

City of Lawrence Coordinated Public Transportation Development Plan
Chapter 4
On-board Survey Results for The T

1. Introduction

As part of the comprehensive operational analysis, the project team conducted an onboard survey of T riders in conjunction with a time check of all routes on October 17, 2006. The survey, designed jointly by the project team and the Study Management Team, solicited input from riders regarding:

- ◆ Trip origin, destination, purpose, and other information regarding the passenger's trip
- ◆ Extent and history of transit usage, including interest in using the KUOW system
- ◆ Ratings of various service elements
- ◆ Desired changes and improvements to the bus system
- ◆ Rider demographics

Passengers were asked to fill out the survey only once. Surveyors were on all buses to distribute and collect surveys and answer questions. Surveyors also noted times at route timepoints.

This report summarizes the results of the on-board survey. Copies of the survey may be found in Appendix C.

2. Summary of Survey Findings

T riders are using transit primarily for work and school trips on weekdays. Cash is by far the most common fare payment method. Most riders walk to and from their origin and destination, and transfer activity is relatively low. T riders tend to ride frequently. The distribution of old and new riders is weighted more toward new riders on The T than on most transit systems: there is an even split in terms of those using the system for more than one year and less than one year.

The survey included questions to gain a greater understanding of riders' decision-making processes, values, and preferences. Convenience and lack of other choices are the major reasons that riders choose The T. Walk and get a ride with someone else are the most common alternate modes, and 15 percent of riders report that they would not make this trip if the bus were not available. The majority of riders prefer a fare increase over weekday or weekend service cuts if revenues need to be brought more into line with costs. A plurality (47 percent) do not view access to KU on Wheels as important, but one-third are not sure.

In terms of demographics, the majority of T riders are male and white, do not have a car available for this trip, and have a household income under \$25,000. Distribution of rider ages is weighted toward those of working age, with only nine percent of riders under 18 and four percent age 65 or older.

T riders are very pleased with the service. On a scale of one (very poor) to five (excellent), respondents rate The T service at an average of 4.22, an unusually high rating. The highest rated items are operator courtesy, ability to find a seat, safety on the bus and at stops, and cleanliness. Average scores for these four items all reached 4.33 or better. The lowest ratings among all service elements are for span of service (3.63) and time waiting for the bus (3.77), but

even these lowest scores are respectable. Sunday service, improved frequency, and later evening service were the most requested improvement among T riders. An analysis of performance versus importance for the eleven service attributes indicates that frequency and days and hours of service are the most critical elements in terms of needed improvements.

3. Survey Findings: Survey and Trip Characteristics

Riders completed a total of 531 usable surveys. Figure 30 summarizes survey responses by bus route. Half of all surveys were received on Routes 5 and 6.

Figure 30
Survey Responses by Route

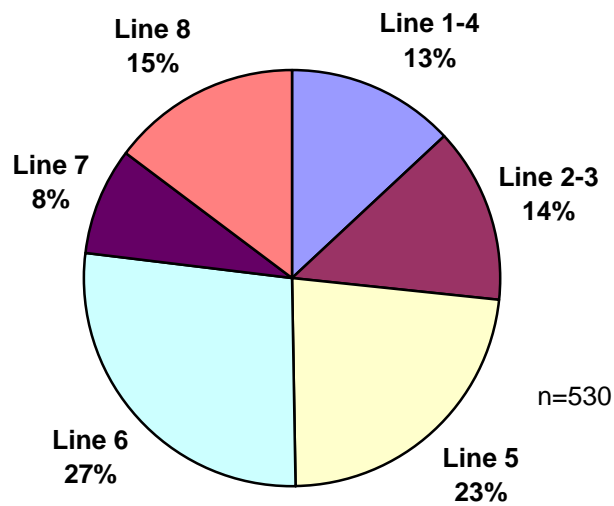


Figure 31 presents a breakdown of trip purpose. Work is the most common trip purpose, with 47 percent of all riders, followed by school (18 percent). Almost two-thirds of T riders are using The T to get to and from work or school.

**Figure 31
Trip Purpose**

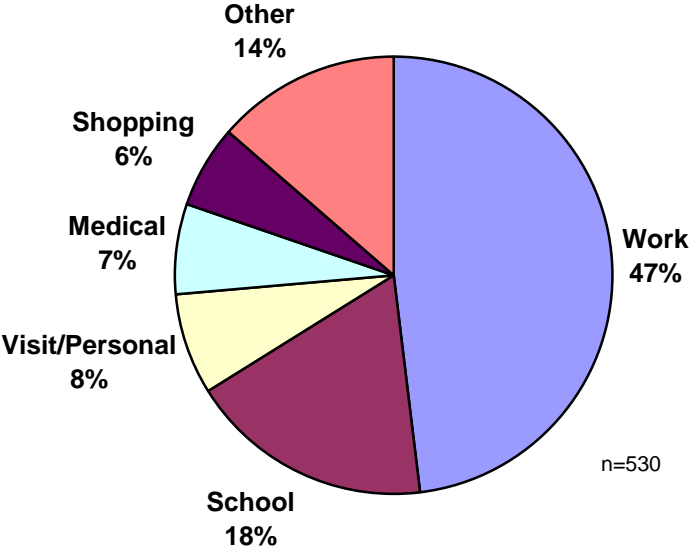


Figure 32 shows how riders got to the bus. The overwhelming majority of riders report walking to the bus stop. Seven percent transfer from another bus. Very few passengers use other modes to get to the bus.

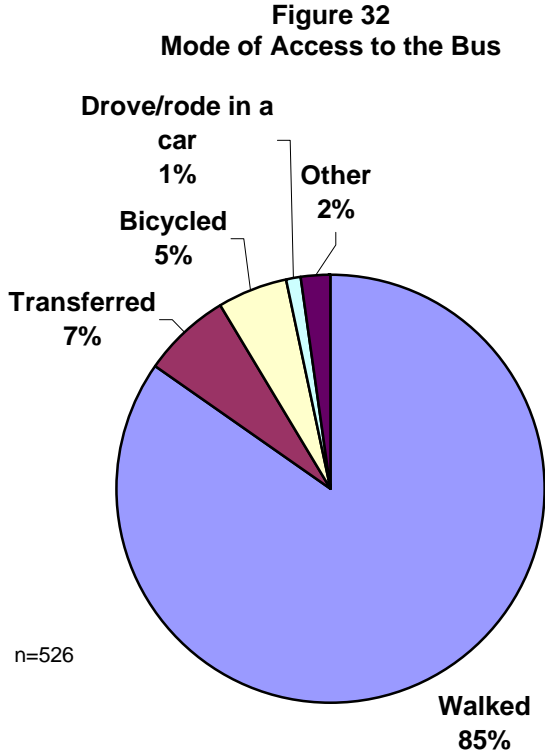


Figure 33 shows what passengers did when they got off the bus. Sixty percent of passengers walk to their final destination, while 24 percent transfer to another route. The percentage transferring to another route is higher than the percentage transferring from another route because we asked riders to fill out the survey only once, and most filled it out on their first trip of the day.

**Figure 33
Mode of Egress from the Bus**

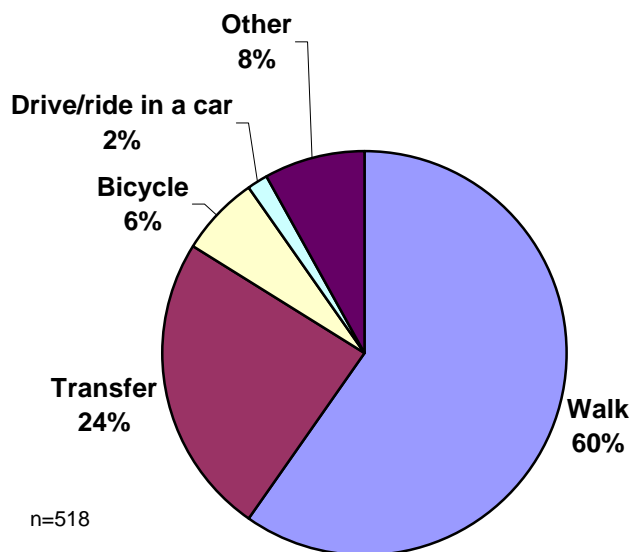


Table 24 shows the transfer matrix for transferring passengers, combining both access and egress information. Note that these totals do not represent all transfers taking place, but only those for which riders provided both the originating and transfer routes.

**Table 24
Transfer Matrix (Reported Transfers Only) for T Riders**

From Route	To Route						Total Transfers from
	1-4	2-3	5	6	7	8	
1-4	4	9	9	3	0	2	27
2-3	1	5	3	2	0	3	14
5	2	3	1	0	4	9	19
6	10	1	1	5	9	9	35
7	1	2	5	8	0	0	16
8	2	1	7	5	0	0	15
Total Transfers to	20	21	26	23	13	23	126

Figure 34 indicates ridership history. Thirty percent of all riders are new to the system within the past six months. At the other end of the spectrum, over 25 percent of riders have been using The T for two years or more. The distribution of old and new riders is weighted more toward new riders on The T than on most transit systems. This is partially a function of the age of the system and partially of the ridership growth that has occurred.

Figure 34
Ridership History on The T

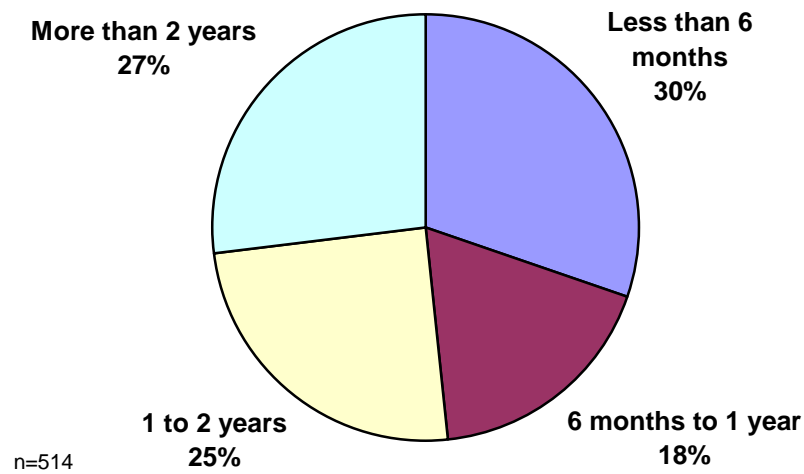


Figure 35 shows the reported frequency of transit ridership in a typical week. On-board surveys tend to under-report infrequent ridership, since passengers who ride only one or two days per week or less have a lesser chance to be surveyed. With this cautionary note in mind, Figure 6 shows that most respondents use The T frequently, but 10 percent are either very occasional riders (once a week or less) or were riding for the first time on the day of the survey.

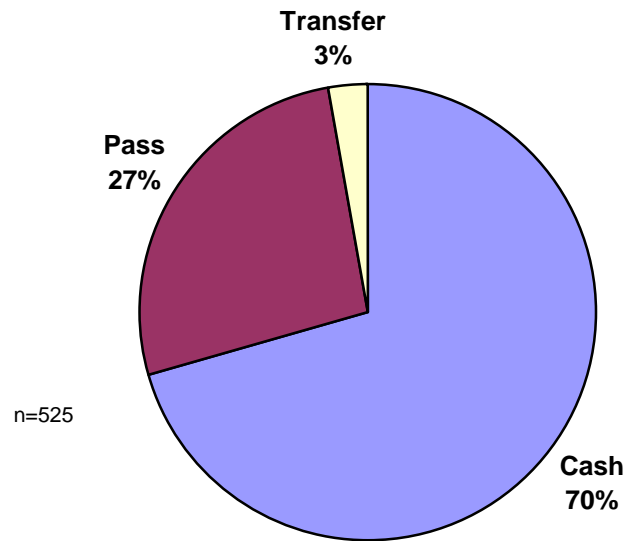
Figure 35
Reported Frequency of Ridership



Figure 36 presents a breakdown of the method of fare payment as reported by respondents. Cash is by far the most popular fare payment method, while just over ¼ of all respondents use a pass.

It is worth noting some differences between this and previous figures. The transfer percentage appears somewhat low compared to the results in Figure 3 (where transfers accounted for 7 percent of all boardings). Typically, some transferring respondents answer the question of how they paid their fare by how they paid when they first boarded a bus (e.g., cash), not how they paid on this trip.

Figure 36
Fare Payment Method



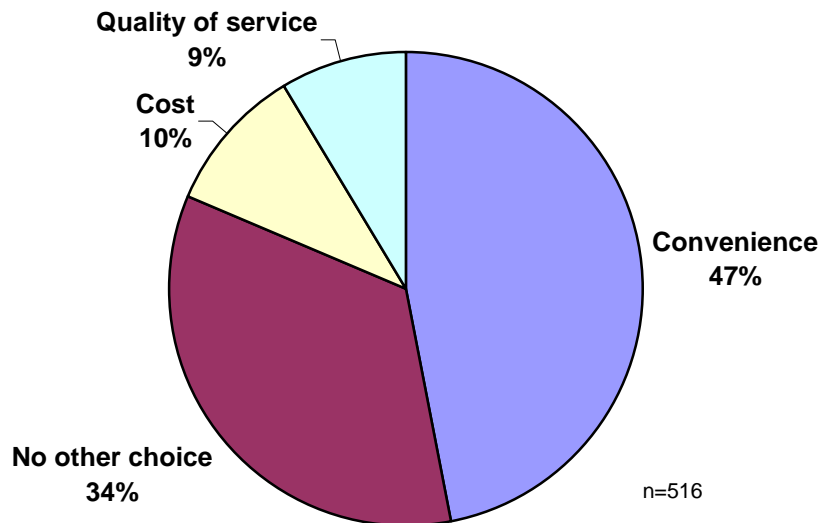
4. Survey Findings: Alternatives and Preferences

The survey included four questions to gain a greater understanding of riders’ decision-making processes, values, and preferences. These questions were:

1. Why did you use The T for this trip?
2. How would you make this trip if the bus were not available?
3. If The T had to bring costs more in balance with revenues, which option would you prefer?
4. Is having access to the KU on Wheels bus system important to you?

Figure 37 shows that convenience and lack of other options are the major reasons to choose The T. Convenience, cited by 47 percent of respondents, suggests that many riders are traveling within the City of Lawrence to places served by The T. Over one-third of all respondents report no other travel option for this trip. The cost of a trip on The T is only 50 cents for adults and 25 cents for passengers over 60 or with disabilities, much less than most transit systems charge. Even with this low fare, cost was not a major factor in the decision-making process of riders.

Figure 37
Reason for Using The T for This Trip



The second question asked riders how they would make their current trip if the bus were not available. As shown in Figure 38, 60 percent of riders would either walk (31 percent) or ride with someone else (28 percent). About 25 percent of respondents would either drive, bike, or take another bus. Most respondents who specified another bus named another T route, but one-quarter of these respondents cited either KUOW or the KU park-and-ride shuttle.

A good measure of transit dependency is the percentage of respondents who would not make this trip if the bus were not available. In this case, 15 percent of all respondents are truly dependent upon The T for their mobility.

Figure 38
Alternate Means of Travel if the Bus Were Not Available

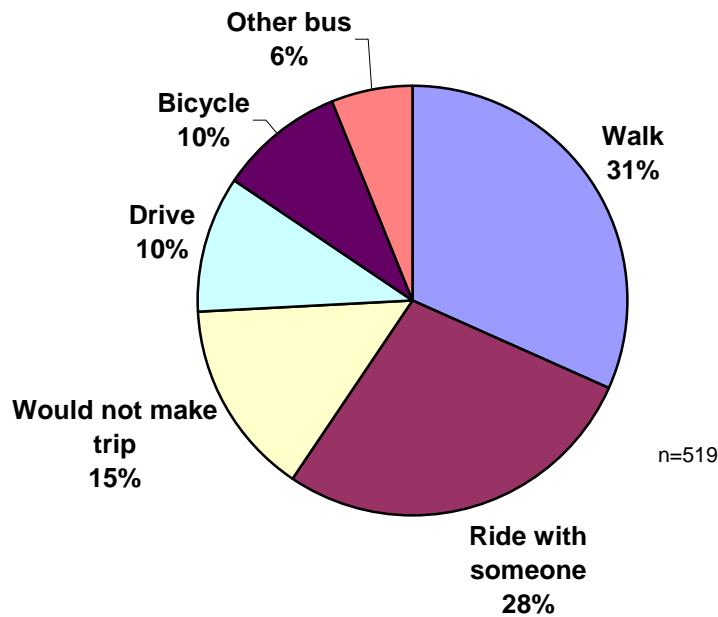


Figure 39 shows riders' preferences if The T had to bring costs more in balance with revenues. The majority favored a fare increase over a reduction in either weekday or Saturday service. This finding is not unusual. At most transit systems, riders place a higher value on service than on fares.

Figure 39
Preferences among Methods to Bring Costs More into Balance with Revenues

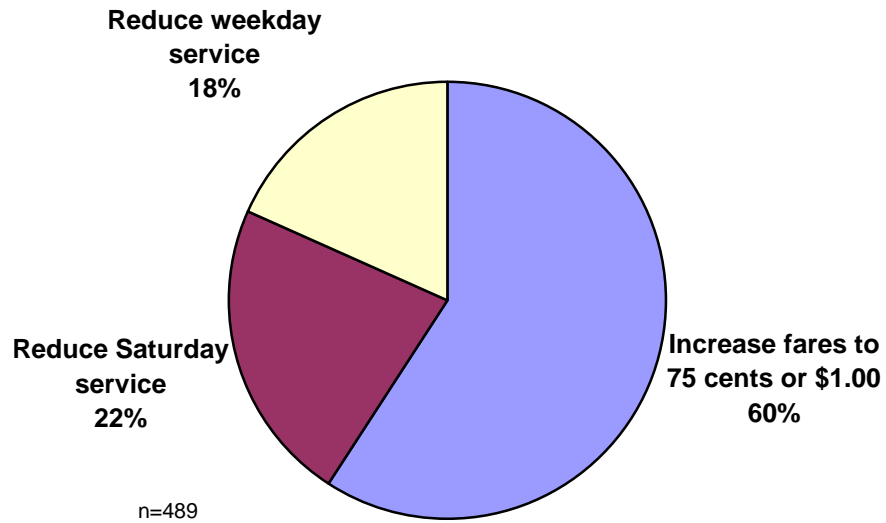
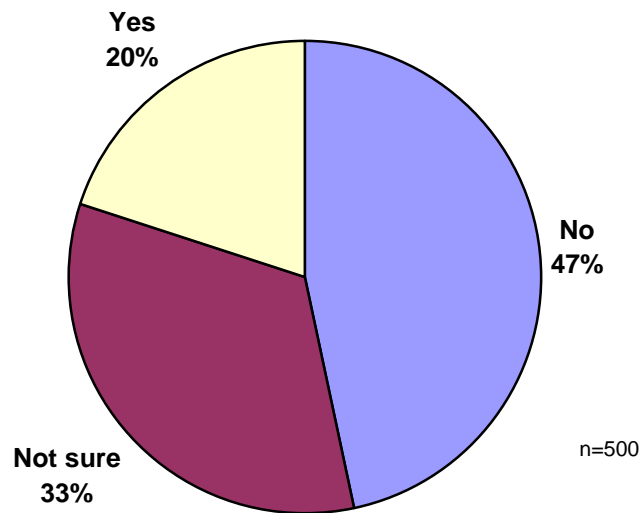


Figure 40 indicates the importance of having access to the KU on Wheels bus system among current T riders. A plurality (47 percent) of respondents do not view this as important. One-third of respondents are unsure, because they do not know much about the KU on Wheels system. Only 20 percent state that access to KUOW is important.

Figure 40
Importance of Access to KU on Wheels among Current T Riders



5. Survey Findings: Rider Demographics

This section reports on demographic characteristics of riders, including age, gender, ethnicity, vehicle availability, and income.

Figure 41 shows the age of respondents. Roughly half of all T riders are between the ages of 18 and 34. Only nine percent are under the age of 18, and only 12 percent are age 55 and over.

Figure 41
Age of T Riders

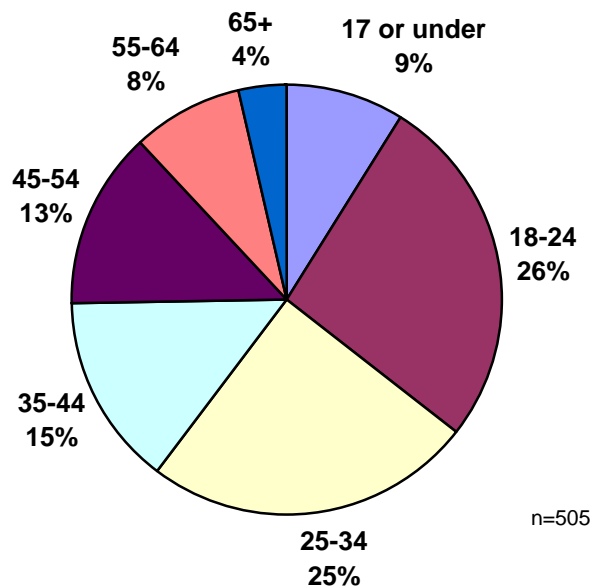


Figure 42 shows the gender of respondents. This finding is very unusual. Local transit riders typically include more females than males, but on The T males account for 55 percent of all riders. Field work and other demographic analysis suggest no obvious reason why ridership is predominantly male.

Figure 42
Gender of T Riders

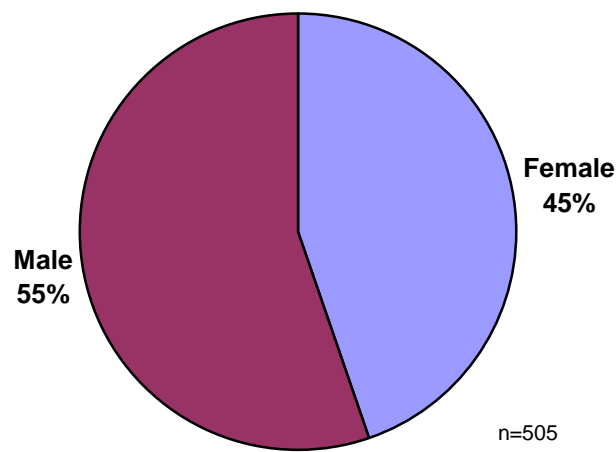


Figure 43 shows rider ethnicity. Over two-thirds of all T riders are white, followed by 14 percent black/African American, six percent Latino/Hispanic, six percent Asian/Pacific Islander, and five percent American Indian. Due to an editing error on the survey form, American Indian was not included as an ethnicity choice and had to be written in by respondents.

Figure 43
Ethnicity of T Riders

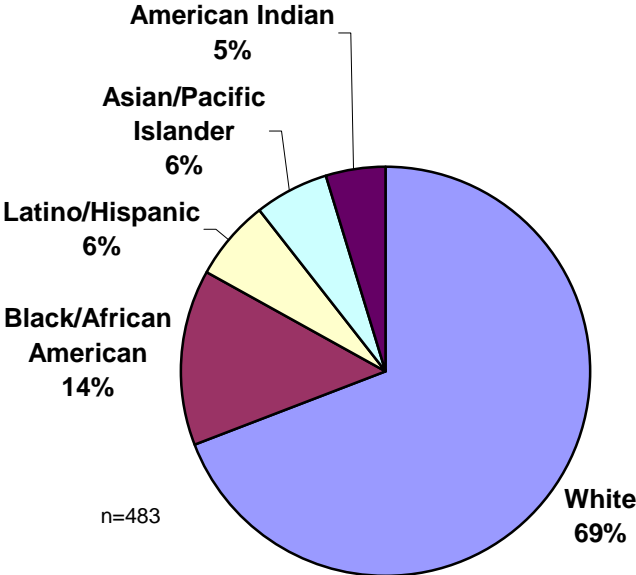


Figure 44 shows whether a rider had a vehicle available for this trip. Over three-quarters of all respondents did not have a vehicle available to make this trip.

Figure 44
Vehicle Availability for This Trip among T Riders

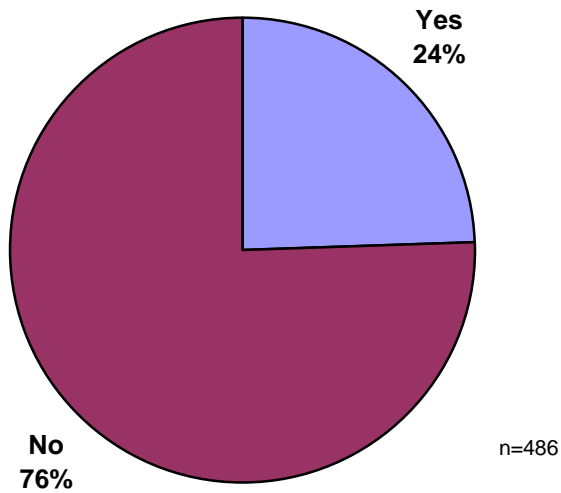
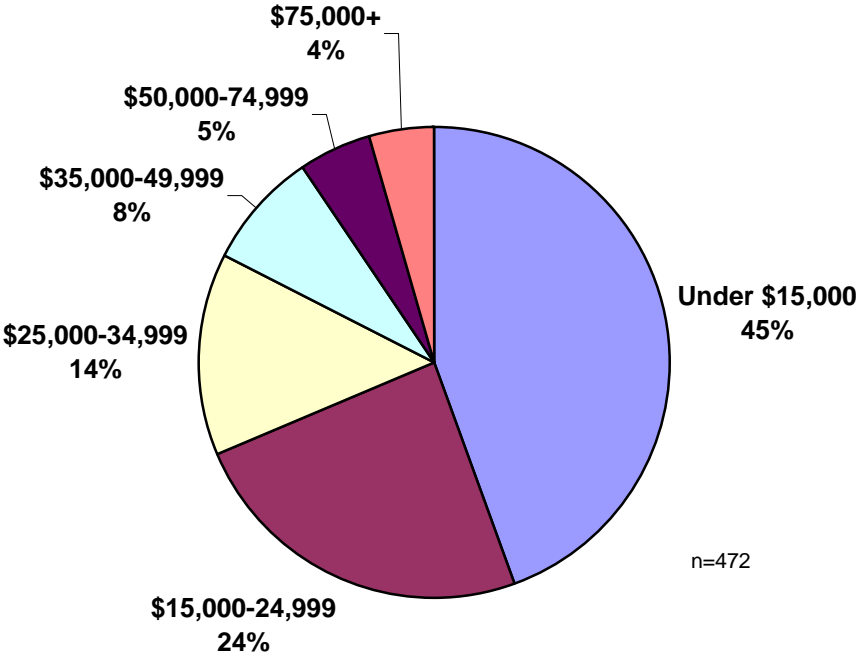


Figure 45 shows income among T riders. Nearly half of all respondents reported household incomes below \$15,000, the approximate poverty line for a family of four, but almost one-third of all riders reported household incomes of at least \$25,000.

Figure 45
Household Income among T Riders



6. Survey Findings: Perceptions of Transit Service Quality

The survey asked riders to rate The T’s performance, on a scale of 1 to 5 with 1 being “very poor” and 5 being “excellent,” for ten different service characteristics as well as to provide an overall rating of The T service. Figure 46 shows the results. Table 25 presents rider perceptions of service, and includes the weighted average score (used in Figure 46) of all ratings for each service element as well as the distribution of actual ratings. The highest rated items are operator courtesy, ability to find a seat, safety on the bus and at stops, and cleanliness. Average scores for these four items all reached 4.33 or better. The lowest ratings among all service elements are for span of service (3.63) and time waiting for the bus (3.77), but even these lowest scores are respectable. The average score for overall T service was 4.22, indicating a very high level of passenger satisfaction with The T.

Figure 46
Average Ratings of The T Service Elements

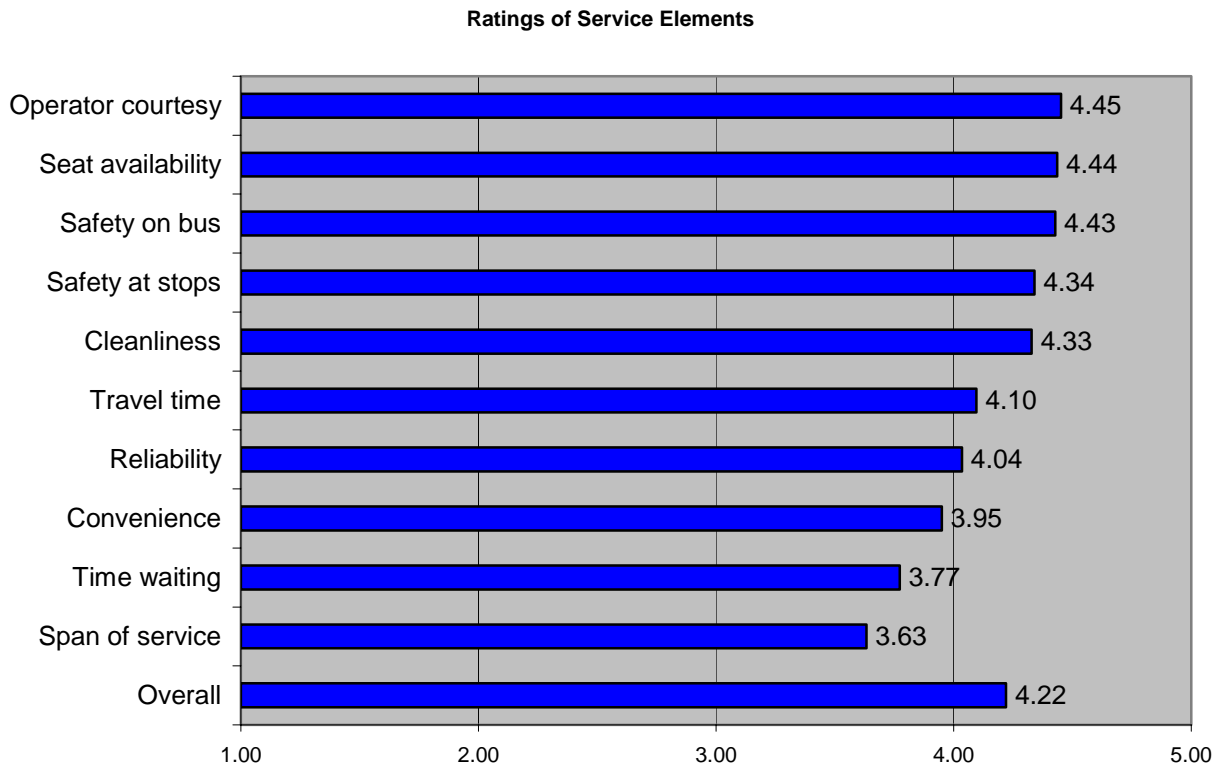


Table 25
Detailed Ratings of The T Service Elements

Service Element	Average Score	Number of Respondents Rating by Score					Total Respondents
		1 Very poor	2 Poor	3 Fair	4 Good	5 Excellent	
Operator courtesy	4.45	0	8	34	181	283	506
Ability to find a seat	4.44	1	6	38	182	277	504
Safety while on the bus	4.43	1	3	28	222	254	508
Safety at bus stops	4.34	0	6	49	219	234	508
Bus cleanliness and comfort	4.33	2	4	47	225	226	504
Travel time on the bus	4.10	2	10	86	253	161	512
On-time performance	4.04	5	16	106	208	171	506
Ability to get everywhere I need to go	3.95	9	25	112	190	164	500
Time waiting for bus	3.77	8	38	132	221	115	514
Days and hours of service	3.63	16	49	145	181	108	499
Overall Rating	4.21	3	1	57	265	179	505

7. Survey Findings: Detailed Analysis of Service Attribute Ratings by Riders

In designing service improvements, The T staff needs to know not only the customer ratings on individual service attributes but also the importance of each attribute in terms of overall satisfaction. The previous section focused on customer ratings; in this section, we consider the ratings together with the relative importance of each service attribute.

The simplest way to measure importance is to ask the customer to rate each element on a scale of 1 to 5, similar to the performance ratings. The drawback of this method is that it lengthens

both the survey instrument and time needed to complete the survey, which in turn could diminish the response rate. An alternate technique to measure the importance of each service attribute is to derive importance by examining the relationship of each attribute to overall satisfaction.

The Bay Area Rapid Transit District in Oakland, CA has developed a practical methodology to derive the importance of individual service attributes.¹ The methodology uses bivariate correlation analysis to estimate the importance of each service attribute. Specifically, Pearson correlation coefficients are calculated between the performance rating of each service attribute and the overall service rating. While there is a degree of intercorrelation among the service attributes, the Pearson correlation coefficients are an effective means to measure the relative importance of each attribute. Importance is derived by calculating the ratio between the correlation coefficient for each attribute and the median correlation coefficient. An index score of 100 is assigned to the median correlation coefficient. Service attributes with a score above 100 are more correlated with overall satisfaction (as measured by the overall rating), while service attributes with a score below 100 are less correlated.

Table 26 shows the Pearson correlation coefficient and the importance score for each service attribute. Operator courtesy rates highest in terms of importance, with several other attributes clustered together slightly above average. Travel time on the bus, time waiting for the bus, and cost of riding the bus are relatively less important.

Table 26
Importance of Service Elements

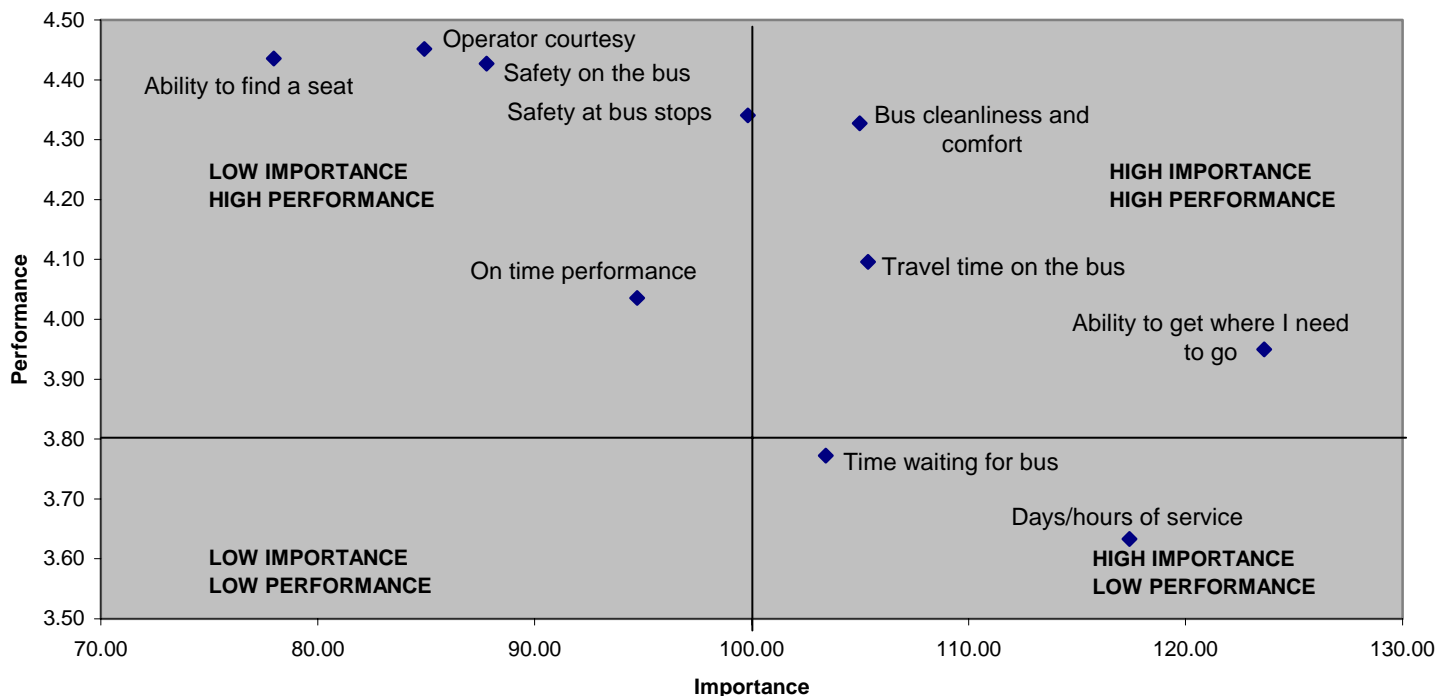
Service Attribute	Pearson Correlation Coefficient	Importance Index
Ability to get where I need to go	0.595	123.62
Days and hours of service	0.565	117.41
Travel time on the bus	0.507	105.36
Cleanliness and comfort	0.505	104.98
Time waiting for the bus	0.497	103.41
Safety at bus stops	0.480	99.82
On-time performance	0.456	94.72
Safety on the bus	0.422	87.78
Operator courtesy	0.408	84.91
Ability to find a seat	0.375	77.98

Performance and importance can be related through scatter diagrams, with derived importance on the x-axis and performance ratings on the y-axis. The scatter diagram (Figure 47) is divided into quadrants, with an importance score of 100 and a performance rating of 3.80 (just below a “good” rating of 4.0) serving as the dividing lines. The 3.80 dividing line for performance is unusually high; a more typical dividing line is in the range of 3.50 to 3.70. Given the high ratings

¹ Aaron Weinstein, “Customer Satisfaction Among Transit Riders – How Customers Rank the Relative Importance of Various Service Attributes” **Transportation Research Record 1735**, 2000.

for T service, however, a higher dividing line is needed to make this quadrant exercise meaningful.

Figure 47
Importance vs. Performance for T Service Elements



Items in the upper right hand quadrant represent important attributes with high performance ratings. These are things that The T does well that are important to riders. The T should take whatever actions are required to ensure continued high performance ratings on these attributes. Bus cleanliness and comfort, travel time on the bus, and ability to get where I need to go are service elements that fall within this quadrant.

Items in the upper left hand quadrant receive high marks in terms of performance but are relatively unimportant to riders. Often, attributes in this quadrant receive lower importance ratings from passengers precisely because the agency does a good job in these areas. Riders, like everyone else, tend to take areas in which their needs are met for granted. This suggests that The T needs to continue to monitor service delivery in these areas to ensure high performance, but that these elements of service are not top priorities for improvements. Attributes within this quadrant include operator courtesy, ability to find a seat, safety on the bus, safety at bus stops, and on-time performance.

Items in the lower left hand quadrant are relatively unimportant to riders and relatively low-scoring in terms of performance. While performance levels are relatively low for these attributes, these are not strong candidates for improvement due to their low levels of importance to riders. There are no attributes within this quadrant.

Items in the lower right hand quadrant are critical priorities for The T. Riders consider these attributes important, but current performance ratings are less than desired. Time waiting for the bus and days and hours of service are in this quadrant.

8. Survey Findings: Improvements

The survey included a question, “If you could make only ONE improvement to the bus system, what would it be?” Surveyors recorded riders’ answers verbatim, and these responses were later coded into 24 categories. Only 55 percent of all riders surveyed proposed an improvement. Table 27 presents the results, including all improvements mentioned by at least three percent of respondents. Greater frequency of service and new buses lead the list of requested improvements.

**Table 27
Riders’ Suggestions for One Improvement to the
Lawrence Bus System**

Improvement	#	%
Sunday service	80	27%
More frequent buses	62	21%
Later service at night	56	19%
Expanded routes	25	9%
Other	68	23%
Total	291	100%