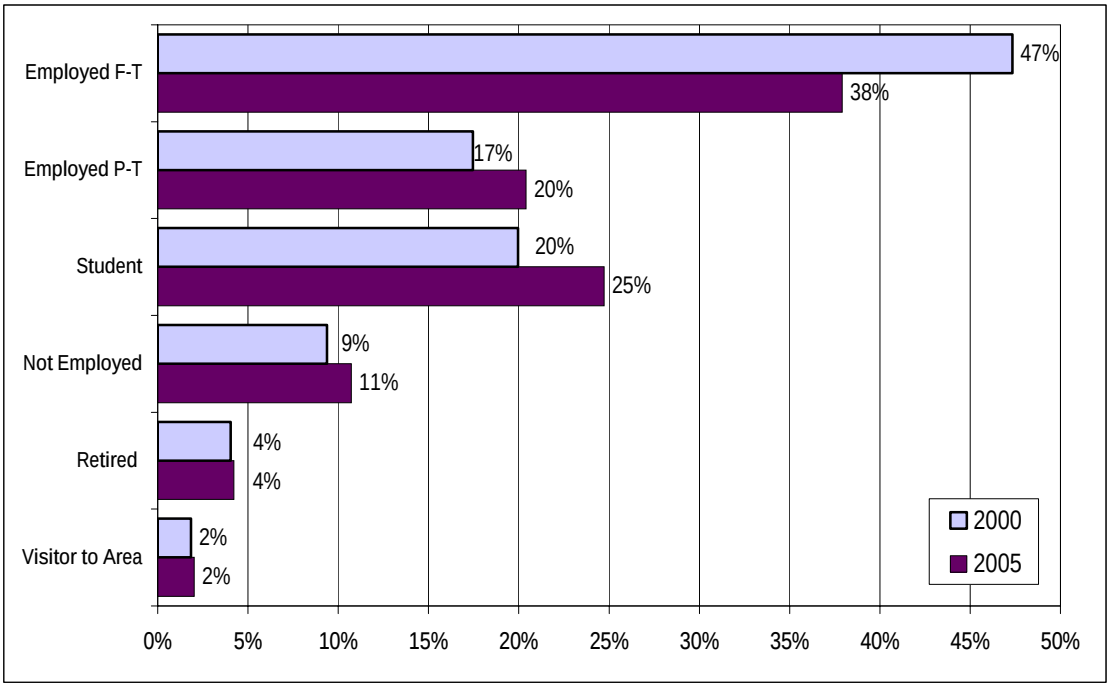


Table 5.1 shows the most common fare, "adult", has increased slightly while "youth" and "senior" fares have both declined. "Disabled" fares have increased, but from a small base.

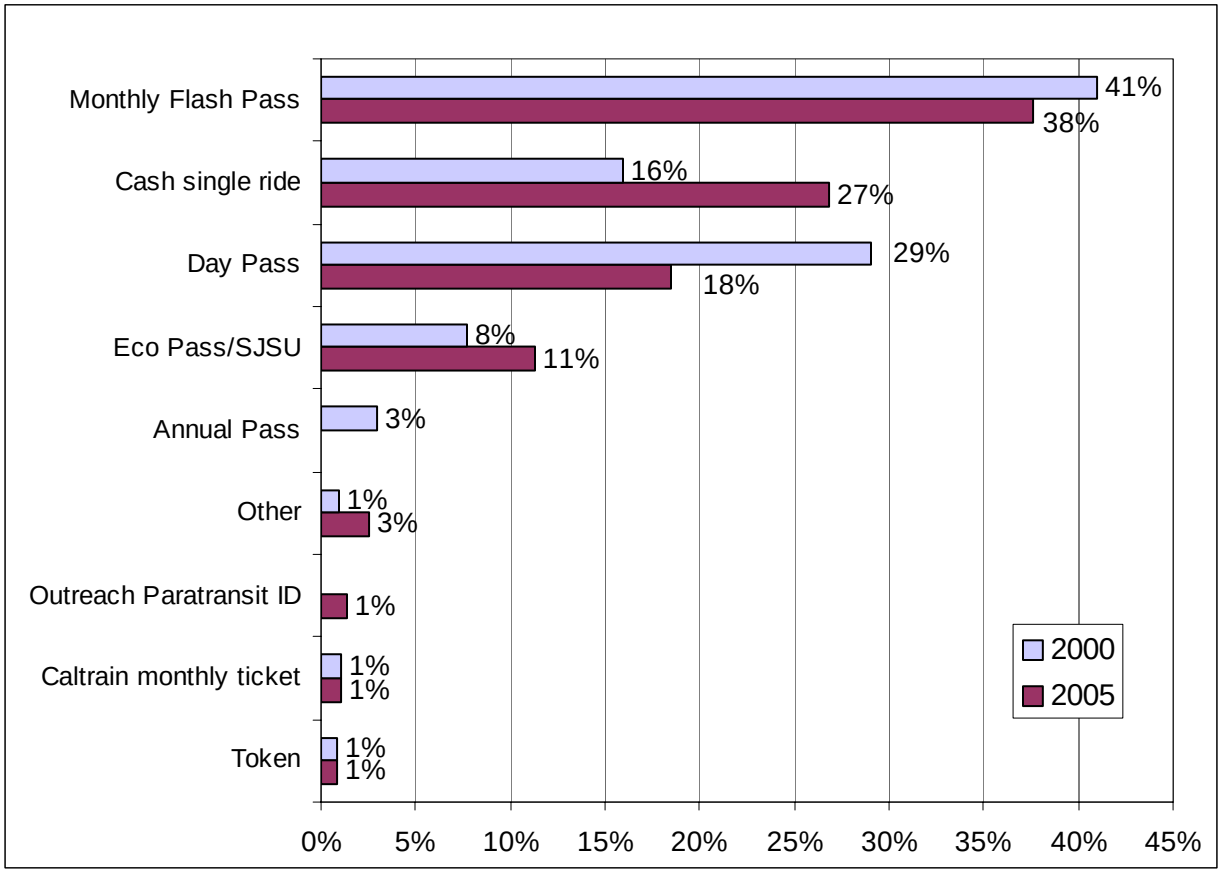
TABLE 5.1: FARE CATEGORY - 2005 VS. 2000

FARE CATEGORY	2000	2005	PERCENT CHANGE '00-'05
Adult	73.8%	76.4%	2.6%
Youth	16.4%	13.2%	-3.2%
Senior	5.4%	4.8%	-0.6%
Disabled	4.3%	5.6%	1.3%

VTA's fare policies and structure have changed since 2000 thus not all fare payment media are comparable. The single ride tokens have been discontinued. Instead, day pass tokens in a bag of 5 are being used. VTA has increased the relative cost of a day pass. Now it is 3 times the cost of a single ride

ticket, compared to 2.4 times the cost of a single ride ticket in 2000. Annual passes have been discontinued. Currently VTA offers a Monthly Pass Subscription Program that allows passengers to pre-purchase 12 monthly passes with a discount. Figure 5.3 shows that Monthly Flash Pass and Day Pass usages have both declined. More passengers used cash or the Eco Pass / San Jose State University pass.

FIGURE 5.3: METHOD OF FARE PAYMENT - 2005 VS. 2000



Transit dependent passengers remained the largest passenger population. The percentage of passengers answered "Would not make trip" remained about the same as in 2000. Table 5.2 shows that getting a ride or carpooling was still the most common alternative when transit was not available, but there has been a slight decline in this alternative mode. Driving and biking were the next most common fallback options when transit was not available and they have increased their share.

TABLE 5.2: WITHOUT TRANSIT, HOW WOULD YOU MAKE THIS TRIP? - 2005 VS. 2000

WITHOUT TRANSIT, HOW WOULD YOU MAKE THIS TRIP	2000	2005	PERCENT CHANGE '00-'05
Get a ride/carpool	33.8%	31.4%	-2.4%
Drive Alone	19.2%	20.7%	1.5%
Would not make trip	17.4%	18.7%	1.3%
Bike	12.5%	14.4%	1.9%
Walk	14.4%	12.1%	-2.3%
Paratransit/outreach	1.1%	1.8%	0.7%
Other	1.7%	1.0%	-0.7%

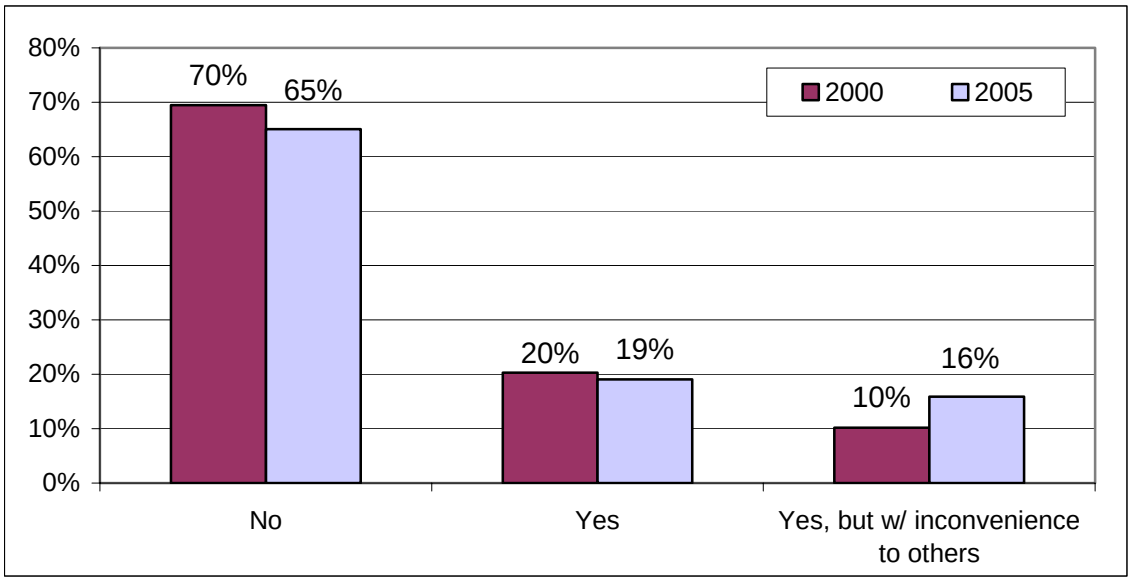
As shown on Table 5.3, the largest percentage of the passenger population cited "no other way" as the main reason for using VTA transit in both the 2000 and 2005 surveys. The time factor "better use of time" and "faster than driving" have declined as the reasons for using transit.

TABLE 5.3: MAIN REASON FOR USING VTA - 2005 VS. 2000

MAIN REASON FOR USING VTA	2000	2005
Have no other way	61.0%	63.1%
Costs less	9.0%	10.5%
Fewer problems than using car	7.3%	6.6%
Good for environment	5.2%	5.6%
Better use of time	7.2%	4.2%
Allow someone else to use car	4.1%	3.9%
Car in shop	3.3%	2.9%
Faster than driving	2.6%	1.7%
Other	0.3%	1.5%

Figure 5.4 shows that the percentage of passengers with no automobile available for their trips decreased slightly, from 70% in 2000 to 65% in 2005. Approximately 6% more passengers answered there was an automobile available to them, but using it would cause inconvenience to others.

FIGURE 5.4: AUTOMOBILE AVAILABILITY ON THIS TRIP - 2005 VS. 2000



B. TRAVEL CHARACTERISTICS

Walking to/from transit remained the overwhelmingly predominant mode for access and egress. The breakdown of each mode accessing bus stops/stations remained about the same from 2000 to 2005 (Table 5.4).

TABLE 5.4: MODE TO TRANSIT - 2005 VS. 2000

MODE TO TRANSIT	ACCESS		EGRESS	
	2000	2005	2000	2005
Walked	73.5%	70.9%	71.5%	73.2%
Mobility Device	0.3%	0.5%	0.3%	0.5%
Drove	3.1%	3.6%	1.8%	3.0%
Transferred to/from light rail	3.3%	5.6%	3.9%	4.2%
Transferred to/from VTA bus	13.3%	12.4%	16.6%	13.3%
Caltrain	1.1%	1.2%	1.4%	1.0%
Dropped off/picked up by automobile	2.1%	2.5%	1.1%	2.0%
Bicycle	2.3%	3.2%	2.5%	2.2%
Other	1.0%	0.0%	1.1%	0.5%

Table 5.5 shows that the average trip length varied in almost all categories in the results from the two surveys. The most significant differences are in trips 20 – 29 minutes and 30 – 39 minutes. Trips completed within 30 minutes increased from 38% in 2000 to 44% in 2005.

TABLE 5.5: NUMBER OF MINUTES TO COMPLETE ONE-WAY TRIP - 2005 VS. 2000

MEAN TRIP LENGTH	2000	2005
1 – 10 Minutes	7.2%	8.5%
10 – 19 Minutes	14.5%	11.9%
20 – 29 Minutes	15.8%	24.0%
30 – 39 Minutes	16.2%	8.9%
40 – 59 Minutes	22.7%	25.2%
60 or More Minutes	23.5%	21.5%

As shown on Figure 5.5, the frequencies of passengers using VTA transit have remained at almost the same levels in every category.

FIGURE 5.5: FREQUENCY RIDING VTA TRANSIT - 2005 VS. 2000

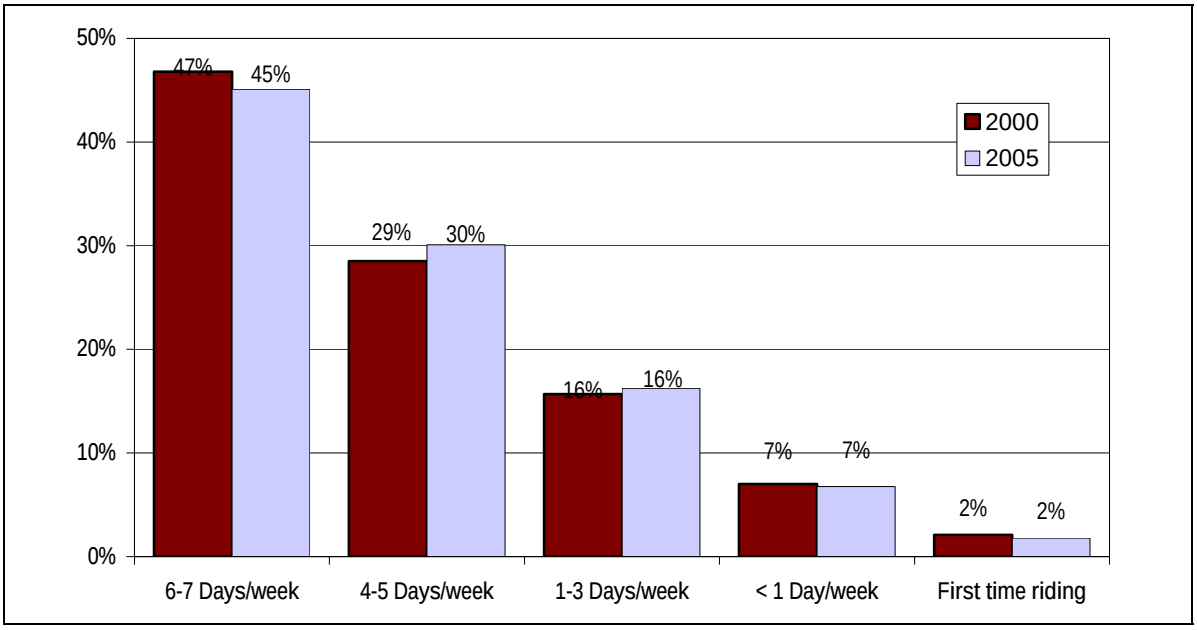


Table 5.6 shows that the length of VTA passengers using the services remained fairly stable from 2000 to 2005. The percentage of passengers who have been riding VTA "more than 3 years" increased by 2 percentage points, while passengers using VTA for "less than one year" decreased slightly.

TABLE 5.6: LENGTH OF TIME RIDING VTA - 2005 VS. 2000

HOW LONG HAVE YOUR BEEN RIDING VTA	2000	2005
Less than one year	27.9%	26.6%
1 – 3 years	24.3%	23.7%
More than 3 years	47.8%	49.7%

6. WEEKEND SUMMARY

In this chapter, weekend survey responses are compared with weekday responses. It should be noted that data collection on weekends was not as comprehensive as the weekday data collection effort. The sampling plan resulted in a +/- 1.3% margin of error at the 95% Confidence Level for weekend data, compared to +/- 1.0% margin of error for weekday data.

Each of the survey response questions has been placed in a table showing results for three separate categories: system-wide, bus, and light rail. The column titled "Difference" shows the net difference between the weekend and weekday responses. It should be noted that there is not an absolute distinction between weekday and weekend passengers. Many VTA passengers ride on both weekdays and weekends thus they are both "weekday" and "weekend" passengers. Nevertheless, there are some notable distinctions between weekday and weekend passengers that are worth analyzing.

A. PASSENGER DEMOGRAPHICS

- System-wide weekend passengers were less likely to be students (18.2%) than were weekday passengers (30.3%). Fewer weekend light rail passengers (43.1%) were employed full-time than were weekday passengers (50.2%).

- Weekend passengers were more likely to be transit-dependent. If transit didn't exist, weekend passengers were less likely to make the trip (20.6% vs. 17.0%). Approximately 5% more weekend passengers did not have a car available for the trip and 2% more had no other way.

- Weekend passengers were more likely to have paid cash for a single ride (28.4%) than were weekday passengers (25.5%), but less likely to use Eco Pass/SJSU pass (8.1% vs. 14.0%). Monthly flash pass usages were about the same.

TABLE 6.1: EMPLOYMENT STATUS BY MODE AND SERVICE DAY

EMPLOYMENT STATUS	SYSTEM WIDE			LIGHT RAIL			BUS		
	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE
Employed full time	36.2%	39.9%	3.7%	50.2%	43.1%	-7.1%	33.7%	39.3%	5.6%
Employed part time	18.8%	22.3%	3.5%	17.5%	22.9%	5.4%	19.0%	22.2%	3.2%
Not currently employed	10.1%	11.5%	1.4%	7.6%	10.6%	3.0%	10.6%	11.7%	1.2%
Student	30.3%	18.2%	-12.1%	20.5%	18.8%	-1.7%	32.1%	18.1%	-14.0%
Retired	3.6%	4.9%	1.3%	2.8%	2.6%	-0.2%	3.7%	5.6%	1.8%
Visitor to the area	1.0%	3.2%	2.3%	1.4%	2.0%	0.7%	0.9%	3.0%	2.1%

TABLE 6.2: WITHOUT TRANSIT, HOW WOULD YOU MAKE THIS TRIP? - COMPARISON BY MODE AND SERVICE DAY

WITHOUT TRANSIT, HOW WOULD YOU MAKE THIS TRIP	SYSTEM WIDE			LIGHT RAIL			BUS		
	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE
Get a ride/carpool	32.8%	29.8%	-3.0%	24.1%	28.4%	4.4%	34.4%	30.1%	-4.3%
Drive alone	22.3%	18.8%	-3.5%	38.2%	30.8%	-7.4%	19.3%	15.9%	-3.4%
Would not make trip	17.0%	20.6%	3.5%	14.2%	18.0%	3.8%	17.6%	21.2%	3.6%
Bike	13.5%	15.5%	2.1%	13.0%	12.1%	-0.9%	13.5%	16.3%	2.8%
Walk	11.4%	13.0%	1.5%	8.7%	8.6%	-0.1%	12.0%	14.0%	2.1%
Paratransit/Outreach	2.1%	1.5%	-0.6%	1.0%	1.2%	0.2%	2.3%	1.6%	-0.7%
Other	1.0%	0.9%	-0.1%	0.9%	0.8%	0.0%	1.0%	1.0%	-0.1%

TABLE 6.3: MAIN REASON FOR RIDING VTA TRANSIT - WEEKDAY VS. WEEKEND

MAIN REASON	SYSTEM WIDE		
	WEEKDAY	WEEKEND	DIFFERENCE
Have no other way	62.1%	64.2%	2.1%
Better use of time	4.5%	4.0%	-0.5%
Costs less	10.9%	9.9%	-1.0%
Faster than driving	1.5%	2.0%	0.6%
Allow someone else to use the car	4.7%	3.1%	-1.5%
Fewer problems than using car	6.7%	6.5%	-0.2%
Car in shop	3.0%	2.8%	-0.2%
Good for the environment	5.5%	5.6%	0.1%
Other	1.2%	1.9%	0.8%

TABLE 6.4: AUTO AVAILABILITY BY MODE AND SERVICE DAY

AUTO AVAILABILITY	SYSTEM WIDE			LIGHT RAIL			BUS		
	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE
Yes	19.5%	18.5%	-1.1	33.9%	29.9%	-4.0	16.8%	15.5%	-1.3
Yes, but with inconvenience to others	17.6%	13.9%	-3.7	15.7%	11.5%	-4.1	17.9%	14.5%	-3.4
No	62.9%	67.6%	4.7	50.4%	58.6%	8.2	65.3%	70.0%	4.7

TABLE 6.5: METHOD OF FARE PAYMENT BY MODE AND SERVICE DAY

FARE PAYMENT METHOD	SYSTEM WIDE			LIGHT RAIL			BUS		
	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE
Paid cash for single ride	25.5%	28.4%	2.9%	29.6%	42.3%	12.7%	24.8%	24.8%	0.0%
Day Pass	16.9%	20.3%	3.4%	13.4%	15.8%	2.4%	17.6%	21.4%	3.8%
Monthly Flash Pass	37.5%	37.6%	0.1%	26.0%	24.6%	-1.4%	39.8%	40.9%	1.1%
Eco Pass/SJSU	14.0%	8.1%	-5.9%	24.7%	11.3%	-13.4%	12.0%	7.3%	-4.7%
Caltrain Monthly ticket	1.4%	0.7%	-0.7%	1.9%	0.8%	-1.1%	1.3%	0.7%	-0.6%
Outreach Paratransit ID	1.4%	1.5%	0.1%	0.9%	2.0%	1.1%	1.5%	1.3%	-0.2%
Token	0.7%	0.9%	0.2%	0.6%	0.5%	-0.1%	0.7%	1.0%	0.3%
Other	2.5%	2.6%	0.1%	3.0%	2.7%	-0.3%	2.4%	2.6%	0.2%

B. TRAVEL CHARACTERISTICS

- For apparent reasons, weekday passengers are more likely to use transit for work and school, and less likely to use it for shopping and recreation/social visits.
- At the system level, no significant differences were observed in mode to boarding or mode from alighting stop.
- Weekend passengers reported a significantly shorter "driving times to make the same trips" as did weekday passengers. This was particularly true of light rail passengers.
- Weekend passengers tended to ride VTA very often, 51% of which rode 6 to 7 days a week. They were less likely to ride 4 to 5 days a week.
- Weekend passengers, on average, have been riding VTA for a longer duration than have weekday passengers (52% more than 3 years versus 48%). This was true of bus passengers (54%) more than light rail passengers (44%).

TABLE 6.6: TRIP PURPOSE - WEEKDAY VS. WEEKEND

TRIP PURPOSE	ORIGIN			DESTINATION		
	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE
Work	22.6%	18.3%	-4.3%	22.9%	23.3%	0.4%
Shopping	4.1%	11.8%	7.7%	5.8%	15.2%	9.4%
School/college	17.0%	3.6%	-13.3%	14.9%	2.7%	-12.2%
Recreation or social visit	3.4%	9.7%	6.3%	4.2%	12.7%	8.5%
Personal business/errands	6.8%	8.5%	1.7%	8.9%	11.0%	2.1%
Home	42.9%	46.5%	3.6%	40.1%	32.8%	-7.3%
Medical	3.2%	1.5%	-1.7%	3.2%	1.7%	-1.5%
Other	0.1%	0.2%	<0.1%	0.2%	0.5%	0.3%

TABLE 6.7: MODE TO BOARDING STOP BY MODE AND SERVICE DAY

MODE TO BOARDING STOP	SYSTEM WIDE			LIGHT RAIL			BUS		
	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE
Walked	71.3%	70.6%	-0.6	61.6%	61.7%	0.1	73.2%	73.0%	-0.2
Mobility device for people w/ disabilities	0.5 %	0.5%	0.0	0.5%	0.3%	-0.2	0.5%	0.6%	0.0
Drove	3.5%	3.6%	0.1	9.1%	10.2%	1.1	2.4%	1.8%	-0.6
Transferred from light rail	5.1%	6.1%	1.0	7.2%	9.4%	2.2	4.7%	5.3%	0.5
Transferred from VTA bus	12.4%	12.3%	-0.1	11.9%	11.5%	-0.4	12.5%	12.6%	0.1
Caltrain	1.8%	0.6%	-1.2	2.5%	0.6%	-1.9	1.7%	0.7%	-1.0
Dropped off by automobile	2.6%	2.4%	-0.3	1.7%	2.6%	0.8	2.8%	2.3%	-0.5
Bicycle	2.7%	3.8%	1.1	5.4%	3.7%	-1.7	2.2%	3.8%	1.6
Other	0%	0%	--	0.1%	0%	--	0.0%	0%	--

TABLE 6.8: MODE FROM ALIGHTING STOP BY MODE AND SERVICE DAY

MODE FROM ALIGHTING STOP	SYSTEM WIDE			LIGHT RAIL			BUS		
	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE
Walked	72.7%	73.8%	1.1	61.9%	73.6%	11.6	74.8%	73.9%	-0.9
Mobility device for people w/ disabilities	0.5%	0.5%	0.0	0.2%	0.6%	0.4	0.6%	0.5%	-0.1
Drove	2.8%	1.6%	-1.2	10.1%	3.9%	-6.2	1.3%	0.9%	-0.4
Transferred from light rail	4.2%	4.3%	0.2	4.6%	4.9%	0.4	4.1%	4.2%	0.1
Transferred from VTA bus	13.4%	13.1%	-0.4	13.2%	10.7%	-2.6	13.5%	13.7%	0.2
Caltrain	1.1%	0.9%	-0.2	1.5%	1.0%	-0.5	1.0%	0.8%	-0.2
Dropped off by automobile	2.2%	1.9%	-0.3	2.2%	1.7%	-0.5	2.1%	1.9%	-0.2
Bicycle	2.6%	3.5%	1.0	5.8%	3.2%	-2.6	2.0%	3.6%	1.7
Other	0.6%	0.4%	-0.2	0.4%	0.4%	0.0	0.6%	0.4%	-0.2

TABLE 6.9: TRIP LENGTH IN MINUTES BY MODE AND SERVICE DAY

TRIP LENGTH TIME (MINUTES)	SYSTEM WIDE			LIGHT RAIL			BUS		
	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE
Less than 10	7.8%	9.5%	1.7	11.9%	12.5%	0.6	7.0%	8.7%	1.7
10 – 19	12.3%	11.4%	-0.9	12.5%	12.5%	-0.1	12.3%	11.1%	-1.2
20 – 29	23.0%	25.1%	2.1	20.2%	24.8%	4.6	23.5%	25.2%	1.6
30 – 39	9.8%	8.0%	-1.8	10.1%	7.9%	-2.2	9.7%	8.0%	-1.7
40 – 49	18.2%	18.0%	-0.2	19.7%	18.9%	-0.8	17.9%	17.7%	-0.2
50 – 59	7.2%	7.0%	-0.2	6.5%	5.3%	-1.2	7.3%	7.4%	0.1
60 – 74	12.1%	12.2%	0.1	11.5%	12.6%	1.1	12.2%	12.2%	0.0
75 – 90	5.1%	3.9%	-1.2	3.6%	2.6%	-1.0	5.4%	4.3%	-1.2
More than 90	4.5%	4.9%	0.4	4.0%	3.0%	-1.0	4.6%	5.4%	0.7

TABLE 6.10: MINUTES DRIVING TO MAKE THE SAME TRIP BY CAR BY MODE AND SERVICE DAY

TRIP LENGTH TIME (MINUTES)	SYSTEM WIDE			LIGHT RAIL			BUS		
	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE
0 – 5	6.2%	8.2%	1.9	2.9%	3.3%	0.3	6.9%	9.6%	2.8
6 – 10	23.1%	22.9%	-0.2	19.7%	24.4%	4.7	23.8%	22.5%	-1.3
11 – 15	25.1%	26.5%	1.4	20.2%	26.7%	6.5	26.0%	26.4%	0.4
16 – 20	19.5%	20.7%	1.2	21.9%	24.5%	2.6	19.1%	19.6%	0.5
21 – 40	20.9%	17.7%	-3.2	27.7%	18.5%	-9.2	19.7%	17.5%	-2.2
41+	5.1%	4.0%	-1.0	7.6%	2.6%	-5.0	4.6%	4.4%	-0.2

TABLE 6.11: FREQENCY OF USING VTA BUS/LIGHT RAIL BY MODE AND SERVICE DAY

HOW OFTEN DO YOU USE THE VTA BUSES/LIGHT RAIL?	SYSTEM WIDE			LIGHT RAIL			BUS		
	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	TOTAL	WEEKDAY	WEEKEND	TOTAL
6 – 7 days a week	40.3%	50.6%	10.3	34.0%	41.0%	37.7%	41.5%	53.1%	46.7%
4 – 5 days a week	38.4%	20.5%	-17.8	41.5%	18.2%	29.4%	37.7%	21.1%	30.2%
1 – 3 days a week	14.7%	18.1%	3.3	16.1%	18.8%	17.5%	14.5%	17.9%	16.0%
Less than once per week	5.0%	8.7%	3.7	6.3%	18.6%	12.7%	4.8%	6.2%	5.4%
First time riding VTA	1.6%	2.1%	0.5	2.0%	3.5%	2.8%	1.5%	1.7%	1.6%

TABLE 6.12: NUMBER OF ONE-WAY TRIPS PER WEEK BY MODE AND SERVICE DAY

NUMBER OF ONE WAY TRIPS PER WEEK	SYSTEM WIDE			LIGHT RAIL			BUS		
	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE
0	7.5%	9.8%	2.3	8.1%	14.5%	6.4	7.4%	8.7%	1.3
1	10.0%	14.6%	4.6	9.6%	20.1%	10.4	10.1%	13.4%	3.3
2	11.9%	16.0%	4.2	10.7%	13.5%	2.8	12.1%	16.6%	4.6
3	7.1%	7.3%	0.3	6.4%	5.0%	-1.4	7.2%	7.9%	0.7
4	8.0%	7.9%	-0.1	6.9%	6.9%	0.0	8.2%	8.1%	-0.1
5	17.7%	9.4%	-8.3	18.5%	6.6%	-11.9	17.6%	10.1%	-7.5
6	5.9%	7.4%	1.5	5.2%	7.1%	2.0	6.1%	7.5%	1.4
7	4.1%	6.8%	2.7	3.6%	7.7%	4.1	4.2%	6.6%	2.3
8	3.7%	1.4%	-2.2	4.9%	1.0%	-4.0	3.5%	1.6%	-1.9
9	0.5%	0.3%	-0.2	0.4%	0.1%	-0.2	0.5%	0.4%	-0.2
10	13.6%	6.3%	-7.3	16.2%	7.2%	-9.0	13.1%	6.1%	-7.0
11	0.2%	0.1%	-0.1	0.7%	--	-0.7	0.2%	0.2%	0.0
12	2.5%	2.4%	-0.1	2.9%	1.5%	-1.5	2.5%	2.6%	0.2
13	0.1%	0.1%	0.0	--	--	0.0	0.1%	0.1%	0.0
14	2.4%	3.7%	1.3	1.7%	4.0%	2.4	2.6%	3.7%	1.1
15	0.5%	1.1%	0.7	0.4%	1.0%	0.6	0.5%	1.2%	0.7
16	0.4%	0.3%	0.0	0.3%	--	-0.3	0.4%	0.4%	0.0
17	0.0%	0.0%	0.0	0.1%	--	-0.1	0.0%	0.0%	0.0
18	0.3%	0.8%	0.5	0.2%	--	-0.2	0.3%	1.0%	0.7
19	0.0%	0.0%	0.0	--	--	0.0	0.1%	0.0%	0.0
20	3.5%	4.0%	0.4	3.2%	3.8%	0.6	3.6%	4.0%	0.4

TABLE 6.13: LENGTH OF TIME RIDING VTA BUS/LIGHT RAIL BY MODE AND SERVICE DAY

HOW LONG HAVE YOU BEEN RIDING VTA BUSES/LIGHT RAIL	SYSTEM WIDE			LIGHT RAIL			BUS		
	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE	WEEKDAY	WEEKEND	DIFFERENCE
Less than 1 year	28.4%	24.5%	-3.9	36.5%	31.2%	-5.4	26.9%	22.8%	-4.1
1 – 3 years	24.0%	23.3%	-0.7	20.4%	24.5%	4.0	24.7%	23.0%	-1.7
More than 3 years	47.6%	52.2%	4.6	43.0%	44.4%	1.4	48.4%	54.2%	5.8

C. SERVICE EVALUATION

- Weekday and weekend passengers gave VTA services similar ratings in all categories. There were slight differences in the categories of "ease of transfers" and "frequency."

- "More weekend service" was selected by 91% of weekend passengers as "very important" or "important" to them, compared to 82% for weekday passengers. Weekday and weekend passengers also differed on the importance of "later service" and "earlier service".

TABLE 6.14: SERVICE RATINGS BY MODE AND SERVICE DAY

SERVICE RATING	Excellent		Good		Fair		Poor	
	Weekday	WEEKEND	Weekday	WEEKEND	Weekday	WEEKEND	Weekday	WEEKEND
Overall service quality	31%	34%	51%	49%	15%	15%	2%	2%
On-time/reliability	24%	27%	43%	45%	25%	23%	8%	6%
Frequency	22%	24%	41%	39%	28%	27%	10%	10%
Ease of transfers	25%	28%	44%	43%	24%	23%	7%	7%
Fares	18%	21%	30%	33%	32%	27%	20%	19%
Drivers	32%	34%	46%	46%	19%	16%	3%	4%
Accessibility for disabled persons	47%	48%	41%	41%	11%	10%	1%	1%
Personal security/safety	30%	32%	46%	45%	19%	19%	4%	4%
Cleanliness of vehicles	25%	26%	43%	43%	24%	23%	8%	8%

FIGURE 6.1: IMPORTANCE OF SERVICE IMPROVEMENTS: WEEKDAY PASSENGERS

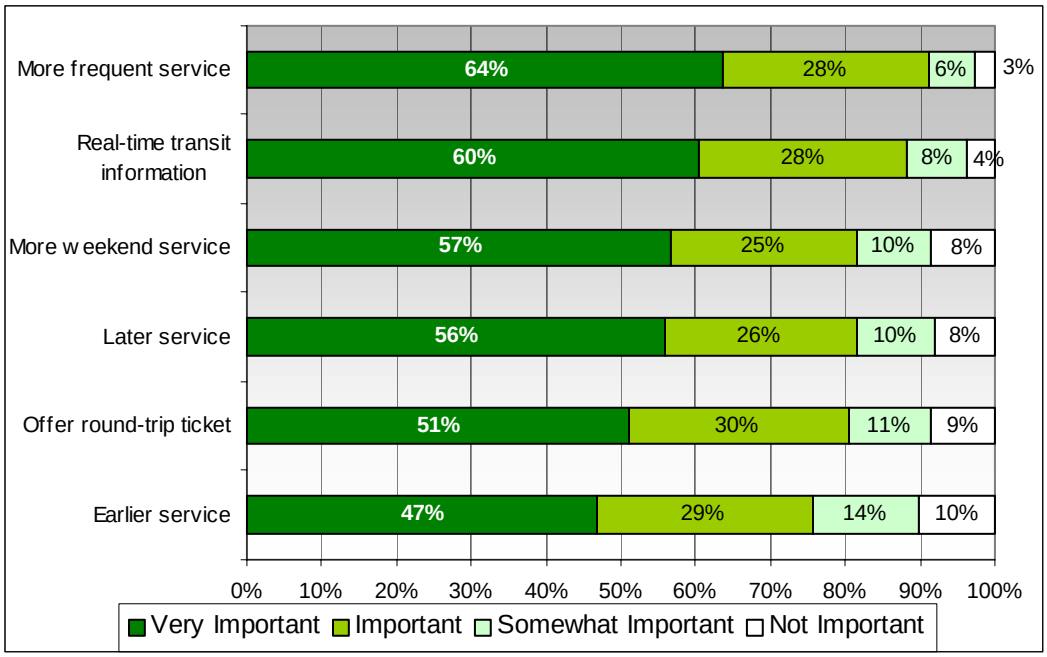
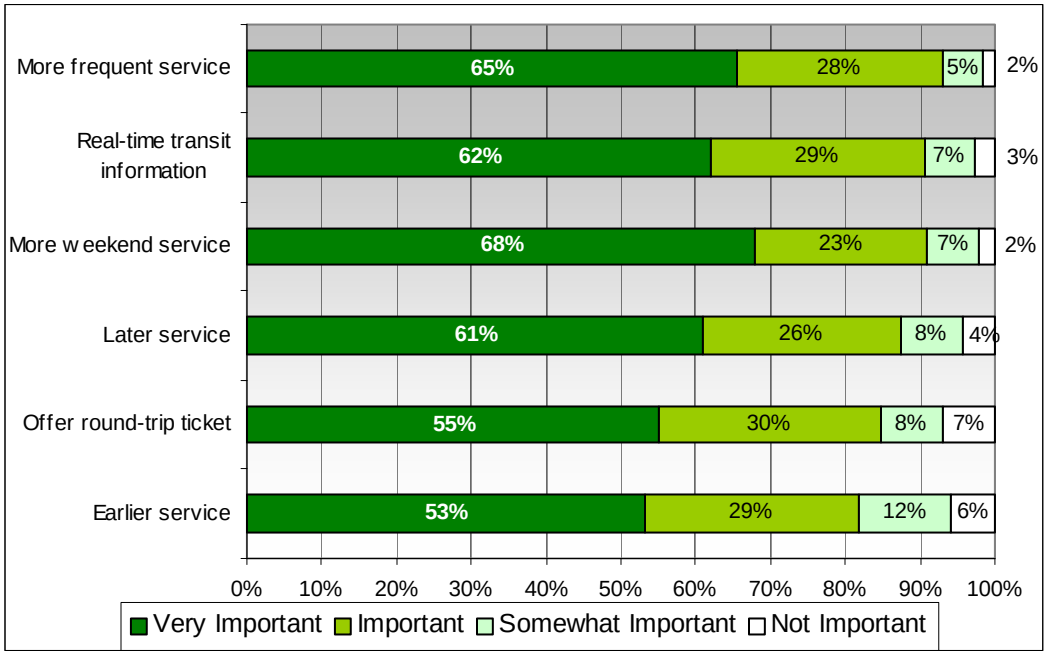


FIGURE 6.2: IMPORTANCE OF SERVICE IMPROVEMENTS: WEEKEND PASSENGERS



7. COMPARISON OF BUS AND LIGHT RAIL

In this chapter, responses from bus and light rail passengers were compared in several categories. It should be noted that there is not an absolute distinction between these two groups of passengers. Many VTA passengers ride both bus and light rail either on the same trip or at different times. Results from this survey show that 12% of light rail passengers transfer to and from VTA buses and 4 to 5% of bus passengers transfer to and from light rail. Nevertheless, there are some notable distinctions between bus and light rail passengers that are significant.

A. PASSENGER DEMOGRAPHICS

- Bus and light rail passengers show similar age distribution patterns. The major distinctions are in the 13-to-17 and the 35-to-44 age groups. Light rail passengers have a smaller share in the youngest age group and a larger share in the working adult age groups (25 – 34, 35 – 44, and 45 – 64).

- There are noticeable differences in income level and employment status by mode. Light rail passengers are more likely to be employed full-time while bus passengers have a higher percentage of students. Light rail passengers also reported higher income levels than bus passengers. Approximately 60% of bus passengers belonged to the low-income categories ($24,999 and lower), compared to 41% of light rail passengers. There were higher percentages of light rail passengers in each income category of $25,000 and higher.

- Light rail passengers are less likely to be transit dependent, with 49% of them indicating they had no other way to travel if transit did not exist, compared to 66% among bus passengers. 67% of the bus passengers said there was not an automobile available for their trips, while only 51% of light passengers indicated such.

- A higher percentage (83%) of light rail passengers are in the “adult” fare category, compared to bus passengers (75%). The bus system has a higher percentage of passengers in the “youth” fare category, 14% in bus vs. 10% in light rail. There are slightly higher percentages of light rail passengers in the “senior” and “disabled” fare categories.

- More bus passengers used a day pass or monthly pass, while more light rail passengers used cash or Eco Pass/SJSU pass.

TABLE 7.1: EMPLOYMENT STATUS – BUS VS. LIGHT RAIL PASSENGERS

	SYSTEM	BUS	LIGHT RAIL
Employed full time	37.9%	36.2%	46.5%
Employed part time	20.4%	20.5%	20.3%
Not currently employed	10.7%	11.1%	9.2%
Student	24.7%	25.9%	19.6%
Retired	4.2%	4.6%	2.7%
Visitor to the area	2.0%	1.9%	1.7%

FIGURE 7.1: AGE DISTRIBUTION – BUS VS. LIGHT RAIL PASSENGERS

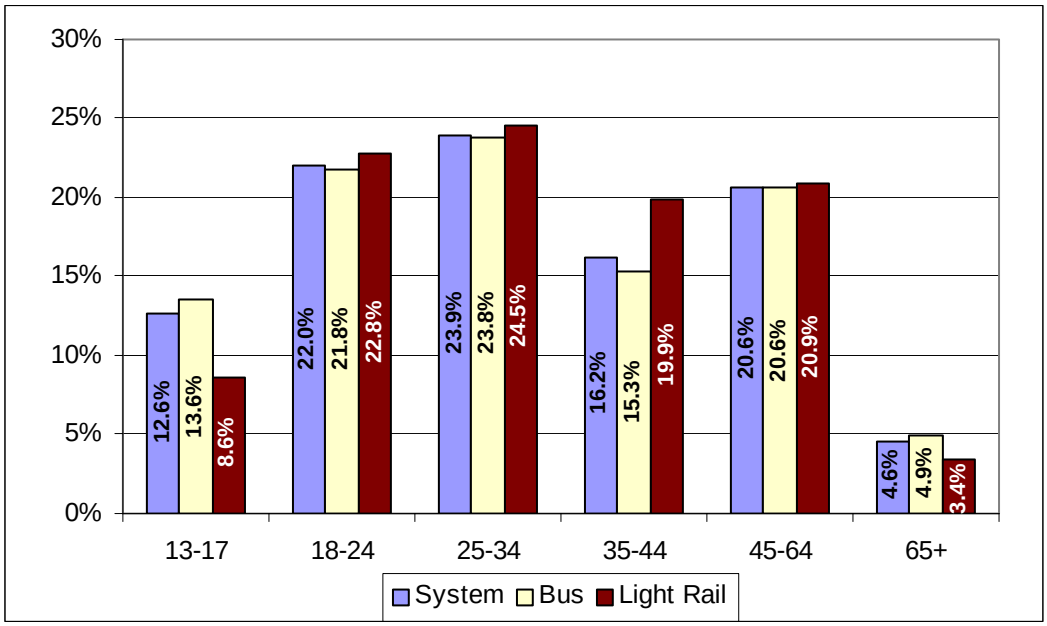


FIGURE 7.2: INCOME – BUS VS. LIGHT RAIL PASSENGERS

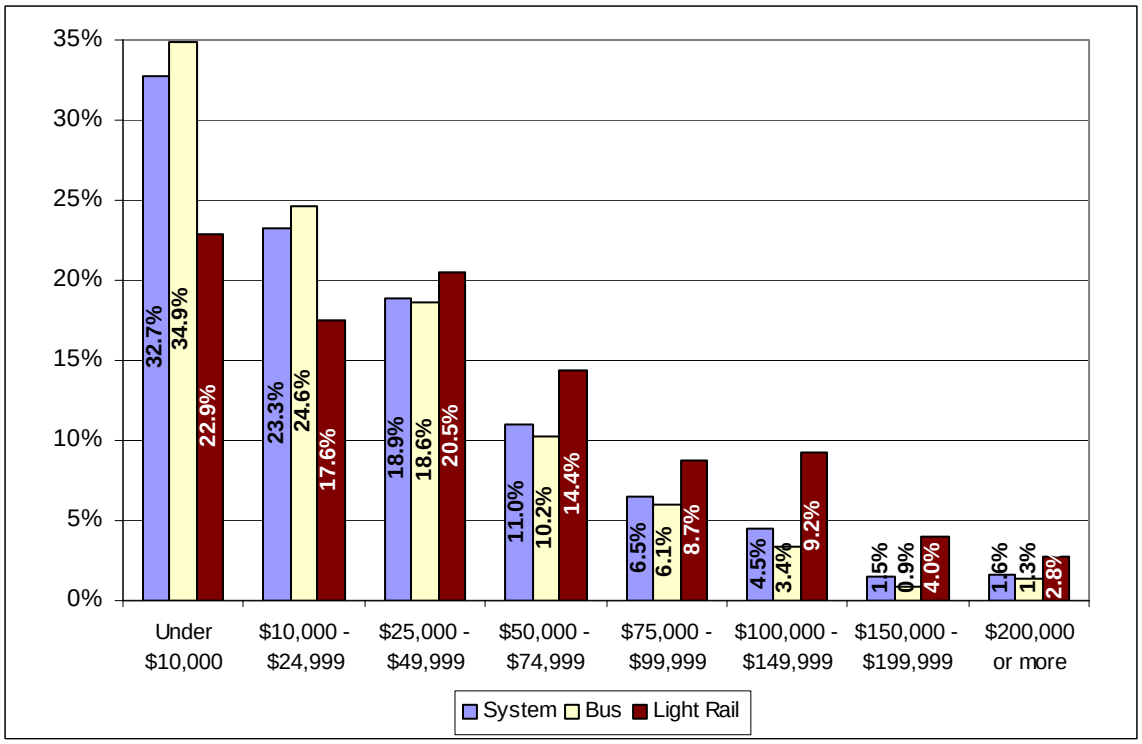


TABLE 7.2: MAIN REASON FOR RIDING VTA TRANSIT – BUS VS. LIGHT RAIL PASSENGERS

	SYSTEM	BUS	LIGHT RAIL
Have no other way	63.1%	66.1%	49.1%
Better use of time	4.2%	3.6%	7.1%
Costs less	10.5%	10.0%	12.7%
Faster than driving	1.7%	1.3%	3.8%
Allow someone else to use the car	3.9%	3.9%	4.1%
Fewer problems than using car	6.6%	5.8%	10.2%
Car in shop	2.9%	2.9%	2.9%
Good for the environment	5.6%	5.2%	7.4%
Other	1.5%	1.3%	2.6%

TABLE 7.3: AUTO AVAILABILITY – BUS VS. LIGHT RAIL PASSENGERS

	SYSTEM	BUS	LIGHT RAIL
Yes	19.0%	16.2%	34.5%
Yes, but with inconvenience to others	15.9%	16.4%	14.6%
No	65.1%	67.4%	50.9%

TABLE 7.4: FARE CATEGORY – BUS VS. LIGHT RAIL PASSENGERS

	SYSTEM	BUS	LIGHT RAIL
Adult	76.4%	75.0%	83.0%
Youth	13.2%	13.9%	9.7%
Senior	4.8%	5.0%	4.2%
Disabled	5.6%	6.1%	3.1%

TABLE 7.5: METHOD OF FARE PAYMENT – BUS VS. LIGHT RAIL PASSENGERS

METHOD OF FARE PAYMENT	SYSTEM	BUS	LIGHT RAIL
Paid cash for single ride	26.9%	24.8%	36.2%
Day Pass	18.5%	19.3%	14.7%
Monthly Flash Pass	37.6%	40.3%	25.3%
Eco Pass/SJSU	11.3%	9.9%	17.7%
Caltrain Monthly ticket	1.0%	1.0%	1.3%
Outreach Paratransit ID	1.4%	1.4%	1.5%
Token	0.8%	0.9%	0.6%
Other	2.5%	2.5%	2.8%

B. TRAVEL CHARACTERISTICS

- No significant difference was found between bus and light rail passengers in regards to their trip purpose, when both origin and destination were taken into consideration. The only noticeable difference is found in recreation/social visit trip purpose. There are more light rail passengers using VTA services for this purpose than bus passengers.

- The percentage of passengers who walked to and from a bus stop/station is higher among bus passengers than light rail passengers, while light rail passengers are more likely to drive to a station.

- Most one-way trips by transit can be completed using only one or two buses or trains. The responses to the number of buses/trains needed to complete the trip show some variation by mode. Approximately 8% more light rail passengers complete their one-way trips boarding one train.

- Travel times are similar for both bus and light rail passengers. The most noticeable differences are in the less-than-10-minute and the 20-to-29-minute categories. Light rail passengers are more likely to complete their one-way trips in less than 10 minutes, while a higher percentage of bus passengers completed theirs in 20 to 29 minutes.

- When asked whether they ever made the same trip in a car, a slightly higher percentage of light rail passengers (56.1%) said yes, compared to 54.5% of bus passengers.

- Bus passengers tend to ride VTA very often, 6 to 7 days a week, while there are more infrequent passengers (less than once a week) on light rail.

- More bus passengers (51%) have been riding VTA for more than 3 years than have light rail passengers (44%).

TABLE 7.6: TRIP PURPOSE – BUS VS. LIGHT RAIL PASSENGERS

TRIP PURPOSE	ORIGIN		DESTINATION	
	BUS	LIGHT RAIL	BUS	LIGHT RAIL
Work	19.7%	24.3%	24.1%	18.7%
Shopping	8.2%	6.1%	10.1%	11.5%
School/college	10.8%	9.5%	10.0%	4.3%
Recreation or social visit	5.6%	9.7%	7.5%	11.7%
Personal business/errands	7.2%	9.4%	10.1%	8.9%
Home	45.8%	39.4%	34.9%	43.9%
Medical	2.5%	1.5%	2.8%	0.7%
Other	0.2%	0.0%	0.3%	0.3%

TABLE 7.7: ACCESS AND EGRESS MODES – BUS VS. LIGHT RAIL PASSENGERS

TRIP PURPOSE	ACCESS		EGRESS	
	BUS	LIGHT RAIL	BUS	LIGHT RAIL
Walked	73.1%	61.7%	74.4%	68.3%
Mobility device for people w/ disabilities	0.5%	0.4%	0.5%	0.4%
Drove	2.1%	9.7%	1.1%	6.7%
Transferred from light rail	5.0%	8.4%	4.1%	4.8%
Transferred from VTA bus	12.5%	11.7%	13.6%	11.9%
Caltrain	1.2%	1.5%	0.9%	1.3%
Dropped off by automobile	2.6%	2.2%	2.0%	2.0%
Bicycle	2.9%	4.5%	2.7%	4.4%
Other	0.0%	0.0%	0.5%	0.4%

TABLE 7.8: TOTAL NUMBER OF BUSES/TRAINS TO COMPLETE ONE-WAY TRIP – BUS VS. LIGHT RAIL PASSENGERS

NUMBER OF BUSES/TRAINS	SYSTEM	BUS	LIGHT RAIL
1	39.0%	37.6%	45.7%
2	42.4%	43.3%	38.3%
3	10.8%	11.3%	8.2%
4 +	7.8%	7.8%	7.9%

FIGURE 7.3: TRAVEL TIME TO COMPLETE ONE-WAY TRIP BY BUS VS. LIGHT RAIL

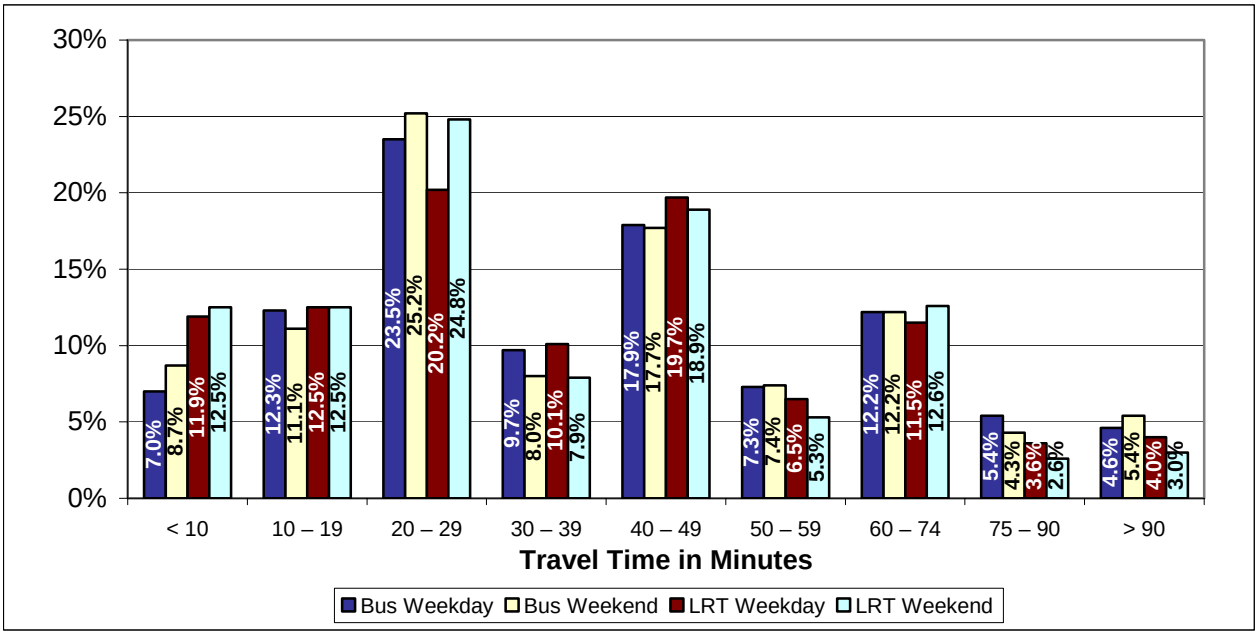
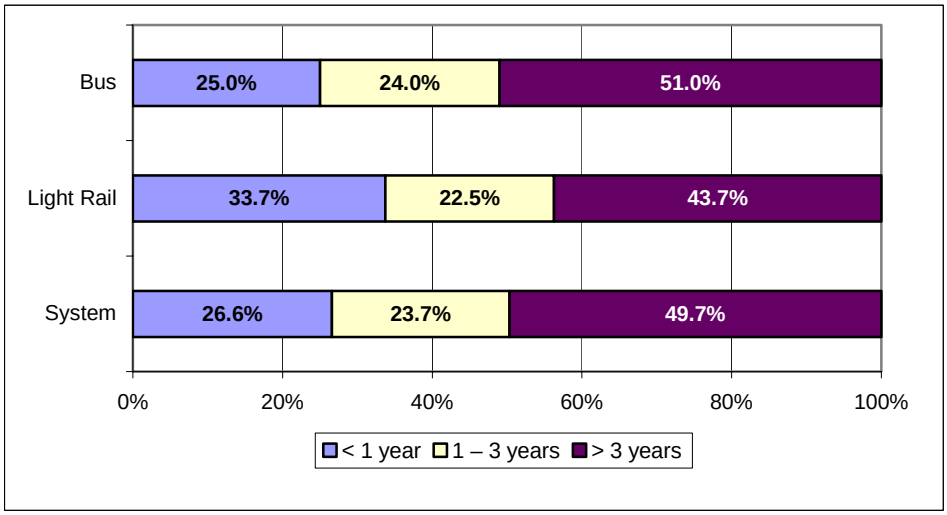


TABLE 7.9: FREQUENCY OF USING VTA – BUS VS. LIGHT RAIL PASSENGERS

FREQUENCY OF USING VTA	SYSTEM	BUS	LIGHT RAIL
6-7 days a week	45.1%	46.7%	37.7%
4-5 days a week	30.1%	30.2%	29.4%
1-3 days a week	16.3%	16.0%	17.5%
Less than once a week	6.8%	5.4%	12.7%
First time riding VTA	1.8%	1.6%	2.8%

FIGURE 7.4: LENGTH OF TIME RIDING VTA BUS AND LIGHT RAIL



C. SERVICE EVALUATION

- Overall, bus and light rail passengers rated VTA's service in similar ways. In some of the service categories, bus and light rail passengers differed in their opinions. Higher percentages of light rail passengers rated all service categories as "Excellent".

- In response to the question of which service improvement was important, bus and light rail passengers ranked all improvement options in the same order of importance. More bus passengers (64%) rated "more weekend service" "very important" than light rail passengers (54%).

TABLE 7.10: VTA SERVICE RAITINGS – BUS VS. LIGHT RAIL PASSENGERS

SERVICE RATING	Excellent		Good		Fair		Poor	
	Bus	LRT	Bus	LRT	Bus	LRT	Bus	LRT
Overall service quality	31%	39%	50%	50%	16%	9%	2%	2%
On-time/reliability	24%	33%	43%	48%	26%	15%	8%	4%
Frequency	21%	28%	40%	42%	28%	23%	11%	7%
Ease of transfers	25%	32%	44%	42%	24%	19%	7%	6%
Fares	18%	26%	31%	35%	31%	26%	21%	14%
Drivers	32%	37%	46%	47%	19%	12%	4%	3%
Accessibility for disabled persons	48%	46%	40%	45%	11%	8%	1%	1%
Personal security/safety	31%	31%	45%	48%	20%	17%	4%	4%
Cleanliness of vehicles	25%	26%	42%	45%	24%	23%	8%	7%

FIGURE 7.5: IMPORTANCE OF SERVICE IMPROVEMENTS: BUS

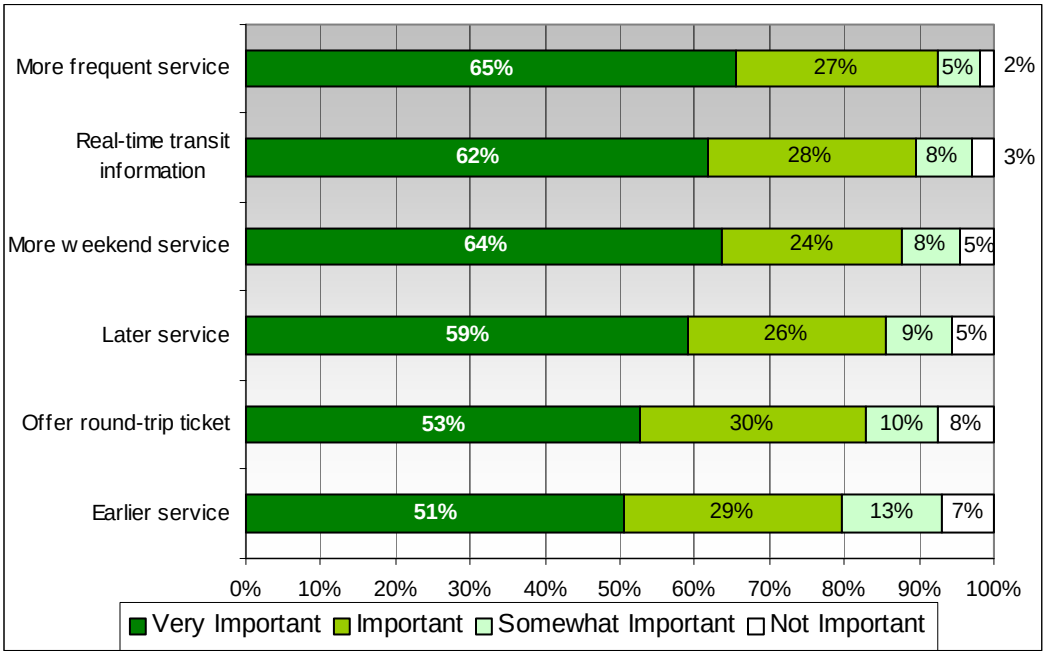
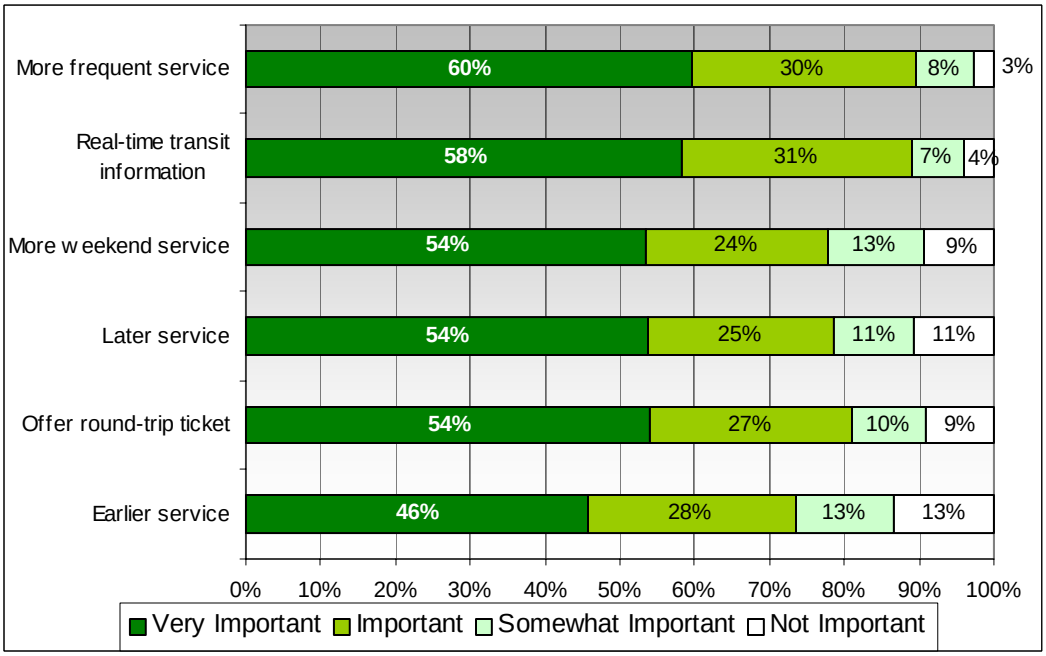


FIGURE 7.6: IMPORTANCE OF SERVICE IMPROVEMENTS: LIGHT RAIL



8. TARGET LINES

There were a total of 14 target lines of special interest to VTA. The target lines for this analysis include bus lines 22, 23, 25, 26, 55, 62, 64, 66, 68, 70, 72, 81, 522, and light rail lines 900, 901, 902, which were combined as one. The combined light rail line is labeled as "LRT" in the tables. The chapter summarizes key variables for each of these lines.

Tables 8.1 through 8.6 provide details for each of these target lines. Key findings include:

- Among the target lines, "walked" was the most prevalent access mode, with 62% to 84% of passengers indicating this particular mode. "Transferred from VTA bus/shuttle" was a distant second – the access mode was between 7% and 17% of passengers.

- While not quite the mirror image of the access mode by target line, passengers tended to egress from the target lines by the manner in which they accessed them. "Walked" was cited by 58% to 82% of bus passengers. Passengers alighting from line 522 were the least likely to walk from the bus stop. "Transfer to VTA bus/shuttle" was a distant second in egress frequency, with 11% to 24% of passengers citing this egress mode. Passengers alighting from line 522 were the most likely to cite "transfer to VTA bus/shuttle".

- There was a wide variance in reported trip length by target line. Trips on the LRT lines were among the shortest trip reported. Trips on lines 68 and 522 were among the longest trips. The most prevalent lengths of trips on the target lines were 20-29 minutes (24% of all target line trips), followed by 40-49 minutes (19% of all target line trips).

- The majority of fares recorded for the target lines were "adult" fares. However, less than half of fares on line 55 were "adult", 44% were "youth." The highest levels of "senior" fares were on lines 26 and 62. For "disabled", the lines with the highest percentages were 23, 62, 68, and 81.

- A comparison between lines 22 and 522 shows that although there are few differences in passenger demographics, passengers' travel patterns are quite different. Passengers on Line 22 tend to make shorter trips, with 46% passengers making trips less than 30 minutes, compared to 29% on Line 522. More passengers on Line 22 (76%) walked to a bus stop than on Line 522 (62%). However, Line 522 has a higher percentage (24%) of passengers transferring to and from VTA bus and light rail.

- There was high variation in age of passengers among the target routes. Line 55 had the highest proportion of teen passengers (ages 13-17), followed by line 70. Line 72 had the highest proportion of young adults (ages 18-24). Lines 26 and 62 had the highest proportion of older passengers (ages 65 and older).

- The majority of target line passengers (56%) reported incomes of less than $25,000. Passengers of lines 25, 64, and 72 reported the lowest incomes. Light rail passengers reported the highest household incomes.

- Lines 22 and 68 as well as the LRT lines have a slightly higher percentage of male passengers than the other lines at about 60% of the passengers for each line. Lines 25 and 81 have the highest percentage of female passengers at 57% and 58%, respectively.

TABLE 8.1: ACCESS MODE BY TARGET LINE

	Target Lines														
Access Mode	22	23	25	26	55	62	64	66	68	70	72	81	522	LRT	Total
Walked	76.4%	75.1%	73.3%	70.3%	76.7%	74.8%	80.7%	76.1%	65.3%	75.1%	83.8%	79.3%	61.9%	61.7%	71.2%
Mobility Device	0.1%	0.3%	1.2%	0.2%	0.3%	1.5%	0.3%	0.9%	1.6%	0.8%	0.0%	1.6%	0.3%	0.4%	0.6%
Drove	2.3%	1.3%	0.9%	0.9%	0.7%	1.1%	0.7%	0.7%	2.3%	1.1%	0.7%	2.2%	5.7%	9.7%	3.7%
Transferred from LRT	2.8%	3.5%	6.4%	5.7%	5.8%	5.9%	2.3%	3.2%	6.8%	6.8%	5.5%	3.9%	3.5%	8.4%	5.4%
Transferred from VTA bus/shuttle	9.1%	13.3%	14.6%	14.5%	8.2%	13.9%	10.7%	14.6%	10.7%	12.3%	6.6%	11.2%	17.3%	11.7%	11.8%
Caltrain	1.2%	1.2%	0.5%	1.0%	0.9%	0.1%	1.6%	1.1%	2.6%	0.9%	0.2%	0.3%	2.0%	1.5%	1.2%
Dropped off by auto	2.9%	2.6%	0.8%	1.7%	3.8%	1.2%	2.3%	1.9%	5.8%	2.4%	1.2%	0.4%	3.5%	2.2%	2.4%
Bicycle	5.1%	2.7%	2.2%	5.7%	3.6%	1.5%	1.4%	1.5%	4.8%	0.8%	2.0%	1.0%	5.7%	4.5%	3.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

TABLE 8.2: EGRESS MODE BY TARGET LINE

	Target Lines														
Egress Mode	22	23	25	26	55	62	64	66	68	70	72	81	522	LRT	Total
Walked	76.4%	76.9%	77.5%	72.6%	76.9%	72.9%	75.7%	75.5%	70.7%	74.6%	78.7%	81.7%	58.3%	68.3%	73.2%
Mobility Device	0.1%	0.7%	0.8%	1.0%	0.9%	1.6%	0.0%	0.9%	1.2%	0.3%	0.3%	0.8%	0.7%	0.4%	0.5%
Drive	1.0%	0.7%	0.2%	0.5%	0.0%	0.6%	0.9%	1.0%	0.9%	0.3%	0.0%	0.9%	2.1%	6.7%	2.3%
Transfer to LRT	2.5%	3.1%	4.9%	3.1%	4.1%	4.7%	5.5%	4.1%	3.7%	6.0%	6.5%	3.9%	3.5%	4.8%	4.1%
Transfer to VTA bus/shuttle	12.1%	14.0%	12.0%	15.2%	10.6%	16.3%	13.1%	16.2%	10.7%	15.3%	11.4%	11.9%	24.3%	11.9%	13.3%
Caltrain	0.3%	1.2%	0.5%	0.2%	1.8%	0.9%	0.7%	0.2%	0.7%	0.6%	0.4%	0.0%	2.0%	1.3%	0.8%
Picked up by auto	2.1%	1.3%	0.8%	1.9%	3.8%	0.3%	2.4%	0.6%	6.7%	1.8%	1.0%	0.0%	3.2%	2.0%	2.0%
Bicycle	4.9%	2.0%	2.1%	4.8%	1.8%	2.5%	1.5%	1.2%	4.4%	1.0%	1.5%	0.4%	5.5%	4.4%	3.4%
Other	0.7%	0.1%	1.2%	0.5%	0.2%	0.1%	0.2%	0.2%	1.0%	0.1%	0.2%	0.4%	0.5%	0.4%	0.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

TABLE 8.3: TRIP LENGTH (IN MINUTES) BY TARGET LINE

	Target Lines														
Trip Length	22	23	25	26	55	62	64	66	68	70	72	81	522	LRT	Total
Less than 10	10%	3%	8%	4%	3%	9%	6%	7%	6%	10%	10%	5%	2%	12%	8%
10 - 19	12%	10%	9%	9%	11%	13%	15%	13%	8%	13%	18%	13%	8%	12%	12%
20 -29	24%	24%	28%	21%	32%	29%	25%	23%	22%	26%	24%	30%	19%	23%	24%
30 - 39	6%	8%	9%	12%	11%	9%	12%	8%	6%	8%	8%	12%	13%	9%	9%
40 - 49	20%	23%	16%	22%	17%	15%	19%	19%	11%	16%	18%	17%	22%	19%	19%
50 - 59	9%	11%	7%	7%	9%	5%	6%	7%	8%	8%	5%	4%	8%	6%	7%
60 - 74	13%	12%	15%	15%	7%	13%	13%	10%	17%	11%	10%	14%	14%	12%	13%
75 - 90	3%	4%	4%	5%	7%	4%	4%	5%	14%	4%	3%	2%	8%	3%	4%
90 +	4%	4%	4%	3%	4%	3%	2%	6%	9%	5%	3%	3%	7%	3%	4%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

TABLE 8.4: NUMBER OF TIMES BOARDING TRANSIT BY TARGET LINE

	Target Lines														
No. of Times Boarding Transit	22	23	25	26	55	62	64	66	68	70	72	81	522	LRT	Average
1	11%	10%	10%	8%	6%	13%	9%	7%	11%	11%	12%	12%	12%	13%	11%
2	45%	41%	39%	38%	41%	44%	42%	44%	39%	37%	39%	44%	42%	49%	43%
3	8%	10%	7%	7%	9%	14%	4%	5%	8%	6%	10%	6%	9%	6%	7%
4+	36%	39%	44%	46%	45%	30%	45%	43%	42%	47%	40%	38%	37%	32%	38%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

TABLE 8.5: FARE CATEGORY BY TARGET LINE

	Target Lines														
Fare Category	22	23	25	26	55	62	64	66	68	70	72	81	522	LRT	Average
Adult	83.1%	79.0%	80.3%	71.7%	48.0%	70.2%	67.4%	71.7%	74.4%	60.5%	80.0%	71.0%	80.2%	83.0%	77.1%
Youth	10.9%	7.1%	7.9%	11.4%	44.3%	10.2%	21.3%	15.5%	10.0%	30.4%	12.4%	15.3%	4.8%	9.7%	12.7%
Senior	3.5%	3.9%	3.9%	10.2%	5.4%	8.7%	4.5%	3.3%	4.8%	5.3%	1.5%	4.1%	7.9%	4.2%	4.6%
Disabled	2.5%	10.0%	7.8%	6.7%	2.3%	10.9%	6.9%	9.5%	10.8%	3.9%	6.0%	9.6%	7.2%	3.1%	5.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.1%	100.0%	100.0%

TABLE 8.6: DEMOGRAPHICS BY TARGET LINE

	Target Lines														
Demographic	22	23	25	26	55	62	64	66	68	70	72	81	522	LRT	Total
Age															
13-17	13.2%	6.0%	7.0%	11.4%	45.1%	10.2%	16.8%	13.8%	6.7%	30.7%	10.7%	14.7%	3.3%	8.6%	12.2%
18-24	17.0%	28.8%	26.1%	15.3%	17.9%	18.9%	26.0%	18.7%	16.9%	19.9%	36.7%	21.8%	19.6%	22.8%	21.4%
25-34	28.6%	31.5%	26.8%	22.4%	16.1%	19.1%	19.2%	22.9%	23.8%	19.1%	18.1%	21.2%	27.5%	24.5%	24.6%
35-44	16.7%	9.6%	20.4%	15.2%	10.4%	17.9%	17.0%	15.5%	20.4%	8.6%	17.4%	12.9%	18.4%	19.9%	16.7%
45-64	21.6%	17.6%	15.9%	25.8%	8.2%	24.8%	17.7%	25.0%	27.3%	17.8%	15.5%	25.1%	24.0%	20.9%	20.9%
65+	2.9%	6.4%	3.8%	9.9%	2.3%	9.1%	3.3%	4.0%	4.9%	3.8%	1.5%	4.3%	7.2%	3.4%	4.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Ethnic Background	22	23	25	26	55	62	64	66	68	70	72	81	522	LRT	Total
Hispanic/ Latino	43.0%	28.0%	57.2%	35.1%	43.0%	42.7%	56.1%	39.0%	46.9%	50.5%	49.6%	44.8%	36.9%	28.2%	40.3%
White	23.2%	33.7%	26.7%	37.1%	13.7%	30.4%	21.6%	25.7%	34.7%	10.8%	21.6%	20.3%	24.6%	39.9%	28.6%
Asian	21.1%	23.8%	10.0%	19.4%	30.1%	15.8%	12.0%	21.4%	8.5%	26.0%	17.8%	21.6%	23.2%	19.3%	19.2%
Black/ Afr. Am.	10.5%	15.0%	9.1%	6.6%	6.4%	9.6%	9.4%	15.4%	9.6%	10.1%	12.6%	10.4%	14.2%	10.4%	10.8%
Native Hawaiian/ Other Pacific Is.	3.7%	2.6%	1.0%	2.6%	8.3%	1.5%	1.7%	6.3%	0.8%	5.5%	5.1%	2.2%	2.5%	3.2%	3.2%
American Indian/ Alaska Native	1.0%	1.1%	3.7%	2.4%	1.5%	3.3%	2.2%	3.0%	3.5%	2.4%	5.4%	2.5%	2.1%	3.2%	2.5%
Other Race	0.3%	1.2%	0.2%	0.3%	0.3%	0.2%	0.7%	0.1%	0%	0.1%	0%	0%	0.8%	0.7%	0.4%

TABLE 8.6: DEMOGRAPHICS BY TARGET LINE (CONTINUED)

	Target Lines														
Annual Income	22	23	25	26	55	62	64	66	68	70	72	81	522	LRT	Total
<$10K	32.4%	37.3%	37.6%	33.1%	33.0%	38.1%	31.8%	30.9%	41.0%	43.6%	42.0%	40.0%	28.3%	22.9%	32.5%
$10-24.9K	21.3%	24.8%	30.7%	27.7%	25.5%	27.9%	36.4%	29.8%	24.2%	19.3%	24.9%	21.9%	28.4%	17.6%	23.4%
$25-49.9K	21.0%	15.6%	19.3%	19.0%	17.8%	17.3%	11.1%	21.7%	20.5%	20.0%	16.4%	19.2%	19.6%	20.5%	19.5%
$50-74.9K	12.7%	9.0%	5.4%	9.1%	15.3%	9.0%	8.4%	11.2%	6.2%	8.4%	8.7%	10.0%	12.3%	14.4%	10.9%
$75-99.9K	8.0%	8.7%	2.9%	4.7%	3.8%	4.0%	8.5%	3.7%	4.5%	3.4%	3.6%	3.0%	6.5%	8.7%	6.4%
$100-149.9K	3.0%	2.6%	2.4%	4.6%	3.1%	2.3%	3.4%	1.6%	0.9%	2.9%	3.6%	3.3%	3.9%	9.2%	4.3%
$150-199.9K	0.6%	0.2%	0.4%	0.8%	0.0%	1.0%	0.0%	0.1%	1.2%	1.5%	0.0%	0.5%	0.5%	4.0%	1.4%
$200K+	0.9%	1.7%	1.4%	0.9%	1.5%	0.4%	0.5%	0.9%	1.7%	0.9%	0.8%	2.2%	0.6%	2.8%	1.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Gender	22	23	25	26	55	62	64	66	68	70	72	81	522	LRT	Total
Male	60.6%	56.8%	43.4%	53.3%	45.3%	54.4%	46.6%	52.0%	61.2%	44.7%	50.0%	41.9%	53.1%	58.8%	54.5%
Female	39.4%	43.2%	56.6%	46.7%	54.7%	45.6%	53.4%	48.0%	38.8%	55.3%	50.0%	58.1%	46.9%	41.2%	45.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%