

## ASSESSMENT OF BICYCLE PATHS FROM USERS PERSPECTIVE

by

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### ABSTRACT

The Rhode Island Department of Transportation (RIDOT) has been on the forefront in recognizing the potential for bicycle travel to provide mobility, reduce congestion, improve environmental quality, and promote healthy lifestyles. An important component of RIDOT's mission has been to create a balanced transportation system that embraces a multi-modal approach to transportation decision-making and bicycling has remained central to the department's inter-modal planning efforts. RIDOT has aggressively pursued a strategy of acquiring abandoned rail lines to convert into scenic commuter and recreational trails. RIDOT's efforts have produced a very popular resource for touring, recreational, exercise, and commuting activities.

As part of RIDOT's continuing efforts to promote bicycle use as another form of transportation, planners in RIDOT's Intermodal Planning Division identified the need to compile a comprehensive survey of bike path activity that would provide a gauge of demand and general attitudes. The construction of several new bikeways as part of RIDOT's statewide bicycle plan have intensified the need for new and current data on path use, types of users, maintenance issues, and the positive economic potential of the state's bikeways to local businesses.

The survey results show that visitors to the bike paths came from all age groups and from all over the state. The paths are clearly facilities with wide appeal. In fact, 99.12% of respondents, answered "yes" when asked if bike path construction constituted good use of tax dollars. The results of the survey reveal enthusiastic support for the bikeways as a facility to promote a healthy lifestyle; unfortunately, use of the bike paths as an alternative facility for commuting remains near its low 1996 level. The lack of restroom facilities and drinking water were the two common complaints from visitors from all of the paths; there are safety concerns about intersections with motor vehicles.

Overall, the survey has provided the Intermodal Planning Division a valuable source of information for improving, maintaining, and providing high quality facilities. The results of this survey presented in this paper in descriptive form are useful to planners responsible for developing, expanding and maintaining bike paths in other parts of the country.

## **INTRODUCTION**

The Rhode Island Department of Transportation (RIDOT), as part of its continued pro-active intermodal transportation policy, is interested in gathering information on user characteristics of bicycle paths in the state. This information provides important indicators of user attitudes and the acceptance of these facilities for commuting, recreation and healthy exercise.

The RIDOT, jointly with the University of Rhode Island (URI) researchers conducted a survey to gauge the attitudes, preferences, and needs of bikeway users with support from the URI Transportation Center (URITC). This project represented an initial step by the United States Department of Transportation Bureau of Transportation Statistics (USDOT BTS) to enhance bicycle and pedestrian data quality and filling data gaps.

## **RHODE ISLAND'S BIKEWAYS LOCATIONS**

All four of Rhode Island's bike path facilities were built on abandoned rail lines. A brief history of each of the four paths is described below, as it may be useful for other regions contemplating construction of bike paths.

### **EAST BAY BICYCLE PATH (PROVIDENCE, EAST PROVIDENCE, BARRINGTON, WARREN, BRISTOL)**

The East Bay Bicycle Path, Rhode Island's first venture into a rail to trail conversion, was indeed the catalyst for the development of future bike paths along abandoned rail corridors. RIDOT acquired the former Bristol-Secondary right-of-way from Providence & Worcester Railroad in the early 1970's, securing federal highway funding for the design and construction of what eventually developed into a 14.5 miles bike path. The path has transformed into one of Rhode Island's recreational jewels, as cyclists, walkers, wheelchair users, and in-line skaters share this greenway corridor along scenic upper Narragansett Bay.

### **BLACKSTONE RIVER VALLEY BIKEWAY (PAWTUCKET, LINCOLN, CUMBERLAND, WOONSOCKET)**

Located in the historic John H. Chafee Blackstone River Valley National Heritage Corridor, this trail currently extends six miles along the canal tow-path and river. The newest 3-mile segment dedicated in November 2002, represents a model example of a "rail-trail" as it is located within the right-of-way of the existing Providence & Worcester (P&W) freight line. When all proposed eight project segments are completed, the bikeway will traverse approximately 17 miles of independent bike path and several short on-road bike routes from Pawtucket to Woonsocket.

### **WASHINGTON SECONDARY BIKE PATH (CRANSTON, WARWICK, WEST WARWICK, COVENTRY)**

RIDOT acquired the right-of-way of the abandoned Providence and Worcester Railroad Corridor with the intent of developing an independent bicycle path along this ten miles stretch from the Providence/Cranston city line, to its terminus at the West Warwick/Coventry border. An additional ten miles of the former rail corridor is currently under design by the RI Department of Environmental Management (RIDEM), and will eventually connect to the Rhode Island/Connecticut border, basically completing Rhode Island's segment of the East Coast Greenway. Known locally as the Trestle Trail, a section of this right-of-way will be designed as separated equestrian trail, to better accommodate multiple path users.

## **SOUTH COUNTY BIKE PATH (SOUTH KINGSTOWN, NARRAGANSETT)**

Much of the path was developed using abandoned railroad property and currently the bike path extends from the Kingston railroad station to Narragansett. Plans are underway to extend the path an additional 1.5 miles from Route 108 to Mumford Road.

## **SURVEY METHODOLOGY**

The construction of the user survey was based on a USDOT, Bureau of Transportation Statistics 2000 report, *Bicycle and Pedestrian Data: Sources, Needs & Gaps* as well as the survey instrument used in a 1996 survey of East Bay bike path users performed by RIDEM with the support of Brown University and Development of a Model Survey for Assessing Levels of Bicycling and Walking (Stutts, 1994). The survey consisted of two phases: the on-path phase, during which visitors to the bike path were asked to fill out a short questionnaire while they were using the path; and the off-path phase, which was more extensive survey that visitors filled out at home. The on-path questionnaire asked the participant to provide either a street address or an email address so that a more thorough survey could be mailed to them or a link to an online version of the survey could be emailed to them.

The on-path interviews on the East Bay and Washington Secondary bike paths were performed by URI students and a former RIDOT employee while, the South County surveys were distributed entirely by URI students. The Volunteers-in-Park Program volunteers played a pivotal role in obtaining the surveys for the Blackstone Valley bike path.

The interviewers were given detailed instructions on how to identify themselves, explain their purpose, and describe the two-phase approach to the survey when they approached users of the path. The interviewers reported a pleasant experience in the conduct of this survey, observing that most of the users of the paths were enthusiastic users of the paths.

## **SAMPLING PLAN**

The sampling of the visitors to the bike paths was spread over eight weeks: four weeks in August, two weeks in September, and two weeks in October. The days of the week and the time of day were randomly selected. For the days of the week, three days were randomly selected (without replacement) between Monday and Friday and two sampling times were selected between Saturday and Sunday. Each day was divided into three time slots: 7:00 a.m.-11:00 a.m.; 11:00 a.m.-3:00 p.m.; and, 3:00 p.m. -7:00 p.m. The time slot for each day was randomly selected. The locations where the interviewers were placed varied as well. For each path, some locations were identified as likely access points to the path. Then, for each path, the location was randomly selected for the interviewer to conduct the survey.

As the survey progressed, some adjustments needed to be made due to inclement weather and/or the availability of the interviewers. In the end, the goal of sampling each path for twelve hours during the week and eight hours during the weekends for eight weeks was accomplished.

## **METHODS OF DATA COLLECTION**

The survey was conducted in two phases. During the first phase, interviewers were placed on the bike paths following the sampling plan described earlier where they distributed a short questionnaire to willing users of the bike paths. At the bottom of the survey, the bike path users were asked to participate in a longer, in-depth survey. To participate in this follow up survey, users had the choice of supplying either their street address or email address. Those who gave their street address were mailed surveys with prepaid return envelopes while those who listed an

email address were emailed a link to an online version of the survey. As a result of the data collection process, two sets of data were gathered: on-path data and off-path data. The survey results will be presented mostly as estimated percentages and their standard errors (SE) will be provided when applicable. Slightly over half of the path users selected the option of having the survey mailed (50.95%, SE=1.38%) to their street address while 14% (SE=0.96%) did not provide any contact information.

A total of 1,309 surveys were collected on the bike paths between August of 2002 and October of 2002. Typically, one person per group filled out the survey; the survey asked for the size of the group (broken down by age). Taking group size into account, the 1,309 surveys represent a total of 2,410 people using the bike paths during the sampling times. The average group size was two, with fifteen groups of more than ten individuals being reported. The largest group had 42 members.

The response rate for the mail-in survey was higher than for the online option: 64% of those who requested a paper survey returned it while 57% of those who provided an email address completed the survey online. Six percent of the email addresses resulted in "Return to Sender -addressee unknown" messages. The overall response rate was 53% (=688/1,309, SE=1.38%).

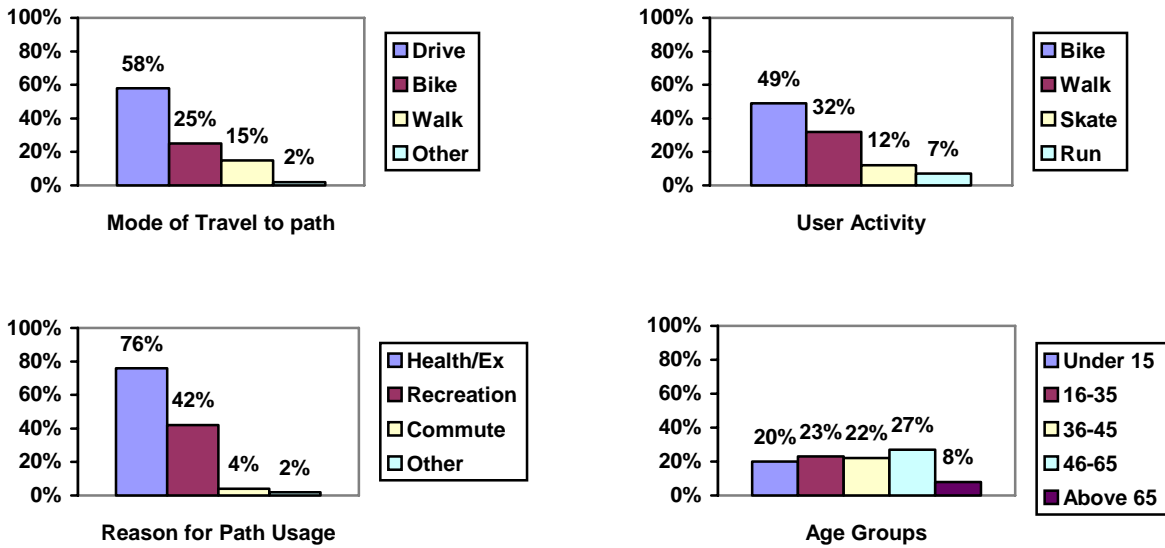
## **ON-PATH SURVEY DATA ANALYSIS**

Driving was the most common method of traveling to the path. Overall, biking to the path was second most popular mode except for the East Bay bike path, where walking was second. Though, bicycling was the most prevalent activity (49%, SE=1.38%), walking (32%, SE=1.29%) and skating (12%, 0.90%) were also noted as significant use of the paths. "Health/Exercise" topped the choices on the reasons for using the path, followed by "recreation", and a small percentage for commuting. This is important data for health practitioners considering recent trends in the prevalence of obesity among American adults.

The demographic characteristic gathered about the path visitors (sampled total of 2,510) showed that the age groups: under 15 (20%, SE=0.80%), 16-35 (23%, SE=0.84), 36-45 (22%, SE=0.83%), 46-65 (27%, SE=0.89%), and 65 and above (8%, SE=0.54%) were evenly distributed except for a smaller proportion in age group 65 and above. When individual paths were considered, some patterns were observed in the users' age distribution. From the contingency table analysis we note that the percentage of "under 15" was higher than expected in South County (25.4%) and lower than expected in East Bay (15.62%). The age groups "16-35", "46-65" and "over 65" were higher than expected in Washington Secondary (27.97%), East Bay (31.37%) and the Blackstone (15.83%) bikeways respectively. The "36-45" age group was lower than expected in the Blackstone River bike path. That is, the younger population was more prevalent in the South County path and the older one in the Blackstone River path. The graphical presentation of some of these on-path survey results is given in Figure 1.

## **OFF-PATH SURVEY DATA ANALYSIS**

The off path survey consisted of five sections, four to address specific objectives -path usage, commuting, infrastructure/operation/maintenance and economic impact- and one to gather demographic data.



**Figure 1.** On-Path Survey Results

**DEMOGRAPHIC DATA**

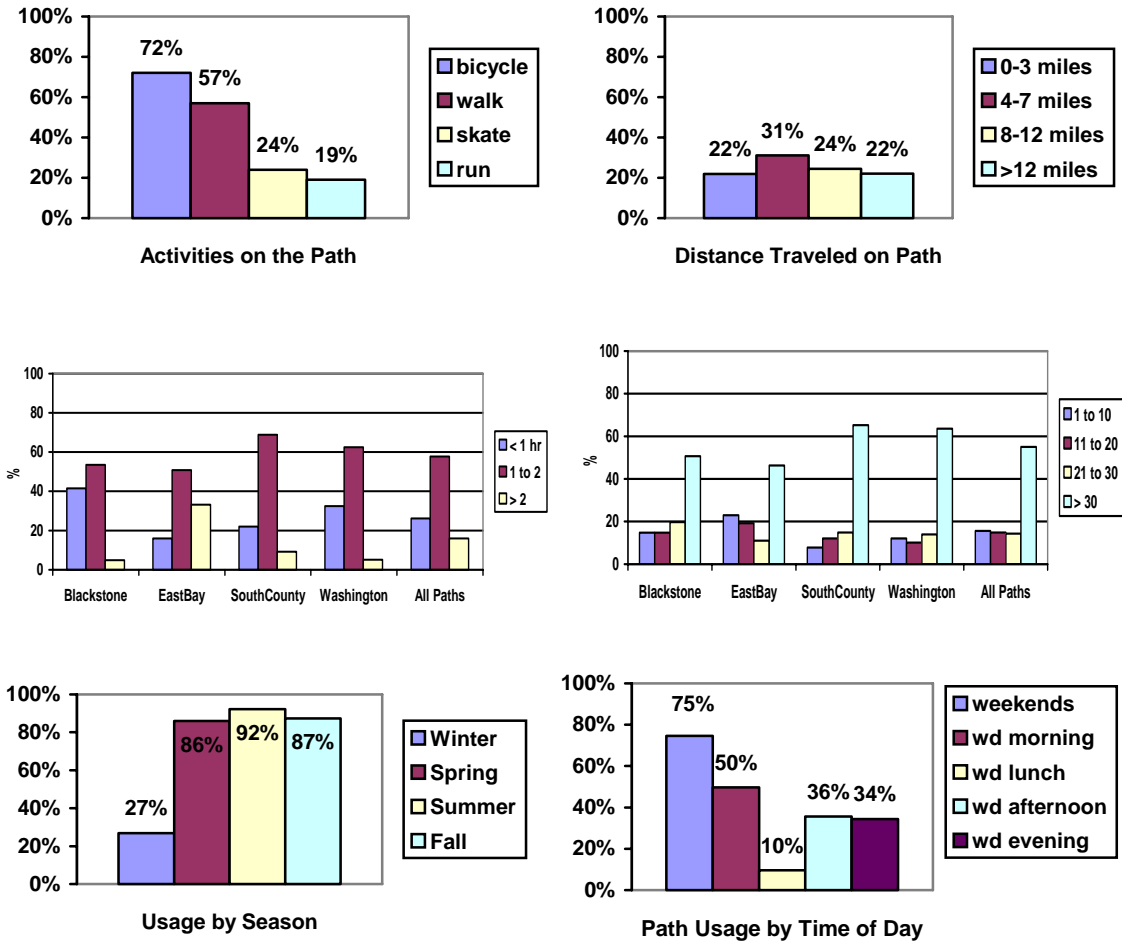
Among the respondents, 87% (SE=1.28%) live in Rhode Island while 9% (SE=1.09%) live in Massachusetts. Responses were received from residents of Connecticut, Indiana, Maryland, New Jersey, New York, and Vermont indicating that bike paths encourage tourism.

**PATH USAGE**

Most users (60.02%, SE=1.87%) drive to the bike path, with bicycling (24.42%, SE=1.64%) and walking (14.10%, SE=1.33%) being the second and third modes of transportation, respectively. This indicates the necessity of parking facilities near the entrances to the bike paths. To determine how the paths are being utilized, respondents were allowed to select all of the activities they participated in on the paths. Bicycling was the overall favorite. Seventy two percent (SE=1.71%) of all respondents stated that they had used the path for this purpose. In response to the distance traveled and time spent on the path, 4-7 miles of travel on the path was the most popular (31%, SE=1.76%) with the other categories ranging from 22%-24% (SE=1.58-1.63%). Users tended to stay on the path 1-2 hours, with 58% (SE=1.88%) of all users selecting this option. The category of less than an hour was the second most popular option. On the question on frequency of use -defined as the number of visits to the paths in the last calendar year 2001-, most users responded that they used the path more than 30 times per year. The paths are heavily used during spring, summer, and fall. During winter, usage of the paths drops off markedly from 90% (SE= 1.14%) experienced during the “warm” months down to approximately 25% (SE=1.65%) during the winter months.

For the question on the time of day when the paths are used, respondents were allowed to select all time slots which apply rather than pick just one. With 75% (SE=1.65%) of the users reporting weekend use, this was by far the most popular time of the week for the paths to be utilized. It is evident that from this data it can be observed that the bike paths are used more for recreational purposes than for commuting to work. During the week, 50% (SE=1.91%) of the respondents use the path in the morning, afternoons and evenings garnered 35% (SE=1.82%) usage, and lunchtime was last at 10% (SE=1.14%). Part of the survey also addressed health and

safety issues. A large percentage (94%, SE=0.91%) of the users responded that “health/exercise” was their reason for using the path. Similarly, 99.42% (SE=0.29%) of the users responded positively that bike paths are a mean to promote healthy lifestyle choices. Only 7% (SE=0.97%) of the users reported using a helmet when it would have been appropriate to do so. Figure 2 gives a graphical representation of these results.



**Figure 2.** Off-Path Survey Results: Path Usage

Promoting bicycle use as an alternative form of transportation remains a priority for RIDOT and its goal of developing a well-balanced inter-modal transportation system. Based on the results gathered in this section, it is clear that greater education directed toward potential bicycle commuters, especially targeting those people working in downtown Providence, is needed. The Providence Foundation’s Bike to Work and College Program, funded through RIDOT’s Congestion, Mitigation and Air Quality Improvement Program (CMAQ) is indicative of the importance of educating the public on bikeway facilities and their potential to increase commuting by bike more attractive.

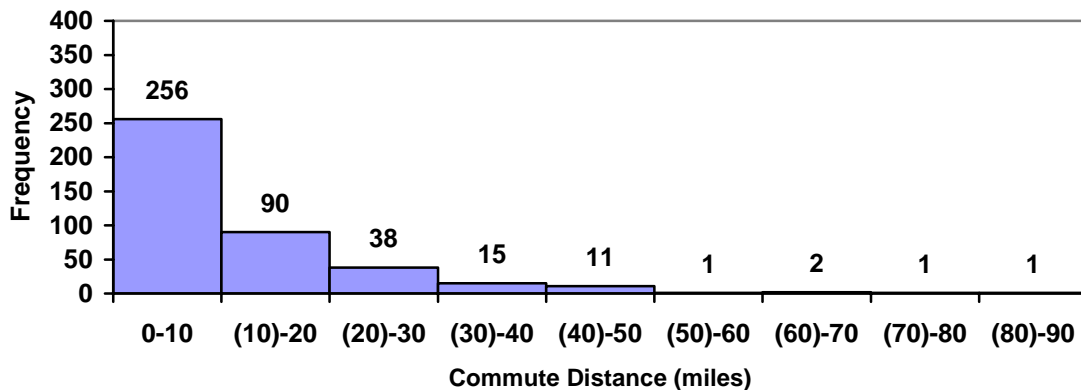
On a positive note, the fact that “Health and Exercise” (99.42%, SE=0.29%) was the most popular reason for using the path indicates that path users are opting to increase their physical activity levels. This is important data for Rhode Island health practitioners considering recent

trends in the prevalence of obesity among the United States adult population. Recently published finding by the U. S. Centers for Disease Control and Prevention (CDC) affirms what many doctors have long asserted—that *obesity is a major factor in America’s rising health care costs and makes the case that obesity should be targeted as aggressively as smoking.* (*Health Costs of Obesity Near Those of Smoking*, The Washington Post, Ceci Connolly, May 14, 2003.)

**COMMUTING**

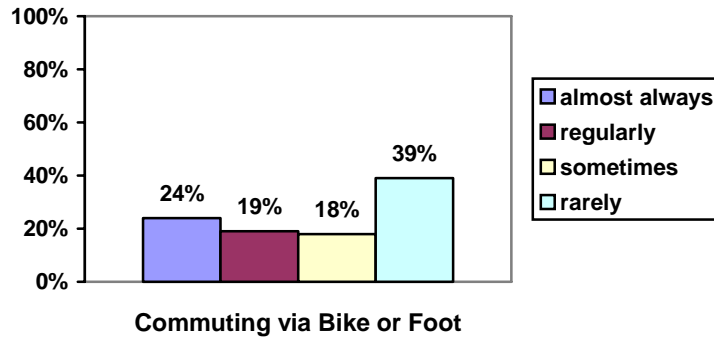
The bike paths provide an alternate means of commuting yet the 1996 survey revealed that the East Bay path was being underutilized with respect to commuting. The purpose of this section of the survey was to gather information about commuting: specifically, the level of path’s usage for commuting and what do users see as barriers to using the bike paths for commuting.

The approximate distance of commute (one way) was answered by only 415 of the 688 respondents. The average distance commuted was 11.76 miles (SE=0.64), with a maximum commute of 90 miles and the minimum commute of 0 (26 of the 415 respondents work at home). This indicates that Rhode Islanders have a shorter daily commute than the national average (17.75 miles one way) as reported in “*Highlights of the 2001 National Household Travel Survey*” published by the Bureau of Transportation (BTS). The distribution of the commuting distance of respondents to the survey is given in Figure 3. That is, 256 individuals commuted between 0 to 10 (inclusive) miles, 90 commuted between 10 (exclusive) and 20 miles (inclusive), 38 commuted between 20 (exclusive) and 30 miles (inclusive) and so on.



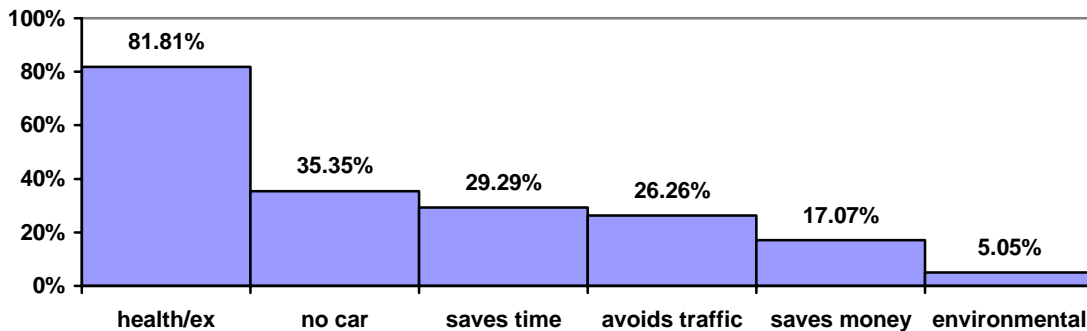
**Figure 3.** Distribution of Commute Distance

Only 571 survey respondents filled out part or all of this section of the survey. From these 571, only 99 (17.34%, SE=1.57%) commuted by walking or bicycling in the last year. Of the 99, 24 (24.24%, SE=4.31%) commuted by bicycle or foot almost always, 19 (19.19%, SE=3.96%) regularly, 18 (18.18%, SE=3.88%) sometimes and 38 (38.38%, SE=4.89%) rarely (Figure 4). Of the commuters, just over half (51.52%, SE=5.02%) have used the paths to do part/all of the commute, while just under half (48.48%, SE=5.02%) have not used the paths for commuting at all.



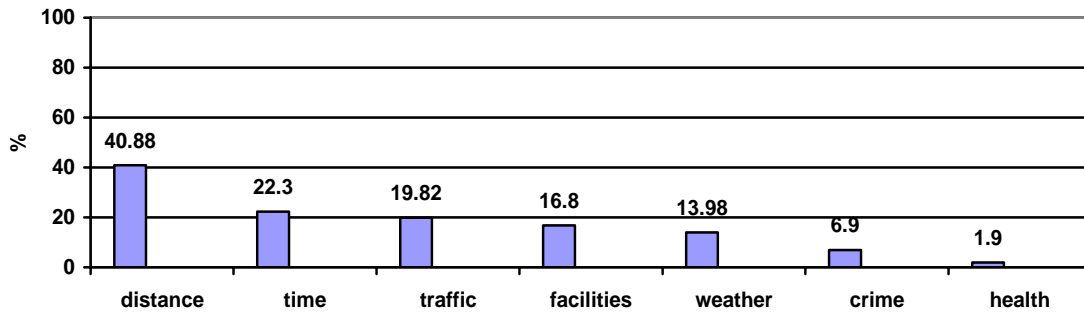
**Figure 4.** Commuting

Bicycle and pedestrian commuters were asked to identify the reason(s) why they commute via bicycle or foot. Health/Exercise was by far the most favored reason with 81 out of the 99 (81.82%, SE=3.88%) commuters citing this as their motivation. Other responses, which were noted include not owning a car (35.35%, SE=4.80%), saves time (29.29%, SE=4.57%), avoids traffic (26.26%, SE=4.42%), and saves money (17.07%, SE=3.78%). Five commuters indicated that environmental concerns prompted them to commute via bicycle or foot (Figure 5).



**Figure 5.** Reasons for Bicycle/Foot Commute.

The question addressing reasons why people do not commute, via bicycle or foot was, answered by 565 respondents. Respondents were allowed to identify all of the factors which precluded commuting via bicycle or foot - they were not restricted to selecting just one reason. The main problem faced by commuters is the distance of their commute: 40.88% (SE=2.07%) noted this issue. Not having enough time (22.3%, SE=1.75%) and narrow shoulders/high traffic volume (19.82%, SE=1.68%) were noted as second and third issues. Two other significant factors were not having shower facilities at work (16.8%, SE=1.57%) and the weather (13.98%, SE=1.46%). Crime/unsafe neighborhoods (6.9%, SE=1.07%) and health problems (1.9%, SE=0.57%) were the remaining two barriers to bicycle or foot commuting (Figure 6).



**Figure 6.** Barriers to Commuting via Bicycle or Foot

Respondents were asked whether they would consider using the Rack & Ride service available on RIPTA buses as part of their commute. Over half of the respondents (56.44%, SE=2.09%) indicated that they might while one third (SE=1.98%) said definitely not. The remaining 10% (SE=1.26%) stated that they would.

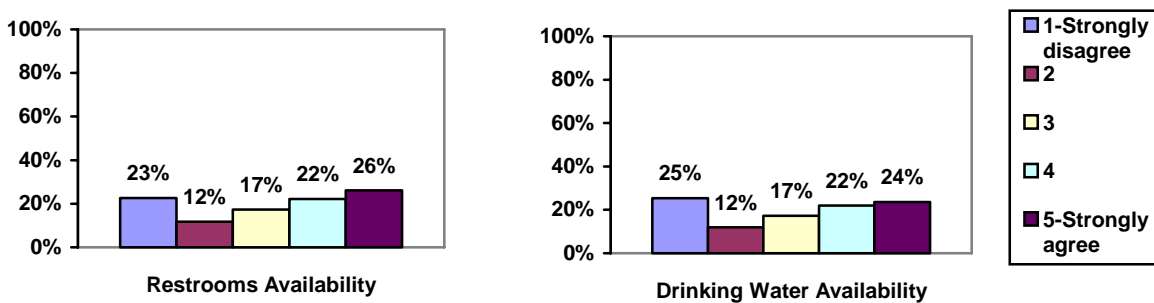
School-age children are also commuters. The survey asked whether school-age children used the bike paths as part of their trip to/from school. Out of the 566 responses to this question, 524 (92.58%, SE=3.89%) said “Not Applicable”. Twice as many said no as responded yes—28 and 14, respectively.

In a recent paper by Dill and Carr (2003), the percentage of commuters by bicycle was regressed on several explanatory variables. In the data set used in this study, the highest percentage commuting by bicycle was only 2.63% with an average of 0.93 miles/commute.

#### INFRASTRUCTURE/OPERATIONS/MAINTENANCE

For continued use of paths information on maintenance issues and safety concerns as well as quality of the “support” facilities such as parking and restroom availability, it is important to gather data. Also, users rated features that people may consider desirable traits of bicycle paths. In addition, respondents provided a measure of their support for various enhancements to the existing paths, such as the addition of police patrols on bicycles.

An ordinal scale of “1-Strongly Disagree” up to “5-Strongly Agree” was used to measure the perceived severity of a wide variety of potential problems with the infrastructure, operation and maintenance of the paths. Out of 15 problems listed, only two of them had at least 50% of the responses between 3 and 5 (moderate agreement to strong agreement) for all four paths: availability of restrooms and availability of drinking water (Figure 7).



**Figure 7.** Infrastructure

Other problems listed with varying degrees of importance are: intersections with motor vehicles, not following walk on left protocol, trail width, availability of places to rest, and vandalism on the path.

Respondents could supply their own issues or concerns in a field on the survey marked “other”. In this field, two issues with dogs were recurring themes: first, dog owners are not picking up after their pets; and second, dogs are not on leads less than six feet in length.

Within this section respondents were also given the chance to comment on enhancements. The off-path survey asked path visitors to rank, on an ordinal scale of “1-strongly disagree” to “5-strongly agree” features of bike paths that they would classify as “desirable” improvements. Among these choices were smooth riding surfaces, natural surroundings, quiet settings, safe traffic crossings, non-motorized vehicles, and access to places they desire to commute.

All of the proposed enhancements received moderate to strong support. For the question on whether bike path construction constituted a good use of tax dollars, users responded “yes” with 99.12% (SE=0.36%) of the votes being cast in favor. It should be kept in mind that this is a strata of the population that uses the bike paths -it does not necessarily represent the view of the “average” Rhode Islanders.

Summarizing, the paucity of restroom facilities and lack of freely available drinking water were common issues on all of the paths. Addition of these facilities requires capital investment and on-going maintenance. Other concerns of path users relate to walkers not following the walking on left rule. Following the completion of the East Bay Bicycle Path, the RIDOT Traffic Engineering Section, in consultation with RIDEM Division of Parks and Recreation, installed signs instructing “walkers to walk on left facing bicyclists.” Certainly, this is an area where path managers should be made aware of, as there are rules for using a bike path in order for all users to coexist and enjoy these popular facilities.

Respondents were allowed to provide additional comments, most of which related to the areas of infrastructure, operations, and/or maintenance. We provide a small sample of their “non-edited” comments in the Appendix.

## **ECONOMIC IMPACT**

The 1996 East Bay survey conducted by Brown/RIDEM found that 88% of path visitor spent money along the path with an average expenditure of \$5 per outing. The most commonly purchased item was food/drink. In this survey, users spent an average of \$3.83 per outing but the average expenditure depended on the path (p-value < 0.0001) with East Bay users spending an average of \$5.13 and Blackstone, South County and Washington Secondary spending an average of \$2.17, \$2.69 and \$2.12 respectively. When asked “While on the bike path, how often do you stop at a store near the path” the answer was dependent on the bike path they were using (p-value < 0.0001), with “higher than expected” percentage of users of the East Bay path selecting the option “Almost Always” but lower than expected number of users of the Blackstone and Washington Secondary selecting the same option. Moreover, in the Blackstone and Washington Secondary paths the most prevalent answer was “non-applicable”. In contrast, users of the South County path selected the “Never” option as the most frequent option. From the analysis above it maybe said that users are willing to spend money if there are businesses nearby the paths.

Bicycle tourism has the potential to reap additional tourist dollars for Rhode Island’s economy with RIDOT’s bike map, *A Guide to Cycling in the Ocean State*, being a catalyst for promoting bicycling as a recreational, commuting, and touring option. Only 67 respondents were

out of state visitors and when asked the question “did bike paths influence your decision to visit Rhode Island”, 47 said yes and 20 said no. What is interesting to note is that the answer to this question was also dependent on path (p-value = 0.0096), with most of the visitors to East Bay answering positively to this question and most of visitors to the other paths responding that bike paths in Rhode Island did not influence their decision to visit the state. These results seem to indicate that the main attraction to out of state visitors is the East Bay bikeway.

### COMPARISON OF RESULTS WITH EAST BAY PATH’S 1996 SURVEY

In 1996, Brown/RIDEM conducted a survey of the only path in the state - the East Bay Bike Path. Despite the fact that the current survey includes responses from the Blackstone Valley path, the South County path, and the Washington Secondary path in addition to the East Bay path, the surveys produced similar responses with respect to demographic data, path usage data, maintenance/infrastructure input, and economic behavior, the area of commuting yielded different responses. Tables 1 and 2 give a comparison of the results of the two surveys.

Two important questions were asked in the commuting section: first, reasons for commuting via bicycle/foot; and second, what prevents respondents from commuting by bicycle/foot. In both surveys, “Health/Exercise” was the primary reason respondents commuted by bicycle or foot. In 1996, the second reason for commuting had two responses: avoids traffic and the environment, both of which received 40.2%. In the current survey, “No car” was second with 36.35% (SE=1.83%) and “Saves Time” was third with 29.29% (SE=1.74%). See Table 1. The numbers in parentheses indicate ranking.

**Table 1.** Comparisons of 1996 and 2002 surveys – Reasons for commuting

<b>Reason</b>	<b>1996</b>	<b>2002</b>
Health/Exercise	86.2 (1)	81.8 (1)
No Car	18.4 (4)	36.35 (2)
Saves Time	16.1 (5)	29.29 (3)
Avoids Traffic	40.2 (2)	26.26 (4)
Saves Money	39.1 (3)	17.07 (5)
Environment	40.2 (2)	5.05 (6)

**Table 2.** Comparisons of 1996 and 2002 surveys – Reasons that prevent commuting via bicycle or foot.

<b>Reason</b>	<b>1996</b>	<b>2002</b>
Distance	51.1 (2)	40.88 (1)
Time	39.4 (3)	22.3 (2)
Traffic	58.8 (1)	19.82 (3)
No Facilities	39.37 (4)	16.8 (4)
Bad Weather	28.1 (5)	13.98 (5)
Crime	11.3 (6)	6.9 (6)
Health	0.9 (7)	1.9 (7)

The three main reasons, which prevent commuting via bicycle or foot, underwent changes between the 1996 survey and the current survey. “Traffic” was the leading reason why people chose not to commute via bicycle or foot in the 1996 survey with 58.8% followed by “Distance” (51.1%) and “Time” (39.4%). In the current survey, the order of the main three is “Distance” (40.88%, SE=1.87%), “Time” (22.3%, SE=1.59%), and “Traffic” (19.82%, SE=1.52%).

## **CONCLUSIONS**

These findings are intended to provide local and national policy makers with an enhanced quality of bicycle and pedestrian data sources. Our objective in gathering this data is to give credence to the potential for bicycle and pedestrian travel to provide mobility, reduce congestion, improve environmental quality, and promote public health. Unfortunately, it is evident from the data on bicycle commuting rates that Rhode Island's bikeways are not being used as a commuting option in any significant numbers, a result consistent with the facts reported by the Bureau of Transportation Statistics, (Issue Brief, Number 11, June 2004) that bikeways are used mostly for recreational purposes. RIDOT's proactive bicycle facility initiatives are an impetus to create a more user-friendly environment, with the goal of both encouraging and promoting alternative transportation options. The low rates of commuting by bicycle, is indicative of the American culture and its reliance on the automobile as a primary mode of transport. RIDOT's current and long-range transportation policy continues to embrace intermodalism in an effort to reduce, ever increasing congestion on our roadways. What can be done to increase bike commuter rates, further promotion of bicycling as alternative transport through publication of RIDOT's *A Guide to Cycling in the Ocean State*, support of programs such as the Providence Foundation's Bike to Work and College Project funded through FHWA's Congestion, Mitigation and Air Quality Improvement Program (CMAQ). Also by creating an interconnected network of bike paths and bike "friendly" roadways that may encourage novice and experienced cyclists to commute one day or a few days per week by bicycle. On the federal level, incentives to encourage commuting such as the Bicycle Commuter Act (S. 1093) introduced in the U.S. Senate (May, 21, 2003) would allow an employer to offer a monthly cash reimbursement to an employee who commutes to work by bicycle, providing a tax benefit to the employer and helping defray commuting expenses for the bicyclist.

Fortunately, as indicated from our data results on path usage, people are using Rhode Island's bike paths as a means to promote healthy lifestyle choices, an encouraging factor, considering the prevalence of increasing obesity rates among children and adults nationwide. Our hope is that this user survey will further USDOT BTS goal of enhancing the quality of bicycle data, filling data gaps, with the overriding goal of bettering the potential for bicycle and pedestrian travel as viable modes of transportation.

The survey instrument used, details of the sampling plan and full results of the survey are available from the authors as well as from the URI Transportation Research website [www.uritc.uri.edu/media/finalreportspdf/536182.pdf](http://www.uritc.uri.edu/media/finalreportspdf/536182.pdf) (González et. al., 2004).

## **ACKNOWLEDGEMENTS**

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## REFERENCE

- González, L., Hanumara, C., Overdeep, C. and Church, S. (2004). *2002 Bicycle Transportation User Survey; Developing Intermodal Connections for the 21<sup>st</sup> Century*. Research Report, University of Rhode Island Transportation Center (URITC), Kingston, RI. Report No. URITC FY02-08.
- Jill J. and Carr T. (2003). Bicycle Commuting and Facilities in Major U.S. Cities. *Transportation Research Record, Journal of the Transportation Research Board*, No. 1828, TRB, National Research Council, Washington D.C., 116-123.
- Krebbs, D.R. (1996). East Bay Bike Path 1996 User Survey, Rhode Island Department of Environmental Management.
- Stutts, J. C. (1994). Development of a Model Survey for Assessing Levels of Bicycling and Walking, University of North Carolina, Highway Safety Research Center.
- U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS), 2000. *Bicycle and Pedestrian Data, Sources, Needs and Gaps*, BTS00-02, Washington DC: 2000.
- U.S. Department of Transportation, Bureau of Transportation Statistics, *NHTS 2001 Highlights Report*, BTS03-05, Washington DC: 2003.
- U.S. Department of Transportation, Bureau of Transportation Statistics, *How Bike Paths and Lanes Make a Difference*, Issues Brief, Number 11, June 2004.

## APPENDIX – SAMPLE OF USER COMMENTS

Inherent in the survey design process is the trade-offs survey designers must face when determining which questions and/or issues to explore in the survey versus the length of the survey. To allow users to express their views on issues that may have been missed in the survey design phase, respondents were allowed to write in their comments for both the electronic survey and paper survey. Only a sample of their comments is presented here. Comments are not edited.

“As far as I’m concerned they are great the way they are. I don’t like commercialism.”

“Exclusion of high speed road racing bicycles. Difficult for elderly users to move out of the way.”

“I enjoy my morning walks at the Blackstone River Bikeway. I walk five miles a day. It is one of the better things the state of RI has done for the tax payer.”

“It is the best use of my tax dollars. I would love to commute all the way to Providence if I didn’t have to ride on the street.”

“Limited parking is the only conflict. Create additional parking, make it safe and add restrooms and water fountains.”

“My friends and I really enjoy walking. I find it ore interesting that a treadmill which I must use if I’m unable to go to the bike path. No better safe place, love it.”

“Please put rest benches on ½ and 1 mile for elderly.”

“It would be fun to eventually have all the paths connect together.”

“As a non-RI resident I am very grateful for the bike paths.”

“I bought a waterfront home on the bike path. I’d be hard pressed to say which I value more – the sunsets over the bay or access to the bike path. All o my gests agree – the bike path is a treasure. I think the bike path definitely is integral to Bristol’s sense of community.”

“I find the bike path very relaxing and enjoyable.”

“It is a real plus for people moving to the state. The well maintained path says something about the government here and to what importance they place outdoor activities, the environment and its citizens opportunity for recreation.”

“My eight year old son will suggest doing errands on the bike path vs using the car – grat for good health and the environment.”

“Suggest separate lanes for bikers and runners/rollerbladers.”

“The path is unevenly maintained. The seagulls litter the path with shells at the beginning in Bristol.”

“Would like more personal protection because of hooligans and criminals which preclude many paths in isolated places after dark.”

“Construction of the Bike path is the best thing that has occurred in S. Kingstown in a long time. I really look forward to its completion through to Narragansett.”

“I love the bike path and use it weekly almost daily. It would be nice to see security every now and then which I believe was promised when it was being built.”

“Maybe put up rest stations (benches) or a couple of water fountains along the way to refill my water bottle. Also, the wooden bridges that cross the streams in South County are uneven and will probably catch a wheel of my rollerblade sooner or later.”

“1. Police on bicycle patrols: Need more police particularly during Spring, Summer, Fall!!!! (A lot of gangs have vandalized the bike paths). 2. Need more safe traffic crossings.”

“All I ask for is a small map at random intervals denoting location of path/on path.”

“Bikepaths are not only good for your health but also a therapy for your mind, since you are surrounded by nature. There is a state of peace; connection between you and nature.”

“You should ask how many people have lost weight/lowered blood pressure, etc., since bike path was completed.”

“I think that the bike paths in Rhode Island are wonderful. It seems like one of the few things Government has gotten right in recent years. All that needs to be addressed is the clean up of glass from the paths, especially Cranston/Warwick/West Warwick. I use this path 4 to 5 times a week and East Providence 1 to 2 times per week.”

“I would like the results of this survey published. Bike path updates published and dated along with future planning – also a public forum for future planning, complaints, suggestions, etc.”

“I would someday like to bike or walk from Maine to Florida on the Greenway – keep it going!”

“My family and I are from S. California. We are used to an active/outdoor lifestyle. We couldn't live without the bike path! Keep up the good work!”

“Signs to indicate walkers on left and bikers on right.”

“Would like to see signs that direct the direction of travel to be a little more clearer. Seems to be a little confusing. How will the results of this survey be used?”