Benefits of Campus Transit Pass

Study of Students' Willingness to Pay for Proposed Mandatory Transit Pass Program

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The problem of estimating the expected net benefits of an unlimited-access campus transit pass, which would also fund an increase in critically needed services, is an example of the problem of estimating the value of a public good. Students at Western Washington University in Bellingham, Washington, used a referendum-format contingent valuation survey to measure students' willingness to pay (WTP) for a mandatory transit pass. Responses by 935 students (a 44.7% response rate) were analyzed with censored logistic regression and revealed a mean WTP of $32.08 per academic quarter (corrected for estimated self-selection bias) for the proposed program. The program could actually be provided by contract with the local transit agency for $20.00 per student per quarter. Thus the estimated net benefit per student per quarter is $12.59, or $428,624 across the campus population. On-campus residents and those who commute via bus or bicycle showed higher WTP. WTP was substantially lower for those who live more than 10 mi from campus. Frequencies of "yes" votes showed majorities supporting the pass up to the $35.00 per quarter fee level, and strong majorities up to the $20.00 level, suggesting the proposal would pass easily by a student vote. Content analysis of reasons given for support, lack of it, or indecision showed that students were persuaded by nighttime bus service, safety, monetary savings, and environmental benefits. Doubts were raised by the mandatory nature of the proposed fee, services not meeting needs, and opposition to more student fees.

In the past 15 years many campuses across the United States have developed bus pass programs that give students, and often faculty and staff, prepaid, unlimited access to local transit systems based on contractual arrangements with local transit providers (*1–4*). At Western Washington University (WWU) in Bellingham, Washington, a voluntary pass, the Viking Xpress Pass, was instituted in September 2000. Data suggest a shift in the mode choices of the campus population toward transit use a few years after this pass program started, with the use of public transit rising from 23% of the campus population in 1998 to 36% in 2003 (*5*).

The number of people purchasing voluntary quarterly passes (currently $20.00) or academic-year passes ($50.00) rose immediately, and was equivalent to 5,500 or about 50% of the campus community purchasing an academic year pass in 2004 to 2005 (WWU Parking Services).

This transit use experience mirrors experiences at other campuses. For two major, linked reasons, however, the voluntary pass may not fulfill the potential for greater transit use at WWU. First, because the program is voluntary, fewer people use the pass than if every student had one. Having a universal access pass in one's wallet reduces the explicit marginal cost of a bus ride to zero. If more people had such passes, more would use the bus instead of other modes, an outcome consistent with WWU institutional transportation goals. Second, because voluntary pass purchases vary from academic quarter to quarter, the passes cannot generate a guaranteed income flow. This makes it difficult for the university, in partnership with the county Whatcom Transit Authority (WTA), to establish a consistent financial basis for increases in service. The increases in service would, in turn, increase ridership, which could generate support for fee increases over time. This upward spiral has been observed with other campus bus pass systems (*1, 3, 4*). Lacking these two mutually reinforcing trends, the transit system at WWU may not be providing the optimal level of service.

A mandatory transit pass is not the only possible funding source. In principle, because there is an expectation of increased ridership, WTA could invest in increased service itself, hoping to recover the cost of that investment through fares collected from the new users. As is argued below, however, benefits also accrue to nonriders in the form of reduced congestion in parking areas and on local roads, and in the form of other public goods relating to the environmental impacts of increased transit use. It would thus be difficult for the transit authority to achieve the optimal level of service without an additional funding source. The university might be able to provide funding to supplement fares, but WWU is constrained in its use of general funds to support parking or commuting. Currently WWU uses parking revenue to help support supplemental bus service, but the university has exhausted its reserves from such fees and finds it politically difficult to raise parking fees sufficiently to cover the increased cost of expanded bus service. Thus, while the mandatory transit pass is not the only alternative for funding the increase in service, it may be the most practical.

WWU BUS PASS PROPOSAL, RESEARCH QUESTIONS, AND RELEVANT LITERATURE

In winter 2005, students in the Campus Planning Studio course formulated a transit pass proposal for the student ballot. Based on the work of students in previous quarters, preliminary surveys, focus

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group research, and campus forums, a proposal took shape around high-priority services. The bus pass would be paid for by a mandatory student fee (students outside the WTA service area could opt out), and would give unlimited access to existing WTA service, parking at the park-and-ride, nighttime use of the pass to park on campus, a limit on increases in the fee to only those linked to inflation, and a student task force with input on uses of the revenue. Most important, a critically needed new service was identified: high-frequency nighttime bus service on a high-density route linking the campus, two neighborhoods with high student densities, downtown, and the WWU park-and-ride lot. Although details remained somewhat fluid, a working-draft proposal emerged as members of the class, the WWU administration, and the WTA negotiated. They settled on the package of services described above, which could be paid for by a mandatory student fee of about $20.00 per academic quarter.

Some key questions arose as the pass proposal was analyzed:

1. Although all initiating parties believed the pass was a good idea, would the cost (fee) imposed on students be justified by the actual level of benefit to students?
2. Would the proposed fee of $20.00 be passed by a student vote, with a large margin?
3. Why do students support or not support the pass idea?

Existing studies and data were examined for possible answers. University unlimited-access bus passes have proven popular. In 2000, administrators of 35 programs at U.S. universities serving 835,000 students were surveyed by Brown et al. (*3*). The researchers identified many benefits to university administrators, students, and transit agencies. Monitoring demonstrated substantial mode shifts with mandatory pass programs. Student ridership at the 35 universities increased in the first year of the program, at levels ranging from 70% to 200% (*3*). Transit vehicle miles traveled (service levels) also increased in the 2 years after universal access passes were instituted. Of the systems studied, 21 paid for the program in part or entirely by student fees. On some campuses bus pass programs have been approved initially by strong margins, and then reapproved, after experience with increased service, by extreme margins such as 16 to 1 in favor of the program (*6*).

In another extensive synthesis of college and university transit programs, Miller (*4*) identified many of the same benefits of universal access programs, especially in the context of transportation demand management practices. Miller also discussed issues in bus pass administration, including funding. Miller found that 63.3% of the programs used student fees as one avenue of funding, often in addition to parking fees and fines and general funds (*4*). Thus, the problem of selling the various constituencies on the value of the bus pass becomes critical. These include the transit agency, university administrators, trustees who oversee student fee loads, students, and other users. A particular selling point for administrators, trustees, and students is the benefit-to-cost ratio for student participants. While experience elsewhere suggests a high benefit-to-cost ratio (*3, 4*), no direct measures were found in the literature.

The approval-margin data cited above do not answer questions about actual levels of benefit provided by bus passes. One study, which placed a monetary value on many benefits of the University of British Columbia's U-PASS program, found that benefits were six times greater than costs (*7*). Another relevant measure is the average cost of transit service to the university: Brown et al. (*3*) found an average cost across all 35 universities of $0.61 per ride, with an average student fee of $30.00 per year. While suggestive, such studies do not examine directly the benefits and costs to students, nor do they forecast answers to questions about WWU today.

In light of the limited relevancy of prior information regarding the desirability of a mandatory transit pass, a study was designed that could answer the questions listed above. The study also promised to answer the general question about the net benefits of such pass programs.

INTRODUCTION TO CONTINGENT VALUATION APPROACH

The questions posed above—particularly the question of net benefits—can be addressed with a contingent valuation (CV) survey, which allows for the estimation of students' willingness to pay (WTP). This tool can be highly targeted, recognizes the contingent nature of the respondents' choices, and can be used to measure the value of public goods that are not provided by private markets. A CV survey makes it possible to estimate the level of economic benefit to students provided by the transit pass, a crucial need for this study.

CV is a survey method for valuing public goods—goods whose use by one does not preclude use by others, and which, therefore, risk being under-provided without some kind of collective action. To evaluate programs that provide public goods, it is important to be able quantify the benefits. The respondent must be informed meaningfully about the good, the range of alternatives, the method of payment, and the level and method of provision. Although there is considerable controversy regarding the use of survey methods in economic valuation, with careful design the CV method can provide useful results. [See Carson et al. (*8*) for an overview of these issues.]

The value of a public good cannot be derived, in most cases, from market data. Moreover, for many public goods the assumptions about consumer choices derived from private market transactions are misleading. "The strict application of a private goods market model ignores any but self-interested consumption behavior and therefore downplays . . . 'public-regardingness' " (*9*, p. 93). Studies have shown empirical variation between communities in the latter kind of "regard." For example, in one study the same respondents said they would pay *less* for a water pollution control device if it were placed in their own homes than if it were installed in the town's water plant. "The respondents valued the latter program more because they perceived that it protected others besides themselves. There was no indication that they subordinated their private desires when they took the broader public interest into account" (*9*, p. 93). Thus, a further consideration in the creation of a WTP survey is how the choice is placed before the respondent.

The applicability of these principles in this case depends on whether the program in question has public good characteristics. In what sense is a bus ride a public good? The public good in this case is not the bus ride itself. Increased use of public transit generates benefits for the larger public. First, the transit proposal is motivated in part by problems of increasing congestion in parking areas and on local roads. A reduction in congestion is a public good. The WWU community is facing a worsening a shortage of on-campus and near-campus parking. The mitigation of congestion is a major benefit of the program for students who drive. Second, there are environmental benefits that derive from reductions in use of automobiles. These include reductions in greenhouse gases and reductions in local air pollution. In short, there are public-good aspects to the transit pass proposal.

For many public goods, a context of a political market is congruent with the actual nature of consumers' decision-making process. A polit-

ical market for a public good is well approximated by a "referendum" WTP format in a CV questionnaire. A predetermined package is presented and respondents choose yes or no, much like voting on a policy. This format has several virtues: it predicts actual voting; it has clear implications for the person bearing the cost; it allows clearer framing of information, including that wanted or needed by participants; it is more engaging; and, if the sample is representative, it has high validity for generalizing to the population (*9*, pp. 94–97).

The specific referendum format used in this study, the take-it-or-leave-it form, uses equivalent representative subsamples, each of which receives a proposal description that is identical except for the price. The prices given vary across a substantial range, within which behavior can be predicted. Take-it-or-leave-it is less susceptible to strategic behavior on the part of respondents than other formats in which respondents are asked to state their WTP. For example, consider an individual who believes that he or she will receive benefits from the program that outweigh costs. Suppose that the person is actually willing to pay $40.00, and the expected cost is less than that. If asked to state the maximum WTP, he or she does not have an incentive to respond truthfully. Because it is in the person's interest for the proposal to pass, and because he or she realizes that his or her response may affect the outcome, he or she has an incentive to overstate the WTP. This will lead to bias in the estimation. Consider now a referendum approach, in which the respondent is asked to vote for or against the proposal given the stated cost of the program. The respondent will have an incentive to vote "yes" only if WTP exceeds the cost. The respondent will have an incentive to vote "no" if WTP is less than the cost. It is this voting behavior that reveals to us something truthful about WTP. As the cost is varied throughout the sample, the induced variations in voting behavior allow us to estimate mean WTP for the sample, even though no individual has been asked to state his or her WTP.

This is helpful for answering the first key question, the estimation of the benefit of the proposed program. Mean WTP represents the average benefit of the program and can be estimated from take-it-or-leave-it data by logistic regression. The mean multiplied by the total population can be compared with the cost of providing the program to estimate the overall net benefit provided. Price points at which various proportions would vote in favor of the proposal can be estimated, helping answer the second key question, about an initiative passing by a substantial margin. Comments collected with the survey can provide insight into the reasons subjects decided as they did, answering the third key question.

METHODS

Instrument and Implementation

Each of the seven versions of the survey contained the same description of the good to be provided, as outlined above. Thus, while the survey can determine WTP for this good, the instrument cannot reveal students' response to different levels of provision of bus services, nor can it tell about the values placed on different service components. The proposal was based on actual negotiations, which were informed by focus groups and other data gathered during the same and preceding terms. (The instrument is not included here because of space limitations, but is available from the authors.)

Questionnaires for CV surveys must meet several requirements if they are to be reliable and valid (*9*). They must contain clear descriptions of the good, how it would be provided, how it would be paid for, what the alternatives are, and what the probable costs and benefits are. These descriptions must be accurate, based on well-researched estimates of real-world figures. The descriptions and the scenario itself must appear realistic, plausible, and meaningful, and be familiar to respondents, and should provide information needed by the target group. If the described scenario appears unrealistic, or is too complicated, subjects may guess, respond to unintended cues, or respond randomly (*9*, 211–223).

The questionnaire addressed these concerns in several ways. With the referendum format, it mimicked an actual student initiative, benefiting from students' familiarity with the mechanism that would actually be used to approve the bus pass. Students are also familiar with WTA services (the good), the current Viking Xpress Pass, and mandatory student fees (the method of provision and payment). The information in the scenario was laid out in a problem/proposed solution/alternatives format. Following this portion, potential benefits and costs were outlined, each followed by a question asking the subject's response to it. Next, the subject's "vote" on the proposal was asked, with a text field soliciting their reasons. The referendum offered a "don't know" choice rather than pressuring respondents to vote "yes" or "no," an addition that should decrease nonmeaningful responses (*9*, p. 219). Finally, demographic questions were asked, including items relevant to different transportation user groups. A field for feedback on the survey completed the instrument.

In an effort to ensure accuracy, the information in each section was researched carefully by class members and verified by WWU documents or administrators. Items that could not be accurately forecast (such as projected increases in bus ridership, or reduction of parking space demand) were stated in general terms. The scenario made it clear that the exact status quo is not a viable option. The seven price versions were $15.00, $20.00, $25.00, $30.00, $35.00, $40.00, and $50.00.

The principal weakness of the instrument design process was the lack of extensive, formal pretesting to determine subjects' information needs, anticipate their mistakes, and correct for impressions of bias. Limited piloting and feedback from WWU's Office of Survey Research, however, led to some changes to reduce impressions of a bias in favor of the proposal. For example, the mandatory nature of the fee (a negative) was highlighted; the problem-solution format was chosen over a more promotional format; various wordings were changed; costs and benefits were turned into questions rather than assertions; and further alternatives were added. Responses to the open-ended comment and feedback questions allow a check on the prevalence of perceived bias; only 0.75% (0.0075) of respondents commented on perceived questionnaire bias.

Seven equivalent (random) subsamples of 300 students each were drawn from the pool of all WWU students by the university's Office of Survey Research (five e-mails were invalid, resulting in a total sample of 2,095). On February 28, 2005, each subject received an e-mail letter addressing him or her by name, inviting participation in the study, emphasizing that the study was initiated by and for students, and providing a link to a web page. A 2-week period was allowed for surveys to be completed, with two follow-up e-mail prompts during that time.

Analysis

Mean WTP was estimated using censored logistic regression, and the effect of demographic and transportation mode variables on WTP were explored. To ensure a conservative estimate, those voting "don't

know" were counted as "no" votes. Raw percentage approvals for each price level were used to determine the price at which majorities would approve the package. Comments in the open-ended fields were content-analyzed to determine major reasons why respondents chose the different options.

RESULTS

Response Rate and Sample Characteristics

The sample size was 2,095 with 938 responses, a response rate of 44.7%, comparable to an average of 47.6% across 16 mail surveys reported in Mitchell and Carson (*9*, p. 281). Of these 938 survey responses, only four were not usable due to missing responses to one or more key questions. The seven subsamples had nearly equal numbers (about 14% of the total in each). Females responded at a higher rate than males. Females comprised 63.6% of the sample, compared with 54.7% of the student population. Class (year in school) composition of the sample closely reflected the campus population.

When asked about transportation behavior, 55% of the sample indicated they had purchased the Viking Xpress pass for some or all of the current year. This compares closely to the number of Xpress passes actually sold. The choice of travel mode (on "most days") reported by the sample corresponds closely to the choice of mode reported by students in an earlier study (*5*).

In sum, the study sample closely resembled known and estimated parameters of the WWU student population. The high response rate allowed reliable estimation of correction factors in cases in which results were skewed by differential responses by a known group.

WTP and Net Benefits

Support for the policy declined as the price of the transit pass increased. This relationship between the probability of a "yes" vote and the price of the pass can be used to estimate mean WTP. The econometric method used to obtain estimates is described in Cameron (*10*) and in Patterson and Duffield (*11*). This method involves first estimating a logistic regression equation, and then transforming this equation into a censored logistic equation. The logistic regression equation is of the form

$$\ln\frac{P_i}{(1-P_i)} = \alpha C_i + \boldsymbol{\gamma}'\mathbf{X}_i \tag{1}$$

where

P_i = probability of a "yes" response for respondent i,
C_i = cost (or price) of the policy to the respondent, and
$\mathbf{X}_i$ = a vector of explanatory variables, including a necessary constant term, as well as other explanatory variables (e.g., the respondent's gender, location of residence).

Inclusion of these other explanatory variables is not necessary for estimation of mean WTP, but such variables can shed light on the determinants of WTP. Using maximum-likelihood estimation, the parameter α and the parameter vector $\boldsymbol{\gamma}$ can be estimated.

The above equation defines an "s curve" relating the probability of a yes vote, P_i, to the cost of the policy to the respondent, C_i. As C_i increases, P_i declines. It can be shown that the area under the curve is the expected value (mean) of WTP_i. As shown by Cameron (*10*), the mathematical expression for this area has a closed form solution, yielding an explicit solution for mean WTP_i. This provides the following censored logistic regression equation:

$$E(\mathrm{WTP}_i) = \boldsymbol{\beta}'\mathbf{X}_i \tag{2}$$

where $\beta = -\gamma/\alpha$ and $E(WTP_i)$ is the expected value of willingness to pay.

As shown by Equation 2, this is simply a transformation of the parameters from the standard logistic regression. An obvious benefit of the censored-logistic approach is that it allows for direct estimation of mean WTP, which allows for a straightforward interpretation of the β as dollar values. The variance–covariance matrix for the censored logistic regression can be calculated from the variance–covariance matrix for the logistic regression using the method described in Patterson and Duffield (*11*).

The logistic regression results for the simplest specification are presented in Table 1. These results show that probability of a "yes" vote is strongly related to the price of the policy, as expected. As the price rises, support drops off. The effect is statistically significant at better than a .001 level. This can be converted to a censored logistic regression equation using the transformation given by Equation 2 above. This yields the following results:

$$E(\mathrm{WTP}_i) = 33.62 \tag{3}$$

In other words, the mean WTP is $33.62 for the program described in the survey instrument. The standard error of the estimate is $2.05.

To ascertain the net benefits of the program, the total program costs ($663,700 per year, or $19.49 per student per quarter) were subtracted from the total social benefit ($33.62 × 11,350 students = $1,144,761 per year). This yields a net benefit (benefits minus costs) of $481,061 per year or $14.13 per student per quarter.

The issue of self-selection by survey respondents can be addressed by comparing early with later respondents. In CV studies it is sometimes found that later respondents have a lower WTP. The rate of decrease (as a function of response order) can be used to correct for upward bias. In this case also, the mean WTP started high and trended downward. After about 700 respondents the curve began to level off. The difference in mean WTP from respondent 700 to respondent 900 was only about $0.14. If a straight line is extrapolated from this curve, the mean WTP drops $0.14 for every 200 responses. This extrapolates to about a $1.54 decrease if the entire sample were to respond. While it is not obvious that a linear extrapolation is the appropriate specification, this approach is almost certainly preferable to the standard approach of using the sample mean without correction. This correction reduces the mean WTP from $33.62 to $32.08; the total social benefit from $1,144,761 to $1,092,324; the net social benefit from $481,061 to $428,624; and the net benefit per student from $14.13 per student per quarter to $12.59.

TABLE 1 Logistic Regression Results, Simple Specification (n = 934)

Variable	Estimated Coefficient	Standard Error	z-Statistic	Significance Level
Constant	1.1170	.20195	5.53	<.001
Price	–.033222	.006112	–5.44	<.001

TABLE 2 Logistic Regression Results, Multivariate Specification (n = 925)

Variable	Estimated Coefficient	Standard Error	z-Statistic	Significance Level
Constant	1.3595	.23124	5.88	<.01
Price	–.035467	.006306	–5.62	<.01
Distance				
< 2 mi	–.32984	.17066	–1.93	.05
2–10 mi	–.46468	.20120	–2.31	.02
> 10 mi	–1.2084	.28571	–4.23	<.01
Mode				
Bike	.78154	.33932	2.30	.02
Ride bus	.54393	.17467	3.11	<.01

Other Explanatory Variables

Support for the policy was principally a function of the price of the policy, however, other explanatory variables were examined. The results showed no statistically significant difference between men and women. Women's WTP was slightly lower than men's. Because the difference was not statistically significant, however, no correction was made.

Demographic variables that did have a significant impact are (*a*) the distance the respondent lives from campus and (*b*) the respondent's current choice of transportation mode. Table 2 shows the multivariate logistic regression results when only statistically significant variables were included. Class standing was not found to be statistically significant when controlling for distance from campus. Moreover, transportation modes other than those listed below were not found statistically significant.

One might question why drivers do not have a significantly lower WTP than all other groups. First, it should be noted that people who drive do have a significantly lower WTP than those who commute by bus or bicycle. This shows up in the positive coefficients for the latter groups. But there is no statistically significant difference in WTP between motorists and students who walk to campus. The willingness of motorists to pay for a transit pass program may reflect the benefits that motorists receive from others' increased bus use. An important benefit is reduced competition for increasingly scarce parking space. The transit pass proposal is motivated in part by a worsening shortage of on-campus (and near-campus) parking. If the transit pass has the effect of increasing ridership (as expected), then people who drive to campus will benefit from reduced competition for parking. Other benefits also accrue to motorists, including reduced congestion on the roads, cleaner air, and an improvement in transportation alternatives—such as improved opportunities to ride the bus when a car is in the shop or when gas prices rise. Apparently these benefits are sufficient to yield a reasonably high WTP for car owners.

The distance variables and transportation mode variables are dummy variables, equal to 1 if the stated condition obtains, and equal to 0 otherwise. The distance variables are for respondents who live off campus. In other words, "distance < 2 miles" means that the respondent lives off campus, but closer than 2 mi from campus. The coefficients show differences relative to the base case, which is the case in which the respondent lives on campus, and does not bike or ride the bus to school.

All of the included variables are statistically significant at a level of .05 or better. There are nine fewer observations than with the simple specification due to missing responses for these nine respondents on one or more of the included variables. The above estimates can be transformed into censored logistic regression parameters with Equation 2 above. This yields the following censored logistic regression coefficients, and the corresponding mean WTP for the various groups. Table 3 shows the effect of distance on mean WTP (for the base case where the respondent does not bike or ride the bus), and the effect of transportation mode on WTP (for the case where the respondent lives less than 2 mi from campus).

One might expect that on-campus students would be willing to pay less than off-campus students because they live within walking distance of classes and campus activities. The results to the contrary suggest that a bus pass may provide substantial value to such students in terms of access to recreation, shopping, and jobs. Buses serve campus with high frequency. Off-campus students may live further from bus lines, and they had access to cars at higher rates: 18.5% of those living within 2 mi of campus lacked access to a car, and only 9.7% of those 2 to 10 mi away lacked such access, whereas 48.2% of those living on campus lacked access to a car.

The difference in WTP between those who commute by bus and those who do not is $15.34 (Table 3). The willingness of bus commuters (or bus pass holders) to pay more is not surprising.

It is less easy to explain the higher estimate for those who ride a bike as their primary means of commuting to campus. Cyclists may place a greater value on improved air quality and reduced congestion, both of which are expected benefits from the plan. Alternatively, the result could reflect a general correlation between attitudes on the environment and the choice of bike as a transportation mode. Regular cyclists may have somewhat "greener" attitudes than the general

TABLE 3 Censored Logistic Regression Results: Effect of Distance and Transportation Mode

Variable	Coefficient	E (WTP $_i$)
Distance		
On campus		$ 38.33
< 2 miles	–9.30	$ 29.03
2–10 miles	–13.10	$ 25.23
> 10 miles	–34.07	$ 4.26
Mode		
Does not bike or ride bus		$ 29.03
Rides bike	22.04	$ 51.34
Rides bus	15.34	$ 44.64

population. Their stronger support for alternative transit systems may be a reflection of this.

Based on the above censored logistic regression results, the policy yields positive net benefits for all groups of students, except those who live beyond 10 mi from campus. This suggests that the efficiency of the policy could be improved by exempting those who live far from campus. The percentage of such students is sufficiently small that it would have only a minor impact on the cost of a transit pass for the remaining students.

Approval Levels

Another way to analyze the results is to examine the crude approval levels. Approximately 63% of respondents voted "yes" at the $15.00 and $20.00 levels. (Given the sample sizes, these exceed 50% "yes" at a 1% significance level.) At the $25.00 to $35.00 levels, weak majorities voted "yes." At $40.00 only 41% voted "yes," with support falling to 36% at $50.00.

Reasons for Choices

Immediately after the "vote" section, the questionnaire solicits reasons for the vote. The questionnaire states, "We are interested in the reasons you answered as you did. Please take a few seconds to help us understand the main reasons for your choice." For analysis, "yes," "no," and "don't know" responses were listed by price level, and separately content-analyzed into categories. Empty fields (no comment) were not counted. There were often several reasons why students voted as they did, but the most prominent comment was recorded from each student's response. No coding reliability was computed.

Reasons for Voting "Yes"

The comments returned by the 486 "yes" votes were separated into six categories. These categories (and the number of comments in each) are as follows:

- Night service (147),
- Safety (22),
- Pass price (44),
- Money saved (47),
- Environment (39), and
- Miscellaneous (77).

The night service category included comments favoring the proposal because of increased service, which was primarily the extension of later night service. The safety category overlapped to some extent with night service. Safety was considered a separate category, however, because a significant number of comments about night service directly stated safety as the main concern. Students counted in the pass price category felt the price of the mandatory bus pass was reasonable. The money saved category was for comments about financial benefits. Examples include, "If it would work, the proposed bus system seems more practical than expanding and/or raising rates of parking lots." Another reads, "It is a little cost compared to owning a car, gas, parking, parking tickets, D.U.I's, and staying safe." The environment comment category included statements pertaining directly to environmental quality. The miscellaneous category included comments too vague to record confidently in any other category.

Reasons for Voting "No" or "Don't Know"

The reasons respondents who voted "no" gave for their vote were divided into three categories:

- "Price too high" (68),
- "Service doesn't meet the individual's needs" (43), and
- "Favored an optional fee rather than a mandatory one" (42).

Of those who voted "no" because of price, higher proportions expressed this reason when the price was $25.00 or more per quarter.

The "don't know" responses followed a similar pattern. Of the total 787 responses, 157 said they "don't know" whether they would support the bus pass. The major categories of reasons were "Price too high" (33); "Mandatory nature of fee" (21); "Service doesn't meet the individual's needs" (12); and "Too many student fees already" (12).

As with the "no" votes, concern over the magnitude of the pass fee followed the price version closely. Zero to six respondents expressed this concern when prices were $15.00 to $35.00. Eight respondents gave this reason when the price was $40.00, and 12 gave this reason when the price as $50.00. Concern over the mandatory nature of the fee was expressed by those who questioned why everyone should have to pay if not everyone uses the bus system. Many of those who explained the pass would not meet their needs said they currently walk or bike to school. Finally, some people said that there are already too many fees.

DISCUSSION OF RESULTS

This study has facilitated an estimate of the average individual benefits of an unlimited-access university bus pass financed with a mandatory fee, before such a pass has been implemented. The mean student willingness to pay determined by this study is substantially above the program cost of the scenario described in the survey, providing strong justification for enacting the pass program based on net benefits to students. The finding of a positive net benefit provides some justification for adopting the pass proposal at this university, and corroborates some of the benefits documented by administrators at other universities (*3*, *4*).

The finding of higher WTP of on-campus students may be of practical significance because WTA currently builds its service around the commuter, offering reduced service in evenings and weekends. The evidence revealed in this survey indicates that, at least among on-campus students at WWU, the value of bus service is not limited to the commute, but also includes access to recreation, shopping, jobs, and other activities outside the regular workweek. This concept is magnified by the proposal's inclusion of expanded service only at night, rather than any expanded day service. Nonetheless, as was found in focus group research before this survey, and as reflected in comments by respondents, night service by WTA is a key need of students and a critical part of support for the proposed pass program.

Some evidence was apparent of majority approval levels at pass prices up to $35.00 per quarter, and strong support at the actual proposed pass fee (the level that would cover costs) of $20.00. Arguably, the sample is more representative of the student population than a typical student election turnout. Assuming the package of services and benefits in the proposal—which includes several benefits to motorists—it can be expected that this proposal will be supported strongly by a student vote.

The analysis of respondents' comments revealed many important selling points of the program, including the services (particularly the new high-frequency night route), and safety, monetary, and environmental benefits. The reasons for opposition or hesitation made it clear that some students felt they would not benefit from the bus pass. Others were uncomfortable with the mandatory nature of the fee, or with the current level of other student fees. Although the numbers expressing these concerns were small, they may merit consideration in the balancing of policy factors. Some of these concerns were most acute among those receiving the higher-price versions of the survey; this reflects a relation of such concerns with expected cost.

The appropriateness of imposing a mandatory fee is an issue that merits careful consideration. Should everyone be required to pay for a transit pass that some will not use? The justification for a mandatory pass relies on the public-good aspect of the proposal. As discussed above, the program is expected to provide benefits to motorists and others who do not ride the bus. These groups seem to recognize these benefits, as reflected in the broad support for the proposal at the actual program cost of $20.00 per student per quarter. Nonetheless, even if the average member of these groups receives positive net benefits, some individuals within each group will not. Is it appropriate to force these individuals to contribute as well? This is an example of a larger problem in the funding of public goods. If payments are made voluntary, both theory and evidence suggest that many individuals will choose to "free ride" or use the good without helping to pay for it. This leads to under-provision of the good. On the other hand, mandatory payments cause some to pay for a good they do not value highly. Even if the overall benefits of the program outweigh the costs, some individuals will experience negative net benefits. This concern needs to be weighed against the problem of underprovision associated with voluntary payments.

Finally, the question arises as to whether this study can be generalized beyond Western Washington University. While the specific benefit and cost estimates are unique to this setting, some of the broader findings may apply to other institutions. First, many institutions are facing problems of growth in the number of students and staff, combined with loss of space for parking. The use of a transit pass that funds an improvement in service while lowering the marginal price of a ride may have appeal elsewhere, because it can reduce congestion while providing other benefits. Second, the results show that a wide mix of students perceive a benefit from such an approach. This suggests an understanding of the broad scope of benefits. Even those who commute by car exhibited a reasonably high willingness to pay for the program. This implies that support for such programs may be greater than administrators or planners initially suspect. Finally, the application of the CV method described here is quite broad, and can be applied to other institutions and other transportation programs. While a consideration of benefits and costs is not the only relevant factor when analyzing transportation proposals, explicit consideration of benefits and costs—including the distribution of benefits across various groups—provides useful information to planners.

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