

**City of Lawrence Coordinated Public Transportation Development Plan**  
**Chapter 5**  
**On-board Survey Results for KU on Wheels**

**1. Introduction**

As part of the comprehensive operational analysis, the project team conducted an onboard survey of KUOW riders in conjunction with a time check of all routes on October 18 and 19, 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 T 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.

During the same time period, surveyors also distributed surveys on-board the KU park-and-ride buses. These surveys were identical to the ones used for KUOW. This may have led to some confusion among park-and-ride passengers, whose responses could reflect only the park-and-ride (which is not operated by KUOW) or all KUOW services. The focus in this report is on survey responses received on KUOW routes, but it also notes similarities and differences for responses received from the park-and-ride passengers. All figures reflect KUOW results only unless otherwise indicated.

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

**2. Summary of Survey Findings**

KUOW riders are using transit primarily to get to and from class. KUOW riders tend to ride frequently. The majority of KUOW are new to the system (within the past six months).

The survey included questions to gain a greater understanding of riders' decision-making processes, values, and preferences. Convenience is by far the major reason that riders choose KUOW. Cost is an important factor for park-and-ride users. Respondents prefer the current system of paying (a combination of student fees and bus pass purchase) to a system based on (higher) student fees only. KUOW riders are split on the importance of access to a citywide transit system and are also split on willingness to pay more for evening and weekend service.

In terms of demographics, 45 percent of KUOW riders are freshmen. Most (59 percent) are female and most (53 percent) have a car available for this trip. Park-and-ride respondents are more evenly distributed in terms of year at KU, and are much more likely (84 percent) to report having a car available for this trip. At least 95 percent of respondents on both KUOW and the park-and-ride shuttle are KU students.

KUOW riders are pleased with the service. On a scale of one (very poor) to five (excellent), respondents rate KUOW service at an average of 3.88. The highest rated items are safety at stops, safety on the bus, and operator courtesy. Average scores for these four items all are 4.1 or better. The lowest ratings among all service elements are for time waiting for the bus (3.31) and reliability (3.49). Improved frequency, expanded routes, and later evening service were the most requested improvement among KUOW riders. An analysis of performance versus importance for the eleven service attributes indicates that frequency, reliability, and bus cleanliness and comfort are the most critical elements in terms of needed improvements.

### 3. Survey Findings: Survey and Trip Characteristics

KUOW riders completed a total of 1,155 usable surveys. Figure 48 summarizes survey responses by bus route. One-quarter of all surveys were received on the Campus Express (Line 1/2).

Park-and-ride passengers completed a total of 294 surveys.

**Figure 48**  
**Survey Responses by Route**

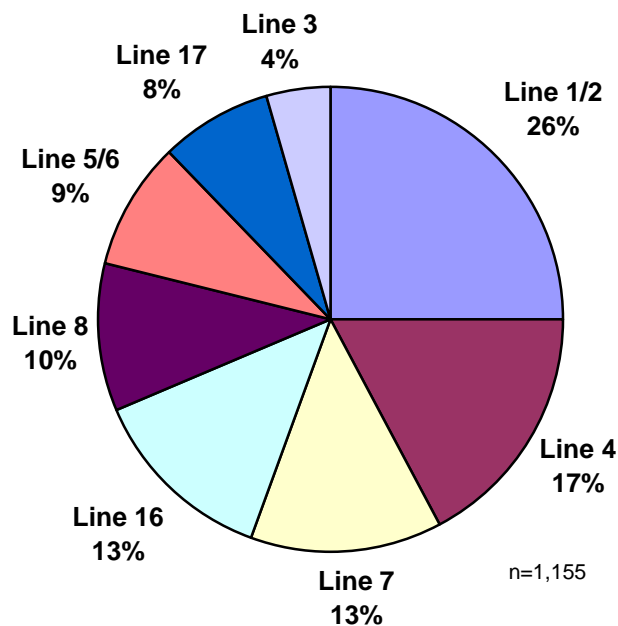


Figure 49 presents a breakdown of trip purpose. The overwhelming majority of KUOW riders are going to class. Park-and-ride results were similar, but seven percent were using the park-and-ride bus to get to work on campus.

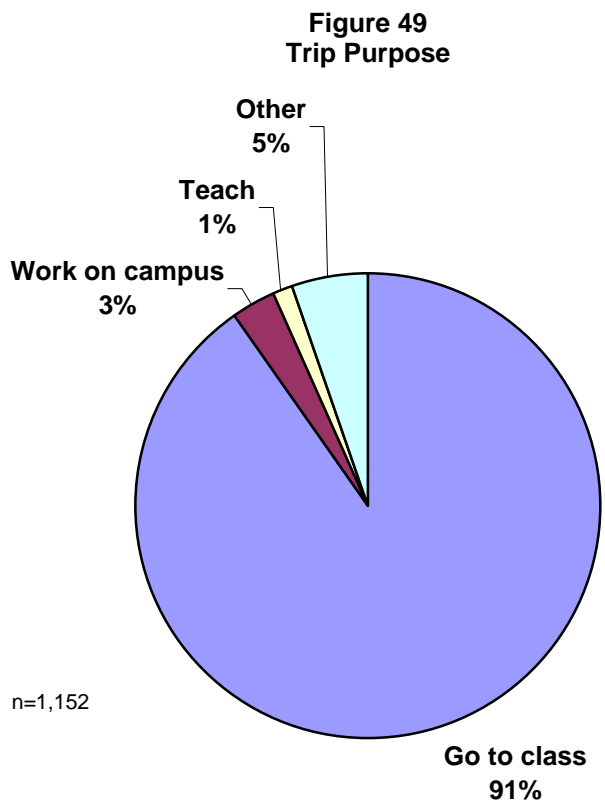


Figure 50 indicates ridership history. The majority of riders are new to the system within the past six months, while only 12 percent have been riding KUOW for two years or more. This suggests that freshmen may be more likely than upperclassmen to use KUOW, a finding borne out in the demographic section later in this chapter.

Park-and-ride users were even more likely (65 percent) to be using the system for less than six months. This finding indicates that at least some park-and-ride users answered with regard to their history of riding KUOW, possibly at the Lied Center park-and-ride lot or elsewhere in the system.

**Figure 50**  
**Ridership History on KUOW**

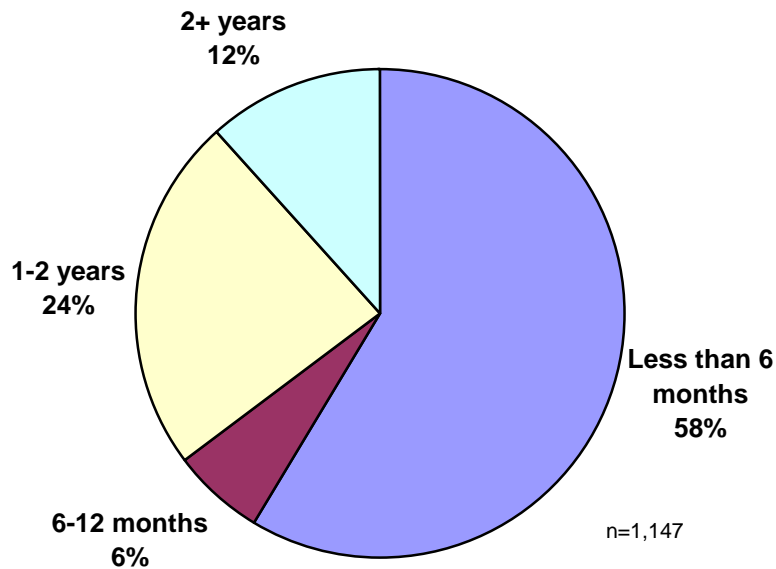
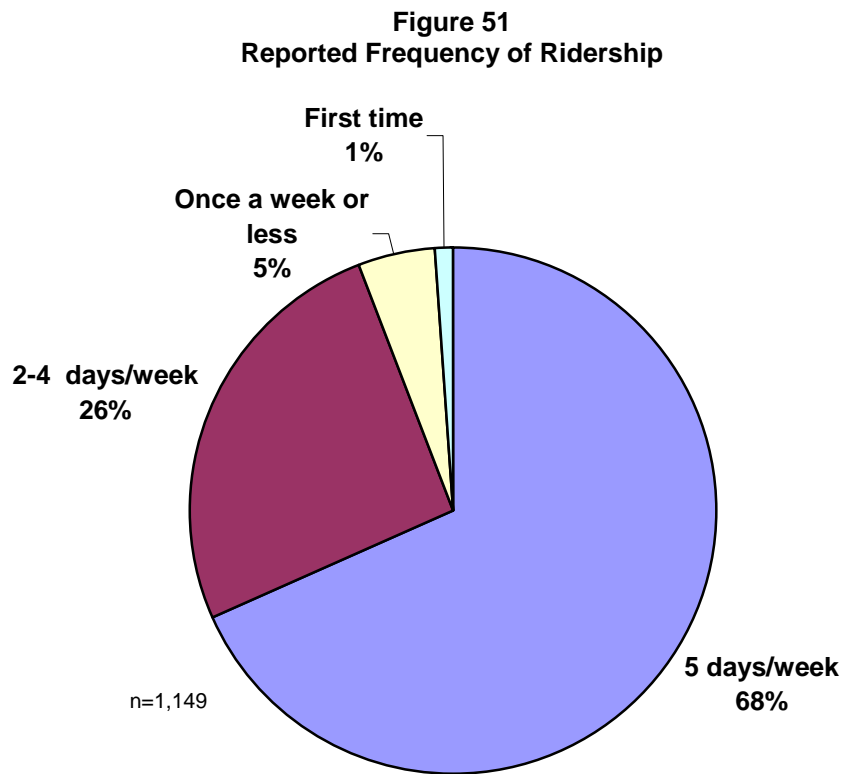


Figure 51 shows the reported frequency of transit ridership in a typical week. On-board surveys tend to under-report infrequent ridership, since passengers who ride only one or two days per week or less have a lesser chance to be surveyed. With this cautionary note in mind, Figure 51 shows that most respondents use KUOW five days a week. Only six percent are either very occasional riders (once a week or less) or were riding for the first time on the days of the survey.

Park-and-ride responses were similar. These respondents were even more likely to use the bus five days a week (74 percent).



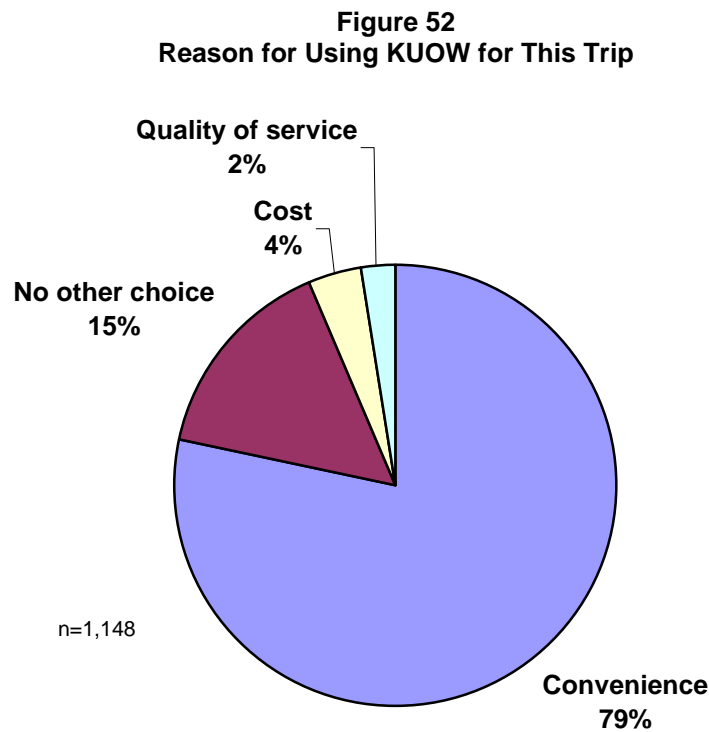
#### 4. Survey Findings: Alternatives and Preferences

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 KUOW for this trip?
2. If it were up to you, how would you prefer to pay for bus service on campus?
3. Is having access to a city-wide bus system important to you?
4. Would you be willing to pay more to have evening and weekend service?

Figure 52 shows that convenience is the major reasons to choose KUOW, with 79 percent of total responses. Only 15 percent of respondents report no other travel option for this trip. Cost and quality of service were not major factors.

The park-and-ride responses for this question were very different. A majority (62 percent) cited cost as the reason for using the bus on this trip, followed by convenience (29 percent), quality of service (six percent), and no other choice (three percent).



The second question asked riders how they would prefer to pay for bus service on campus. KUOW is funded by a combination of student fees (\$16 per semester for KUOW and LiftVan), pass purchases (\$75 per semester or \$140 per academic year), and single fares (\$1.00 per trip). As shown in Figure 53, riders prefer the current system to one funded solely by a higher student fee. This question did not specify the fee level, nor did it mention that existing riders would pay less overall under the student fee only option. Park-and-ride responses were identical to KUOW responses on this question.

**Figure 53**  
**Preferred Means of Payment for Bus Service on Campus**

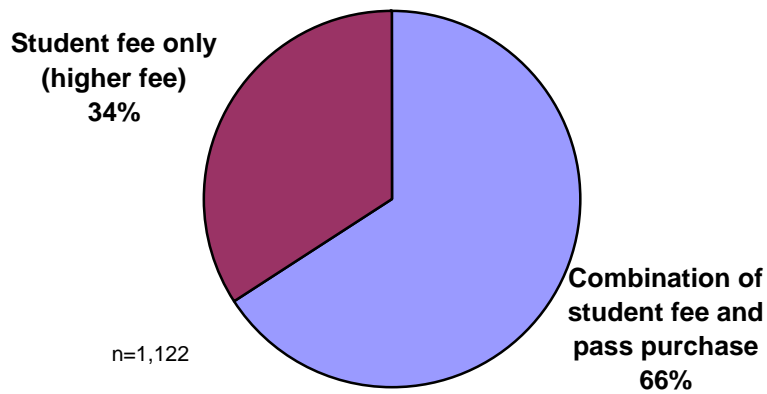


Figure 54 indicates the importance of having access to a city-wide bus system for current KUOW riders. Responses were very evenly split on this issue.

Park-and-ride responses to this question were different: 46 percent said that access to a city-wide bus system was not important; 36 percent were not sure; only 18 percent said that it was important.

**Figure 54**  
**Importance of Access to a City-wide Bus System among Current KUOW Riders**

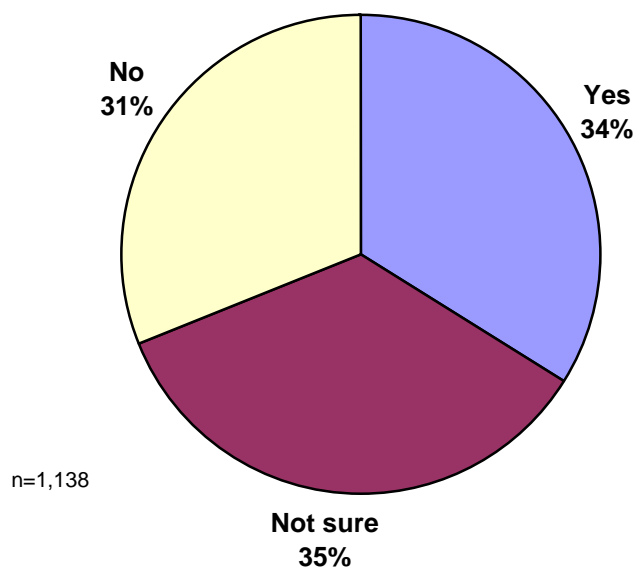
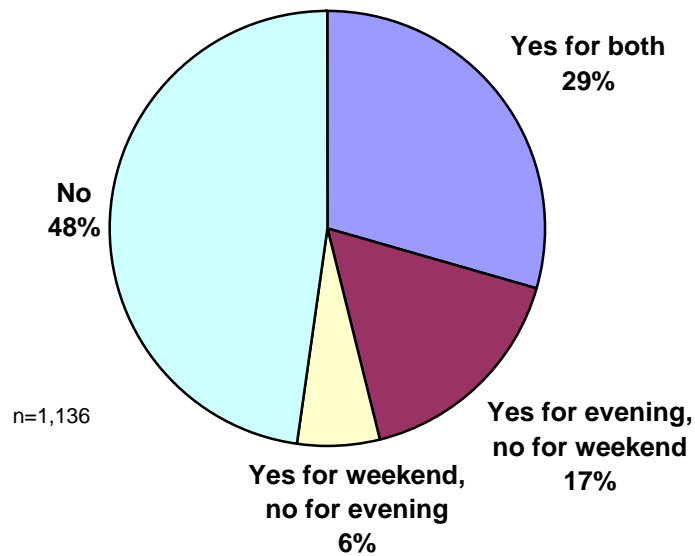


Figure 55 shows riders' willingness to pay more for evening and weekend service. K Route 15 provides evening service on a route that combines many daytime routes. KUOW does not operate on Saturday or Sunday. Responses to this question were also evenly split. There was a slight preference for evening service over weekend service, but neither evening nor weekend service captured a majority of responses.

Among park-and-ride respondents, 65 percent were unwilling to pay more.

**Figure 55**  
**Willingness to Pay More for Evening and Weekend Service**



### 5. Survey Findings: Commuting between Johnson and Douglas Counties

This section reports on responses to questions related to commuting between Johnson and Douglas Counties. KU has a campus in Johnson County and requested that these questions be added to the KUOW survey.

Figure 56 shows interest in using a commuter bus between the two counties. The exact phrasing of the question was, “If available, would you ride a commuter bus between Johnson and Douglas Counties?” Slightly under one-quarter of all respondents answered yes to this question. Among park-and-ride respondents, 21 percent answered yes.

**Figure 56**  
**Would You Ride a Commuter Bus between Johnson and Douglas Counties?**

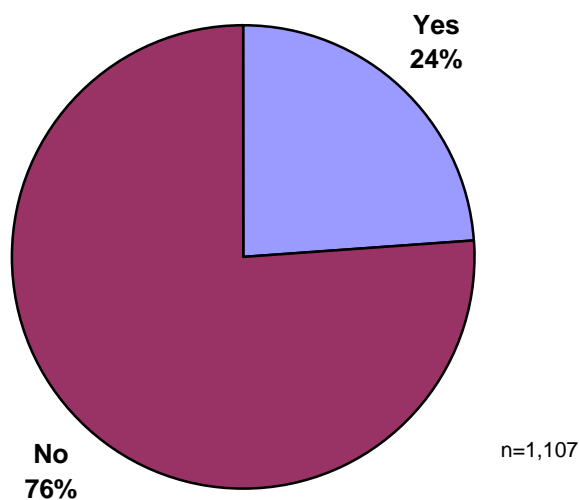
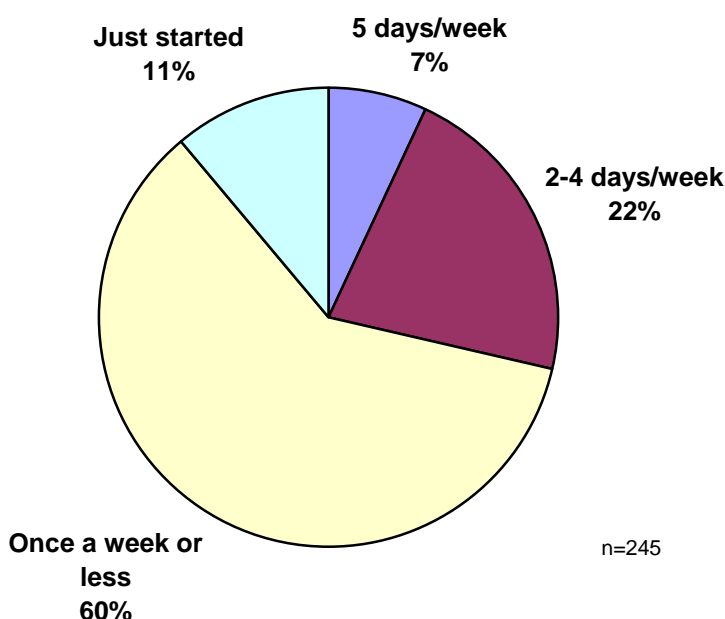


Figure 57 reports on frequency of commuting between Johnson and Douglas Counties. These results reflect only respondents interested in riding a commuter bus between the two counties. The majority of the 245 respondents commute once a week or less; only seven percent reported commuting five days a week.

Park-and-ride responses were very different. Among the 61 park-and-ride responses, 33 percent commute once a week or less, followed by 31 percent who commute five days a week, 28 percent who commute two to four days a week, and eight percent who just started.

**Figure 57**  
**Frequency of Commuting between Johnson and Douglas Counties**



The final commute-related question asked for the home zip code of those interested in riding a commuter bus between Johnson and Douglas Counties. Table 28 shows responses for all zip codes listed by at least eight percent of respondents. Park-and-ride responses were similar.

**Table 28**  
**Home Zip Codes of Respondents Interested in Using a Commuter Bus**

| Zip Code | Number of Responses | Percent of Responses |
|----------|---------------------|----------------------|
| 66046    | 33                  | 15%                  |
| 66044    | 27                  | 13%                  |
| 66047    | 20                  | 9%                   |
| 66049    | 18                  | 8%                   |

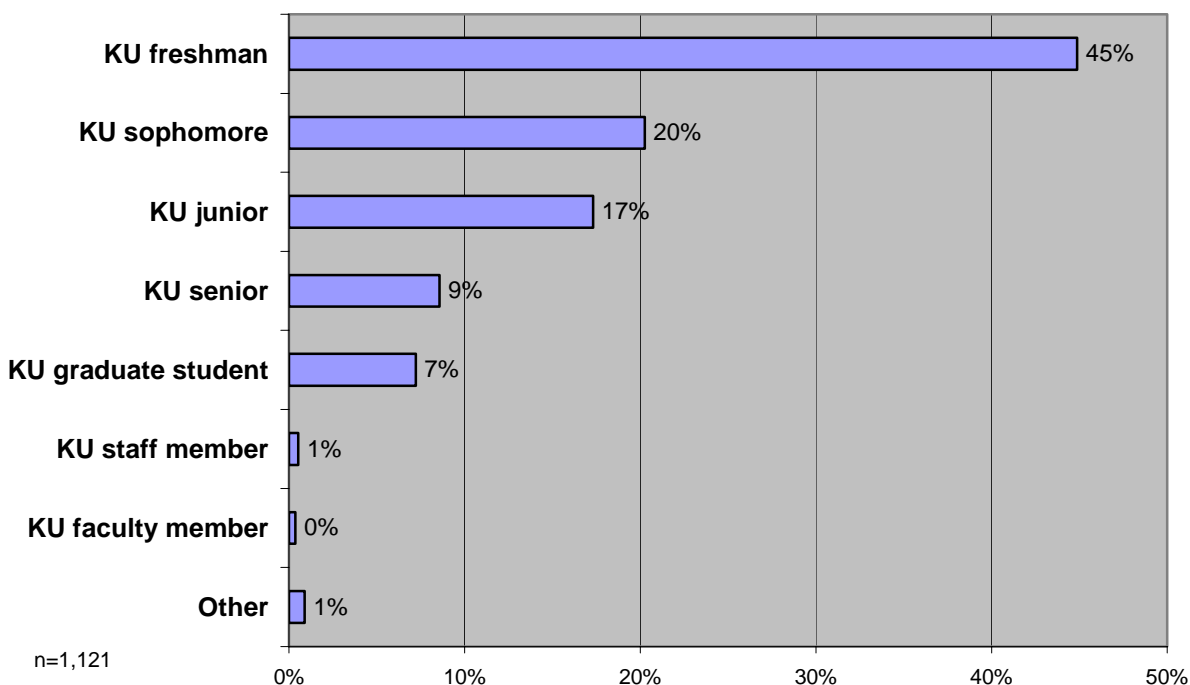
### 6. Survey Findings: Rider Demographics

This section reports on demographic characteristics of riders, including on-campus status, gender, and vehicle availability.

Figure 58 shows the on-campus status of respondents. A plurality (45 percent) are freshmen, and the percentages decrease as the year increases. Only two percent of KUOW riders are not KU students.

Park-and-ride responses show a different pattern. Table 29 summarizes the differences.

**Figure 58**  
**On-campus Status of KUOW Riders**



**Table 29**  
**Campus Status of KUOW and Park-and-Ride Respondents**

| Campus Status       | Percent of KUOW Respondents | Percent of Park-and-Ride Respondents |
|---------------------|-----------------------------|--------------------------------------|
| KU Freshman         | 45%                         | 22%                                  |
| KU Sophomore        | 20%                         | 28%                                  |
| KU Junior           | 17%                         | 23%                                  |
| KU Senior           | 9%                          | 14%                                  |
| KU Graduate Student | 7%                          | 7%                                   |
| KU Staff Member     | 1%                          | 2%                                   |
| KU Faculty Member   | 0%                          | 1%                                   |
| Other               | 1%                          | 2%                                   |

Figure 59 shows the gender of respondents. Females account for 59 percent of all riders. Most transit systems across the country have a majority of female riders. Females also account for 59 percent of park-and-ride users.

**Figure 59**  
**Gender of KUOW Riders**

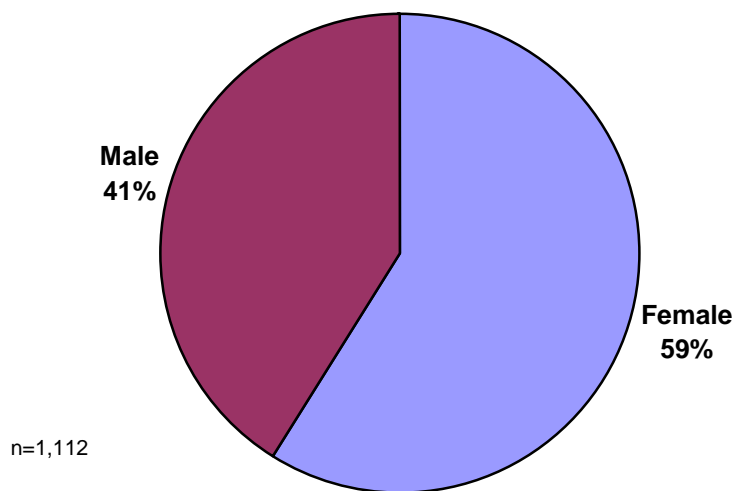
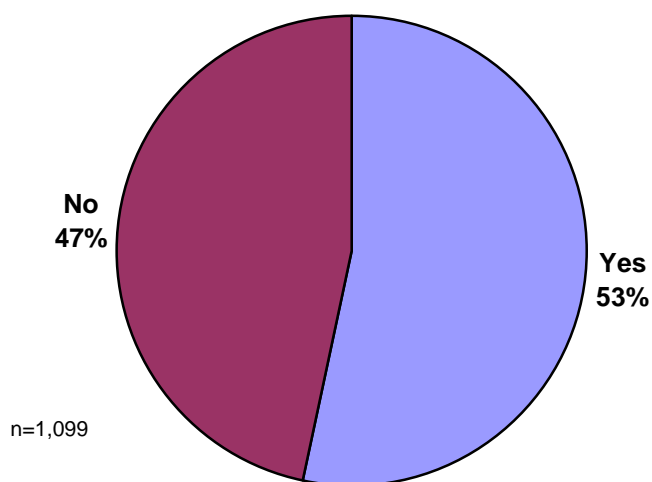


Figure 60 shows whether a rider had a vehicle available for this trip. A majority of all respondents had a vehicle available to make this trip. It is likely that the difficulty and/or cost of parking on campus were factors in the decision to use KUOW.

Not surprisingly, 84 percent of park-and-ride respondents had a vehicle available for this trip. The others may have carpooled with someone to the park-and-ride lot or may have been using the park-and-ride service to get around campus.

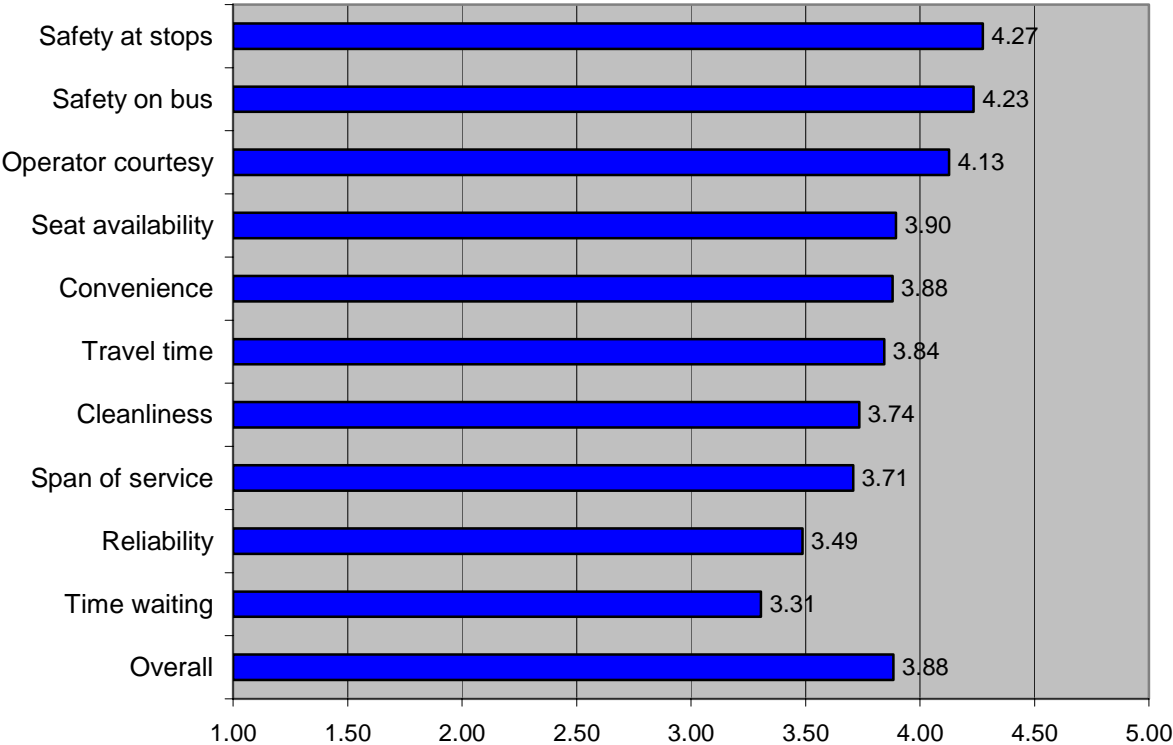
**Figure 60**  
**Vehicle Availability for This Trip among KUOW Riders**



**7. Survey Findings: Perceptions of Transit Service Quality**

The survey asked riders to rate KUOW’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 KUOW service. Figure 61 shows the results. Table 30 presents rider perceptions of service, and includes the weighted average score (used in Figure 61) of all ratings for each service element as well as the distribution of actual ratings. The highest rated items are safety at stops, safety on the bus, and operator courtesy. Average scores for these three items all scored 4.1 or better. The lowest ratings among all service elements are for time waiting for the bus (3.31) and reliability (3.49). The average score for overall KUOW service was 3.88, indicating a fairly high level of passenger satisfaction with KUOW.

**Figure 61  
Average Ratings of KUOW Service Elements**



Park-and-ride respondents gave slightly different ratings to the various elements of transit service. The highest-rated elements among park-and-ride users were cleanliness (4.41), operator courtesy (4.38), safety at bus stops (4.38), and safety on the buses (4.35). The lowest rated elements were time waiting for the bus (3.15), reliability (3.31), and travel time on the bus (3.43). The average overall rating by park-and-ride respondents was 3.76.

**Table 30**  
**Detailed Ratings of KUOW Service Elements**

| Service Element                        | Average Score | Number of Respondents Rating by Score |           |            |            |                | Total Respondents |
|--|---------------|---------------------------------------|-----------|------------|------------|----------------|-------------------|
|  |               | 1<br>Very poor                        | 2<br>Poor | 3<br>Fair  | 4<br>Good  | 5<br>Excellent |                   |
| Safety at bus stops                    | 4.27          | 4                                     | 9         | 116        | 509        | 442            | 1,080             |
| Safety while on the bus                | 4.23          | 4                                     | 20        | 134        | 482        | 439            | 1,079             |
| Operator courtesy                      | 4.13          | 7                                     | 34        | 182        | 447        | 407            | 1,077             |
| Ability to find a seat                 | 3.90          | 10                                    | 61        | 264        | 436        | 304            | 1,075             |
| Ability to get everywhere I need to go | 3.88          | 8                                     | 60        | 269        | 456        | 284            | 1,077             |
| Travel time on the bus                 | 3.84          | 13                                    | 42        | 256        | 563        | 210            | 1,084             |
| Bus cleanliness and comfort            | 3.74          | 13                                    | 71        | 335        | 428        | 231            | 1,078             |
| Days and hours of service              | 3.71          | 18                                    | 75        | 307        | 480        | 197            | 1,077             |
| On-time performance                    | 3.49          | 41                                    | 135       | 337        | 386        | 177            | 1,076             |
| Time waiting for bus                   | 3.31          | 49                                    | 151       | 411        | 364        | 108            | 1,083             |
| <b>Overall Rating</b>                  | <b>3.88</b>   | <b>4</b>                              | <b>25</b> | <b>233</b> | <b>641</b> | <b>171</b>     | <b>1,074</b>      |

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

In designing service improvements, KUOW 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.<sup>1</sup> 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 mean correlation coefficient. An index score of 100 is assigned to the mean 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 31 shows the Pearson correlation coefficient and the importance score for each service attribute. Time waiting for the bus rates highest in terms of importance, followed closely by on-time performance, then travel time on the bus. Safety at bus stops and on the bus, the ability to find a seat, and operator courtesy are relatively less important.

**Table 31**  
**Importance of Service Elements**

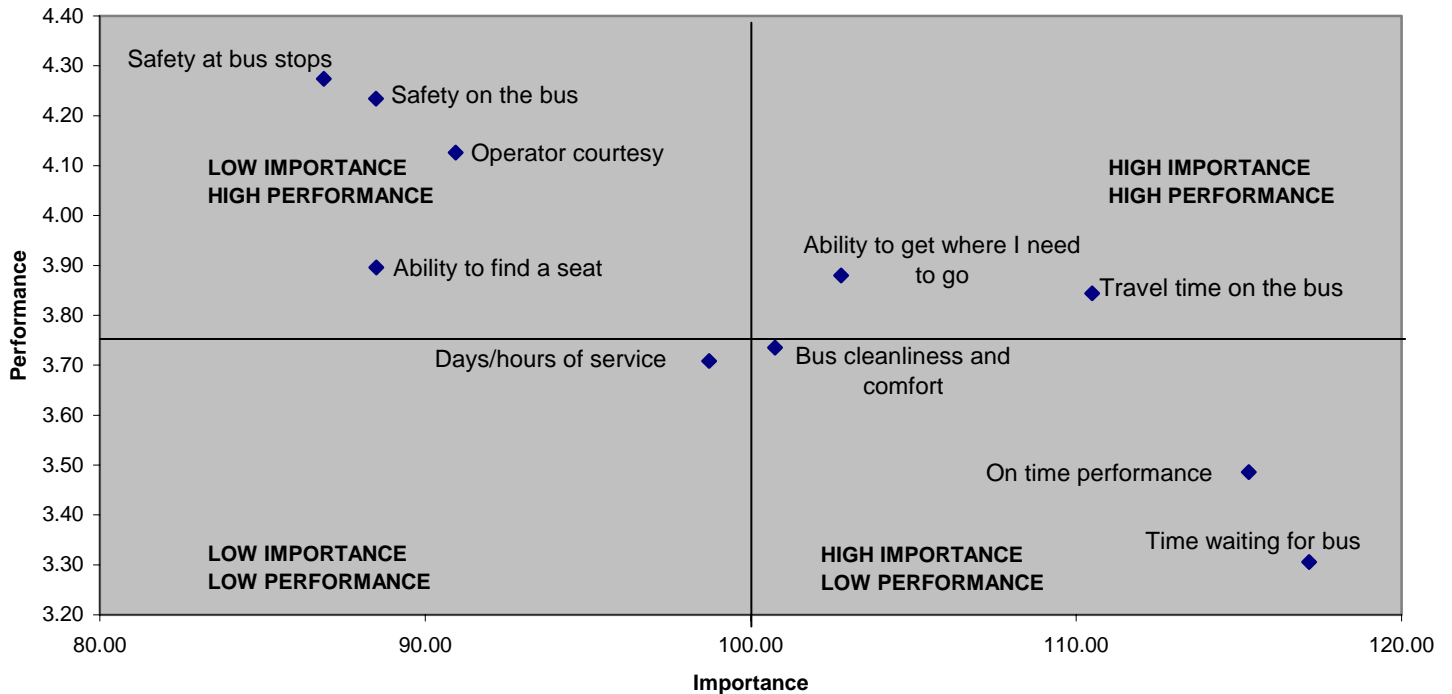
| Service Attribute                 | Pearson Correlation Coefficient | Importance Index |
|-----------------------------------|---------------------------------|------------------|
| Time waiting for the bus          | 0.5736                          | 117.16           |
| On-time performance               | 0.5645                          | 115.30           |
| Travel time on the bus            | 0.5409                          | 110.49           |
| Ability to get where I need to go | 0.5031                          | 102.78           |
| Cleanliness and comfort           | 0.4932                          | 100.74           |
| Days and hours of service         | 0.4833                          | 98.72            |
| Operator courtesy                 | 0.4452                          | 90.93            |
| Ability to find a seat            | 0.4332                          | 88.50            |
| Safety on the bus                 | 0.4332                          | 88.48            |
| Safety at bus stops               | 0.4253                          | 86.88            |

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 62) is divided into quadrants, with an importance score of 100 and a performance rating of 3.75 (below a “good” rating of 4.0) serving as the dividing lines. The 3.75 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

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

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

**Figure 62**  
**Importance vs. Performance for KUOW Service Elements**



Items in the upper right hand quadrant represent important attributes with high performance ratings. These are things that KUOW does well that are important to riders. KUOW should take whatever actions are required to ensure continued high performance ratings on these attributes. 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 KUOW 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 safety on the bus, safety at bus stops, operator courtesy, and ability to find a seat.

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. Days/hours of service is the only attribute within this quadrant.

Items in the lower right hand quadrant are critical priorities for KUOW. Riders consider these attributes important, but current performance ratings are less than desired. Time waiting for the bus, on-time performance and bus cleanliness and comfort are in this quadrant.

**9. 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. About two-thirds (64 percent) of all riders surveyed proposed an improvement. Table 32 presents the results, including all improvements mentioned by at least three percent of respondents. Greater frequency of service and expanded routes lead the list of requested improvements.

The top improvements suggested by park-and-ride respondents included more frequent buses, expanded routes, more midday service, better transfers, and more reliable service.

**Table 32  
Riders’ Suggestions for One Improvement to the  
KUOW Bus System**

| <b>Improvement</b>                  | <b>#</b> | <b>%</b> |
|-------------------------------------|----------|----------|
| More frequent buses                 | 173      | 23%      |
| Expanded routes                     | 84       | 11%      |
| Later service at night              | 61       | 8%       |
| Better transfers                    | 55       | 7%       |
| More evening service                | 47       | 6%       |
| New buses                           | 44       | 6%       |
| Weekend service                     | 36       | 5%       |
| More reliable service               | 34       | 5%       |
| Heating/air-conditioning that works | 29       | 4%       |
| Better information                  | 23       | 3%       |
| Lower fares                         | 23       | 3%       |
| Other                               | 133      | 18%      |
| Total                               | 742      | 100%     |

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